ECONOMIC GROWTH AND STRUCTURAL FEATURES OF TRANSITION

Edited by Enrico Marelli
and Marcello Signorelli

STUDIES IN ECONOMIC TRANSITION
General Editors: Jens Hölscher and Horst Tomann

Studies in Economic Transition

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Economic Growth and Structural Features of Transition

Edited by

Enrico Marelli

and

Marcello Signorelli

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Foreword

Twenty years of economic transition is a timely occasion to take stock of its failures and successes. This collection of studies focuses on economic growth in the period under review and therefore lies in the core of the spirit of this book series *Studies in Economic Transition*, which celebrated ten years of successful existence recently in London. The speech given on this event is published on the following pages. Many people 20 years ago would have expected transition to be over by now. This book documents that this is not the case. In fact progress has been rather modest. Also we find that concepts or measurement are still under discussion. In this current climate of the global economic crisis, interest in economic transition and in comparative economic studies is bigger than ever. Lessons can be learned for other emerging market economies and in fact for mature economies, which undergo large scale nationalization programmes as response to the crisis. Studies in economic growth can hardly be more important than in times of negative growth. This volume attempts to make a major contribution to our understanding of features of growth in turbulent times.

Jens Hölscher
President of the European Association for Comparative Economic Studies

Reflections on Progress in the Transition*

Brigita Schmögnerová

I would like to thank the organizers for the privilege to speak on this important occasion when we celebrate the tenth year anniversary of *Studies in Economic Transition* Series. Allow me to use this opportunity to share with you a few thoughts, some of which might appear to be a little provocative.

I would like to commence my speech with references to two reports.

A fortnight ago *The Lancet Medical Journal* published findings from a research (www.thelancet.com. 15/01/09) according to which 'shock therapy' and rapid mass privatization can account for a considerable increase in short-term mortality rates among working-age men in the former Soviet Union who lost their jobs in the early 1990s because of 'transition recession'. The deaths were directly caused by alcohol poisoning, poor diet, stress, and also due to inadequate healthcare and social care provided to unemployed. The most affected were Russia, Latvia, Estonia, Lithuania and Kazakhstan where the speed of reforms was the most rapid and increase in men death rates between 1992 and 1994 was by around 40 per cent. As a consequence of their research the authors warn societies undergoing economic and social transitions to better consider the extent and speed of such changes and effects of the changes on the population's health.

In 2006 the EBRD in collaboration with the World Bank surveyed 29,000 households in the post-Soviet bloc (and Turkey) asking them how transition has affected their lives (*Life in Transition*, EBRD, London 2007). According to the survey more than 50 per cent of the households responded that they live worse nowadays than around 1989 and only 30 per cent agree or strongly agree that their households live better nowadays. At the same time, a majority (54 per cent) believe that children who are born now will have a better life than current generation.

What implications could be drawn from the reports and what lessons can be learnt? Quite a few, but I would like to refer to one: both reports – the Lancet's report and the EBRD's survey – show that transition from

* Speech (revised) given at the Ten Year Anniversary Celebration of the Palgrave Macmillan *Studies in Economic Transition* Series, London University College, 30 January 2009.

the centrally planned economy (CPE) to a market economy, apart from an impressive record of achievements, has been associated with hardship. EBRD's survey also shows that the hardship has not been distributed evenly. Indeed, transition has generated winners and losers. In most transition countries, according to statistical data, income inequalities have deepened considerably. Life satisfactions in the transition countries tend to be the lowest of any country ranking.

The lesson to be learnt is the following: when celebrating the tenth anniversary of the *Studies in Economic Transition*, it is appropriate to recognize that transition is not only a subject for studying but that it is an everyday reality for hundreds of millions of people. As a matter of fact it is not a short episode in their lives: we will celebrate the twentieth anniversary of the fall of the Berlin wall this year. Most studies of the economic transition in general have concentrated on transition process and not so much if at all on the result of transition on human lives. This shows clearly a lack of interest in the political economy of transition process despite the observation that most of the transition economies have experienced 'stop-and-go' reform policies due to the fact that very few 'reform' governments have been re-elected for the second term. This was the way how population reacted to the hardship of transition.

The second point, which I would like to make, is on the speed of transition process. In the early nineties there was the intensive discussion on the speed of the process and the two approaches have been discussed: rapid versus gradual transition. Majority of policymakers, from the left to the right political spectrum decided for a rapid transition and radical reforms as advised by international financial institutions (IFIs) and as a condition for having access to international financial capital provided by them. Today it is much better understood that some components of the transition are possible and desirable to be implemented rapidly (like price liberalization) and others (like development of private sector, market institutions, change of behaviour, and so on) can develop only gradually. In general transition is a time-consuming and a complex process.

The third point, which I would like to make, is on the role of state in transition. The dominant aspect of a neo-liberal approach to transition was a minimal state. The dismissal of a state in the early years of transition was also a reaction to the 'big state' in centrally planned economies: pendulum was swinging from one extreme to another extreme point. The transition paradigm has been later adjusted recognizing the role of state, and a need to redefine its role as compared to the role of state in the planned economy, but it took time. The price for the loss of time was high: for some time non-existing or improper functioning of market institutions, inability to address market failures, bad governance, and so on. The recognition of a role of state in developing a regulatory framework had accelerated in transition countries accessing to the EU as they were requested to adopt *acquis communautaire*.

However, many non-accession countries had more difficulties with defining a role of state and to introduce an appropriate division of labour between state and market or experienced a weak, often corrupted, state not capable to perform its functions.

This brings me to the fourth point: on progress in transition. A huge heterogeneity in progress in economic transition can be observed across the former Soviet bloc. EBRD classifies its countries of operations into three groups: advanced transition countries, intermediate and least advanced transition countries; and produces sector-based measurements of progress in transition. The Bank has also recognized different stages of transition: market creation (first phase) and second and third phase of transition defined as deepening and sustaining markets through stronger public and corporate governance and better provision of the public goods including infrastructure, effective state regulation and enforcement of law. Wide variation across the transition countries is not only the result of different stage of transition; different initial conditions which played a bigger role at the beginning, different geopolitical, historical, cultural, and so on; factors also play a role. One implication is that there is no 'one size fits all reform policy'. Another finding is that reform policies must be also adjusted to the transition phase. Regarding the role of state in early transition countries there could be situations where advancing transition may not require a reduction in the role of state but just the opposite: its bigger role in some sectors.

The Bank's document raises an interesting issue of the end point of transition. It does not provide any definition of the 'end point' but at the same time points to the importance of introducing the quality dimension of transition with emphasis on governance and quality of market institution. In other words, quantitative measurements like percentage of private sector in GDP, and so on, are not sufficient to measure progress in transition*.

Debate on advancement in transition has an imminent 'prestige' dimension: the most advanced transition economies wish to be addressed as 'post-transition' or 'market economies' or 'emerging market economies'.

Review of the transition history provides an interesting insight to drivers of reforms. More research in this aspect is needed. Reforms in the first stage defined by transition orthodoxy were imposed by the IMF and the WB as a conditionality for providing financial assistance in the form of stand-by arrangements, structural adjustment loans, and so on. The second stage of reforms in the accession countries was strongly affected by adoption of *acquis communautaire*. The EU accession – as known – was an 'engine of reform'. The third stage of reforms for new-comers to the EU is marked by

* "Fighting the Crisis, Promoting Recovery and Deepening Transition", Internal Document, EBRD, February 2009.

two aspects: first by greater discretion of political parties in power to make reform decisions, second by the agenda in the EU: like progress in Europeanization, EU response to globalization, and so on. This shows that the weight of key players in the reform process has been changing depending on the stage of transition. One can make another observation: different key players – to some extent – expressed different preferences in promoting reform process. Therefore, for transition countries with the prospect of EU integration three different phases in the transition management could be identified: the dominant role of the IFIs in the first phase of transition, the EU or more likely the European Commission in the second phase and more discretion in the reform policies for political parties in power in the third phase of transition. However, the above scheme on the role of different players in history of transition is being altered by the recent crisis. What we can observe is the renewed role of the International Monetary Fund (IMF) in the transition countries as touched upon below.

Finally, I would like to raise a question, what will be the impacts of the current financial and economic crisis on countries in transition and on transition process? In the early stage of the crisis there was some school of thoughts about decoupling the crisis that originated elsewhere and the transition economies. It did not take long and namely Central and Eastern Europe experienced the hardest hit among the emerging markets. Notwithstanding the fact, there remains significant diversity of the size of the crisis within the transition economies. Crisis revealed weaknesses in transition reforms in many transition economies: poorly functioning market institutions like failure of banking regulators, failure of risk management and more general corporate governance in the banking sector, under-developed long-term local currency markets, and so on; lack of diversification of economies like reliance on oil and gas in Russia, Kazakhstan, and so on, and car industry in Slovakia; unsustainable model of convergence when the catching-up process has been often artificially accelerated by inadequate domestic policies of governments and central banks often characterized by excessive pro-cyclicality.

As a matter of fact the rapid pre-crisis convergence process of transition economies with advanced economies in the current crisis is being slowed down and in numerous cases reversed. The crisis will also have significant negative social consequences: rise in unemployment as a result of recession and reversed work migration from host countries back to sending countries accompanied by drastic cuts in remittances, particularly in the Western Balkans, Moldova, Tajikistan, Kyrgyzstan, and so on; rise in household 'bankruptcies', rise in poverty, and so on.

It is too early to see the implications of the crisis on the future integration of transition economies with the advanced economies and particularly on the future of the EU enlargement. But as the euro-zone entry is more on the agenda of some new EU Member States which experienced a considerable shake-up of their currencies or currency regime in the current crisis, the reality is that the crisis has deferred their euro-zone accession because of considerable worsening of their non-compliance with most of the Maastricht criteria.

Impact of the crisis on the transition process generates two contradictory tendencies. One is the tendency towards transition reversal as some governments implement counter-market measures including growing state involvement in economy, economic protectionism, slow-down of pension reforms, and so on, re-enforced by the erosion of confidence in the transition model, lower trust in FDI and namely FDI in banking viewed as a factor of instability and last but not least by shrinking new middle class considered as a strong advocate of reforms.

The opposite tendency is based on lessons learned from the crisis and the will to use the crisis as an opportunity to speed up implementation of the impending reforms or adjusting the former reforms, if needed. This tendency might be strengthened in the countries seeking assistance from the IMF in the form of stand-by-arrangements requiring governments to undertake additional reforms. It is important that the IMF programmes do not fall back to its ‘transition orthodoxy’ as historically in the first phase of transition and that its macroeconomic stabilization requirements assist in restoring market confidence without pressing the edge. As pointed out in the EBRD paper, the crisis should be an opportunity to reaffirm the importance of appropriate regulation and good governance and not pure market fundamentalism.

Ladies and gentlemen, we celebrate the tenth year anniversary of *Studies in Economic Transition*, edited by Jens Holscher and Horst Tomann in cooperation with a publishing house, Palgrave. The success of this series is due to their leadership and capacity to mobilize excellent economists in the European universities and research centres including in Central and Eastern Europe. May I congratulate the editors, publishing house and authors to the anniversary and express the wish that this is not the end of the series as it is not the end of transition yet.

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Introduction

The aim of the book is to investigate, theoretically and empirically, some key aspects and differences of economic growth as well as the main structural features of development in transition countries. In the empirical analyses the two decades – from the 1989 fall of the Berlin wall to the 2008–2009 global financial crisis and recession – are generally considered. Most of the chapters refer to the European transition countries, in particular the new European Union (EU) members (NMS); however, in some chapters a comparative perspective (Eastern versus Western European countries) is adopted, in order to highlight the peculiarities of transition countries.

The first chapter includes a thorough discussion of the main characteristics of transition and the key role played by institutional change in the transition toward 'market economy'. This chapter is also useful for understanding the links, interdependences and complementarities between the different chapters as well as the rationale of their presence and sequence in the book. The chapters included in Part I investigate the main characteristics of economic growth and its determinants: the 'new' governance, human capital, social capital, and the trade-off between productivity and employment. A second group of chapters (Part II) deals with the structural features and regional performance of the development processes, encompassing such aspects as sectoral structure, the changing spatial distribution of economic activities and the increasing regional disparities; the new foreign relations of transition countries in the global economy, which are also discussed in Chapter 1, are further developed in a chapter dedicated to trade relations with the EU. One of the most evident effects of transition to market economies concerned the (structure and performance of) labour markets: it is known that in the 'planned economies' there was virtual full employment (accompanied by low productivity levels and dynamics), while during the transitional recession huge unemployment appeared. Thus, the following set of chapters (Part III), after an analysis of the changes in income distribution, investigates the institutional and structural characteristics of labour markets in transition economies, their performances, the 'job quality' and diffusion of irregular employment, the persisting imbalances (at the sectoral, regional or age-group levels).

In order to collect theoretically innovative and up-to-date empirical research on these issues, we have selected some high-quality conference papers presented at the relevant 2008 international conferences, especially the European Association for Comparative Economics Studies (EACES) bi-annual Conference (Moscow, 28–30 August 2008). The above conference papers have been largely revised, updated and improved by the authors, according to the suggestions received by anonymous referees.

The comprehensive investigations concerning economic growth and the main structural features of transition – based on the state-of-the-art theories and on the latest data covering not only the first stages of transition but also a long horizon including key recent evidences on 2008–2009 crisis and world recession (thus capturing the long-term consequences of institutional and structural change together with the crucial role of active economic policies) – may be useful for many researchers, scholars and students in the fields of economics of transition, economic growth, development economics, regional economics and labour economics.

With the aim of allowing the reader to perceive a more precise, although introductory, idea of the content in all chapters, distributed in three parts, we provide here a brief summary of each one.

Chapter 1 – Economic Growth and Structural Features of Transition: Theoretical Framework and General Overview (E. Marelli and M. Signorelli)

This chapter presents a theoretical framework useful to understand the main features of the complex dynamics and relations characterizing transition processes, especially in Central and Eastern European Countries (CEECs). A heuristic model is used to illustrate complex, multi-faceted phenomena and links between variables. The core of the 'great transformation' in transition countries is identified in the process of 'institutional change', which interacts with four additional spheres: (i) economic growth and development, (ii) structural change and regional performance, (iii) inequality and labour market evolution, (iv) relations and shocks in the global economy. The heuristic model is integrated and supported by a partial review of the main literature, both theoretical and empirical, concerning the specific aspects discussed. Chapter 1 also presents some key data concerning the process of institutional, economic and structural change over a 20-year period, with special (but not exclusive) reference to EU NMS. The empirical evidence includes recent data and forecasts highlighting some effects of 2009 world recession. This general information offers an introductory overview of the main characteristics of transition, to be complemented by the more specific empirical evidence provided in subsequent chapters. The chapter closes by stressing the appropriateness of following a 'comparative' approach and also sketching the consequences of the 2008–2009 financial and economic crisis. In conclusion, the aim of this chapter is to show – in a unified framework of analysis – the links, interdependences and complementarities between the specific studies included in the remaining chapters of the volume.

Chapter 2 – Governance, Institutions and Growth: Empirical Lessons from the Post-Communist Transition (C. J. Gerry, J-K. Lee and T. M. Mickiewicz)

The post-communist countries of Central Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) have proved to be a fertile arena in which to empirically explore the role of institutions and economic policy in promoting economic development. In the first part of the chapter, the authors review the theoretical and empirical literature on the role of institutions and macroeconomic performance in determining economic growth. In the second part, using panel data since 1989, the authors revisit the empirics of economic growth in the context of the post-communist transition. In particular, they examine the role of both traditional factor accumulation variables and variables relating to policy choices and governance. Through a careful deployment of robust panel econometric techniques the authors make two key claims. First, while macroeconomic stability promotes economic growth in the countries of CEE and the CIS, robust institutions and good governance are what 'condition' the attainment of macroeconomic stability – a result that finds support in the context of the 2008–2009 global financial crisis. Second, as transition has progressed, human capital investment has regained its significance as a key driver of economic growth.

Chapter 3 – Human Capital and Social Capital as Interacting Factors of Economic Development (A. Kaasa and E. Parts)

Cross-country differences in income levels and economic growth rates can only partly be explained by the differences in physical capital endowment, as it constitutes only a small part of a society's total capital. This chapter concentrates on the more intangible assets like human and social capital which are expected to play a significant role in economic development not only directly, but also via interaction with each other, resulting in lower transaction costs and hence higher productivity levels. In fact, individuals and their human capital do not exist in isolation – instead, the value of the abilities and skills of individuals depends on the social and institutional context within which they are embedded. The purpose of this chapter is to analyse the reciprocal relationships between human capital and social capital as interacting factors of economic development: both factors are assumed to play a significant role in the economic development, as they complement and influence traditional growth factors like investments into physical capital, innovations, exports and population growth. These hypotheses are tested on the sample of 29 European countries. Data (since 1999) come from two main sources: World Values Survey and Eurostat. Methodologically, factor analysis and regression analysis are used. A number of regressions (estimated in different specifications including interaction terms of intangible growth factors) confirm the importance of several cross effects of human and social capital on economic development. More specifically, education and institutional trust seem to work together, while formal participation, political activity and quality of governance appeared to be the most influential individual social factors of economic development. The joint effect of human and social capital appears mainly in interaction of educational levels with institutional trust, indicating thus the importance of trustworthiness of public institutions in order to realize the potential of human capital. This is especially important in transition countries where educational levels are relatively high but institutional trust is much lower than in the rest of the Europe.

Chapter 4 – Productivity, Employment and Human Capital in Eastern and Western EU Countries (E. Marelli and M. Signorelli)

This chapter analyses some features of the economic performances in EU-27 members, especially highlighting the peculiarities of transition countries. In particular, the focus is on employment rate and productivity levels and dynamics (since 1990); on the trade-off between employment growth and productivity growth; and, lastly, on the main determinants of the productivity differences between countries, with a special consideration for human capital. After a partial review of the theoretical and empirical literature, a preliminary 'descriptive' analysis allows different 'models' of economic growth (extensive, intensive, virtuous or stagnant) to be detected during the post-1989 period. In the econometric investigations (cross section and panel analyses), the authors try to explain the differences between countries in the levels of labour productivity (especially for the post-2000 period) by considering differences in the human capital level as well as in some other explanatory variables (R&D, competitiveness, the progress in transition, some structural indicators and synthetic indices of specialization, the extent of the 'shadow economy' and, at last, the employment rates). The institutional proxy turns out to be particularly significant in the case of transition countries. As for the typologies of growth, the two blocs (East and West) moved in opposite directions: from an 'extensive' model to an 'intensive' one in the Eastern countries; from 'intensive' to 'extensive' in many Western countries. The policy implication, on this point, strictly recalls the

EU Lisbon's goal to achieve 'more and better' jobs. Finally, the econometric results concerning the education variable place human capital as a key factor of productivity differences and emphasize the peculiar conditions of transition countries.

Chapter 5 – Trade-off between Productivity and Employment in Transition Countries: An International Comparison (M. T. Choudhry and B. van Ark)

This chapter presents an empirical analysis of the trade-off between productivity and participation in different regions of the world (since 1980), with a particular focus on transition and developing economies. Patterns of employment productivity trade-off have been analysed across regions and different income groups. The results of this analysis show that the intensity of this trade-off varies across countries and depends on different income groups and regions. Cross-country empirical analysis shows that the trade-off is weak in developed, high income economies and fades away in less than five years. However, trade-off is stronger in developing and transition countries and weakens slowly after multiple years. The trade-off has become weaker after 1995 for all regions and income groups except transition economies. This diversity in the pattern of trade-offs can be explained by differences in structural transformation phases and dissimilar labour market institutions between transition and developed countries. The results also suggest a low productivity trap for Africa because of unproductive employment growth, whereas the Southeast Asian region shows positive growth both in employment and productivity. The extent of this trade-off for female workers and young and aged workers is also investigated.

Chapter 6 – Sectoral Structure and Productivity in the EU: New Member States' Adjustment to Structural Transformation (T. Paas, J. Sepp and N. J. Scannell)

This chapter affords empirical insights into the structural transformations undergone by EU countries during the recent decade. The method of principal component is employed in concert with regression analysis; on the basis of the resultant aggregated indicators of economic structure, three distinct sub-groups emerge among the EU-27 countries: (i) West and North European welfare countries with developed service economies (Sweden, Denmark, Finland, Germany and so on); (ii) South European countries where tourism maintains a stronghold within the economic structure (for example, Portugal, Greece, Spain); and (iii) East and Central European countries where the production sector share is relatively large, albeit declining, and gradually yielding to business and service sectors (the Baltic States, Poland, Hungary and so on). Experiences among members of the first two groups combined, constituting EU-15, may prove a harbinger for the prospective development paths of the EU-12, whose members confront contemporary challenges in connection with weathering the deindustrialization phase and segueing from low to high value-added sectors. The chapter also features a comparative analysis of the Estonian economic structure vis-à-vis the EU. The Baltic States' favourable geo-coordinates flanked by the proverbial East and West, their market economy encounters amid a period of movements toward independence – an era demarcated by two world wars – and their legacies of cooperation with developed countries in proximity to the Baltic Sea, denote salient initial conditions intimately linked to the economic development of these states. Accordingly, lessons from the Baltic States may be expediently generalized to extend to post-socialist transition and European (re)integration processes, most conspicuously in a global context.

Chapter 7 – The Emerging Economic Geography Setting in New EU Member States: A Comparative Account of Regional Industrial Performance and Adjustment (D. Kallioras, G. Petrakos and M. Tsiapa)

It is possible to associate the market-based process of economic integration, though it is perceived to generate higher levels of aggregate efficiency, with higher levels of inequality. In spatial terms, this is believed to lead to regional imbalances, with less advanced regions possibly experiencing, in the integration process, weaker gains or even net losses, compared with their more advanced counterparts. Such types of argument are in variance with the neoclassical understanding of the operation of the spatial economy and contribute to an ongoing discussion among academics and politicians about the impact of integration on the growth potential of less advanced regions. This chapter evaluates the emerging economic geography setting in EU NMS and provides a comparative account with respect to regional industrial performance and adjustment (since 1995). The analysis also focuses on the sector of industry (manufacturing), as this sector constitutes the main diffusion channel of the economic integration dynamics due to the displaceable character of its activities, the tradable character of its products and the linkages that it retains with the other sectors. The main part of the analysis is based on data disaggregated at the Nomenclature of Territorial Units for Statistics (NUTS) III spatial level and the Nomenclature for Classification of Economic Activities (NACE) two-digit structural level. The findings of the chapter reveal that the process of the EU integration, as well as a number of structural and spatial characteristics, had an important impact on the NMS regional industrial performance.

Chapter 8 – Is European Trade Integration Completed? Perspectives for CEE Countries (F. Festoc-Louis and N. Roudaut)

For some 30 years, European construction occurred in a Europe divided into two sides: on the one hand, ‘Western Europe’ and capitalism, and on the other hand, ‘Eastern Europe’ and socialism. Trade between these two sides was reduced to a minimum. The breakdown of socialism in Eastern Europe at the end of the 1980s led to immediate negotiations between the two sides and ended in the EU enlargement. The clear reorientation of trade from East to West led to a strong integration between Eastern and Western Europe. It therefore seems relevant to ask whether this integration process is completed. This chapter first reviews gravity models, discusses the theoretical basis of such models and also looks at the main drawbacks. Then, it applies empirically a gravity model to assess, by an out-sample approach, the ‘potential trade’ between the EU-15 and the CEECs. The gravity equation is estimated on panel data (since 1990) of EU-15 countries, using an instrumental variable method. The main results are the following: (i) some EU countries have already reached their trade potential with CEECs in 2005 (Germany, Spain and France); (ii) as far as Eastern European countries are concerned, some of them (mainly Central European countries) should expect a limited increase of their exports to the EU; whereas (iii) some other countries (at the periphery) still have a great trade potential with the EU; finally (iv) there is still a large potential for more trade between the CEECs.

Chapter 9 – Is the Kuznets Hypothesis Valid for Transition Countries? (O. Demidova)

Kuznets’ hypothesis states that the relation between income distribution and economic development is characterized by an inverted-U curve. In other words, inequality in the income distribution first rises but then falls after reaching a turning point. Many researchers have verified this hypothesis, using the data for developed countries or developing countries, excluding transition countries. The purpose of this chapter is to determine the theoretical conditions on which the inverted-U relation might hold and to test the Kuznets hypothesis using the data for 29 transition countries. The main theoretical result is as follows: the drop in the Gini index after reaching the turning point is possible only with a fast growth of low-income groups. The author estimates the unknown relationship between the Gini index and Gross Domestic Product (GDP) per capita using nonparametric regressions and some other techniques. The graphical outcomes show that the Kuznets hypothesis is confirmed (with small deviations) for the transition countries. Among the countries with lower GDP per capita, Russia is the closest to the turning point. We can expect a reduction of the inequality level in this country with increasing GDP per capita. The models estimated by using panel data for Russian regions confirm the validity of the Kuznets hypothesis. However, except the richest ones, not all the regions reach the level of mean income necessary for reducing the inequality in income distribution.

Chapter 10 – Perceived Job Security in Transition Countries: A Comparative Perspective (M. Facchinetti and F. Origo)

After a review of the theoretical literature, this chapter analyses the determinants of perceived job security, highlighting in particular the distinctive features of EU NMS with respect to other Western countries. More specifically, the authors empirically test whether the negative effect of holding a temporary contract on a subjective measure of job security is influenced by individual characteristics (such as gender, age and education) and by the (macro) flexicurity model prevailing in the country where the workers live. On the basis of individual data from the Fourth European Working Conditions Survey, it is shown that the overall negative effect of the temporary contract on perceived job security does not vary significantly with workers' characteristics (especially gender), but it is actually lower in countries characterized by higher levels of (macro) flexicurity. In the case of Denmark, which is considered a 'best practice' in the implementation of flexicurity in Europe, no statistically significant relationship is found between temporary contracts and perceived job security. The main results are overall robust with respect to alternative definitions of job security and different model specifications, also based on alternative data-sets. The peculiarities of the institutional and macroeconomic settings of the NMS are analysed and discussed with respect to the above empirical results and to the new guidelines of the European Employment Strategy for 'more and better jobs'.

Chapter 11 – Unemployment Convergence in Transition (J. Tyrowicz and P. Wójcik)

Transition economies typically experienced rapid growth of unemployment rates due to profound restructuring. Naturally, these processes affected local labour markets asymmetrically, since regions were diversified with respect to industry composition and economic outlooks. In this chapter an attempt is made to investigate the dynamics of regional unemployment rates in three transition economies. Authors use policy relevant NUTS-4 level unemployment rates for countries characterized by both relatively intense (Poland, Slovak Republic) and relatively mild labour market hardships (Czech Republic). To seek traces of convergence, we apply beta and sigma convergence as well as time-series approach (stochastic convergence).

Findings allow the authors to define the patterns of local labour market dynamics, pointing to differentiated divergence paths. Results in each of the countries suggest that diverging unemployment rates seem nested in the data. Further, for each of the analysed countries, regions with either relatively high or relatively low unemployment rates show signs of high persistence and essentially low mobility in the national distributions, while the middle ones tend to demonstrate somewhat higher mobility and in some cases even no regional unemployment differentials persistence. Importantly, these tendencies persist despite cohesion targeting policies and labour market policies' financing schemes, which allocate relatively more resources to deprived regions in all these countries.

Chapter 12 – Structural Change and Regional Labour Market Imbalances in Transition (F. E. Caroleo and F. Pastore)

This chapter provides a critical overview of the recent literature on the determinants of regional labour market imbalances in EU NMS. The focus is on those contributions that elaborate on the microeconomic foundations of structural change and its spatially asymmetric impact on local labour markets. A too optimistic view on the ability of the market economy to sustain economic development has long neglected the consequences of structural change, but the availability of new data and the specific nature of economic transition in NMS has again brought this issue to the fore, suggesting that it might also provide an explanation of several typical features of regional imbalances in old member states. The literature suggests theoretical reasoning and empirical evidence to confirm this. It shows that throughout the 1990s, and also in some cases more recently, structural change caused by a number of factors in a number of sectors has been a major cause of regional unemployment differentials in old and new member states. In fact, it is correlated to high labour turnover and high local unemployment.

In addition, this study witnesses the changed perspective of research on regional imbalances on such issues as labour and capital migration. In the traditional way of thinking, the migration of inputs was supposed to play an important part in the adjustment process causing conditional convergence in the long run. In the more recent literature, migration, especially of high skill workers, is a cause of further divergence among advanced and backward regions. In fact, economies to scale and social returns to human capital explain why higher returns are expected to happen not in backward regions, but in those advanced regions where these factors already concentrate. For similar reasons, domestic and foreign direct investment, not to mention portfolio investment, also tend to pool in those advanced regions that are more attractive promising higher returns both for the greater opportunities (local market size) and for the lower production costs (better infrastructures, complementary production factors, lower crime rate and so on).

The new approaches provide new theoretical justification for regional economic policy that has to operate on short- and long-term factors. In the short term, passive and pro-active schemes are necessary to help the weakest social groups in depressed and peripheral regions. In the long run, it is necessary to concentrate every effort to increase the factor endowment and infrastructures in backward regions.

Chapter 13 – Youth Unemployment in Transition Countries and Regions (C. Perugini and M. Signorelli)

The integration of young people in the labour market is a key policy issue of the European Employment Strategy. In particular, the European Employment Guidelines call for intensified efforts to build employment pathways for young people and to reduce youth unemployment. Youth employment issues have also been given a high profile in the Commission's Strategic Guideline for Cohesion for the period 2007–2013 as well as in the new European Social Fund regulation. In addition, the reduction of regional (and gender) disparities is one of the traditional objective of EU in order to favour 'economic and social cohesion' and equal job opportunities. The first part of this chapter provides some key theoretical background and literature review. The existing literature usually considers (i) youth labour markets and (ii) regional (sub-national) labour markets as separate topics, mainly due to limitation in the data availability, and/or analyses single countries or separate geographic areas. An innovative aspect of this study is the empirical analysis of regional (NUTS-2 level) differences and changes in youth unemployment rates, especially focusing on the peculiarities of NMS with respect to the Western group of EU countries. In particular, after some basic descriptive analysis at both national and regional levels, the authors investigate econometrically regional youth unemployment rates determinants, by means of dynamic spatial panel techniques (since 1999). The analysis is carried out for 248 EU regions, distinguishing the two samples of Eastern and Western regions, in order to stress the peculiarities of the Eastern regions. Outcomes provide new evidence and highlight interesting differences in the determinants of male and female youth unemployment. This may favour a better understanding of the complex regional youth labour market performance and dynamics in the NMS, with important policy implications at different levels.

E. M.–M. S.

1
Economic Growth and Structural Features of Transition: Theoretical Framework and General Overview

Enrico Marelli and Marcello Signorelli

1. Introduction

The 'Great Transformation' that occurred in Eastern Europe after 1989 involved many spheres: institutional, political, social and economic. Even considering only the economic sphere – in addition to the overall transition to market economies – this transformation involved several structural changes, affecting economic growth and performance in many markets (with manifest effects in the labour market), as well as international relations with other regions of the world.

Especially if formalized, a simple theoretical model is unable to capture the complexities of this transformation. The relations between variables are numerous, are also unstable over time and exhibit significant feedback from economic and structural changes to institutional change itself. Thus, a heuristic model is probably more adequate to illustrate complex, multi-faceted phenomena and links between variables.

In this chapter, we propose a theoretical framework aiding understanding of the main features of the complex dynamics and relations characterizing transition processes, with special reference to Central and Eastern European Countries (CEECs). The heuristic model is integrated and supported by a partial review of the most important literature, both theoretical and empirical, concerning the specific aspects discussed. Its aim is also – in a unified framework of analysis – to show the links, interdependences and complementarities between the specific studies included in the chapters of the volume and to illustrate the rationale behind the sequence of the individual studies.

In addition, in order to better understand the importance of the various topics, we present some key data concerning the process of institutional, economic and structural change over a 20-year period, especially in those CEECs which became members of the EU in the 2004 and 2007 enlargements

(NMS). This general information (provided in the Appendix) offers an introductory overview of the main characteristics of transition, to be complemented by the more specific empirical evidence provided in subsequent chapters.

The structure of this chapter is as follows: The heuristic model is presented with the aid of a graph summarizing the intricate links between the main variables (Section 2). Then we develop the five main areas of the theoretical framework. The starting point is the process of institutional change, of which the main features and effects on the economic systems are examined (Section 3). One prominent economic consequence of transition concerns economic growth and development (Section 4). Institutional change and economic growth also interact with specific aspects of structural change (Section 5), concerning the sectoral specialization of economic systems and the spatial distribution of economic activities. The impact of transition, growth and structural change is particularly significant in labour markets (analysed in Section 6), in terms of their quantitative (unemployment and employment dynamics) and qualitative (quality of jobs, youth performance) effects; also the dynamics in income inequality are investigated in this section. The transition process also entailed new foreign relations (Section 7), these countries now gravitate mostly towards Western Europe (increased trade integration is only one of the several aspects) and are much more 'vulnerable' to shocks upsetting the global economy; in this section, the consequences of the 2008–2009 financial and economic crisis are briefly sketched. Lastly, the conclusions (Section 8) also stress the appropriateness of following a 'comparative' approach in the investigation of transition countries.

2. A theoretical framework for an integrated appraisal of transition

The 'Great Transformation' is a quite complex phenomenon, as already admitted by Kornai (2006). Many areas of the economic, social and political spheres are involved, not only in the countries directly affected by the fall of the Berlin Wall, but also in the whole of Europe and in East–West relationships. The core of the transformation was *institutional change*, an overall process in which price liberalization, privatization and the emergence of a new 'governance' were key aspects.

In addition to institutional change, we identify four main areas of influence – characterized by the working of specific and peculiar variables – which may in turn generate important feedback with the process of institutional change itself. The chart below highlights these four main areas:

a) economic growth and development,
b) structural change and regional performance,

c) income inequality and labour market evolution,
d) relations and shocks in the global economy.

First of all, the complex institutional change in the CEECs has affected economic growth in quantitative terms, because of the 'transitional recession'[1] of the initial years, subsequent recovery in the 1990s and recent (2000–2007) rapid growth, up to the 2008–2009 world recession.

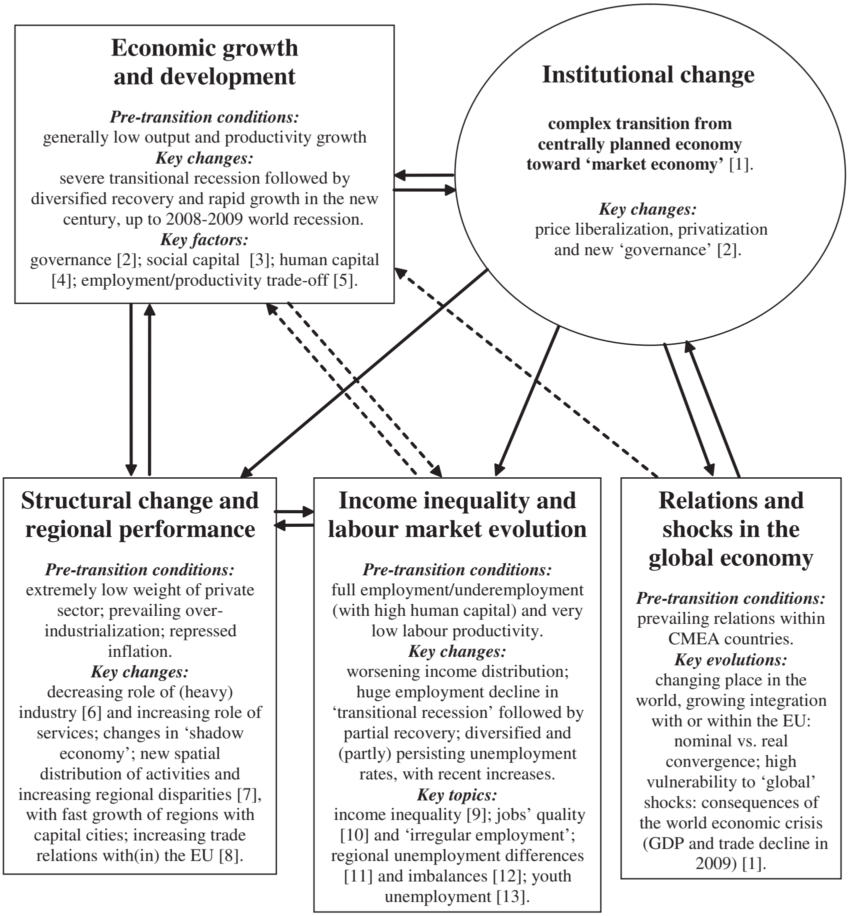
In general, the key factors of growth include technical progress, physical capital and human capital, as stated in standard neoclassical and endogenous growth models. Economic development in a broad sense is also shaped by more general factors, such as social capital and quality and effectiveness of 'governance', which is itself an aspect of the process of institutional change. Notice that there is also feedback from economic growth to institutional change, because high, balanced economic growth facilitates the implementation of structural reforms (partly by increasing the 'tolerance' versus the short-term costs they often involve).

Development processes are closely interrelated with vast structural changes, involving first a transformed sectoral mix, with contraction of manufacturing (especially heavy industry) and an expansion of services, particularly in capital cities. This in turn implies a modified spatial distribution of economic activities, with resulting regional disparities, whose increase has been a generalized phenomenon in the CEECs.

A special area which is worth examining concerns inequality in the income distribution (that has shown wide deterioration also as a consequence of the mentioned disparities) and labour markets. These markets are of course disrupted by institutional change (and specific labour market reforms); they are also interrelated with both economic growth and structural change. Before the onset of the transition, the situation in the CEECs was characterized by 'full employment' (and comparatively high levels of human capital) but also by low productivity and underemployment. The subsequent dynamics produced lower employment and rising unemployment, but were accompanied by significant productivity gains, together with changes in the spread of the shadow economy. However, the labour market performance and dynamics (including job types) differed widely according to gender, age and region.

A last sphere deserving attention refers to the foreign relations of the CEECs in the global economy. After half a century (or more) of leaning toward Russia and the other Soviet Republics,[2] these countries started or intensified new economic (and political) relations with Western countries: this is already clear-cut in the trade reorientation of the 1990s. The process is not yet completed and is now largely conditioned by the huge and diversified decline in 2009 world trade. Trade switching was favoured by the increasing inclination toward the EU: ten CEECs are now New Members and two of them have already adopted the euro.[3]

THE 'GREAT TRANSFORMATION' IN THE CEECS



3. Features and effects of institutional change

As noted in the previous section, the core of the transformation was *institutional change,* which profoundly affected economic, social and political life in the CEECs. Of all the 'great transformations' in world history (Polanyi, 1944), Kornai emphasizes that the transformation in Central and Eastern Europe is the only episode with the following six characteristics: (i and ii) the changes followed the main direction of Western development, economically towards capitalism and politically towards democracy; (iii) there was a complete transformation, comparable in all spheres (economic, political, legal, in political ideology and in social stratification); (iv) no violence occurred in the transformation; (v) the process of transformation took place in peaceful circumstances – it was not preceded by war and changes were not forced upon society as a result of foreign military occupation; (vi) the transformation took place incredibly quickly, within a time-span of ten to 15 years.[4]

First, it should be noted that the 'transformational recession and unemployment'[5] which occurred during the first years of transition were largely unexpected by many economists. Although some of the economic literature had already analysed the importance of institutions and their effects on uncertainty (for example, Hirschman, 1970; North, 1990), the renewed focus on the key role of institutional change was also due to the evident difficulties in finding explanations for the (differences in the) economic performance of transition countries by means of standard (or even neoclassical alone) approaches and instruments, partly adopted in development economics.[6]

Here, we recall only a few examples of the vast theoretical and empirical literature on the relations between institutions (or institutional change) and economic performance in transition countries, by distinguishing studies focusing on: (i) the use of alternative definitions of institutions and institutional change, and the adoption of many and different 'performance variables'; (ii) the role of initial economic or institutional conditions and reform or institutional policies in explaining GDP dynamics; (iii) the speed of transition and its effects on unemployment.

In the first group, authors generally used a wide concept of institutions and institutional change. Raiser (1999) pointed out that any process of rapid formal institutional change, as in transition economies, must contend with the legacy of an inherited set of informal institutions that may or may not be efficient in a changing economic and social environment. He also compared 'top-down' versus 'bottom up' institutional reforms, emphasizing the role of social capital and trust in transition. Hare (2001) examined the role of certain key institutions[7] and highlighted the importance of 'missing institutions' in the early stage of transition. Schneider and Enste (2000) stressed the remarkable impact of the shadow economy on official institutions, norms and rules, and proposed that its influence (see data in Appendix) was an indicator of the deficit of legitimacy of the social order and existing rules of official economic activity. Raiser et al. (2001) treated institutional change as a multidimensional unobserved variable and examined the determinants of institutional change (initial conditions and path dependence, changes in the structure of market demand, interaction with the outside world, and the capacity of the State to implement and enforce new rules), using a panel dataset for 25 transition economies. Nuti (2004) discussed the complexity of the 'great transformation', the role of an institutional vacuum and the huge national differences in the paths of institutional transition. Roland

(2001) considered certain stylized facts of the transition process in CEECs and China, and proposed an 'evolutionary-institutionalist' interpretation founded on: (i) the institutional perspective, (ii) the evolutionary approach, (iii) the great importance of economists' relative ignorance of economic and social systems and their transformation and (iv) the emphasis on the high level of uncertainty associated with social engineering (aversion towards large-scale institutional transformation).

An example of studies of the second group is given by De Melo et al. (1997), who examined the role of initial conditions and policies (liberalization) in explaining economic outcomes (in terms of growth and inflation) by considering two strictly institutional initial variables: the characteristics of state formation and a variable of 'market memory' measured by the number of years under central planning. Fisher and Sahay (2004) examined output performance determinants in 25 transition countries by considering certain institutional variables (reform index and state capture index) together with an initial conditions index derived from factor analysis.[8] The importance of initial conditions for economic performance was also stressed by Falcetti et al. (2006) who showed both the effects of progress in market-oriented reforms on growth and the existence of important feedbacks (from growth to reforms) using simultaneous equation estimation. The feedback effect of growth to reforms has been recognized in many other papers. The sensitivity of results to the choice of time period is discussed by Fidrmuc (2003) and Lysenko (2002).[9]

In the third group, the seminal paper of Aghion and Blanchard (1994) was followed by extensive literature focusing on the costs and benefits of the speed of transition and on the role of government for an 'optimal speed of transition' (OST). Transition is described as a regime change from an allocation system based on central planning to one based on market forces. In particular, the optimal pace of worker and job reallocation gave rise to a division between a 'gradualist approach' (Dewatripont and Roland, 1995) and rapid 'big bang' reform (Murphy et al., 1992). Roland (2000) distinguished the following three main positions: (i) one faction supporting 'shock therapy' and suggesting fast, comprehensive reform to avoid the risk of 'gradualism', mainly in terms of probable individual measure ineffectiveness and consequent public opposition; (ii) a second faction was in favour of 'gradualism' (and attention to national differences in sequencing) in order to minimize the social costs of transition, especially in order to avoid the negative effects on unemployment rates caused by too rapid reforms; (iii) a third stance highlighted the need for rapid change in certain aspects and gradualism for others. Many other papers analysed certain effects (especially on labour market performance) of the pace of transition (Bruno, 2006).

The above brief literature review acknowledges the key importance of institutions and institutional change, notwithstanding the specific approach.[10] We conclude by quoting Raiser (1997): 'what transition is all about is redesigning the institutional framework of formerly centrally planned economies; therefore, a transition theory is necessarily a theory of institutional change'.

4. Economic growth and development

Economic growth and development is the theme of Part I of the book. There is a huge amount of literature on this. Let us consider, firstly, the more general factors of growth, by examining their importance for transition countries. We shall examine later more specific features of growth in the CEECs. Growth models – starting from the neoclassical growth model (Solow) – have focused on the main determinants of productivity growth. In the 'conditional convergence' variant of Solow's model (Barro, 1991; Mankiw et al., 1992), some other exogenous variables, such as human capital, are considered. In general, technical progress, the process of innovation and R&D expenditure are the main variables usually considered in economic growth investigations, to integrate the role of capital accumulation.

Concerning R&D expenditure (see, for example, Sveikauskas, 2007; Zachariadis, 2004), empirical results highlight a generally positive effect on growth, but with different intensities and explanations. For example, some research investigates the role of spill-over effects (Engelbrecht, 1997) or the different impact of public and private R&D expenditure (Sveikauskas, 2007), or even the complex interactions between many variables (FDI, R&D and human capital), particularly in the CEECs (Perugini et al., 2008).

The role of education or human capital for economic growth (and productivity dynamics) has also been extensively investigated in the literature, by both mainstream and heterodox economists, especially in the last two decades. Not only has human capital been incorporated into endogenous growth models (beginning with Lucas, 1988) and in the 'augmented' Solow model (Mankiw, Romer and Weil, 1992), but it has also been considered in analysing conditional beta-convergence between different economies (Barro, 1991). More specific studies have analysed the role of education – the other factors of human capital being training and experience – on economic growth: the results are various, depending on the definition used, on considering education in terms of stocks rather than flows, or even on the different specifications of human capital as inputs in the production function.[11]

Differences across countries in income levels and economic growth rates can only partly be explained by differences in physical capital endowment or even by joint consideration of physical and human capital. A significant role is played by intangible assets in a broad sense, considering both human and social capital, since individuals and their human capital do not exist in isolation (Schuller, 2000); even the cross-effects of human and social capital may be important for economic development.[12] Social capital refers to a wide range of social activities and relations between individuals and groups, together with shared norms and values allowing participants to act together more effectively to pursue shared objectives (Putnam, 2000; World Bank, 2008); at a macro level it also includes institutional trust and quality of governance.[13] The real effects of institutional changes (on productivity, growth or employment) have been examined in many studies: see, for example, Marelli and Signorelli (2010), who detect different effects (in intensity of impact or even in its sign) in the various phases of transition.

When discussing economic growth in the CEECs, it is natural to start from the first years of huge productive decline (see Table 1.A1 in Appendix). The 'transitional recession' was particularly severe in Latvia (−44. 2 per cent from the maximum to the later minimum values of real output) and Lithuania (−40. 6 per cent), Bulgaria (−39. 3 per cent), but also in Estonia (−29. 4 per cent), Slovakia (−24. 4 per cent), Romania (−20. 6 per cent), Slovenia (−20. 4 per cent) and Hungary (−18. 1 per cent). The output fall was lower in Poland (−13. 7 per cent) and the Czech Region (−12. 1 per cent). The duration of the recession ranged from two years (Poland) to five or six years (Estonia, Lithuania and Bulgaria). The subsequent recovery was diversified but generally fast at the end of the 1990s (with the exception of Romania and Bulgaria) and the rate of growth boomed almost everywhere in the new decade (see data in Appendix), until the 2008–2009 financial crisis and world recession.

The high economic growth of the CEECs was gained in the last decade also from the trade deepening[14] and reorientation toward the EU; some CEECs actually became NMS of the EU (there position in the EU will be discussed in Section 7). Finally, we should mention that a specific strand of the literature on economic growth focuses on the trade-off between productivity and employment growth (Dew-Becker and Gordon, 2008); on this point however, see also the discussion on labour market performance in Section 6.

5. Structural change and regional performance

Structural change and regional performance is the specific topic of Part II of this book. On one hand, structural change has been affected by the general process of economic growth and development (in the CEECs, as in all countries of the world) and, on the other, by the institutional change typical of transition countries.

Concerning the former, since the early studies of Colin Clark, economic growth is shown to be associated, in a first stage, with the shift from agriculture to industry and, subsequently, by a move toward service activities (the 'three sectors law'). In addition to assuming a close relation between the stage of development and the productive structure of each country (and region), famous development economists (Chenery, Clark, Hirschman, Kaldor) in many cases also considered the interaction between structural and institutional convergence.[15] Structural convergence can also easily be incorporated in neoclassical growth models; in the 'conditional convergence' approach, homogenization of structural conditions in economic systems implies that steady states can be equalized, allowing countries (or regions) to achieve similar per capita output levels. On the opposite side, some 'endogenous growth' models predict increasing specialization and diverging paths for (structurally) different economic systems.

Structural change, especially considering the evolution of the main economic sectors, may interact with economic growth, with particular reference to productivity dynamics and differences, through many channels (see Kruger, 2008). The effects of technological progress are examined in many studies. In particular, Pasinetti (1993) analyses the effects of technological progress on aggregate income in a model in which structural change is driven by Engel's law; Pasinetti himself and other authors develop multi-sector growth models.[16] However, a key finding of much research is that aggregate productivity growth may result from structural change alone (even without productivity growth at the level of individual industries): in fact, industries with relatively lower rates of productivity growth tend to shrink in terms of shares and the opposite occurs in industries with relatively higher rates of productivity growth (Kruger, 2008).

Some comparative analyses between Eastern and Western Europe have been carried out: for instance, Stephan (2002) focuses on sectoral structure, path dependence and specialization patterns to explain the productivity gap. Marelli (2007) investigates specialization and convergence of the EU-25 countries and regions, also focusing on the role of structural convergence and diversification of production in affecting the dynamics of employment, output and productivity. Concerning Eastern countries, while broad economic structures – in terms of value added or employment – have not always converged ('specialization indexes' are generally higher in the CEECs than in Western countries), the differences in trade specializations have declined continuously. Some of the new member states have changed their specialization towards medium and high-tech products (including machinery and transport equipment), for which the world demand has been dynamic: these countries can take advantage of a highly skilled labour force, huge FDI inflow, restructuring in production and modernization of capital stock (Zaghini, 2005).

In contrast with former mono-industrialized industrial regions (generally specialized under central planning in mining production, steel and textile industries, and armaments), some regions were more prompt to change their specialization. This is the case for regions with capital cities[17]: they were generally highly diversified and more flexible in adjusting to transition and to EU integration and changing economic structures. The clustering of activities around capital cities – whose growth of productivity and per capita income has been much faster than in the rest of the countries – can also be explained by the interaction between industrial activities, existence of advanced services, accessibility to both domestic and foreign markets and availability of 'superior' resources, such as public services, research centres, human capital, FDI attraction pools and good infrastructure.

Thus, structural change interacts with the spatial distribution of economic activities. Some regions, especially the leading regions of transition countries, can become centres of production thanks to the relations between the working of scale economies and trade costs: economies of scale, together with easier access to markets, may compensate for higher production costs.[18] Spatial polarization effects – for example, those investigated in the new economic geography – may derive from the interplay between trade integration, economies of scale and concentration of production (Krugman, 1993).

Scarpetta (1995) showed that transition mostly affected regions where production was concentrated under the planned economy. Instead, accessibility factors (distance from the core of Europe) were stressed by Gorzelak (1996). One conclusion about regional disparities is that economic growth and catching-up of transition countries have reduced the gap (at national level) with Western Europe, but at the cost of increasing within-country (regional) disparities (Marelli and Signorelli, 2010). Of course, income distribution at the individual level has also been affected by these tendencies.

One last structural feature to be recalled is the shadow economy. This phenomenon refers in no way only to the CEECs but also to many other developed and developing countries; however, the characteristics of the planned economy and the transition toward a market economy have witnessed a significant role played by the informal or 'shadow' economy. As reported in the Appendix, country differences in the size of the shadow economy[19] are remarkable (Schneider and Enste, 2000), even when considering only the NMS, where it ranges from under 20 per cent (Slovak and Czech Republics) to more than 30 per cent (Latvia, Estonia, Bulgaria, Romania and Lithuania).

6. Income inequality and labour market evolution

Labour market evolution in the CEECs has been affected by transition processes (especially, privatizations and price liberalizations), economic growth and structural change (with many sorts of feedbacks also in this case). For example, the generally huge GDP decline during the 'transitional recession' was accompanied and followed by high and (partly) persisting unemployment rates in many countries. (Un)employment was of course influenced by the degree of restructuring, in turn affected by the depth and speed of the reform process.

Starting from a situation of 'virtual' full employment,[20] the labour market situation deteriorated for several years, although with differences between countries. In the 1990s, unemployment rates reached two-digit values (with peaks of 15–20 per cent) in many CEECs (see Appendix), with significant persistence in some cases.

For a better interpretation of more recent trends, it is useful to refer to the three quantitative objectives of the European Employment Strategy. In the Lisbon European Council (2000) the following two objectives were defined: (i) a total employment rate of 70 per cent (calculated on a working age population of 15–64 years) and (ii) a female employment rate higher than 60 per cent; at the Stockholm European Council (2001) an objective of employment rate higher than 50 per cent for the population between 55 and 64 years was also added (all three objectives are to be reached by 2010). Also in the case of these indicators, national differences emerge across countries.

More specific studies consider flow data and labour turnover (that is, net job creation and destruction) in addition to the usual disaggregation by sex and age. While the position of working women in the CEECs is not worse than in Western countries, the performance of young people – with particular reference to youth unemployment – deserves special attention. The stability and 'quality' of jobs is also an area in which recent research is appearing.

The mechanisms of regional labour market adjustment in transition have been studied by many authors.[21] Fidrmuc (2004) highlighted the minor role played by migration in reducing regional disparities in the CEECs, whereas the immobility of workers, caused by lack of housing in potential destination areas and the existence of wage rigidities, was emphasized by Boeri (2000). However, Boeri and Garibaldi (2005) argue that the NMS are not more rigid than the old member states, despite the persistence of some structural problems and, in some cases, large pools of unemployment (in particular, the Baltic states have high degrees of labour market flexibility).

Rutkowski (2006) argues that low-productivity employment in the CIS is a mirror image of unemployment in the CEECs (where a developed social safety net exists), while Belorgey et al. (2006) show that employment rate changes negatively affect the productivity growth rate, supporting the hypothesis of diminishing returns for the employment rate.

Research on disparities across regions in labour market performance has also highlighted regional differences in initial conditions. Polarization effects – similar to those illustrated in Section 5 – can also be found in terms of unemployment (Overman and Puga, 2002).

In general, increasing regional disparities in the CEECs have caused an upsurge in economic inequality. Also the income distribution among households has deteriorated during transition, although it could be expected, after a turning point, a future reduction in income inequalities (see Chapter 9). Income inequality and labour market evolution is the topic of Part III of the book.

7. The CEECs in the global economy, the effects of the world economic crisis and the current outlook

Transition was accompanied in the CEECs by a changing position in the global economy, in many cases together with new political or even military alliances (EU or NATO membership). The previous remarkable, or in some cases exclusive, orientation toward Russia and the other Soviet Republics has been (partly) replaced by a reorientation toward Western Europe. In particular for the NMS trade relations developed significantly even before the official EU accessions (2004 and 2007); the notable increase in trade is due to the robust growth rates of these countries (after the transitional recession), the large economic weight of the EU area and geographical proximity (Bussière et al., 2005). Increased trade links also augmented the synchronization of business cycles with the EU (and euro) area. Above all, the output growth of Hungary, Poland and Slovenia is the most highly correlated with the euro-zone, like some core EU-15 countries and even more than EU-15 peripheral countries (Greece, Portugal, Spain, Ireland, Finland); the lowest correlations, close to zero, are found for the Baltic states (Darvas and Szapáry, 2008; Fidrmuc and Korhonen, 2006).

New EU member states have high trade openness, growing trade integration with EU-15, reforms in labour markets (with relatively high degrees of flexibility) and in institutions, and increasing business cycle synchronicity with the euro area; however some countries are lagging behind as regards certain aspects of 'real convergence' (growth, productivity, price levels) as well as output specialization and delays in the modernization of financial systems (Angeloni et al., 2005).

Conversely, they show prevailing nominal convergence:[22] inflation,[23] interest rates and debt to GDP ratios, but with some imbalances in deficit to GDP ratios. It should be noted that CEECs have quite low debt to GDP ratios with respect to many Western EU countries.

As for the exchange rate, four countries (out of ten) joined the ERM-II agreements. Note that, in the early 1990s the NMS had some kinds of 'soft pegs', but moved in the following years to either flexible exchange rate regimes with inflation targeting (the larger countries) or to currency boards or hard pegs (the smaller ones). It is interesting to note that the larger countries – such as Poland, Hungary and the Czech Republic, which had the highest output correlations with the European core – have not yet entered the ERM-II (and will have to wait much longer before adopting the euro). In the past, appreciation of exchange rates was enhanced by capital inflows associated with huge FDIs (which partly counterbalanced current account deficits).[24]

However, what about the present situation and expected trends for the next few years? We cannot conclude this introductory chapter without briefly mentioning the dramatic effects of the financial crisis which arose in 2008. We have observed both financial and real consequences. In the former, banking systems suffered (partly because credit was provided in most countries by the foreign subsidiaries of Western banks, owing to the fragility of the local financial systems), stock indices plunged (even when compared with the generalized world decline), exchange rates underwent huge devaluations in countries adopting flexible regimes (harming economic agents who had been accustomed to borrowing in foreign currencies), interest rates soared, at least comparatively, due to rapidly increasing risk premiums (less so in countries with floating exchange rates), public deficits increased (see Tables 1.A9 and 1.A10 in Appendix) and consequently – despite initially low debt levels – the risk of default has become worryingly apparent in many countries (Latvia, Hungary and, outside the EU, Ukraine are in the worst position).[25]

The real impact is similar, but more intense, to what we are observing all over the world this year (2009): a large-scale recession, falling consumption and investment (partly due to the drop in confidence and expectations), decrease in industrial production, falling employment and rising unemployment (see Table 1.A5 in Appendix). The real effects are amplified by the very openness of the economies in question and their great vulnerability: exports are decreasing (see Table 1.A11 in Appendix), also because of the deplorable situation in foreign (Western) markets, and FDI flows are retrenching, also as a consequence of hidden protectionist tendencies in Western countries which prefer to maintain firms and activities at home (even foreign banks are tempted to distance themselves).

Let us, now, provide some figures about the current and expected (2009 and 2010) developments according to the most recent forecasts of international organizations. Following the deepest decline in post-war history, two points seem rather sure in the 'new world' of uncertainty: (i) a full collapse of the world market economy – a debated scenario in the Fall 2008 – has been avoided, also thanks to strong economic policies, which have helped in restoring some confidence in the markets; (ii) although the global recession has not yet ended, real economic activity seems to be nearing its bottom in this Summer 2009.

According to OECD (June 2009) forecasts, real GDP is expected to decline in 2009 by −2.2 per cent for the world as a whole, accompanied by an even larger and dramatic contraction (−16 per cent) of world real trade. The fall in real GDP will be greater in specific regions of the world: −4.8 per cent in the euro area[26] and −2.8 per cent in the US in 2009; a modest recovery is expected for 2010: +0.9 per cent and 0 per cent respectively for the two areas. Emerging countries, although partially affected by the slowdown (+7.7 per cent and +5.2 per cent are the expected growth rates in China and India in 2009), that caused significant negative effects (such as return migration from industrial urbanized areas to rural areas in China, falling wages in India), should recover soon and help to pull the world out of recession (+9.3 per cent and +7 per cent are the expected growth rates for these two countries in 2010). A comparison between the above and other countries (and aggregates) in the world can be made thanks to the recent forecasts by EU Commision (April 2009), presented in Appendix (Table 1.A3).

Concerning the CEECs of Eastern Europe, EBRD forecasts (released on 7 May 2009) show different situations for 2009: (i) a real GDP change equal to zero in Poland; (ii) a group of countries (Czech Republic, Slovak Republic, Slovenia, Bulgaria and Romania) with a recession (between −3 per cent and −4 per cent) lower than the average of Western Europe; (iii) a country with a large decrease (similar to Germany's or Italy's), that is Hungary (−5 per cent);[27] (iv) finally, the worst performers are the Baltic states (−10.5 per cent Estonia, −11.8 per cent Lithuania, −13.2 per cent Latvia). According to current forecasts, in 2010 growth will be negative but close to zero or moderate (less than +1 per cent) in almost all CEECs; the only exceptions – with a worse performance – will be Bulgaria (−1 per cent), Lithuania (−2 per cent) and Latvia (−4.1 per cent).

In the face of this horrendous scenario, economic policies adopted by almost all countries in the world have been robust and multifaceted including: (i) easy monetary policies (the official interest rates set by central banks range at historically low levels between 0 and 1 per cent); (ii) rescue plans for the banks most deeply affected (the most relevant ones have been adopted in the US and in the UK); (iii) huge fiscal stimuli (with negative effects on public deficits and debts that will last for several years); (iv) plans to reform the international financial system (new rules have been approved, following the London G-20 summit, both in the US and in the EU and should be implemented in the next months).

Despite this strong reaction by policymakers, the recession has already caused extensive problems for real economic activities and labour markets: the deepest effects on employment will be felt with a lag of some months. The unemployment rate has already reached 9–10 per cent in both the US and the EU, where it is expected to grow further toward the 12 per cent ceiling in 2010. Not only is cyclical unemployment growing, because of the output gap (expected to rise to −3.6 per cent in 2010 in the euro area: see European Commission, 2009b), but a permanent rise in structural unemployment is also likely, because even potential output will be significantly reduced as a result of the crisis (for example, by 2–3 per cent in the medium term in the OECD area). Hence, stabilization policies to support aggregate demand should be accompanied by a continuous effort to adopt reforms and structural policies (including improvements in passive and active labour policies).

Needless to say, all these problems are exacerbated in the CEECs. In particular, the unemployment rate is expected to especially increase in the Baltic states (Table 1.A5 in Appendix). To prevent mass unemployment and social disruption, the 'solidarity' of EU countries should be directed – as mentioned in the EU Treaty – to the most vulnerable members, not only the CEECs, but also, we may add, to neighbouring countries in the region.[28]

8. Conclusions

In this chapter, we briefly recalled the complexities of the 'Great Transformation', which jointly involved the institutional, political, social and economic spheres and, for better comprehension of the specific studies presented in the following chapters, proposed a unified theoretical framework based on a heuristic model. We identified five main areas, headed by 'institutional change', interrelated with the following additional areas: (i) economic growth and development, (ii) structural change and regional performance, (iii) income inequality and labour market evolution, (iv) relations and shocks in the global economy.

After highlighting the relation and feedback between the above areas, we partly reviewed the main contributions in the literature for each issue, concentrating on evolution in transition countries. The focus is on CEECs which became EU members in the 2004 and 2007 enlargements, but their various evolutions are compared whenever possible with other transition countries or groups of countries. We believe that a comparative approach is essential in order to grasp the diverse situations and dynamics of such complex processes. Although most of the studies presented in the following chapters refer to a number of transition countries (in some cases, the CEECs are compared with Western European countries to highlight their specificities better), a general overview referring to all of them seemed appropriate.

Although transition in the CEECs has been a fast process, a 20-year interval is long enough to include different phases. The 'transitional recession' of the early 1990s was followed by recovery in the second half of the 1990s and by rapid growth in the new century (when these transition countries almost reached the extraordinary pace of growth of China).[29] Again as regards institutional change, many events occurred. After the onset of transition towards 'market economy', all these countries started leaning towards Western Europe (with which trade, economic and political relations were established or reinforced), most of them joined the EU and a few even entered the euro-zone.

The reforms aimed at the development of a market economy, the trade deepening and reorientation toward Western countries (and the huge FDI flows coming from that area), the process of admission into the EU and other processes of institutional change helped in strengthening the recent catching-up and economic growth of almost all CEECs – although with some imbalances – at least until the 2008–2009 economic crisis.

We have sketched some characteristics and likely (huge) consequences of this crisis in the previous section. This 'global shock' – suggesting the need for a more effective new 'world governance and coordination of economic policies (together with more effective rules and institutions)' – is producing generalized real effects, although with different intensities in the various world areas (continents, countries, regions); their persistence will crucially depend on the effectiveness of (integrated) policies adopted at the different levels of government.

For many aspects, the 2009 world recession can be considered, also for CEECs, as the beginning of a new – rather uncertain – phase of development and integration. However, in our opinion, once the storm is over, and assuming the adoption of appropriate policies, these countries will gradually be able to return to reasonable growth rates – despite the ongoing structural break – thanks to their competitiveness, favourable structural conditions, good economic resources (including human capital) and, above all, irrevocably established democratic and institutional settings.

Appendix: Key Empirical Evidence on the 20-year Long Transitions

Table 1.A1 Initial Conditions (1989–1990) and 'transitional inflation and recession'

	GNP pc	*PS (%)*	*TD*	*[T_0] and YUCP*	*INF*	*[T_M] and TOD*
PL	5150	30	8.4	[1990] 41	302	[1991]−13.7
HU	6810	5	13.7	[1990] 42	27	[1993]−18.1
CZ	9000	5	6.0	[1991] 42	30	[1992]−12.1
SK	8000	5	6.0	[1991] 42	31	[1993]−24.4
EE	8900	10	30.2	[1992] 51	150	[1994]−29.4
LV	8590	10	36.7	[1992] 51	395	[1993]−44.2
LT	6430	10	40.9	[1992] 51	350	[1994]−40.6
SI	9200	10	4.0	[1990] 46	363	[1992]−20.4
RO	3470	15	3.7	[1991] 42	209	[1992]−20.6
BG	5000	10	16.1	[1991] 43	163	[1997]−39.3
RUSSIA	7720	5	11.1	[1992] 74	485	[1998]−45.6
CIS-5	5954	5–10	25.9**	[1992] 70–73	298	[1995–1999]−42.0
CIS-7	4191	10***	27.6**	[1992] 70–71*	434	[1993–1999]−46.0

Legend and Sources: Countries and Aggregates: PL = Poland; HU = Hungary; CZ = Czech Republic; SK = Slovak Republic; EE = Estonia; LV = Latvia; LT = Lithuania; SI = Slovenia; RO = Romania; BG = Bulgaria; CIS-5 includes Belarus, Kazakhstan, Russia, Turkmenistan and Ukraine; CIS-7 includes Armenia, Azerbaijan, Georgia, Kyrgyz Republic, Moldova, Tajikistan and Uzbekistan. The data for Czech Republic and Slovak Republic are referred to the two Republics that formally became separated countries in 1993.

GNP pc = per capita GNP at PPP in US$1989 (*Source*: DDGT 1997, World Bank).
PS = 1989 private sector % share in GDP. *** Kyrgyz Republic is the only exception with 5%. (*Source*: EBRD online database).
TD = Trade dependence in 1990, defined as the % ratio between the average of exports and imports and GDP (*Source*: World Bank). ** Average values of the 5 or 7 countries included in CIS-5 and CIS-7 [for example De Melo et al., 1997].
[T_0]= first year of transition (transition year is defined as the year in which central planning was dismantled, for example, Fisher and Sahay, 2004).
YUCP = years under central planning; * excluding Moldova (51).
INF = Average inflation rate during the first three years since price liberalization.
[T_M] = Lowest output year.
TOD = Total output decline, from [T_{-1}] to [T_M] (*Source*: World Economic Outlook, 2004).

Table 1.A2 Institutional Change: Transition index and Privatization

		1989	*1992*	*1995*	*1998*	*2003*	*2008*
PL	TI	1.26	2.56	3.22	3.52	3.66	3.78
	PS	30	45	60	65	75	75
HU	TI	1.33	2.63	3.48	3.78	3.85	3.96
	PS	5	40	60	80	80	80
CZ	TI	1.00	2.63	3.30	3.48	3.70	3.81*
	PS	5	30	70	75	80	80
SK	TI	1.29	2.62	3.37	3.64	3.75	3.74
	PS	5	30	60	75	80	80
EE	TI	1.00	1.85	3.15	3.44	3.74	3.93
	PS	10	25	65	70	80	80
LV	TI	1.00	2.00	2.81	3.11	3.56	3.63
	PS	10	25	55	65	70	70
LT	TI	1.00	1.59	2.85	3.07	3.52	3.70
	PS	10	20	65	70	75	75
SI	TI	1.52	2.04	2.93	3.22	3.37	3.41
	PS	10	30	50	60	65	70
RO	TI	1.00	1.59	2.41	2.89	3.11	3.44
	PS	15	25	45	60	65	70
BG	TI	1.00	1.85	2.33	2.81	3.30	3.56
	PS	10	25	50	65	75	75
Russia	TI	1.00	1.89	2.59	2.55	2.92	3.04
	PS	5	25	55	70	70	65

Legend and Sources: TI = Transition synthetic indexes are calculated as the simple mean of the following nine EBRD index: (i) large scale privatization, (ii) small scale privatization, (iii) enterprise restructuring, (iv) price liberalization, (v) trade and foreign exchange system, (vi) competition policy, (vii) banking reform and interest rate liberalization, (viii) securities markets and non-bank financial institutions, (ix) overall infrastructure reform. The scores are from 1 to 4. *Source*: elaborations on EBRD online database.
Note: *2007.
PS = private sector % share in GDP. *Source*: EBRD online database.

Table 1.A3 GDP Growth

	1996–1999	2000–2003	2004–2006	2007	2008	2009	2010
	Average yearly per cent changes			*1989 = 100*	*Annual per cent change*		
PL	5.7	2.7	5.4	169	4.9	*0.0*	*0.8*
HU	3.7	4.4	3.5	135	0.5	*−5.0*	*0.0*
CZ	1.0	2.9	5.9	139	3.2	*−3.5*[**]	*0.1*[**]
SK	4.1	3.8	7.7	154	6.4	*−3.5*	*0.8*
EE	5.3	8.1	8.4	150	−3.6	*−10.5*	*−0.2*
LV	5.1	7.2	10.5	124	−4.6	*−13.2*	*−4.1*
LT	4.9	7.0	8.0	116	3.0	*−11.8*	*−2.0*
SI	4.5	3.5	5.3	151	3.5	*−4.0*	*0.5*
RO	−2.0	4.5	6.7	120	7.1	*−4.0*	*0.4*
BG	−2.2	4.8	6.3	107	6.0	*−3.0*	*−1.0*
RUSSIA	−0.3	6.8	7.3	102	5.6	*−7.5*[***]	*2.5*
EU-27					0.9[*]	*−4.0*[*]	*−0.1*[*]
US					1.1[*]	*−2.9*[*]	*0.9*[*]
Japan					−0.7[*]	*−5.3*[*]	*0.1*[*]
China					9.0[*]	*6.1*[*]	*7.8*[*]
India					7.2[*]	*4.3*[*]	*5.0*[*]
World					3.1[*]	*−1.4*[*]	*1.9*[*]

Source: EBRD online database and EBRD forecasts (2009 and 2010) as of May 7, 2009; * EU Commission data and forecasts (2009 and 2010) as of April 2009.
Note: **IMF projections; ***Based on first quarter GDP growth estimates of the Ministry of Economy of the Russian Federation of −9. 5 per cent year-on-year.

Table 1.A4 Sectoral Composition of GDP

	1989		1995		2000		2007	
	Ind	*Agr*	*Ind*	*Agr*	*Ind*	*Agr*	*Ind*	*Agr*
PL	44.1	11.8	32.1	5.6	31.7	3.0	32.6[g]	2.3[g]
HU	21.0[b]	7.8[b]	23.1	5.9	27.3	4.5	21.7	3.6
CZ	36.7[a]	8.2[a]	33.3	4.7	36.0	3.9	42.0	3.0
SK	35.2[c]	5.7[c]	29.1	4.9	25.5	4.2	27.2	2.6
EE	28.3[d]	9.5[d]	26.3	7.3	24.8	4.3	25.3	2.7
LV	35.1[a]	21.2[a]	26.7	8.0	21.1	4.9	19.4	2.9
LT	55.7[b]	19.2[b]	29.9	10.3	26.4	7.0	29.8	4.7
SI	39.8	4.4	25.5	3.6	25.6	2.7	23.2	2.1
RO	49.9[a]	23.7[a]	32.9	19.8	27.3	11.1	24.6[f]	8.4[f]
BG	39.8[b]	15.4[b]	31.0	12.7	25.8	12.3	26.1[f]	8.0[f]
RUSSIA	38.2[b]	14.0[b]	29.0	7.2	30.8[e]	7.7[e]	28.0	4.1

Source: EBRD
Note: a = 1990; b = 1991; c = 1992; d = 1993; e = 1999; f = 2005; g = 2006.
Legend: Per cent data. The complements to 100 are accounted by the Services.

Table 1.A5 Unemployment Rates

	1989–1991	*1992–1995*	*1996–1999*	*2000–2003*	*2004–2007*	2008*	2009*	2010*
PL	9.4	15.4	12.4	18.5	13.9	*7.1*	*9.9*	*12.1*
HU	3.4	10.5	8.3	5.9	7.0	*7.8*	*9.5*	*11.2*
CZ	2.4	3.8	6.0	8.0	7.2	*4.4*	*6.1*	*7.4*
SK	5.4	12.9	12.9	18.4	14.6	*9.5*	*12.0*	*12.1*
EE	0.5	6.9	10.4	11.6	7.0	*5.5*	*11.3*	*14.1*
LV	0.6	11.9	16.1	12.5	8.0	*7.5*	*15.7*	*16.0*
LT	0.3	6.7	14.6	15.0	7.4	*5.8*	*13.8*	*15.9*
SI	7.3	8.4	7.2	6.6	6.0	*4.4*	*6.6*	*7.4*
RO	1.0	9.7	6.4	7.1	7.1	*5.8*	*8.0*	*7.7*
BG	6.0	15.9	15.1	16.6	9.5	*5.6*	*7.3*	*7.8*
RUSSIA		7.1	11.2	8.8	6.8	*5.9*	*9.5*	*8.4*

Source: EBRD online database.
Notes: *Eurostat definition and EU forecasts as of Spring 2009.
Legend: Annual average per cent values.

Table 1.A6 Employment Rates (total and female)

	1996–1999		*2000–2003*		*2004–2007*		2008	
	Total	*Female*	*Total*	*Female*	*Total*	*Female*	*Total*	*Female*
PL	58.5	51.4	52.8	47.2	54.0	48.0	59.2	52.4
HU	53.5	46.7	56.4	50.1	57.1	50.9	56.7	50.6
CZ	66.5	58.1	65.0	56.8	65.1	56.6	66.6	57.6
SK	59.4	52.8	57.0	51.7	58.7	51.7	62.3	54.6
EE	63.1	59.1	61.6	57.8	66.2	63.3	69.8	66.3
LV	59.4	54.5	59.6	56.1	65.1	61.2	68.6	65.4
LT	62.0	59.0	59.4	57.4	63.1	60.1	64.3	61.8
SI	62.3	57.9	63.2	58.4	66.4	61.6	68.6	64.2
RO	64.3	58.3	60.2	54.5	58.2	52.4	59.0	52.5
BG			50.8	47.4	57.6	53.6	64.0	59.5
EU-15	61.2	51.4	64.1	55.2	65.9	58.3	67.3	60.4

Source: Eurostat online database.
Legend: Annual average per cent values (with respect to working age population 15–64).

Table 1.A7 Shadow Economy (% of official GDP)

	1999–2000	*2001–2002*	*2002–2003*
PL	27.6	28.2	28.9
HU	25.1	25.7	26.2
CZ	19.1	19.6	20.1
SK	18.9	19.3	20.2
EE	38.4	39.2	40.1
LV	39.9	40.7	41.3
LT	30.3	31.4	32.6
SI	27.1	28.3	29.4
RO	34.4	36.1	37.4
BG	36.9	37.1	38.3
Russia	46.1	47.5	48.7

Source: Schneider (2007).
Legend: Shadow economy as per cent of official GDP using the DYMIMIC and Currency Demand Method.

Table 1.A8 Inflation Rates

	1997–1999	*2000–2003*	*2004–2007*	*2008*	*2009**	*2010**
PL	11.3	4.5	2.4	4.2	*2.6*	*1.9*
HU	14.2	7.3	5.6	6.0	*4.4*	*4.1*
CZ	6.5	2.4	2.3	6.3	*1.1*	*1.6*
SK	7.7	7.8	4.1	3.9	*2.0*	*2.4*
EE	7.1	3.6	4.6	10.6	*0.6*	*0.5*
LV	4.8	2.5	7.5	15.3	*4.6*	*−0.7*
LT	5.7	0.5	3.4	11.1	*3.6*	*−0.4*
SI	7.4	7.7	3.1	5.5	*0.7*	*2.0*
RO	86.6	29.5	8.1	7.9	*5.8*	*3.5*
BG	10.7	6.5	6.8	12.0	*3.9*	*3.6*
EU-15	1.4	2.1	2.1	3.3**	*0.4***	*1.2***

Source: Eurostat online database.
Note: * EU Commission forecasts as of Spring 2009; ** Euro-16 area.
Legend: Annual average rate of change in Harmonized Indices of Consumer Prices (HICPs).

Table 1.A9 Deficit (% of GDP)

	1996–1999	*2000–2003*	*2004–2007*	*2008*	*2009**	*2010**
PL	−4.0	−4.9	−4.0	−3.9	*−6.6*	*−7.3*
HU	−6.2	−5.8	−7.1	−3.4	*−3.4*	*−3.9*
CZ	−4.0	−5.7	−2.6	−1.5	*−4.3*	*−4.9*
SK	−7.2	−7.4	−2.6	−2.2	*−4.7*	*−5.4*
EE	−0.6	0.4	2.2	−3.0	*−3.0*	*−3.9*
LV	−0.8	−2.2	−0.4	−4.0	*−11.1*	*−13.6*
LT	−5.3	−2.5	−0.9	−3.2	*−5.4*	*−8.0*
SI	−2.3	−3.2	−1.1	−0.9	*−5.5*	*−6.5*
RO	−4.0	−2.9	−1.8	−5.4	*−5.1*	*−5.6*
BG		−0.6	1.7	1.5	*−0.5*	*−0.3*
EU-15	−2.4	−1.4	−1.8	−1.9**	*−5.3***	*−6.5***

Source: Eurostat online database.
Note: * EU Commission forecasts as of Spring 2009; ** Euro-16 area.
Legend: Annual average per cent values of Deficit/GDP and Debt/GDP ratios.

Table 1.A10 Debt (% of GDP)

	1996–1999	*2000–2003*	*2004–2007*	*2008*	*2009**	*2010**
PL	41.2	40.9	46.4	47.1	*53.6*	*59.7*
HU	65.2	55.0	63.1	73.0	*80.8*	*82.3*
CZ	14.3	25.6	29.7	29.8	*33.7*	*37.9*
SK	36.8	46.3	33.9	27.6	*32.2*	*36.3*
EE	6.3	5.3	4.3	4.8	*6.8*	*7.8*
LV	11.8	13.6	11.9	19.5	*34.1*	*50.1*
LT	17.3	22.6	18.2	15.6	*22.6*	*31.9*
SI		27.4	26.1	22.8	*29.3*	*34.9*
RO	16.2	23.8	15.0	13.6	*18.2*	*22.7*
BG	88.0	60.3	27.0	14.1	*16.0*	*17.3*
EU-15	68.4	62.5	62.6	69.3**	*77.7***	*83.8***

Source: Eurostat online database.
Note: * EU Commission forecasts as of Spring 2009; ** Euro-16 area.
Legend: Annual average per cent values of Deficit/GDP and Debt/GDP ratios.

Table 1.A11 Export of Goods and Services (% annual change or five year averages)

	1992–1996	*1997–2001*	*2002–2006*	*2007*	*2008**	*2009**	*2010**
PL	12.2	9.7	11.0	9.1	*5.8*	*−11.0*	*0.2*
HU	11.7	16.3	10.9	15.9	*4.6*	*−11.9*	*0.8*
CZ	9.7	10.3	11.3	14.9	*6.9*	*−11.6*	*0.7*
SK		10.8	11.8	13.8	*3.2*	*−10.2*	*0.2*
EE		13.0	10.4	0.0	*−1.1*	*−14.1*	*0.4*
LV		5.8	9.2	10.0	*−1.3*	*−12.9*	*0.5*
LT		6.7	11.9	4.3	*11.3*	*−15.1*	*−0.2*
SI	−2.1	7.9	9.0	13.8	*3.3*	*−11.8*	*−0.3*
RO	10.4	10.8	11.6	7.9	*19.4*	*−16.9*	*0.6*
BG		5.5	9.2	5.2	*2.9*	*−11.1*	*2.2*
Russia				6.4	*3.0*	*−8.0*	*3.0*
EU**	6.8	7.9	5.2	5.0	*1.6*	*−12.6*	*−0.2*
US	7.4	4.2	4.9	8.4	*6.3*	*−14.0*	*0.5*
Japan	3.5	2.9	9.4	8.4	*1.7*	*−18.4*	*1.9*
China				22.2	*8.5*	*−8.0*	*3.8*
India				9.5	*5.0*	*−8.5*	*3.1*
World				6.5	*3.3*	*−11.5*	*0.7*

Source: Eurostat online database.
Note: * EU Commission forecasts as of Spring 2009; ** intra- and extra-EU trade.
Legend: Annual average per cent values of Deficit/GDP and Debt/GDP ratios.

Notes

1. Price liberalization also caused a period of high inflation (with huge differences between countries) in all countries.
2. The Council for Mutual Economic Assistance (CMEA) was created in 1949 by the Soviet Union, Bulgaria, Czechoslovakia, Hungary, Poland and Romania.
3. Slovenia and Slovakia joined the Euro-zone in 2007 and 2009, respectively.
4. Kornai also stated that the largest difference, with respect to previous great transformations, was the speed of the change. However, it is important to recall that there were politicians and economic experts who urged even faster changes.
5. As illustrated by the data in the Appendix, the generally huge GDP decline (and high inflation) during the early years of transition were accompanied and followed by high and (partly) persistent unemployment rates in many countries.
6. Stiglitz (1994) draws attention to the weakness of the neoclassical model of a market economy as a basis for advising transition governments on appropriate reform strategies.
7. Such as private property and business contracts, banking and financial regulation, labour market institutions, clear fiscal environment for firms, institutions dealing with competition/industrial/trade policies and, lastly, trust between economic agents and trust and honesty in public institutions.
8. This ‘initial condition index’ (EBRD Transition report, 1999) represents a weighted average of measures for the level of development, trade dependence on CMEA, macroeconomic disequilibria, distance to the EU, natural resources endowments, market memory and state capacity.

9. The use of 'transitional time' rather than usual calendar time is interesting, as it takes into account the fact that the transition process started at different times in different countries. All references in this section are only examples of a much wider literature.
10. More specific works include the following: Boeri and Terrell (2002), Brown and Earle (2004), Gabrisch and Holscher (2006), Popov (2007), Svejnar (2002).
11. For an overview of key issues on the knowledge-based economy in Central and Eastern Europe, see Radosevic (2006). For more complete references on this point, see Chapter 4.
12. This is the outcome of the empirical research presented in Chapter 3; in particular, education seems to act jointly with institutional trust and political activity.
13. The traditional factor accumulation variables and variables relating to policy choices and institutions of governance are jointly considered in the empirical study presented in Chapter 2.
14. As already recalled, the 2009 world recession was accompanied by a huge trade decline.
15. Empirically, we can observe that, in many lagging regions of Southern and Eastern Europe, there is still a large primary sector; at the same time, in some regions of Europe the tertiarization process has been continuing for decades, whereas in others the peak of industrialization has not yet been reached (see Marelli 2004, which provides more complete references about prominent studies on structural change).
16. Much other research has highlighted the role of supply and demand factors in shaping the process of structural change, with remarkable effects on the dynamics of aggregate output, employment and productivity. Baumol (1967) and Durlauf (1993) focus on the role of the technological side; Laitner (2000) presents a neoclassical multi-sector growth model; Klette and Kortum (2004) produce a multi-sector endogenous growth model: Metcalfe et al. (2006) use an evolutionary model for simultaneous consideration of demand-side factors and technological progress.
17. Jasmand and Stiller (2005) found higher productivity levels and widening gaps in the capitals (with the largest gap in Budapest, whose productivity is 80 per cent greater than the national average); many of the capital cities of transition countries already have a per capita income (measured in purchasing power parities) well above the EU-15 average.
18. According to Martin (2006), a scenario of 'global convergence and local divergence' arises if the international cost advantage of the poorer country is larger than the national cost advantage of the poorer region; the cost of production is the main driving cost between countries (in fact wages and labour costs still differ widely between countries), whereas market access is the main driving force of location between regions.
19. Countries with larger shadow economies normally have lower 'regular' employment rates (for example, Perugini and Signorelli, 2004). Average productivity levels in the 'informal sector' are also generally lower with respect to the formal economy, partly due to composition effects of employment – for instance, the relatively higher share of workers with lower-than-average educational attainments (for example, Boeri and Garibaldi, 2006).
20. Kornai (2006) is clear on this point:

    > Open unemployment was unknown in the socialist economy; the employment rate was very high, every worker could feel secure at his or her workplace.

Indeed, an inverse disequilibrium prevailed. The socialist economy created chronic shortages, including a chronic labor shortage – at least, in the more developed and industrialised Central Eastern European countries. This has come to an end. The employment rate has significantly declined and open unemployment has appeared.

21. A good survey of the empirical literature is provided by Huber (2007). A survey on regional labour market performance differentials can be found in Elhorst (2003); Ferragina and Pastore (2006) present a complete review of the theoretical literature focusing on regional unemployment and the OST (optimal speed of transition).
22. The complex links between nominal and real convergence are illustrated – and partly empirically tested for the group of EU-27 countries – in Marelli and Signorelli (2009).
23. Obviously, excluding the first years of very high inflation that followed price liberalizations (also due to initial conditions of prevailing 'repressed inflation' in centrally planned economy). Also in recent years, it has been difficult for many countries to abide by the inflation criterion: at the beginning of 2008, only three countries out of ten were respecting it (ECB, 2008).
24. According to De Grauwe and Schnabl (2005), who highlight the conflict between nominal and real convergence during the run-up to EMU, a real appreciation of the exchange rate may be achieved by a nominal appreciation (at least within the ±15 per cent band allowed by the ERM-II agreements). An appreciation is required by the *Balassa-Samuelson* effect: the NMS, characterized by lower per capita income levels and consequent strong catching-up processes, will inescapably have higher *inflation* rates in the transition to EMU and in the first period after adopting the euro (because of productivity differences between sectors and high inflation in the non-tradable sector).
25. See, for example, 'Argentina on the Danube', *The Economist*, 19 February 2009; 'The whiff of contagion', *The Economist*, 26 February 2009.
26. The forecast of the European Commission (2009b) for the EU as a whole is −4 per cent.
27. Also the recent OECD (2009) forecasts confirm that the fall in real GDP will be greater in Hungary (−6. 1 per cent in 2009, −2. 2 per cent in 2010) than in Czech Republic (−4. 2 per cent and +1. 4 per cent), in Slovak Republic (−5 per cent and +3.1 per cent) and in Poland (−0. 4 per cent and +0.6 per cent).
28. In the short term, this should include the possible bail-out of countries risking default; the IMF has already provided loans to many countries. For the more general EU response to the crisis, see European Commission (2009a).
29. China and India, which were already the leading powers in the world until the seventeenth century, are forecast, respectively, to outstrip or approach the US GDP by 2050 (see Cohen, 2009).

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Part I

Economic Growth and Development

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2

Governance, Institutions and Growth: Empirical Lessons from the Post-Communist Transition

Christopher J. Gerry, Jong-Kyu Lee and Tomasz M. Mickiewicz

1. Introduction

The post-communist countries of Central Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) have proved to be a fertile arena in which to empirically explore the role of institutions within the context of economic growth. As the short term evolves into the medium term, as quantitative proxies for institutions extend their coverage and grow increasingly sophisticated, and as more advanced econometric techniques become available, we now revisit the empirics of economic growth in transition. In particular, using data for 1989–2007,[1] we re-examine the role of both traditional factor accumulation variables and variables relating to policy choices. In doing the latter, we are able to observe more closely the causal links between institutions of governance, economic policy outcomes and economic growth and thus go some way towards identifying the important conditioning role played by governance institutions.

There have been numerous attempts to empirically examine economic growth in both transitional and non-transitional settings. The majority of economic growth studies, covering non-transition economies, confirm the positive role played by factor accumulation. That is, a higher capital investment ratio, higher levels of human capital investment and lower population growth rates are all associated with higher economic growth (Barro, 1991; Mankiw et al., 1992; Knight et al., 1993; Islam, 1995; Caselli et al., 1996; Sala-i-Martin et al., 2004). In contrast, at least in the initial period of reform, studies on the transition economies have found these 'standard' variables to be insignificant. Accordingly, much of the research on transition has omitted the standard variables from the growth estimation in favour of a range of 'transition specific' variables pertaining to liberalization and stabilization (Fischer et al., 1996; Havrylyshyn et al., 1998; Berg et al., 1999;

Fischer and Sahay, 2000; Campos, 2001; De Melo et al., 2001; Falcetti et al., 2006; Havrylyshyn, 2006).

It is in the spirit of this empirical research that we now interrogate afresh the relationship between institutions and growth in the post-communist economies. In particular, given the time elapsed since the 'start' of transition, we are now able to extend the 'transition' approach by (re)incorporating the traditional neoclassical factor accumulation variables while, at the same time, thinking more carefully about how to best capture the effects of macroeconomic stability in the evolving institutional context. Adopting this approach we find evidence, robust to a variety of econometric approaches, that institutions of governance are important for economic growth *through* their influence on the macroeconomic environment. That is, macroeconomic stability is important for economic growth (see Figure 2.1) but it is the quality of the institutional environment which dictates the extent of macroeconomic stability (see Figure 2.2). We also find that human capital (re)emerges as an important driver of growth over the medium term.

We proceed as follows. In Section 2 we present a brief review of the theoretical and empirical literature concerning institutions, macroeconomic stability and economic growth in transition economies. In the following three sections we then revisit the empirics of economic growth and explore

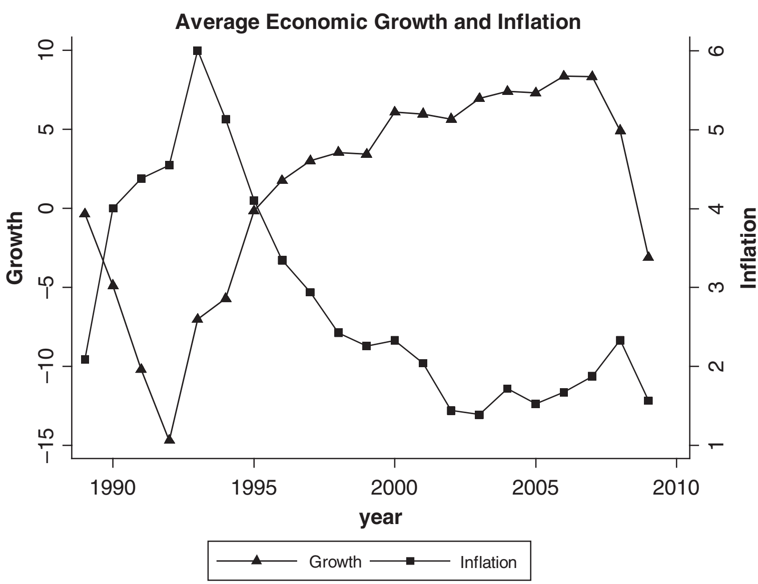

Figure 2.1 Inflation (CPI) and economic growth, 1989–2009 (2009 estimates)

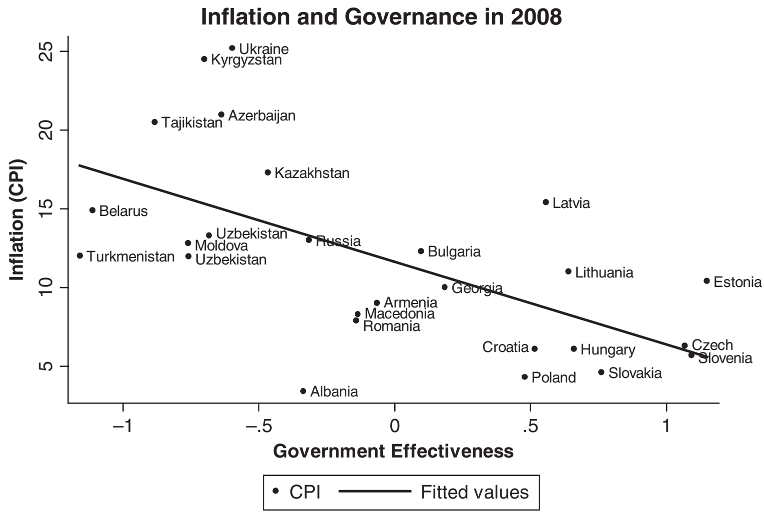

Figure 2.2 Inflation (CPI) and government effectivness (average 2002–2007)

the links between growth and institutions using a variety of econometric techniques. We conclude in Section 6.

2. Economic growth, macroeconomic stability and institutions

Macroeconomic stability has long been identified as one of the main determinants of economic growth in both transition and non-transition settings (Lucas, 1973; Easterly and Rebelo, 1993; Fischer, 1993; Barro, 1995; Aslund et al., 1996; Loungani and Sheets, 1997; Bruno and Easterly, 1998; Zinnes et al., 2001; Lawson and Wang, 2005; Falcetti et al., 2006; Havrylyshyn, 2006). In the bulk of this literature, the relevant empirical proxy for macroeconomic stability is an inflation variable, which is typically shown to have a negative and significant impact on economic growth.

One of our main contentions is that, while the macroeconomic environment is indeed crucial for economic growth, as indicated for the transition countries by Figure 2.1, the use of inflation as a proxy for it deserves much more cautious treatment. Firstly, inflation is endogenous to growth: there may be some omitted variable, such as movement in the oil price, that is correlated with both growth and inflation; the association between growth and inflation may simply be spurious, particularly in transition economies where, following the initial ‘shock’, inflation and growth have, respectively, declined and increased over time for transition specific reasons; and the growth–inflation relationship may suffer from simultaneity (or reverse causality). Secondly, inflation is a policy *output* variable and therefore further caution is called for before thinking of it as an explanatory variable determining another output. This is likely to be particularly important in the transition context.

If inflation is the product of a set of policy choices then it should not be treated in the same way as other factor inputs typically are in economic growth estimates. Indeed, as Rodrik (2005) argued, if we fail to distinguish policy effort from policy outcomes when measuring potential growth determinants we are unlikely to learn much from our estimation efforts. Campos and Horvath (2006), in drawing the distinction between policy inputs and outputs, give further succour to this argument, while the empirical work of Loyaza and De Soto (2002) and Glaeser et al. (2004) is also consistent with this line of reasoning.

In this spirit, we argue that macroeconomic stability is associated with the effectiveness of institutions and that the direction of causation is from the latter to the former and that nowhere is this more true than in the transition context where a stable macroeconomic environment reflects the degree of the government's commitment to a programme of stabilization and its capacity to sustain it. Figure 2.2, depicting a simple cross-section of inflation during the current financial crisis against average government effectiveness, supports this thesis.

This being so, we cannot consider stabilization itself to be an exogenous policy tool (Campos and Horvath, 2006; Falcetti et al., 2006). Accordingly, we argue that the inflation-economic growth transmission mechanism can be summarized thus: poor quality governmental institutions lower the effectiveness of government; this in turn exacerbates fiscal and macroeconomic instability and *ceteris paribus* negatively impacts upon economic growth.

So, while we agree that macroeconomic stability is important for growth, we augment this observation by noting that the policy inputs that determine stability are related to institutions of governance. Thus, the role of the institutional environment is central to our story. Before detailing how we deal with this econometrically it is worth visiting briefly the underlying argument linking institutions and economic stability in the empirical context.

To provide the necessary empirical realization we call upon the Kaufmann et al (2008) indicators of institutional quality. Among diverse categories of institutions that may affect macroeconomic stability, Kaufmann catalogues six dimensions of governance: (i) voice and accountability; (ii) political stability; (iii) government effectiveness; (iv) regulatory quality; (v) rule of law; and (vi) corruption. We argue that it is the 'government effectiveness' indicator which best captures the underlying mechanism that most closely links institutions of governance with macroeconomic stability.

Kaufmann defines government effectiveness as 'the quality of public service, the quality of civil service and the degree of its dependence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.' This is crucial since it reflects the ability of the government to collect taxes, and thus removes the need (or temptation) to rely on seigniorage to increase its revenue. At the same time, less effective governance is likely to result in low tax collection and more prevalent tax evasion, contributing to increased budget deficits and higher inflation. A recent World Bank Report (2007) supports this view, comparing the public spending and taxation regimes in the transition group with those in comparator countries in Asia and Africa, and demonstrating that government spending and taxation reforms have positive effects on the public finances. Furthermore, it is argued that higher public spending leads to macroeconomic instability and lower economic growth, specifically when institutions are weak. That is, with lower quality governance institutions, money is less likely to be well-spent and higher tax and/or fiscal deficits will eventually distort the business environment and threaten macroeconomic stability.

In sum, there is a growing and convincing body of evidence emerging suggestive of a strong causal link between institutional settings and macroeconomic stability. This body of literature, stemming from attempts to detail the conceptual, political economy linkages at play, has prompted the development of increasingly sophisticated quantifiable measures that attempt to capture institutional structures empirically. This makes our task of going beyond the conventional treatment of the inflation–growth relationship by identifying potential 'input' instruments for inflation more achievable.

3. Econometric methodology

Growth regressions have become a somewhat inveterate feature of empirical work in long-run macroeconomics in recent times. Examples abound, stemming from the original work of Barro (1991) and Levine and Renelt (1992), incorporating independent variables derived from both growth theories as well as from macro and microeconomic policy variables. The early examples utilize cross-country regressions measuring long-run 'equilibrium' values while, more recently, improved data sets and econometric software have facilitated a preponderance of panel-based empirical growth studies.

In the latter, real GDP per capita growth is typically regressed on a number of explanatory variables, as per Equation (2.1), in which subscripts i and t denote country and time period respectively. Thus,

$$G_{it} = \beta_0 + \beta_1 \ln (Y_0)_{it} + \beta_2 X_{it} + \varepsilon_{it} \tag{2.1}$$

where, G_{it} represents the average growth rate in country i at time t; ln (Y_0) is the log of initial GDP per capita; and X_{it} is a vector of control variables derived from theories of economic growth supplemented with empirically plausible policy variables.

Panel data analyses have clear advantages over the earlier cross-section approaches in so far as they allow for differences in individual country effects, while also controlling for unobserved heterogeneity (Islam, 1995). Nevertheless our main macroeconomic stability variable – inflation – remains empirically troublesome since, as explained in Section 2, it is endogenous to the process of economic growth and is a product itself of the institutional environment emerging in transition. In this situation, an instrumental variables approach in the form of two-stage Least Squares (2SLS), is a popular procedure to adopt. Valid instruments though are hard to come by: they must be both strongly correlated with inflation and substantially uncorrelated with the error term in (2.1). If we can identify such instruments then we are in a position to explore whether inflation, as a growth determinant, is robust to the attenuation of an inherent endogeneity. Following our earlier discussion, logic dictates that we should instrument inflation (a policy output) with a policy input variable and, in Section 2, we proposed the Kaufmann measure of 'government effectiveness', as a potential instrument, capturing the most generalized measure of public sector institutional quality.

So far, we have reviewed methods aimed at reducing the effects of unobserved heterogeneity and have discussed the important possibility that inflation, as a proxy for macroeconomic stability, is in fact an endogenous policy output variable. However, in empirical growth applications, it is also possible that other explanatory variables are in fact endogenous or indeed that there is state dependence in the dependent variable. In the spirit of the discussion above we may conceive of identifying instruments for each potentially endogenous variable, yet realistically, the plausibility and appropriateness of 2SLS as a general solution is questionable. Fortunately, panel data open up the possibility of estimating parameters of dynamic models that specify the dependent variable for a particular country to depend in part on its values in previous periods. Indeed, the emergence of more reliable panel data series, augmented by more powerful econometric software, allows us to call upon Generalized Methods of Moments (GMM) techniques to produce 'difference' and 'system' dynamic panel analysis (Arellano and Bond, 1991; Blundell and Bond, 1998).[2]

Difference GMM (Arellano and Bond, 1991) uses the lagged values of the dependent variable as instruments for the endogenous variables in a differenced equation. Consider the standard panel dynamic model (2.2), where Y_{it} represents GDP per capita, X_{it} is a vector of explanatory variables, c_i is an unobserved country specific effect and u_{it} is the error term.

$$\ln(Y_{it}) = \beta_0 + \beta_1 \ln\left(Y_{i,t-1}\right) + \beta_2 X_{it} + c_i + u_{it} \tag{2.2}$$

To net out the country specific effect (c_i), we take first differences of this equation:

$$G_{it} = \beta_1 \left[\ln\left(Y_{i,t-1}\right) - \ln\left(Y_{i,t-2}\right)\right] + \beta_2 \left[X_{it} - X_{i,t-1}\right] + \left[u_{it} - u_{i,t-1}\right] \tag{2.3}$$

where G_{it} now represents ln (Y_{it})–ln ($Y_{i,t-1}$). In sweeping c_i out of the equation this transformation reduces the problem of omitted variable bias but, in so far as G_{it} and/or ($X_{it} - X_{i,t-1}$) are correlated with the new error term (u_{it}–$u_{i,t-1}$), estimates of Equation (2.3) will suffer from endogeneity bias. To overcome this we can use lags of greater than one period as valid instruments. In the growth context, for example, if X_{it} is the investment ratio, and current investment is correlated with the current GDP growth rate, then 'standard' approaches will be subject to endogeneity bias. Using difference GMM, and instrumenting investment with values of itself lagged two periods or more, we can expunge this bias (Arellano and Bond, 1991; Easterly and Levine, 2001; Hoeffler, 2002).

Blundell and Bond (1998) argued that estimators relying on lagged variables are weak instruments if the data in question are close to being a 'random walk'. In this situation, the weak correlation of the lagged value of the regressor ($X_{i,t-1}$ or $X_{i,t-2}$) with its difference (X_{it}–$X_{i,t-1}$) affects the asymptotic and small sample performance of the differenced estimator. In these circumstances, 'difference' GMM performs poorly as the coefficient variances are inflated and finite sample bias becomes an issue. To combat these potential problems, 'system' GMM emerged (Arellano and Bover, 1995; Blundell and Bond, 1998; Bond 2002), drawing on the same instruments as difference GMM for the regression in differences but for the regression in levels the instruments are specified as the lagged differences of the corresponding variables (Easterly and Levine, 2001). Through this, system GMM reduces any bias associated with the weakness of instruments in difference GMM.

We present estimates stemming from all of these approaches in Section 5, after a brief introduction to the data.

4. Data

Empirical research on economic growth generally uses International Financial Statistics (IMF), World Development Indicators (WDI, World Bank) and the Summers-Heston data set (the Penn World Tables).[3] In this contribution, our focus is on 25 transition economies of CEE and the CIS.[4] We have data on these economies for a period, 1989–2007, which we consider as representing the 'medium term'.[5] Following the approach of Islam (1995) and Hoeffler (2002), rather than using annual observations from within our data, we construct three-year averages, resulting in six time units.[6] This is appropriate in our case as, by averaging over three-year periods, we introduce an element of stability to our data that serves to offset the missing values and measurement errors that afflict the data during the early stages of transition in particular. In addition, by reducing the number of time periods, from 19 to six, we constrain the number of instruments used to obtain the GMM estimates (Roodman, 2006).

As discussed, our growth estimation follows the approach widely used in the general empirical literature: the growth rate is regressed on explanatory variables motivated with reference to a combination of growth theories and growth empirics. Accordingly, we estimate economic growth (change in log GDP per capita averaged over three-year periods) as a function of initial income level, factor accumulations and economic policies. Specifically:

$$\begin{aligned}\text{Growth} = \beta_0 + \beta_1^*\text{GDPPC} + \beta_2^*\text{WPOP} + \beta_3^*\text{INV} + \beta_4^*\text{SEC}\\ + \beta_5^*\text{TRADE} + \beta_6^*\text{FUEL} + \beta_7^*\text{INF} \qquad (2.4)\end{aligned}$$

where the convergence effect (Solow, 1956) is captured by incorporating the average value of PPP GDP per capita over each period (GDPPC); the evolving demographic situation is controlled for through the incorporation of the growth of the working age population (WPOP); and factor accumulation is captured through the ratio of gross fixed capital formation to GDP (INV) and the general upper secondary school enrolment rates (SEC). These four variables are relatively conventional and stem from the standard theoretical approach to modelling economic growth. We now briefly explain our empirical approach to capturing important policy effects.

Many studies on economic growth in transition have used the EBRD's liberalization index (EBRD, 1994–2008) to capture the seemingly important impact of transitional reforms. However, aside from being a subjective indicator and artificially constrained by its lower and upper bounds, it is also significantly correlated with virtually every relevant independent variable and therefore likely to bias the econometric results. We therefore adopt 'TRADE' – the sum of exports and imports of goods and services measured as the share of GDP – as our preferred proxy for liberalization. In particular, TRADE captures the important impact of economic openness on growth. In view of the significance of the natural resource sector to many of the CIS countries in our study, we also include the percentage of fuel exports over merchandise exports (FUEL). Finally and consistent with the literature, we use inflation as our proxy for macroeconomic stabilization during transition.[7] In contrast to the GDP deflator, the CPI includes imported goods and therefore incorporates the surge of imports prompted by the initial external liberalization associated with transition.

As discussed in Section 2, we regard (input) institutions as the appropriate instrumenting variable for inflation. Among the diverse categories of institutions that may affect macroeconomic stability, we draw on the Kaufmann et al. (2007) governance indicators which range in value from

Table 2.1 Correlation Matrix of Six Governance Indicators

	VA	PS	GE	RQ	RL	CC
VA	1.00					
PS	0.75	1.00				
GE	0.82	0.83	1.00			
RQ	0.87	0.79	0.93	1.00		
RL	0.82	0.85	0.98	0.92	1.00	
CC	0.78	0.82	0.97	0.88	0.98	1.00

Source: Kaufmann et al. (2007).
Notes: (i) VA: Voice and Accountability; (ii) PS: Political Stability; (iii) GE: Government Effectiveness; (iv) RQ: Regulatory Quality; (v) RL: Rule of Law; (vi) CC: Control of Corruption.

-2.5 to $+2.5$ with the higher values corresponding to better governance outcomes. These indicators rely on 276 variables[8] to measure institutions across the six dimensions of governance indicated earlier. Unsurprisingly, the six Kaufmann governance indicators are closely correlated with each other, as Table 2.1 demonstrates. This provides further justification for using the government effectiveness indicator rather than attempting to combine indicators. Therefore, in our 2SLS analysis, we instrument inflation (a policy output variable) with government effectiveness (a policy input factor). We turn now to a discussion of our empirical results.

5. Results

In this section we present our empirical results in three stages: effects estimates controlling for unobserved heterogeneity; 2SLS estimates attenuating the potential endogeneity of our macroeconomic stability variable; and GMM estimates accounting for a dynamic process with multiple endogenous variables. The results of each approach are consistent and mutually reinforcing.

Following conventional panel procedures we estimate economic growth in transition using both fixed and random effects models, before conducting the Hausman (1978) test of whether the individual country effects are correlated with the explanatory variables. Finding that we are unable to reject the null hypothesis (P-value = 0.048), that they are correlated; we are left relying on the consistent, but less efficient fixed effects estimates. The latter allow us to control for omitted variables that differ between countries but that are constant over time. The results (Table 2.2) indicate that, though fixed effects estimates are preferred, there is no major qualitative distinction to be made between the two.

The results are broadly consistent with expectations. Initial conditions, though insignificant, have the expected negative sign. The investment rate

Table 2.2 Basic Model (Fixed and Random Effects)

	T1–T6 (1989–2007)	
	FE ($n = 82$)	RE ($n = 82$)
ln(GDPPC)	−4.85	−0.20
	(5.83)	(0.59)
WPOP	−0.10	−0.01
	(0.02)	(0.02)
INV	0.05	0.08
	(0.23)	(0.11)
SEC	0.52***	0.18***
	(0.17)	(0.05)
TRADE	0.03	0.002
	(0.04)	(0.02)
FUEL	0.25*	0.03
	(0.14)	(0.03)
CPI	−0.02***	−0.02***
	(0.004)	(0.003)
Hausman Test	Chi Sq = 14. 20 Prob(Chi Sq) = 0. 048	

Data Source: WDI (2008); IMF (2008); TRANSMONEE (2008).

and openness to trade have the expected positive sign, though again are not significant and the working population growth is negative and insignificant. The proportion of natural resource exports is positive and weakly significant, perhaps reflecting the dominating effect of the oil price boom over the opposing forces of the more long-term prospect of 'Dutch disease'. Most promisingly however, education and macroeconomic instability are both highly significant and with the expected signs. This is our first evidence that higher levels of human capital have a positive impact on economic growth in transition while macroeconomic instability has a negative impact. As discussed above, the latter result is consistent with findings elsewhere. However, until now, there has been little evidence of a significant positive association between education levels and economic growth in the transition context.[9]

In our earlier discussion we identified Kaufman's 'government effectiveness' indicator as an intuitively plausible instrument for inflation. Empirically, we find that 'government effectiveness' is significantly and negatively related to macroeconomic instability (inflation) but is consistently unrelated directly to economic growth. Indeed, reproducing the effects estimates of Table 2.2, with government effectiveness incorporated, we are unable to discern any significant relationship with economic growth.[10]

Following Wooldridge (2002), we therefore proceed to combine 2SLS with effects models in order to obtain parameter estimates purged of both unobserved effects and endogeneity in the macroeconomic stability variable. Conducting the Hausman test we find no evidence that the individual country unit effects are correlated with the explanatory variables incorporated in the model and so we concentrate our discussion on the results of the random effects instrumental variables regression presented in Table 2.3.[11]

Table 2.3 Panel 2SLS Estimation (IV: Government Effectiveness)

	T3–T6 (1996–2007)	
	Fixed Effects ($n = 68$)	Random Effects ($n = 68$)
1st Stage Regression	−294.06	26.88
ln(GDPPC)	(195.58)	(20.92)
WPOP	27.52	2.57
	(35.22)	(14.09)
INV	1.87	2.49
	(6.51)	(2.70)
SEC	4.93	−0.06
	(6.74)	(1.27)
TRADE	−0.32	0.60
	(2.10)	(0.44)
FUEL	1.77	0.12
	(3.34)	(0.78)
Gov Eff	−96.66*	−95.59***
	(57.79)	(32.23)
2nd Stage Regression	−0.03	−0.03**
CPI	(0.02)	(0.01)
ln(GDPPC)	8.37	−0.47
	(8.94)	(0.51)
WPOP	−0.57	−0.60
	(1.30)	(0.47)
INV	−0.19	0.14
	(0.20)	(0.09)
SEC	−0.10	0.15***
	(0.20)	(0.04)
TRADE	0.04	−0.001
	(0.64)	(0.02)
FUEL	0.22**	0.03
	(0.11)	(0.03)
Hausman Test	Chi Sq = 8.55 Prob(Chi Sq) = 0.29	

Data Source: WDI (2008); IMF (2008); TRANSMONEE (2008).

In the first stage regression, where inflation (CPI) is the dependent variable, 'government effectiveness' is strongly and negatively associated with 'CPI', whereas no other variable is significantly related to inflation. This result is not affected by the use of different estimators or specifications and is strongly supportive of our earlier discussion, namely that macroeconomic stability is an outcome of sound institutions of governance. In the second stage regression, where the growth rate is again the dependent variable, we purge the endogeneity introduced by the inflation variable by using, in its place, the 'government effectiveness' instrument. Entirely in keeping with the results of simple effects models, we find that initial conditions, the growth of the working population, the investment rate, trade openness and natural resource exports are all insignificant but with plausible signs, while macroeconomic instability and levels of human capital are both highly significant and with the expected signs. We now further investigate the robustness of these results using dynamic panel methods.

In Table 2.4, we report four sets of dynamic growth regressions mirroring the specifications discussed above: pooled OLS, fixed effects, difference GMM and system GMM. By examining the coefficient on the lagged dependent variable we are able to check the validity and robustness of our GMM results. In particular, the estimate for the lagged dependent variable in the pooled OLS regression (column 1) is likely to be upward biased in so far as it is positively correlated with the unobserved country specific effects (Hsiao, 1986; Hoeffler, 2002). In contrast, the fixed effects estimator (column 2), though eliminating the problems stemming from country specific effects, is likely to produce downward biased estimates of the lagged dependent coefficient (Nickell, 1981). The coefficients, both of which are strongly significant, from these two approaches can therefore be thought of as approximate upper (1.02) and lower (0.21) bounds for the GMM regressions. That is, if the GMM estimates for the lagged dependent variable fall outside of the upper and lower bounds, it suggests some form of bias is also present in the GMM estimates.

With the pooled OLS and fixed effects estimates confirming that there is a dynamic process at work we then address the problem of endogeneity within our model, first through difference GMM (column 3) and then through system GMM (column 4). Specifically, in each case we consider that the investment ratio and the human capital proxy, *as well as* the macroeconomic stability variable, are endogenous to the process of economic growth. In terms of our upper and lower bounds we find that the difference GMM estimate of the lagged dependent variable, 0.23, is similar to that of the fixed effects estimate, while the system GMM coefficient, 0.99, is just below the upper bound represented in the OLS estimate. Blundell and Bond (1998), demonstrate that the difference GMM estimator suffers large finite sample biases such that, if the instruments available are weak, difference GMM estimates are also downward biased. The evidence of Table 2.4

Table 2.4 Growth Estimation of Transition Economies

DV: $\ln(GDPPC)_{i,t}$	*(1) Pooled OLS (n = 79)*	*(2) Fixed Effects (n = 79)*	*(3) DIF-GMM (n = 55)*	*(4) SYS-GMM (n = 79)*
$\ln(GDPPC)_{i,t-1}$	1.02***	0.21**	0.23	0.99***
	(0.02)	(0.09)	(0.22)	(0.03)
WPOP	0.005	0.01	0.03	0.05
	(0.02)	(0.02)	(0.06)	(0.03)
INV	0.005	0.01***	0.003	0.008
	(0.003)	(0.003)	(0.02)	(0.006)
SEC	0.003***	−0.001	−0.04*	0.01**
	(0.001)	(0.004)	(0.02)	(0.005)
TRADE	−0.001***	−0.002	0.002	−0.001
	(0.0004)	(0.001)	(0.005)	(0.001)
FUEL	−0.001	0.005**	−0.004	−0.0004
	(0.001)	(0.002)	(0.006)	(0.002)
CPI	−0.0003**	0.0001	−0.00008	−0.001***
	(0.0002)	(0.0001)	(0.0003)	(0.0004)
AR(2)			0.328	0.922
Instruments			15	24
Hansen			0.727	0.349

Data Source: WDI (2008); IMF (2008); TRANSMONEE (2008).
Notes: All standard errors are corrected for heteroskedasticity. Each regression includes time dummies, excluded here for ease of exposition.

is cautiously supportive of this finding and, since the corresponding system GMM estimate falls below the upper bound, we consider that the system GMM approach is preferred. Indeed, between these estimators, the system GMM has been preferred in many studies for logic mirroring that which we have applied (Blundell and Bond, 1998; Easterly and Levine, 2001; Hoeffler, 2002; Nkurunziza and Bates, 2003).

Notwithstanding these comments, any GMM estimate must have valid instruments and be correctly specified. In both of our GMM estimates, the Hansen test fails to reject the assumption that our instruments are valid, the Sargen test results are consistent with the assumption that our models are correctly specified and the overall results are robust to different lag structures (Roodman, 2006).

Concentrating on the system GMM results, Table 2.4 provides strong evidence supportive of the findings derived from simple effects models and 2SLS approaches and of our *a priori* expectation that the growth process is indeed dynamic. Specifically, we find once again that macroeconomic stability and human capital are important for economic growth in the transition economies while, even allowing for their potential endogeneity; investment, trade openness, natural resource exports and growth of the working population have ambiguous effects on economic performance for this set of countries.

Finally, there is a further transition specificity, regarding the inflation–economic growth relationship, which merits consideration. It is well understood that at the start of the transition process there was a concurrent output decline and hyperinflation which may lead us to the erroneous conclusion that hyperinflation caused recession and thus that macroeconomic stability should result in economic recovery. This is not the effect we want to be capturing in this chapter. Indeed, the explanation for and implication of the initial price hikes is quite distinct from subsequent inflationary episodes occurring across parts of the post-communist world. In order to confirm our findings therefore, we estimate our model without the first two time periods, covering 1989–1994,[12] and are thus able to observe the role of inflation in the later stages of transition. Reassuringly, our results are confirmed as we find once more that macroeconomic stability and education are significant and positive determinants of economic growth.[13]

In sum, by revisiting the latest panel data available for transition countries up to and including 2007, and averaging over three-year periods, we find evidence that the key determinants of economic growth are human capital and macroeconomic stability. The latter result has been widely reported in the literature but we find evidence supportive of a slightly more nuanced explanation. That is, macroeconomic stability is an outcome of effective government institutions and it is this combination of factors which explains differences in economic performance across the transition economies. The former result, regarding education, is a new finding for the transition economies and indicates that as these economies emerge from the 'transitional' process they may converge on 'behaviour' concordant with that observed elsewhere. The results are robust to different econometric approaches, assumptions, specifications and time spans and are likewise robust to a range of different panel econometric approaches.

6. Concluding discussion

In this chapter we have systematically revisited the dense empirical and theoretical literature pertaining to economic growth in transition. We have done so with a view to refocusing the attention of researchers and policymakers on to the medium-term determinants of economic growth in the post-communist economies. Thus, in taking a longer data series than previously available, we have: assessed the evolving impact of factor accumulations; controlled for well-rehearsed transition specificities; and incorporated a revised role for the institutions of governance. Our main findings are consistent and mutually reinforcing across econometric specification and technique and taken together they provide us with our two core contributions: (i) macroeconomic stability promotes economic growth in the countries of CEE and the CIS but it is robust institutions and good governance that are required to generate that macroeconomic stability; (ii) as transition has progressed human capital investment seems to have regained its significance as a generator of economic growth.

Macroeconomic instability, as proxied by inflation, is always statistically significant in our estimates and with a negative impact on economic growth. Inflation, it seems, is definitively bad for economic growth in transition. However, inflation itself is a policy output, the inclusion of which is likely to introduce simultaneity bias into our growth estimates. We therefore go further, instrumenting inflation with Kaufmann's 'government effectiveness' variable. We find that inflation is determined by effective governance, even though the latter cannot be linked directly to economic growth. That is, good governance is important for growth indirectly through its association with the kind of institutions that facilitate a stable macroeconomy.

Our results regarding investment in human capital are different from those provided by other studies on growth in transition, in which education is generally found to be insignificant. The explanation for this lies in the fact that we are using different measures and that we have a longer, more medium-run time horizon. Most previous studies take the value of *initial* education to estimate the human capital–economic growth relationship. It should come as little surprise that levels of human capital characteristic of the end of the communist period transpire not to be appropriate for the market-based economy. Indeed, Laporte and Schweitzer (1994) argue that a higher level of initial education is meaningless for, or perhaps even detrimental to, economic growth since the social sciences and the humanities endured particular neglect during the central planning period. By way of contrast, we take three-year averages of the secondary school enrolment rate on the grounds that sustained investment in education during the transition is more likely to have a significantly positive impact on economic growth. The raw data supports this thesis. Countries achieving high economic growth during the transition, such as Estonia, Poland, Albania and Latvia, show a significant increasing trend in secondary education enrolments. On the other hand, the poor performers in terms of economic growth – Tajikistan, Georgia and Turkmenistan – exhibit a decreasing or constant trend in educational enrolments.[14]

In terms of the other factor accumulation variables known to be important for economic growth in developed and/or developing economies our results pose more questions than answers since, although the signs on the variables are plausible enough, they are generally not statistically significant. We feel that, since physical investment in particular has been one of the main determinants of rapid growth elsewhere in the world, this merits further investigation. Several avenues show promise: it may be that there is some complex relationship between investment and inflation which our data cannot detect; more plausibly still, as argued by Mickiewicz (2005), it is the quality of investment, rather than the quantity that matters in the transition context; finally, there may be a transition specific story relating the impact of investment to the appropriateness of institutions. These are interesting and important lines for future research but are outside the scope of this chapter. It is also worthy of comment that we have utilized an openness measure instead of the (more common) liberalization indicator. We choose to do this on the grounds that it is less subjective and less sensitive to measurement error and not because we are denying the importance of microeconomic reforms in transition. Rather, our story is in the spirit of Mckinnon (1993) who argues that microeconomic, macroeconomic and institutional aspects are closely and inextricably linked. To the extent that we are able to capture this, we do so in our 2SLS estimation which confirms that government effectiveness leads to macroeconomic stability, which in turn is a main determinant of economic growth.

The recent financial crisis has exacted a heavy toll on the transition countries (EBRD, 2008) with economic growth in decline across the region though most substantially in the Baltic region and parts of the CIS. Inflationary pressures also emerged across the region but as Figure 2.2 confirms, those countries with the best governance records have suffered the least in terms of inflation during this crisis. If our story is correct, then we might expect those countries retaining macroeconomic stability to find the smoothest paths back to their medium term growth paths.[15]

Finally, it is also worth reflecting that empirical growth studies must be treated with caution due to the ever present possibility of heterogeneity and endogeneity, data inconsistency and the potentially biased selection of variables. Moreover, these issues become potentially more worrisome in the case of transition economies. These concerns inform our systematic approach and our caution in interpretation. However, as Falcetti et al. (2006) suggest, although we cannot yet have a clear understanding of the long-term determinants of growth in transition economies, investigating growth patterns in these important economies will rightfully continue to be fruitful areas of research as the transition from the command economy structures progresses. Ultimately, as we seek more generally to understand and refine economic growth models in a world in which institutions and governance are known to be ever more important, the research community should not ignore the lessons to be learnt from the unique setting provided by the transition economies of Central and Eastern Europe and the Former Soviet Union.

Notes

1. At the time of writing this is the latest comprehensive data available for the 28 EBRD countries (we do not include Mongolia in this analysis).
2. Good applications of GMM techniques can be found in Bond, 2002; Hoeffler, 2002; and Nkurunziza and Bates, 2003. Roodman (2006) presents perhaps the

definitive guide to implementing and understanding 'Difference' and 'System' GMM.

3. Examples abound including Barro, 1991; Levine and Renelt, 1992; Mankiw et al., 1992; Islam, 1995; Quah, 1996; Sala-i-Martin, 1997; Barro and Sala-i-Martin, 2004.
4. We exclude Serbia, Montenegro and Bosnia-Herzegovina (as well as Mongolia), from the 28 countries that the EBRD typically identifies as transition economies in the pan-European region, due to data availability in the early 1990s.
5. Our data are drawn principally from the EBRD Transition Reports (1989–2008), augmented with data from WDI, IMF (inflation) and, for education, UNICEF's TransMonee database.
6. The six units T1, T2, ... T6 are: 1989–1991; 1992–1994; 1995–1997; 1998–2000; 2001–2003; 2004–2007. The latter time unit spans four years but this does not qualitatively affect the results and it remains too soon to construct a 7th time period based on 2007–2009.
7. Specifically we use the change in the Consumer Price Index (CPI). The CPI is a measure of the average prices paid by consumers for a fixed market basket or bundle of goods and services. We obtain our data from IMF Financial Statistics (2008), since the IMF provides superior coverage.
8. The data draw on 31 sources constructed by 25 different organizations, covering 213 countries for 1996, 1998, 2000 and annually for 2002–2007.
9. *All* results in this section are robust to the exclusion of TRADE alone, FUEL alone, and TRADE/FUEL together and to estimates using annual panel observations.
10. We note also that the inclusion of government effectiveness as an explanatory variable does not qualitatively effect the results reported in this section.
11. Since the Kaufman indicators are not available for T1 and T2, this estimate is indicative but is consistent with all of our other findings.
12. As also in Table 2.3.
13. These results are not reported but are available on request from the corresponding author.
14. Moreover, these findings are robust to the potential endogeneity of the human capital variable.
15. It is of course too early to comment concretely on this since other factors, ranging from capacity constraints in labour markets, through fiscal and monetary policies to choice of exchange rate regime and beyond condition the impact of global financial instability on the domestic macroeconomy.

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3

Human Capital and Social Capital as Interacting Factors of Economic Development

Anneli Kaasa and Eve Parts

1. Introduction[1]

When studying empirically the differences in levels of income and development between nations and regions, it appears that these enormous and growing differences cannot be fully explained by traditional theories of economic growth, which consider physical capital as the main factor of development. The basic assumption made in classical and neoclassical economic theory states that society consists of a set of independent individuals, each of whom acts to achieve goals that are independently arrived at, implying that the best institution to govern economic exchanges is free market. However, market mechanism based on individually rational behaviour will often not guarantee collectively optimal outcomes because of externalities, whose solving requires cooperative behaviour and attitudes. Acknowledging such duality in economic theory has forced economists to look for new explanations to economic processes. Earlier, the concept of human capital – consisting of good education and health which should yield higher productivity – was added into endogenous growth models, and following empirical work has proved that human capital has strong explanatory power in growth regressions.

However, as stressed by Schuller (2000), individuals and their human capital do not exist in isolation – instead, the value of the abilities and skills of individuals depend on the social and institutional context within which they are embedded. The importance of social and institutional resources for ensuring economic growth and development was highlighted in the 1990s in the context of conditional convergence theory. It was acknowledged that there are various structural impediments to growth and development, like cultural differences, transaction costs, ineffective government policies, weak legal and business institutions, capital market imperfections and others (Yeager, 1999). Many of these development obstacles could be – at least partly – overcome with the help of social capital. By the notion of 'social capital'[2] we understand here a wide range of social activity and connections between individuals and groups, together with shared norms and values that enable participants to act together more effectively to pursue shared objectives. Besides these mostly micro-level aspects, at macro level institutional trust and quality of governance can be also gathered under the umbrella concept of social capital (Knack, 2002; North, 1990; Olson, 1982). Altogether, social capital theory is one possibility to find alternative solutions to the problems of allocation, cooperation and economic efficiency, which take into account social context in economic behaviour.

The purpose of the current chapter is to analyse the reciprocal relationships between human capital and social capital as interacting factors of economic development in the sample of European countries. Theoretically, both factors are assumed to play a significant role in economic development, as they complement and influence traditional growth factors like investments into physical capital, innovations, exports and population growth. Also, because of possible interaction between social capital and human capital, it can be assumed that these two factors influence economic growth not only directly but also via each other. However, there are only few attempts to test these interrelationships empirically. Hence, our approach is predominantly exploratory and attempts to shed some more light on complementarities of human and social capital as factors of economic development.

The rest of the chapter is structured as follows. Section 2 presents theoretical background, explaining interrelationship between human and social capital and alternative mechanisms for how these factors could influence development outcomes both separately and jointly. Section 3 describes indicators and methodology used in the empirical analysis. Sections 4 and 5 present the results of the empirical analysis, while Section 6 concludes.

2. Theoretical background

In the simple neoclassical model of economic development (Solow, 1956), welfare levels and their growth rates are expected to depend on society's total capital, consisting of physical capital and labour force. Also, diminishing returns to capital investments are assumed, which should lead to the long-term stagnation of economy in the absence of technological progress. Incorporating human capital into the endogenous growth model (Lucas, 1988; Romer, 1986, 1990) enables us to endogenize technological progress and divert from the assumptions of decreasing returns. As investments into human capital and technology are characterized by widespread spill-over effects, returns to such investments are expected to be constant or even increasing. More recent empirical work on the determinants of growth often relies on the conditional convergence model (see Barro, 1998; Mankiw et al., 1992), which enables the incorporation of a wide range of social and institutional factors into growth regressions, being thus especially useful in studying the effect of social capital on economic development. As the nature of our approach is exploratory, we are relying on the above models simultaneously.

When discussing the joint effect of human and social capital on economic development, first the similarities and differences of these concepts should be clarified. Although closely related, blurring the distinction between social and human capital – as both are embodied in people – is not correct. The critical difference between human and social capital is that education and health can be embodied in one individual and can be thus acquired individually regardless of what other people do, while social capital – consisting of networks, interpersonal trust and common norms – can only be acquired by a group of people and requires a form of cooperation among them (Coleman, 1990; Grootaert, 1998). On the one hand, at individual level human and social capital can be seen as opposites: it has been argued that human capital (based on individual achievement and competition) is a key for social success, while social capital has only limited importance for the welfare of minorities (for example, disabled, immigrants) who are more or less isolated from the broader society (Saraceno, 2002). On the other hand, individual achievements would be higher, if one both competed and cooperated with others through different networks and common value systems. In addition, although human capital may include both social and technical skills, the amount of and economic returns to these skills depend on the social context in which those human skills are built, deployed and rewarded (Schuller, 2000). In this respect, human and social capitals should be considered as complements that reinforce each other's effect on economic welfare.

What are the distinct effects of human and social capital on economic development? Concerning human capital, most of the scientific work has been focusing on education as a factor of welfare growth. Theoretically, since educational attainment is seen as a major indicator of investment in skills and knowledge, this becomes individuals' major asset in the labour market, resulting in their joining better firms and receiving higher wages (Becker, 1964; Mincer, 1970). At the aggregate level, a rise in the average level of education of the nation's workforce would be expected to increase national productivity and income levels. This argumentation relies on the treatment of human capital as a rival good – if knowledge and skills are directed to one particular activity or sphere, their simultaneous use in others is prevented (Lucas, 1988). However, at the level of community, the set of knowledge and ideas is basically non-rival and can be implemented in many activities at the same time (Romer, 1990). Hence, human capital can create positive externalities – for example, higher education levels help to attract foreign capital and utilize new technologies in poor countries, leading to faster economic growth.

When assessing the effect of social capital on economic development, a distinction should be made between two different approaches (Knorringa and Staveren, 2005). Firstly, social capital can be seen as a separate key production factor having direct effect on growth. Secondly, social capital can indirectly determine the allocation and productivity of other basic production factors like physical capital, human capital and technology. In addition, it is useful to distinguish between structural and cognitive aspects of social capital. *Structural social capital* includes formal and informal structures in the society that mediate the flow of information and other resources, while *cognitive social capital* comprises norms and values as regulators of human behaviour (Grootaert and Bastelaer, 2002). Different sub-types of social capital are closely related and can influence each other, being both complements and substitutes. Along with the cognitive dimension it can be shown how individual informal norms and values influence the behaviour of social groups (as groups are formed from individuals). Moving further to the macro level we should simply extend 'group' to cover whole society. At the macro level, commonly accepted norms usually transform into formal laws, which in turn influence individual values. Opportunities and constraints created by formal institutions and rules also influence formation and activity of informal organizations and lobbying groups, while the latter can induce changes in formal institutions.

The expected direct positive relationship between social capital and economic performance is based on several causal mechanisms. According to Putnam (2000), social networks generated through participation in voluntary organizations open up channels for the flow of philanthropy and altruism, which, in turn, foster norms of individual and general reciprocity. Trust and norms can help to discourage opportunistic behaviour, thereby filling the gaps in incomplete contracts, thus promoting capital investments (Lyon, 2005). Ostrom (1990) has shown how norms of reciprocity may help to suppress free riding and thus enhance the voluntary provision of local public goods. Beside her examples of self-governing institutions created mostly in poor countries for the management of common pool resources, Brusco (1992) notes that similar collective good features arise in developed countries when several firms form consortia or industrial districts in order to share their costs. Such network settings are especially important as they facilitate flows of information about reliability of possible business partners and workers, but also about technological developments. Resulting spill-over effects favour innovation, which in turn has a positive effect on economic development. All of the above explanations are related to lower transaction costs, as in the presence of social capital less time and financial resources need to be spent on formal contracts and monitoring.

However, empirical evidence has shown that the different dimensions of social capital are not equally beneficial for growth and development. Most of the empirical work has proved that both trust and civic cooperation are associated with stronger economic performance (Fukuyama, 1995; Helliwell and

Putnam, 1995; Knack and Keefer, 1997; Putnam et al., 1993; Zak and Knack, 2001), while the effects of associational activity are more ambiguous. Positive effects of group membership appear mainly at regional level (Beugelsdijk and Schaik, 2005; Putnam et al., 1993), while cross-country analyses usually do not show correlation between participation and economic performance (Helliwell, 1996; Knack and Keefer, 1997). However, Raiser et al. (2001) have found that unlike in market economies, in transition countries generalized trust is not positively related to growth, while participation in civic organizations shows a positive correlation.

Still, these empirical examples should be taken with caution when comparing with the effect of human capital on development – no country has achieved sustained economic growth without a high level of education, while some highly developed economies have low and arguably declining levels of social capital, measured, for example, by declining family and kinship cohesion, falling trust in government and lower participation in political processes (Grootaert, 1998; Putnam, 2000). Given that human and social capital are related concepts but their presence might yield different development outcomes, the question arises about the complementary nature of these two factors. In this respect, for example, Piazza-Georgi (2002) has noted that although social capital may influence economic performance by reducing transaction costs, it could have an indirect effect through abilities realization and entrepreneurship, reducing thus human capital investment costs. Unfortunately, empirical work on possible cross effects of social capital and human capital on economic development is rear. There is a current study by Miguélez and Moreno (2008) testing cross effect of social and human capital on the number of patents in Spanish regions. However, they found no direct positive effect of interaction term; instead, including the cross effect in the model increased the separate direct effects of human and social capital on patenting activity. Given this gap in the literature of economic growth, we are subsequently focusing on the alternative explanation of complementarities between social and human capital as factors of development.

When considering human capital and social capital as interacting factors of economic development, one should keep in mind that causal sequence could run in several directions – from social capital to human capital to economic development; from human capital to economic development through social capital; and also from economic development to human capital and social capital. Empirical studies mainly emphasize the effect of social capital on accumulating human capital. Although traditional models of human capital (Becker, 1962; Ben-Porath, 1967; Mincer, 1974) focus narrowly on the link between education and income, more recent studies have shown how social networks provide access to useful labour market information and thus help to find better and high-paying jobs (Bourdieu, 1980; Burt, 1992; Loury, 1977). As such, social capital enables human capital to realize its potential in the short run even without increasing its actual stock. As regards more long-term effects, social capital is an important determinant of educational achievement in the case of children. There is considerable evidence to confirm that family, community and state involvement in education improves outcomes by decreasing the probability that the child may drop out of school (Coleman, 1988; Teachman et al., 1996). Thus, social capital extends individual access to human capital, the latter leading also to higher private and public returns in the future.

The impact of human capital on social capital is less clear. The most common explanation of the expected positive effect of human capital on social capital relies on the notion that schools as educational institutions impart good standards of behaviour, helping to socialize young people and also enabling them to engage in society by virtue of being better informed. At the more general level it has been suggested that both formal and informal education act as mediators of social values and norms between human generations (Montgomery, 2000). However, such value transmission should not always be supportive to social capital generation – education may also foster individualistic and competitive attitudes and hence reduce social capital.

In the labour market context, higher levels of education are usually associated with lower unemployment rates. Expectedly, the unemployed have less financial resources (although more time) for participating in associational life, which in turn leads to social isolation and narrows the access to information about new job opportunities. Further, political scientists argue that education would have the effect of raising people's awareness of political issues: higher literacy stemming from greater education might, for example, enable individuals to read political literature and thus to be more aware of current affairs (Rosenstone and Hansen, 1993). This tends to raise political activity in the form of higher political participation and voting turnout (Dee, 2004).

Further, there are contradictory opinions concerning the impact of education on individuals' propensity to participate in community and voluntary activities. On the one hand, insofar as voluntary activities are altruistic, educated people may be more aware of the deficiencies in society (Denny, 2003). On the other hand, as higher education is associated with a higher opportunity cost of time, measured by foregone earnings, one could expect a negative effect of education on volunteering (Brown and Lankford, 1992). However, since volunteering typically takes place out of work time, there may be little or no trade-off. Finally, the positive correlation between education and voluntary participation could be determined by some omitted variables – for example, some people may simply have more initiative or energy which makes them both more inclined towards studying and volunteering (Denny, 2003).

The argument that education is one of the most important predictors of many forms of political and social engagement is nowadays also challenged by several global developments. Since the second half of the twentieth century the educational levels in many countries have risen sharply, while levels of political and social participation have not (Putnam, 2000). One explanation for this inconsistency relates to the fact that in the course of rapid developments in technology and individualism, traditional face-to-face socializing is replaced by new types of entertainment (for example, TV and internet) which are not taken into account in traditional social capital statistics. On the other hand, IT development opens up new virtual information channels, which may function similarly to traditional networks. It could be expected that poor computer skills and limited access to the internet make it more difficult to find a new job when unemployed, leading thus to higher unemployment rates and lower incomes at aggregate level.

3. Methodology and the measurement of the variables

The following empirical analysis includes 29 European countries, of which 12 are post-communist transition countries (see Appendix 3.A2 for detailed list). Basic data of economic development and its factors are taken from Eurostat (2008). Social capital data come from two databases: micro-level social capital data are retrieved from the World Values Survey (WVS) (2008), while macro-level social capital is measured by six indicators of institutional quality, obtained from Kaufmann et al. (2008). The analysis covers the period 1999–2007. Selection of the time period was limited for several reasons. Firstly, this period presents quite stable growth experience without large global shocks (Asian financial crisis and Russian crisis of the years 1997–1998 are excluded, as well as the recent financial and economic crisis which started in 2008[3]), thus allowing more accurate estimations, despite the short time span. Secondly, social capital data were available only for year 1999. As the factors of growth should be estimated prior to the growth in order to minimize simultaneity and endogeneity problems, including earlier years would not be meaningful.

Methodologically, our empirical analysis is based on the simplified neoclassical growth model in the widely used Mankiw, Romer and Weil (1992) specification, where GDP per capita depends on investments and population growth. This basic specification can be extended to incorporate additional growth factors, including human and social capital, among others. In the following regression analysis we test, in parallel, how the growth rates $((y - y_{-1})/y_{-1})$ and absolute changes[4] $(y - y_{-1})$ of the GDP per capita over the period 1999–2007 depend on the proposed growth factors, including human and social capital, initial levels of GDP per capita in order to test the convergence among countries and some other control variables described below.

When measuring human capital, we test several alternative variables. Mean level of education refers to year 1999 and is obtained from WVS, while educational levels of working-age population – referring to the human capital potential of the country – come from Eurostat and are included in the analysis with the average values over the period of 1999–2007. Regarding our sample, which includes relatively highly-developed countries, it could be expected that economic growth depends more on tertiary and secondary education than primary education. In addition, based on theoretical considerations, school dropout (percentage of the population aged 18–24 with at most lower secondary education) and unemployment rate are included in the initial stage of empirical analysis.

As regards social capital, it can be assumed that different dimensions of social capital may have dissimilar impacts on development (Franke, 2005). We use weighted data from the fourth wave of the WVS, which refers mostly to year 1999[5] and contains standardized cross-national measures of the following dimensions of social capital: formal and informal networks, general and institutional trust, social norms and political engagement. Macro-level social capital is measured by six indicators of institutional quality as defined in Kaufmann et al. (2008), including rule of law, control of corruption, government effectiveness, political stability, regulatory quality, voice and accountability. As these governance indicators are available on bi-annual basis, they are here calculated as the average over years 1998 and 2000. Together with institutional trust and political engagement, these indicators can be considered also as a part of broader institutional environment influencing economic performance. In addition, virtual networks as a new form of socializing and information channel are approximated by the availability of mobile and telephone services and internet access.

The above variables of social capital were aggregated into broader dimensions using principal component analysis. As exploratory analysis confirmed the proposed structure of social capital elements, these factors were subsequently re-estimated with confirmatory analysis. Altogether, eight factors were constructed, which explain about 49–87 per cent of the variances in initial indicators (see Appendix 3.A1). Mean factor scores were calculated per country (see Appendix 3.A2) and are used as composite indicators of social capital in the subsequent analysis. As general trust was measured only by a single survey question, this measure was standardized for further analysis.

Further, complementarities between human capital and social capital are investigated by including interaction terms of education and different dimensions of social capital into regressions. Although such interaction terms enable us to capture both directions of causality, in our relatively short period of analysis (and considering that both capitals are measured at the same point of time) it is reasonable to expect influence of human capital on social capital, but not vice versa, because the opposite impact needs more time to become apparent. On the other hand, existing social capital may help to get higher returns from human capital (for instance, getting a job with the help of network relations), therefore reverse causality could not be completely excluded.

Finally, we also examine the set of traditional growth factors obtained from Eurostat (2008). Initial income level (GDP per capita in PPS, 1999) is expected to associate with lower growth rates due to catch-up phenomena. Higher investments into physical capital (gross capital formation as percentage of GDP, average 1999–2007) and openness of the economy to foreign trade (export index, 2000 = 100) are expected to increase income levels, while faster population growth is believed to decrease average incomes because some resources should be directed into job creation instead of increasing capital per worker.

4. Regression results: Independent effects of proposed growth factors

In order to show how different factors influence growth rates and absolute change in GDP per capita, alternative model specifications are used.[6] We start with the baseline model including only the initial level of GDP (or so-called catch-up term), measured in purchasing power parities in order to ensure better comparability of the initial conditions across countries. After this we move to more complex models by adding additional variables into the regression.

Table 3.1 presents basic regression results with traditional growth factors. Firstly, we can see the high importance of catch-up term in determining both GDP growth rate and absolute change. Expectedly, richer countries grow slower (Model 1A), indicating the potential of real convergence in the long run. However, the positive sign of initial GDP per capita in Model 1B means that the absolute per capita income cap among European countries is increasing in the short run, despite the higher growth rates in poorer countries. Secondly, including other traditional growth factors decreases significantly the catch-up effect (Models 2A and 3A). Among additional predictors, export is most influential in determining GDP growth and change, while investments and population growth affect only absolute change in GDP. Finally, mean level of education as most general human capital indicator has an expectedly positive effect on growth.

Next specifications in Table 3.2 concentrate on the variety of human capital and social capital indicators as predictors of economic development, while other basic growth factors except initial income level are left out from the models. This has been done partly because investments and export can be considered as part of the GDP growth itself, not so much its predictors (especially when considering growth accounting by expenditure method). As a result, keeping them in the model tends to mask the possible influence of more intangible assets like human capital and especially social capital. Initial regression models in Table 3.2 were retested with backward method[7] in order

Table 3.1 Results of the Regressions with Basic Growth Factors (standardized regression coefficients)

Dependent variable:	GDP per capita average yearly growth rate 1999–2007			GDP per capita average yearly change 1999–2007		
Predictors	Model 1A	Model 2A	Model 3A	Model 1B	Model 2B	Model 3B
Initial GDP per capita	−0.67***	−0.28	−0.32*	0.81***	0.94***	0.91***
Investments		0.22	0.18		0.30**	0.27**
Export		0.48***	0.56***		0.31**	0.37***
Population growth		−0.07	0.01		0.26*	0.31**
Mean education			0.20*			0.15
F-statistic	21.83***	16.66***	15.45***	51.35***	26.60***	23.39***
Adjusted R^2	0.43	0.70	0.73	0.64	0.79	0.81

* Significant at level $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

to diminish the collinearity problem. Backward deletion of insignificant variables slightly decreased the absolute values of initially significant predictors, but at the same time, some additional predictors became significant and overall model fit improved.

Model 4 includes initial GDP per capita and human capital as independent variables. Similarly to Model 1, catch-up term has a strong negative effect on GDP growth rate and a positive effect on GDP change. However, most human capital indicators are insignificant (except secondary education in reduced Model 4A) and their signs are varying. Although surprising, this result is not unique in cross-country growth studies. For example, education has also been found to have insignificant and/or negative effect on growth in the works of Benhabib and Spiegel (1994), Pritchett (1997) and Beugelsdijk and Schaik (2005), among others. There are several explanations for this puzzle. Temple (1999) suggests that the missing effect of human capital on growth could be hidden by a small number of unrepresentative countries in some samples. Piazza-Georgi (2002, p. 465) argues that if human capital is measured purely by years of education (which refers to quantity, not quality of the human capital), it is robustly uncorrelated with economic growth. In the current study, this result could be related either to the human capital indicators used or to the small sample size and its relatively homogeneous composition.

Next, the effect of social capital is tested. The prior correlation analysis revealed that all the dimensions of social capital (except norms) are positively and significantly correlating with GDP per capita levels and absolute changes, but negatively with GDP growth rates (see Appendix 3.A3). When it comes to regressions, it can be seen from Model 5A that the initial negative

Table 3.2 Regression Results of the Models with Human and Social Capital as Independent Factors of Development (standardized regression coefficients of the full models)

Dependent variable:	GDP per capita average yearly growth rate 1999–2007			GDP per capita average yearly change 1999–2007		
Predictors	Model 4A	Model 5A	Model 6A	Model 4B	Model 5B	Model 6B
Initial GDP per capita	*–0.63****	–0.15	0.16	*0.80****	*1.05****	*1.35****
Primary education	–0.08		–0.42	–0.07		–0.37
Secondary education	*0.21*		–0.31	0.03		–0.29
Tertiary education	–0.05		0.20	0.04		*0.29*
Mean education	0.13		–0.13	0.06		–0.08
General trust		0.06	–0.18		–0.02	*–0.37*
Institutional trust		0.29	0.19		0.40	0.28
Formal networks		*0.29*	*0.55*		0.24	*0.52*
Informal networks		–0.09	–0.09		0.11	0.06
Social norms		–0.13	–0.02		–0.21	–0.02
Political activity		*–0.51**	*–0.52**		*–0.45*	*–0.42*
Governance		*–1.01***	*–1.05***		–0.40	–0.41
Virtual networks		0.31	–0.09		–0.08	–0.48
F-statistic						
Full model	6.39***	6.82***	5.28***	8.23***	5.41***	4.17***
Reduced model	17.11***	23.03***	21.28***	45.29***	24.25***	12.34***
Adjusted R^2						
Full model	0.50	0.68	0.69	0.57	0.61	0.62
Reduced model	0.54	0.73	0.76	0.62	0.65	0.69

Note: Regression coefficients which turned out to be significant at level lower than 0.1 after backward elimination of insignificant variables are in *italics*.
* Significant at level $p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

effect of catch-up term (which turns now very small and insignificant) on growth is replaced by the significant negative effect of two macro-level social capital indicators – governance and political activity. In other words, these social capital indicators 'take over' the initial negative effect of catch-up term.[8] However, it is probably not correct to interpret this result in terms of social capital hindering economic development. Instead, the explanation could be related to the peculiarity of our sample – due to convergence process, higher growth rates appear in new member states, which are at the same time characterized by lower levels of social capital (see Figure 3.1).

The last regularity is usually explained as a result of communist past, underdevelopment of democracy and uncertainties created by transition processes (Badescu and Uslaner, 2003). At the same time, the effect of formal networks is positive, confirming Putnam's argument about the importance of formal participation.

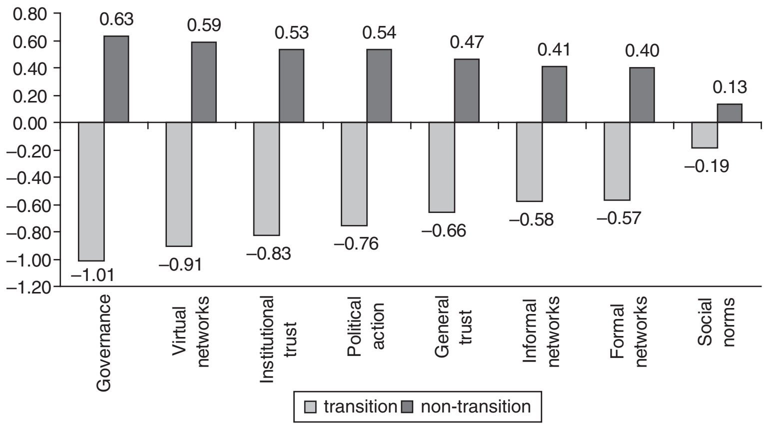

Figure 3.1 Average mean factor scores of social capital (based on Appendix 3.A2)

In Model 5B the initially positive effect of catch-up term is even stronger and the negative effect of political activity becomes significant when implementing the method of backward deletion. This confirms again that absolute yearly change in GDP is larger in richer countries, if not undermined by the negative effect of some elements of social capital. Finally, Model 6 incorporates both human and social capital indicators together with catch-up term. In this case, the results concerning the effect of social capital on GDP growth and absolute change are basically the same as in Model 5. Besides, in both cases the backward method highlights the positive effect of formal networks on economic development – the respective regression coefficients are now significant and about two times larger than in the previous models. Additionally, in Model 6B tertiary education, general trust and political activity appear to be significant predictors of GDP change when implementing backward method. When comparing Models 4 and 6, it can be seen that the effects of most education indicators increase remarkably when including social capital in the models. These results can be interpreted as the first proof of complementarities between human and social capital.

5. Interaction between human and social capital

A preliminary overview of the relationships between human and social capital can be drawn from the correlation analysis (see Table 3.3). Among educational levels, secondary and tertiary education show significant positive correlations with most social capital indicators (except institutional trust and civic norms, which are significantly but negatively related only to mean education), while the association between primary education and social capital is negative. Since population growth, unemployment and

Table 3.3 Partial Correlations between Human Capital and Social Capital Indicators (controlling for transition dummy; significance levels in parentheses)

	General trust	Institutional trust	Formal networks	Informal networks	Civic norms	Political activity	Governance	Virtual networks
Population growth	–0.20	0.32	0.03	0.09	0.03	0.01	0.25	–0.02
	(0.32)	(0.10)	(0.87)	(0.64)	(0.86)	(0.96)	(0.22)	(0.94)
Unemployment	–0.13	–0.27	–0.20	–0.13	–0.19	–0.05	–0.39	–0.31
	(0.54)	(0.17)	(0.34)	(0.51)	(0.36)	(0.80)	(0.06)	(0.13)
School dropout	–0.22	0.27	–0.01	0.12	0.13	–0.01	0.13	–0.18
	(0.29)	(0.19)	(0.98)	(0.57)	(0.54)	(0.96)	(0.54)	(0.38)
Primary education	–0.61	–0.32	–0.46	–0.35	0.11	–0.54	–0.54	–0.69
	(0.00)	(0.10)	(0.02)	(0.08)	(0.57)	(0.00)	(0.01)	(0.00)
Secondary education	0.46	0.27	0.49	0.21	–0.09	0.54	0.35	0.57
	(0.02)	(0.17)	(0.01)	(0.30)	(0.64)	(0.00)	(0.09)	(0.00)
Tertiary education	0.65	0.19	0.35	0.37	–0.21	0.28	0.47	0.50
	(0.00)	(0.34)	(0.08)	(0.06)	(0.29)	(0.16)	(0.02)	(0.01)
Mean education	0.12	–0.42	0.46	0.21	–0.38	0.30	–0.36	–0.02
	0.55	(0.03)	(0.02)	(0.28)	(0.05)	(0.13)	(0.08)	(0.92)

school dropout as more distant proxies of human capital are not significantly related to any social capital indicator (with the exception of negative correlation between unemployment and governance), we exclude these variables from the following regression analysis.[9]

At the next stage of the analysis, interaction terms between human and social capital were added into the regression models of economic growth and change. Before calculating the interaction terms, the respective indicators were standardized in order to avoid the influence of different scales used to measure human and social capital. The results are presented in Table 3.4. The alternative model specifications differ in respect of the human capital indicator used to calculate interaction terms. As models with all the possible interaction terms pose a problem of over-fitting because of small sample size, only reduced models are presented.[10]

As regards the interpretation of interaction terms between human and social capital, they can theoretically capture both directions of causality. However, as in our models both capitals are measured at the same point of time, it is reasonable to expect the influence of human capital on social capital, but not vice versa, because the opposite impact usually becomes apparent with larger time lag. On the other hand, as existing social capital may help to get higher returns from human capital (for example, getting a job with the help of network relations), the reverse causality could not be completely excluded.

Concerning the influence of interaction terms on GDP growth rates, it can be seen from Table 3.4 that adding them into the models eliminates completely the significance of the catch-up effect. The latter is apparently 'overtaken' by the negative effect of macro-level social capital. The most stable outcomes are negative effects of primary education, political activity and governance. When compared with Model 6A, the direct effects of primary education and governance are now remarkably smaller, and the positive effect of formal networks has turned insignificant. Instead, mean education shows an expected positive effect on growth, both directly and jointly with formal networks. However, the effect of interaction terms remains insignificant in most cases. The few that are significant among them do not show any clear pattern and remain thus arbitrary. Therefore, as a very general conclusion it could be suggested that higher GDP growth rates are related to higher human capital, especially to lower share of labour force with primary education. As regards social capital, political activity and governance are the most influential factors of economic growth both directly and through interaction with human capital. In addition, institutional trust shows a significant effect in relation to primary and secondary education.

In the models with GDP per capita change as a dependent variable, the effect of initial GDP per capita remains positive but smaller than in Model 6B. Among the human capital indicators, only the share of labour force with tertiary education shows significant positive effect. The direct effects of the social capital indicators are basically the same as in Model 6B when using

Table 3.4 Regression Results of the Models with Interaction Terms of Human and Social Capital (standardized regression coefficients after backward elimination of insignificant variables)

Dependent variable:	GDP per capita average yearly growth rate 1999–2007				GDP per capita average yearly change 1999–2007	
HC =	Primary education	Secondary education	Tertiary education	Mean education	Tertiary education	Mean education
Initial GDP per capita					1.07***	0.81***
Primary	–0.24**	–0.24**	–0.25**			
Tertiary					0.48***	
Mean education	0.28**	0.42***				
General trust					–0.64***	
Formal networks				0.56***	0.37*	
Institutional trust	0.38**					
Political activity	–0.41***	–0.78***	–0.32**	–0.69***	–0.53**	
Governance	–0.73***		–0.59***	–0.65***		
HC*insttrust	0.25**	–0.38***			0.32**	
HC*formal						–0.63***
HC*norms						–0.46**
HC*polact				–0.26**		
HC*virtual						0.56**
F-statistic	18.21***	21.66***	24.96***	22.11***	13.64***	15.10***
Adjusted R^2	0.81	0.77	0.74	0.77	0.75	0.69
VIF	1.03–4.79	1.03–1.18	1.02–1.88	1.32–3.88	1.80–4.65	1.03–4.55

* Significant at level $p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

tertiary education for calculating interaction terms. Additionally, a positive effect of interaction with institutional trust appears. Interaction of social capital and mean education gives different results, indicating that a joint effect of the intangible assets under consideration could also run through social norms and formal or virtual networks.

6. Conclusions

Systematic theorizing about human capital and especially about social capital as a factor of economic development is comparatively recent. While good education obviously associates with higher productivity, economic effects of social capital are less known. Theoretically, social capital is believed to encourage collective action, affecting thus productivity directly through improving the functioning of markets. In addition, the discussion has started about the possible interaction effects of social capital through increasing productivity of other development factors, especially human capital.

Our empirical results suggest that economic growth and convergence processes in Europe are substantially influenced by human and social capital both directly and via each other, although interpretation of the results is complicated – partly because of implicit interaction between the levels of social capital and economic development. Concerning the effect of human capital, the following conclusions can be drawn. Firstly, higher growth rates, which are necessary for catch-up in the less advanced economies, depend on decreasing the share of labour force with primary education. Secondly, increasing the share of labour force with tertiary education supports absolute increase in income levels, which is naturally higher in economically more advanced European economies.

Among the different dimensions of social capital, formal participation, political activity and quality of governance appeared to be the most influential factors of economic development. At the same time, the more traditional and cognitive forms of social capital – like trust, social norms and informal participation – appeared to be not so important for GDP growth, although earlier theoretical and empirical literature has shown their importance for individual-level welfare and for achieving social development objectives. The joint effect of human and social capital appears mainly in interaction of educational levels with institutional trust, indicating thus the importance of the trustworthiness of public institutions – especially in transition countries where institutional trust is much lower than in the rest of the Europe. Also, the spread of virtual networks seems to have a positive effect on economic welfare in countries with a higher mean level of education. Altogether, our findings clearly support the idea that cross-national variations in economic growth and development are related to differences in human and social capital, given that interaction between these factors determines to what extent nations are able to utilize their potential.

Appendix

Table 3.A1 Indicators of Social Capital and Results of Confirmatory Factor Analysis

Latent factors of social capital	Indicator	Factor loadings	Variance explained (%)
General trust	Most people can be trusted (1) rather than you need to be very careful in dealing with people (0)	Z-score	
Institutional trust	Confidence in parliament, scale 1–4	0.81	
	Confidence in the civil services, scale 1–4	0.79	60.20
	Confidence in the police, scale 1–4	0.76	
	Confidence in the justice system, scale 1–4	0.75	
Formal networks	Belonging into voluntary organizations, number of organizations mentioned, scale 0–16	0.89	79.23
	Unpaid work for voluntary organizations, number of organizations mentioned, scale 0–16	0.89	
Informal networks	Frequency of spending time with friends, scale 1–4	0.81	
	Friends important in life, scale 1–4	0.68	52.95
	Spending time with colleagues from work, scale 1–4	0.68	
	Cheating on taxes if you have a chance, not justified, scale 1–10	0.80	
Civic norms	Claiming government benefits to which you are not entitled, not justified, scale 1–10	0.76	57.98
	Someone accepting a bribe in the course of their duties, not justified, scale 1–10	0.72	
Political action	Attending lawful demonstrations, scale 1–3	0.80	
	Joining in boycotts, scale 1–3	0.80	64.13
	Signing a petition, scale 1–3	0.80	
	Rule of law, scale −2. 5 to +2. 5	0.97	
	Control of corruption, scale −2. 5 to +2. 5	0.97	
Governance	Government effectiveness, scale −2. 5 to +2. 5	0.97	87.37
	Political stability, scale −2. 5 to +2. 5	0.91	
	Regulatory quality, scale −2. 5 to +2. 5	0.90	
	Voice and accountability, scale −2. 5 to +2. 5	0.88	
Virtual networks	Internet access (percentage of households, average 2004–2007)	0.95	
	Computer use (percentage of all individuals who used a computer in the last 3 months, average 2004–2007)	0.91	72.18
	Number of main telephone lines (per 100 inhabitants, average 1999–2006)	0.88	
	Subscriptions to cellular mobile services (per 100 inhabitants, average 1999–2006)	0.63	

Notes: Scales are chosen so that higher values refer to higher stock of social capital. Mostly social capital data refer to year 1999 (Macedonia 2001, Finland 2000).

Table 3.A2 Country Mean Factor Scores of Social Capital

Country	General trust	Institutional trust	Formal networks	Informal networks	Social norms	Political action	Governance	Virtual networks
Bulgaria	−0.18	−1.15	−1.03	0.29	0.78	−1.39	−1.84	−1.44
Croatia	−0.75	−0.52	−0.56	0.78	0.62	0.32	na	na
Czech Republic	−0.39	−1.43	−0.06	−0.63	0.13	0.37	−0.61	−0.55
Estonia	−0.45	−0.72	−0.81	−0.53	−1.33	−1.41	−0.46	−0.15
Hungary	−0.51	−0.32	−0.89	−1.61	−0.15	−1.86	−0.28	−0.69
Latvia	−0.81	−0.49	−0.87	−1.61	0.29	−0.99	−1.21	−0.86
Lithuania	−0.33	−1.92	−1.20	−1.74	−1.62	−0.72	−1.21	−0.95
Macedonia	−1.04	na	0.23	0.92	0.05	−0.22	na	−1.67
Poland	−0.72	−0.20	−1.00	−1.61	0.38	−1.39	−0.64	−0.97
Romania	−1.28	−1.18	−1.07	−0.95	0.33	−1.56	−2.18	−2.00
Slovakia	−0.93	−0.58	0.43	−0.56	−1.41	−0.27	−1.28	−0.74
Slovenia	−0.54	−0.58	−0.04	0.29	−0.36	0.03	−0.44	0.00
Average transition	−0.66	−0.83	−0.57	−0.58	−0.19	−0.76	−1.01	−0.91
Austria	0.26	1.06	0.29	0.00	0.46	0.00	0.79	0.31
Belgium	0.06	−0.43	0.71	−0.17	−1.25	0.65	0.10	0.14
Denmark	2.35	1.69	0.82	0.69	1.68	0.97	1.05	1.41
Finland	1.81	1.20	0.86	0.78	0.33	0.52	1.29	0.92
France	−0.48	−0.06	−0.59	0.06	−1.62	1.09	0.12	0.28
Germany	0.32	0.46	−0.52	0.23	0.33	0.45	0.75	1.18
Greece	−0.39	−1.58	0.75	1.08	−2.10	0.45	−0.54	−0.57
Iceland	0.71	1.97	1.46	0.62	1.11	1.19	0.93	1.14
Ireland	0.38	1.14	0.12	1.44	0.70	0.30	0.92	0.07
Italy	0.18	−0.23	−0.32	−0.10	0.66	0.77	−0.31	0.01
Luxembourg	−0.24	1.23	0.49	0.16	−1.17	0.50	1.09	1.62
Malta	−0.60	0.40	−0.41	−1.91	2.08	−0.50	na	−0.03
Netherlands	1.93	0.51	2.31	1.18	0.54	0.99	1.31	1.31
Portugal	−1.28	0.20	−1.09	0.03	0.21	−0.87	0.35	−0.33
Spain	0.56	0.14	−0.78	0.19	−0.07	−0.62	0.35	−0.08
Sweden	2.35	1.03	2.75	1.64	0.13	2.41	0.99	1.66
United Kingdom	0.00	0.37	0.01	1.05	0.25	0.79	0.95	0.97
Average non-transition	0.47	0.53	0.40	0.41	0.13	0.54	0.63	0.59

Table 3.A3 Correlations between Economic Welfare and Its Factors (two-tailed significance levels in parentheses)

	Pearson correlations			Partial correlations (controlling for transition dummy)		
Factors of economic welfare	Initial GDP per capita	GDP per capita change	GDP per capita growth	Initial GDP per capita	GDP per capita change	GDP per capita growth
Export share of GDP	–0.572	–0.239	0.781	0.378	0.361	0.345
	(0.001)	(0.220)	(0.000)	(0.052)	(0.064)	(0.078)
Gross capital formation	–0.479	–0.080	0.612	0.013	0.290	0.282
	(0.009)	(0.680)	(0.000)	(0.949)	(0.135)	(0.146)
Population growth	0.723	0.683	–0.602	0.341	0.564	–0.080
	(0.000)	(0.000)	(0.001)	(0.076)	(0.002)	(0.684)
Unemployment	–0.650	–0.500	0.446	–0.399	–0.323	0.009
	(0.000)	(0.008)	(0.020)	(0.043)	(0.108)	(0.966)
School dropout	–0.151	–0.156	–0.207	–0.019	–0.085	–0.557
	(0.453)	(0.437)	(0.299)	(0.927)	(0.678)	(0.003)
Primary education	0.101	–0.024	–0.297	–0.446	–0.280	0.063
	(0.610)	(0.904)	(0.125)	(0.020)	(0.157)	(0.756)
Secondary education	–0.311	–0.169	0.469	0.505	0.220	–0.111
	(0.107)	(0.390)	(0.012)	(0.007)	(0.271)	(0.580)
Tertiary education	0.353	0.356	–0.236	0.155	0.241	0.038
	(0.065)	(0.063)	(0.226)	(0.440)	(0.227)	(0.852)
Mean education	0.032	0.094	0.088	–0.039	0.070	0.227
	(0.872)	(0.633)	(0.657)	(0.845)	(0.728)	(0.254)

Table 3.A3 (Continued)

Factors of economic welfare	Pearson correlations			Partial correlations (controlling for transition dummy)		
	Initial GDP per capita	GDP per capita change	GDP per capita growth	Initial GDP per capita	GDP per capita change	GDP per capita growth
General trust	0.548	0.352	–0.484	0.195	0.119	–0.084
	(0.002)	(0.061)	(0.008)	(0.321)	(0.546)	(0.673)
Institutional trust	0.737	0.586	–0.618	0.442	0.414	–0.196
	(0.000)	(0.001)	(0.000)	(0.021)	(0.032)	(0.327)
Formal networks	0.559	0.424	–0.472	0.318	0.253	–0.165
	(0.002)	(0.022)	(0.010)	(0.099)	(0.194)	(0.401)
Informal networks	0.450	0.345	–0.534	0.101	0.146	–0.271
	(0.014)	(0.067)	(0.003)	(0.609)	(0.459)	(0.163)
Civic norms	0.039	–0.091	–0.227	–0.155	–0.192	–0.163
	(0.842)	(0.639)	(0.236)	(0.430)	(0.328)	(0.407)
Political action	0.675	0.413	–0.668	0.340	0.162	–0.341
	(0.000)	(0.026)	(0.000)	(0.076)	(0.411)	(0.076)
Governance	0.830	0.576	–0.821	0.506	0.379	–0.509
	(0.000)	(0.002)	(0.000)	(0.010)	(0.062)	(0.009)
Virtual networks	0.866	0.621	–0.674	0.672	0.460	–0.221
	(0.000)	(0.000)	(0.000)	(0.000)	(0.016)	(0.268)

Notes

1. The research leading to these results has received funding from the European Community's Seventh Framework Program (FP7/2007–2013) under grant agreement no. 216813 and from the Estonian Ministry of Education target funding SF0180037s08.
2. For alternative and more precise definitions of social capital, their comparisons and critique see, for example, Bourdieu (1985), Coleman (1990), Putnam et al. (1993, 2000), Portes (1998), Fine (2001).
3. Although GDP per capita growth rates slowed down in 2008 in most analysed countries and in some cases even turned negative, it could be suggested that these developments would not influence the interrelationship between human and social capital, and their effect on economic development. However, human capital and social capital may influence the way and speed of coming out of the current crisis. Also, it would be interesting to see whether the current crisis has any effect on the level of social capital in different countries.
4. As noted by Solow (2001, p. 288), the long-term steady state in neoclassical growth model is only a theoretical convenience, while many countries actually are nowhere near steady-state growth. It follows that comparative studies should focus, in addition to the growth rates, also on understanding the time paths of development process.
5. Although these data do not enable us to analyse the effect of the changes in social capital levels over the period of interest, this shouldn't be a great problem because social capital is expected to be rather stable over the times.
6. It should be noted that although these kind of growth regressions are usually expressed in logarithmic form, in our analysis the indicators used show no clear need for logarithms: after omitting a few outlier values, the normality assumptions are satisfied; the inspection of observation clouds does not show any clear exponential pattern, and the correlations of GDP-related indicators with proposed growth factors do not change significantly (in order to motivate using logarithms the correlations should become higher and more significant).
7. Backward selection method begins with all proposed independent variables in the model. At each step, the least useful predictor is removed according to the established criterion: probability of F-to-remove = 0.10 (SPSS, 1999, p. 216).
8. These and the following regression results are obviously influenced by differences between transition and non-transition countries in our sample. However, including transition dummy into regressions did not work because of multi-collinearity with initial GDP per capita. As such, one can say that likely effects of transition operate through catch-up term.
9. There are some other reasons apart from weak correlation for excluding these variables. Firstly, although school dropout can be theoretically considered as a result of low social capital, its possible effect on development outcomes is not very clear and could arguably work through higher share of workforce with primary education. Secondly, unemployment can be considered as a result, not the cause of slow economic growth.
10. However, in models of GDP change where interaction terms were based on indicators of primary and secondary education, the collinearity problem occurred even after backward elimination of insignificant variables, so these models are not presented in the paper.

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4
Productivity, Employment and Human Capital in Eastern and Western EU Countries

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1. Introduction

Many institutional, economic and policy changes have occurred in Europe over the last two decades, within a world that in the meantime was rapidly 'globalizing' and where new competitors were making their appearance. The most important changes as regards Eastern (or CEEC) countries concerned: (i) the fall of the Berlin wall (1989), with the subsequent complex and diversified transition processes, (ii) the further EU enlargements (with particular reference to 2004 and 2007) and attainment of deeper integration, with the adoption of a monetary union (since 1999) in the Euro-zone, progressively extended also to the New Member States (NMS). Recently the 2008–2009 global crisis and recession also significantly affected the CEECs, especially those (small) countries with a higher degree of openness.[1]

The good performance of CEECs in this new century (after the transitional recession of the early 1990s and the subsequent recovery), until the 2008–2009 financial crisis, contrasts with the difficulties and disappointing growth of many Western European countries, which had lasted more than two decades, characterized initially by a 'jobless growth' model (with high and persistent unemployment rates) and more recently by weaknesses in terms of GDP and productivity growth. A possible economic decline, in comparison with the US and emerging countries in the world, was a worrying outcome.[2] To (partly) oppose this evolution, the Lisbon Strategy was launched at the onset of the century, crucially based on the support of innovations, human capital and creation of 'more and better' jobs, thus emphasizing both 'quantitative' and 'qualitative' dimensions in the strategy of employment creation.

A first aim of this chapter is to analyse the different evolutions of EU countries in terms of employment dynamics – that is the 'quantitative' dimension – paying particular attention to the links between employment and productivity, and to the peculiarities of NMS in comparison to 'old' EU countries. A natural extension would be to compare the situation in transition countries with other regions of the world: this task will be accomplished in Chapter 5, where the participation–productivity trade-off is analysed.

A second aim is to investigate the 'quality' dimension of employment, focusing on the human capital and education variables and on their contribution to economic growth. Also in this case an analysis of the full group of EU-27 countries is a preliminary step toward comprehending the differences between Eastern and Western transition countries.

In this chapter, we analyse – more specifically – the performance of EU-27 countries, subdivided into the two groups of Eastern and Western members during the post-1989 period, by: (i) comparing the employment rates and productivity differences in order to identify differing 'growth models' and (ii) carrying out deep investigations of some key determinants of productivity differences, by paying particular attention to the role of human capital together with other 'control' variables, concerning institutional, structural and labour market (employment) features. So, our study is complementary to that of Chapter 3, where the focus was on the interaction between human capital and social capital (other growth determinants were not considered).[3]

In particular, following a partial review of the theoretical and empirical literature on the two specified issues (Section 2), Section 3 contains a descriptive analysis focusing on employment growth and its possible trade-off with productivity growth. Section 4 illustrates some econometric investigations (cross-section and panel analyses) dealing with conditional convergence and, especially, the key determinants of productivity differences (human capital and other variables). The policy implications are presented in the final section.

2. Productivity–employment dynamics, human capital and other determinants of growth: A partial review of the literature

A huge theoretical and empirical literature exists on economic growth and its determinants, including the specific applications to the transition countries (see also Chapter 1 in this book). Here we review only a small part of that literature, focusing especially on the variables considered in the empirical part (Sections 3 and 4).

Economic growth investigations usually follow a long-run approach and the focus is generally on the dynamics of per capita income or productivity. The investigation of a possible employment–productivity trade-off is easier in a business cycle perspective. In many studies, productivity growth has been related to the growth of employment or unemployment: this includes the line of work on Okun's law[4] (Padalino and Vivarelli, 1997; Lee, 2000). For more specific studies on the trade-off between employment growth and productivity growth see Beaudry and Collard (2002), Dew-Becker and Gordon (2008); in particular, Pichelmann and Roeger (2008) consider this potential trade-off within the Lisbon Strategy. See also Chapter 5 in this book.

Concerning transition countries, Rutkowski (2006) highlights the fact that low-productivity employment in the CIS is a mirror image of unemployment in the European transition countries (where a developed social safety net exists), whereas Belorgey et al. (2006) show that employment rate changes negatively affect the productivity growth rate, supporting the hypothesis of diminishing returns for the employment rate.

The role of education or human capital for economic growth – the second element of the review in this section – has been extensively investigated, by mainstream and heterodox economists, especially in the last two decades.[5] The results of studies on the role of education in economic growth (see survey by De La Fuente and Ciccone, 2003) vary, and depend, for example, on the definition used (Sapir 2004), in considering education in terms of stocks rather than flows (Krueger and Lindahl, 2001) or the different specifications of human capital as an input in the production function.

Education is known to be a fundamental component of human capital; however, the main elements of human capital accumulation are not only education through school and university (primary, secondary, tertiary, and so on), but also out-of-job training courses, on-the-job training (generic training, specific training, learning-by-doing) and life-long learning. In addition, if we admit that it would be useful to adopt a wider concept of 'education' (notwithstanding that the reciprocal relationships between human capital and social capital as interacting factors of economic development are also important and have been stressed in Chapter 3 of this book), we are aware that the generally adopted empirical measures (such as years of schooling or level of formal education completed – sometimes distinguishing between the different types of schools and universities) are only 'proxies' and exclude the role played by non-school subjects, like family networks and social background, in contributing to the achievement of higher and better 'education' and to the accumulation of human capital. This suggests some cautions when using education (levels or attainment rates) as proxies for human capital.

Let us now focus on some other determinants of economic growth, in addition to human capital (that in Section 4 will be used as 'control variables'). A key variable, widely investigated in the literature as a determinant of productivity dynamics, is R&D expenditure (whose effect on economic growth has been reviewed in Chapter 1).

As for CEECs, Radosevic (2006) notes that, during the transition period in the 1990s, neither domestic nor foreign R&D expenditure played a crucial role in supporting economic growth, but large-scale productive reallocations and provisions of new equipment were implemented to boost innovation and productivity (see also Brown and Earle, 2004).

Concerning the other main determinants of productivity, institutions and institutional change have been widely considered, to explain real economic performance, including both employment and productivity dynamics and relative performances. In Eastern European countries, the features (speed and shape) of the transition process have been particularly investigated (see again Chapter 1). A widely used proxy of the intensity of transition is the EBRD transition index: this will also be used in our empirical investigations (Section 4); a more general indicator, applicable also to 'old' EU countries, is the 'Global Competitiveness Index' by the World Economic Forum.

Another important part of the literature on the determinants of productivity deals with 'structural change', especially the evolution of the main economic sectors. In addition to the general reflections on the role of structural change (Chapter 1), we can notice that, starting from the consideration that industries with relatively lower rates of productivity growth tend to shrink in terms of shares, and the opposite occurs in industries with relatively higher rates of productivity growth (Kruger, 2008), the main result of some research is that aggregate productivity growth may result from structural change alone (even without productivity growth at the level of individual industries). Some comparative analyses between East and West Europe have been carried out: for instance, Marelli (2007) analyses the specialization of EU-25 countries and regions, also focusing on the role of structural convergence in affecting the dynamics of employment, output and productivity; Stephan (2002) focuses on sectoral structure, path dependence and specialization patterns to explain the productivity gap. In empirical analysis, either the employment (or value added) shares of individual productive sectors or some synthetic 'specialization indices' are often used as control variables (see Section 4).

The importance of the shadow economy in affecting productivity level and dynamics may also be relevant;[6] however, it has been less frequently investigated (Bovi, 2007) in econometric models, partly because of less data availability. Average productivity levels in the 'informal sector' are generally lower than in to the formal economy, also due to the relatively higher share of workers with lower-than-average educational attainments (Boeri and Garibaldi, 2006).

For more specific effects on productivity growth – for example the 'diminishing returns for the employment rate' hypothesis – we refer to the empirical part of the chapter (Section 4).

3. Employment, productivity and 'models of growth'

Although ten Eastern European countries entered the EU (2004 and 2007 enlargements), economic research has traditionally investigated growth and development in the two blocs of West and East EU countries separately. Here we offer a complete account, in order to highlight the specificities of the CEECs, by considering a descriptive analysis useful to enucleate different 'models of growth'. In view of the subsequent analysis, we selected the 1990–2007 period and all EU countries, distinguishing between EU-15 (the 'old' countries) and EU-12 (the 12 new members after 2004).[7]

Figure 4.A1(a) shows the *employment rate* – here defined as employment over total population[8] – in the initial and final years, for an idea of the rankings and differences between countries as well as of relative evolutions over time. Some new members (SE quadrant)[9] exhibit decreasing employment rates, the most evident case being Romania; rationalizations and restructuring processes during transition caused a general reduction in employment rates. The (persisting) low employment countries (in the SW quadrant) include mostly the Mediterranean countries.

In the case of *productivity*, here defined as GDP per person employed[10] (Figure 4.A1(b)), two distinct blocs of countries stand out: the NMS, with low productivity, and almost all the old members (excluding Portugal). The lowest productivity countries (Bulgaria and Romania) have an index 60–70 per cent lower than that of the EU-27 average level; but all new (EU-12) members have increased their relative productivity, thus converging towards the richest countries.

Now, by simple graphical inspection, we are in a position to highlight the different 'models of growth', by relating the employment rate of each country to the corresponding (relative) productivity. A static analysis (for 1990) shows that an *extensive growth model* (SE quadrant of Figure 4.A2(a)) was initially followed by all transition countries: relatively high employment rates accompanied by low productivity levels. This is what remained of the centrally planned phase, in which situations of virtually 'full employment' were the most common, but typically in low productivity state sectors or firms, thus consisting mostly of 'under-employment' (Rutkowski, 2006). In the same period, most 'old' European countries were following either an *intensive* model (NW quadrant) or a *virtuous* model (NE quadrant).

From the early 1970s to the late 1990s, 'old' Europe mainly followed a *job-less* growth model, leading to high and persistent unemployment rates, even after the end of cyclical downturns (this was in opposition to the US capacity to create millions of new jobs). However, in the last ten years, many old European countries have shifted to a more 'extensive' model of growth, mainly thanks to labour market reforms, leading to greater flexibility (in countries like Italy employment has frequently risen even when GDP growth was scant or nil). Instead, productivity has not increased as fast as in the US (despite the Lisbon targets).

A *stagnant* model (SW quadrant), with low productivity and employment, was followed in 1990 only by two small Mediterranean countries (Cyprus and Malta) and by Croatia.

During the 1990s, the most significant changes regarded the NMS. Most of them shifted progressively to the 'stagnant' model, because of heavy reductions in employment, following the restructuring of their economies, not yet accompanied by significant improvements in productivity levels. Lastly, in the new century – up to the 2009 world recession – the productivity levels in many transition countries began to converge towards the European average, and in some of them a new rise in the employment rate – in comparison to the large fall of the 1990s – can be seen (see Figure 4.A2(b)).

The previous comparisons between 1990 and 2007 suggest the convenience of an explicit *dynamic perspective*. For this analysis, we preferred to compare productivity growth (annual rate) with employment growth (annual rate). Thus, for the full period (1990–2007) the *intensive* model adopted by all NMS is quite clear (Figure 4.A3(a)). Among the 'old' countries, the *extensive* model followed by Spain contrasts with the *virtuous* model of Ireland. A similar graph (Figure 4.A3(b)) for the period 2000–2007 highlights the better performance of the new countries in terms of productivity: for the EU-12 average, growth reaches 4 per cent per annum. Moreover, in some of them (the Baltic States, plus Slovakia and Bulgaria), employment growth turned positive, thus shifting to a virtuous model of growth. Instead, restructuring with huge increases in productivity and still large-scale falls in employment continue in Romania. In Western European countries, the shift to the 'extensive' model of countries like Spain and Italy should be noted.

It is interesting to note that in a wider comparison of countries of all regions in the world (see Chapter 5) it has been found that in developed or high income economies the trade-off between productivity and participation is weak and low compared to other income groups; moreover, the trade-off has decreased in the decade (1995–2005) compared to previous years, in all regions except for transition economies (although it is expected that it will begin to fade after several years of transition).

At this point, it is useful to anticipate something about the main determinants of productivity, beginning with one key factor: *human capital*. Even restricting our attention to formal *education*, adequate and comparable data at international level are not easy to find. Hence, we used Eurostat's 'Total population (aged 25–64) having completed at least upper secondary education'. Concerning 'old' Europe, a positive relation between this proxy and the productivity level can be found (Figure 4.A4(a)), in which productivity is the index number. In three countries, Portugal, Spain and Italy, education level seems particularly low, but this matches the low productivity of these countries. However, when we consider all EU-27 countries, the relation between the two variables – again for the final year (2006) – turns out to be negative (Figure 4.A4(b)). An easy explanation is that the group of NMS still has low productivity levels, but rather high education levels in both absolute and relative terms (high education is one of the few good heritages of the socialist economies).

The latter result suggests, partly in view of the following empirical analysis, considering the two groups of countries, 'old' and 'new' Europe, separately, or introducing some dummy variables for the CEECs in the regressions; or alternatively making some estimates with fixed effects, which are able to capture the specificities of all individual countries (which cannot be taken into account by other explicative variables).

4. Econometric results on productivity and its determinants

This section presents some results of our investigations on productivity in the European countries. Our aim was to focus on the main *structural* (or long-run) *determinants of productivity*: from this point of view, the differences between countries are the main object of the analysis, so that cross-sections and panel regressions seem to be adequate procedures. A second implication of our strategy is that estimation of productivity levels is in general quite satisfactory, although in some cases we shall try to explain productivity change.

Coming now to data sources, Eurostat publishes *labour productivity* (per worker) data in the form of index numbers (EU-27 = 100). These data have been available for all EU-27 countries since the mid-1990s. We then used Cambridge Econometrics data (gross value added divided by employment), both to estimate 1992 index numbers (whenever missing data were ascertained for some countries) and to compute nominal values (in constant euros). Concerning labour *productivity per hour*, a similar procedure was followed, although the nominal values were obtained from both Cambridge Econometrics (for total gross value added) and the Maddison/Groningen data (for total annual hours worked). The most satisfactory and complete proxy for human capital (from the point of view of countries and time coverage) is probably Eurostat's 'Total population (aged 25–64) having completed at least upper secondary education'.[11] The data sources for the remaining explanatory variables are specified below.

The first investigations refer to links between labour productivity and *education*. We estimate some cross-sections (OLS) for the distinct years 1992, 1998 and 2006, using EU-27 countries as observations. The only explanatory variable is education, but we add a dummy for the CEEC countries. Table 4.1 shows that education is always positively related to productivity and in almost all cases is significant at 5 per cent significance levels. This occurs in both specifications [1b] and [1d], in which the dependent variable is productivity per worker, and specifications [1c] and [1e], in which the dependent variable is productivity per hour worked.

Instead, the dummy CEEC is negative and highly significant in all cases: the productivity level has been generally lower in transition countries. In fact, as already shown in Section 3, education is positively associated with productivity, but we must consider the CEEC as a separate group, because of

Table 4.1 Productivity: Cross-sections (1992, 1998, 2006)

	[1a]	[1b]	[1c]	[1d]	[1e]
Productivity:	*per worker*	*per worker*	*per hour*	*per worker*	*per hour*
year	1992	1998	1998	2006	2006
No. of obs.	27	27	27	27	27
Explanatory variables:					
Education	0.026	0.131**	0.158**	0.251**	0.230**
Dummy CEEC	−24.6***	−25.6***	−18.3***	−25.2***	−18.1***
Adj. R2	0.719	0.752	0.721	0.624	0.625

Significance levels: 1 per cent***, 5 per cent**, 10 per cent*; constant and fixed effects not reported (even when included).

the particularly high educational level (without the dummy CEEC, we would obtain a negative coefficient for education in the regressions).

Before turning to more detailed panel estimations, with additional explanatory variables for recent years, let us now consider a dynamic aspect of productivity. This is the well-known issue of convergence: is the productivity of different countries converging to a single level? In the literature, the two fundamental approaches refer to *absolute* or *conditional beta-convergence*.

If we follow the first approach, in order to have convergence, productivity growth over time should be negatively related to the initial productivity level. This is what happens in the EU-27 countries (by focusing on productivity 'per worker'), both in 1992–2006 and in 2000–2006.[12] When we consider a β-conditional approach, since we are mainly interested here in the impact of *education*, by adding this control variable in the regressions, we obtain that education is positive and significant, and convergence is confirmed as well.[13]

Now we turn to the determinants of productivity in the period 2000–2006. For this period, we can find several explanatory variables for all EU-27 countries more easily. We grouped them into three main types:

i. the main *long-run determinants* of productivity: education, the Global Competitiveness Index (World Economic Forum), EBRD transition index and R&D index;
ii. some *structural indicators*, for example the employment share of the three main sectors (agriculture, manufacturing, services) or some synthetic indices of specialization, as well as a 'shadow economy' index;
iii. *labour market indicators*, in particular, employment rates (in this case, it seemed more significant in some specifications to consider productivity changes rather than productivity levels).

We carried out several panel estimations by considering jointly the 27 countries and the seven years (2000–2006). The results concerning group (i) variables are listed in Table 4.2. In all regressions of this group, productivity per worker is the dependent variable and fixed (or random) effects are added.

According to regression [2a] education, alone, is positive and highly significant; the overall goodness of fit is very high; most of the fixed effects are also significant (not shown in the table). Regression [2b] receives a second explanatory variable, to capture the progress in institutional change, which is particularly important in the former transition countries. The 'EBRD Transition report' provides numerical scores for a set of nine reform indicators: scores range from 1, which represents little or no change from a planned economy, to 4+, which represents the standard of an advanced market economy. We computed the simple mean of the nine EBRD transition indexes, and the synthetic EBRD index was used in the regressions.[14] Our results show that EBRD is positively related to productivity and is significant; the coefficient of education remains significant and is almost identical in its numerical value (as in the previous equation [2a]).

One alternative to the EBRD index is the Global Competitiveness Index (GCI) published by the 'World Economic Forum'.[15] For all years, the ranks of countries[16] are available, and the numerical scores have also been published since 2004; all data are transformed into scores, to obtain a synthetic GCI index. The advantage of this index (unlike EBRD), is that it is available for all countries, old and new. The results of regression [2c] also reveal that the GCI index is positive and significant, without altering the significance of the education variable.

Table 4.2 Panel Regressions: Productivity per Worker and Its Main Determinants (2000–2006)

	[2a]	[2b]	[2c]	[2d]	[2e]	[2f]
No. of obs.	27 × 7	27 × 7	27 × 7	27 × 7	27 × 7	27 × 7
Explanatory variables:						
Education	0.455***	0.357***	0.497***		0.359***	0.489***
EBRD index		12.65***				
GCI index			0.103***			0.101***
R&D index				4.43***	2.88**	0.69
Fixed effects (FE) or Random (RE)	FE	FE	FE	FE	RE	FE
Adj. R2	0.993	0.993	0.994	0.975	0.980	0.993

Significance levels: 1 per cent***, 5 per cent**, 10 per cent*; constant and fixed effects not reported (even when included).

Another important variable which may explain inter-country differences in productivity is R&D expenditure.[17] We used Eurostat data on *gross domestic expenditure on R&D*, as a percentage of GDP. From regression [2d], we can see that the coefficient of this variable is also positive and significant. When R&D is included in the regression together with education, both variables remain significant (equation [2e]).[18]

We can now turn to the second bloc of regressors, that is, *structural indicators*. The links between productivity and structural change have been studied both theoretically and empirically.[19] Although the effects of structural change can be better assessed in a dynamic setting, productivity levels probably differ across countries according to their sectoral production mix. The results for this group (ii) are listed in Table 4.3, again based on panel regressions with fixed effects and productivity per worker as the dependent variable. The 'structural' explanatory variables are included by keeping the two regressors which in previous analyses turned out to be the most significant: education and the GCI index (or, in alternative specifications, the EBRD index).

The first important structural variable influencing productivity is the extent of the *shadow economy*. Data were taken from a paper by Schneider (2004), using extrapolations to estimate data for recent years (2004–2006). The results of equation [3a] show that this variable is significant and positively related to productivity.[20] One explanation of the positive link is that productivity in the 'official' economy is higher where a larger share of the various and heterogeneous low-productivity activities are relegated to the

Table 4.3 Panel Regressions: Productivity per Worker and Structural Indicators (2000–2006)

	[3a]	[3b]	[3c]	[3d]	[3e]	[3f]
No. of obs.	27 × 7	27 × 7	27 × 7	27 × 7	27 × 7	27 × 7
Explanatory variables:						
Education	0.514***	0.506***	0.365***	0.377***	0.124**	0.450***
GCI index	0.062**	0.112***	0.095***	0.090**	0.072**	0.075**
Shadow index	0.704***					
KSI index		−34.26**				
TURB index						−46.21**
Agriculture share			−0.86***			
Industry share				−0.53***		
Services share					0.98***	
Fixed effects	FE	FE	FE	FE	FE	FE
Adj. R2	0.997	0.993	0.991	0.992	0.984	0.993

Significance levels: 1 per cent***, 5 per cent**, 10 per cent*; constant and fixed effects not reported (even when included).

'shadow' economy, instead of (partly) emerging and being formally included in national accounts (GDP, employment and productivity).

A synthetic structural indicator is the *index of specialization*, in particular, the well-known Krugman's index (KSI):

$$\mathrm{KSI}_j = \sum_i \left| s_{i,j} - s_{i,0} \right|$$

where $s_{i,j}$ is the share of sector *i* out of total employment in country *j*, and $s_{i,0}$ is the corresponding share in the reference country – in our case, the EU-27 average. Its numerical value may range from 0 (the country has the same sector structure as the European average) to 2 (the sector structure is totally different). Employment data by sector are taken from Cambridge Econometrics. In this specification, the KSI index is computed by considering the most detailed sectors available for each country.[21]

The result of equation [3b] shows that the coefficient of the KSI index is negative and significant, whereas the two additional regressors (education and GCI) continue to be positive and significant. Note that the countries with high KSI indexes are those with a rather 'atypical' productive structure: a potential example is high specialization in agriculture, the productivity of which is lower than average.

One alternative to the synthetic specialization index is inclusion of the *employment shares* of the main sectors: we did this for the three macro-sectors: primary, secondary and tertiary. The *agriculture* share is negatively related to productivity (equation [3c]) and the same result is obtained by considering the *industry* share (equation [3d]). Instead, the *services* share is positively related to productivity (equation [3e]). In all cases, education and GCI are positive and significant. Since in other papers the positive impact of industrial specialization on average productivity has been found, we offer our interpretation: many rich, high-productivity countries in Western Europe are mainly specialized in services, whereas industrial specialization now chiefly characterizes Eastern countries, the productivity level of which is still lower than that of Western countries.

A last structural indicator refers to short-term labour reallocations across sectors. Reallocations of labour are connected to productivity, since job creation and destruction both normally relate to sectors characterized by different productivity levels.[22] A structural *turbulence* indicator has been proposed (see Huber, 2007):

$$\mathrm{TURB}_j = \frac{1}{2} \sum_i \left| s_{i,j,t} - s_{i,j,t-1} \right|$$

where $s_{i,j,t}$ is the share of sector *i* in country *j* at time *t*; it varies from 0 (no change in shares) to 1 (complete change from one sector to another). Employment data are again Cambridge Econometrics.

In regression [3f], the coefficient of TURB turns out to be negative and significant. One interpretation is that, when labour reallocations are more intense, although they are generally from low-productivity to high-productivity sectors, productivity may temporarily be lower in the destination sectors, because of problems of knowledge accumulation, learning-by-doing and so on, which may prevail in the adjustment period. The sign, numerical values and statistical significance of the two additional regressors – education and GCI – confirm their robustness.

The third group of explanatory variables refers to labour market indicators. We focused on *employment rate* and used Eurostat data on 'employment rate as per cent of population aged 15–64'. The main results are listed in Table 4.4, in which panel regressions with fixed effects still have productivity per worker as the dependent variable. However, in this group, we used variables in both levels and differences, as specified below.

Regression [4a] has *employment rate* as the only explanatory variable, besides the country effects. It is positive and highly significant.[23] When we add some of the previous regressors, for example, education and the EBRD index, these control variables have the expected sign (see regression [4b]), but the coefficient of the employment rate is much lower and not significant. One explanation is that the employment rate seems to have a positive effect on productivity – when individually included as an explanatory variable – because it is positively associated with education, EBRD, R&D and so on; but when we control for these variables, its impact tends to become not significant anymore. Why? A better explanation of this outcome is to consider some dynamic specifications, in which the *change in productivity* is the dependent variable: see the last two equations of Table 4.4, where productivity change is negatively linked to change in employment rate (equation [4c]).[24]

Table 4.4 Panel Regressions: Productivity per Worker and Employment Rate (2000–2006)

Productivity	[4a] *level*	[4b] *level*	[4c] Δ	[4d] Δ
No. of obs.	27 × 7	27 × 7	27 × 6	27 × 6
Explanatory variables:				
Education		0.354***		0.170***
EBRD index		12.53***		1.59
Employment rate	0.547***	0.014		
Δ Empl. rate			−0.47***	−0.56***
Fixed effects	FE	FE	FE	FE
Adj. R2	0.982	0.993	0.726	0.775

Significance levels: 1 per cent***, 5 per cent**, 10 per cent*; constant and fixed effects not reported (even when included).

This specification in differences is sometimes used to verify the 'diminishing returns for the employment rate' hypothesis. In recent empirical works, this hypothesis has been proposed because 'a low employment rate indicates that only the most productive workers are involved in the production process, because of their skill level or their age; as the employment level rises, less productive workers are hired' (Belorgey, Lecat and Maury, 2006).

We may also add that, in many CEECs rationalizations and the restructuring of their economies have temporarily reduced employment rates (also with an increase in the shadow economy and irregular employment), but with significant productivity gains. Conversely, in some countries of 'old' Europe, such as Italy and Spain, which have recently moved to an 'extensive model' thanks to the reforms introducing greater flexibility in labour markets, there has been a considerable increase in employment rates (and a corresponding fall in unemployment), accompanied by a slowing down of productivity; many new jobs, partly emerging from the shadow economy, have clustered in unskilled and low-wage employment, in many cases occupied by immigrant workers: this evolution seems (partly) to contradict the EU Lisbon strategy to create *more and better* jobs. All these links are probably captured by equation [4d].

5. Summary of main results and policy implications

After a review of the main theoretical and empirical literature, this chapter has analysed some features of the economic performance of the European (EU-27) countries, highlighting the peculiarities of transition compared with 'old' EU countries. The focus has been on labour market evolutions in the various countries (for the period 1990–2006), the trade-off between employment and productivity growth, and the main determinants of productivity differences between countries, with special consideration for human capital.

Through 'descriptive' analysis, Section 3 derives different 'models' of economic growth: extensive, intensive, virtuous or stagnant. In the initial year (1990) an extensive growth model was followed by all transition countries: relatively high employment rates accompanied by low productivity levels were a typical situation for the former centrally planned countries, where 'full employment' coincided with 'under-employment' (normally in low-productivity state sectors or firms). In the 1990s, most of these countries shifted to a 'stagnant' model, because of heavy reductions in employment, following the restructuring of their economies, not yet accompanied by significant improvements in productivity. Only in the new century have productivity levels begun to converge towards the European average – in some countries accompanied by a new rise in the employment rate.[25] Instead, many old European countries have moved in the opposite direction: coming from two decades of 'jobless growth', they have shifted in the last ten years to an 'extensive' growth model, mainly thanks to labour market reforms leading to greater flexibility, whereas productivity growth has been weak – much lower than in the US: Italy and Spain are the clearest examples of this growth model.

Among the different sources of growth, human capital emerges as a leading factor in theoretical and empirical studies (as confirmed by the review in Section 2). Hence, by considering the old European countries (EU-15), we tried to relate a proxy of human capital with average labour productivity: the overall relation is positive (Section 3).[26] However, when we consider the full sample of EU-27 countries, the relation between the two variables turns out to be negative: in fact, the new members have rather low productivity levels but relatively high education (the latter being a long-standing tradition in CEECs).

In our more complete empirical investigations (Section 4), we explained the differences between countries in levels of labour productivity, considering differences in the human capital level as well as in some other explanatory variables, such as: R&D, competitiveness, progress in transition (EBRD transition index); some structural indicators (for example, employment shares of the three main sectors), some synthetic indices of specialization, the extent of the 'shadow economy'; and, lastly, employment rates.

Both cross-sections and panel estimations were used. It seemed appropriate: (i) either to introduce some dummy variables for the CEECs in the regressions; (ii) or to make estimations with fixed effects (which can capture the specificities of all individual countries). We tried both specifications, with average labour productivity (per worker) and labour productivity per hour (although most of the results have the former variable).

In the cross-sections – for three separate years: 1992, 1998 and 2006 – education is always positive and significant in explaining differences in productivity levels, whereas the dummy CEEC is always negative and significant. In estimations of conditional beta-convergence, the education variable is still positive and significant, whereas productivity convergence across countries is established.

As regards panel estimations, since all the (above) explanatory variables have the expected sign (for example, R&D, competitiveness, transition index, specialization index, services share), while education remains positive and significant in all cases (as are fixed effects), we deal here with some results particularly relevant for CEECs.

For example, a high industrial share seems to have a negative effect on productivity: one explanation is that industrial specialization now chiefly characterizes the Eastern countries, the productivity level of which is lower than that of Western countries (which are more specialized in service activities). The negative coefficient of the turbulence indicator is explained as follows: although labour reallocations are from low-productivity to high-productivity sectors, productivity may temporarily be lower in the destination sectors, because of problems of knowledge accumulation, learning-by-doing and so on, which may prevail in the adjustment period. One explanation of the positive link between the shadow economy index and productivity is that the latter is higher where a larger share of low-productivity activities are relegated to the 'shadow' economy, instead of (partly) emerging and formally being included in national accounts (that is, in GDP, employment and productivity variables).

Lastly, productivity growth seems to be negatively linked to changes in the employment rate, consistent with the 'diminishing returns for the employment rate' hypothesis, according to which, as employment level rises, fewer productive workers are hired. In many CEECs rationalization and restructuring processes have produced significant productivity gains (although temporarily reducing employment rates) in contrast with countries which recently followed an 'extensive model' (like Italy and Spain).

The main policy implication calls to mind, at this point, the EU Lisbon strategy to create *more and better* jobs, while reducing regional and national disparities, which are going to be exacerbated by the current (2008–2009) financial and economic crisis. The help of structural funds and cohesion fund is fundamental in preventing mass unemployment and consequent social disruptions in the CEECs.

On the other hand, many 'old' Europe countries have been able to create in the last decade *more* jobs, partly thanks to labour market reforms. But this strategy must be completed in two ways: (i) by paying attention to the *better* jobs specification[27], not only to increase workers' welfare but also to foster their effort and motivation; (ii) by focusing more directly on productivity growth which, in several European countries, is particularly lacking.

A special endeavour is needed to place knowledge and education, together with R&D and innovation capabilities, at the top of the policy agenda, as the main instruments for achieving growth and competitiveness. In the long run, in fact, sustained productivity growth is beneficial also in preserving and expanding employment, thus overturning (apparent) short-term trade-offs.

The global recession in 2009, deeply affecting the industrial sector, is producing huge and different real effects (GDP and employment decline) also for Eastern EU members. The degree of persistence of such effects and their influence on productivity will crucially depend, among other things, on policy interventions. In the short run the aggregate effect of the recession on productivity is ambiguous for many reasons. For example, the productivity (per worker) decline will probably be amplified in 2009 by the different lags in GDP and employment reductions;[28] on the opposite side, a short-term apparent increase could derive by the abandonment of least productive activities. However, in the medium–long run, a high risk of worsening in the productivity (potential) dynamics could especially stem by reductions in (public and private) R&D expenditure and human capital investment, that are cut due to conditions of growing financing difficulties for public administrations, firms and households. It is extremely important that, in both Eastern and Western EU countries, the future fiscal consolidation (necessary to offset the current increases in deficits and debts) will not be too detrimental to those public expenditures functional to economic growth and productivity dynamics, a long-run prerequisite for achieving 'more and better' employment.

Appendix

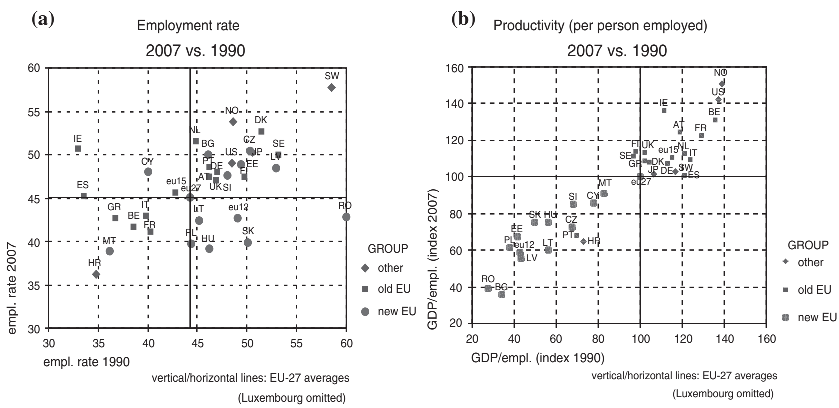

Figure 4.A1 (a) Employment rate (b) Productivity per Employed person

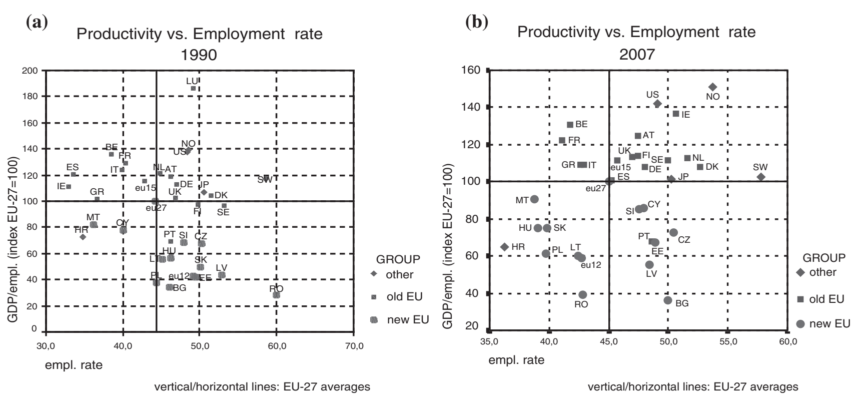

Figure 4.A2 (a) Productivity vs. employment rate 1990 (b) Productivity vs. employment rate 2007

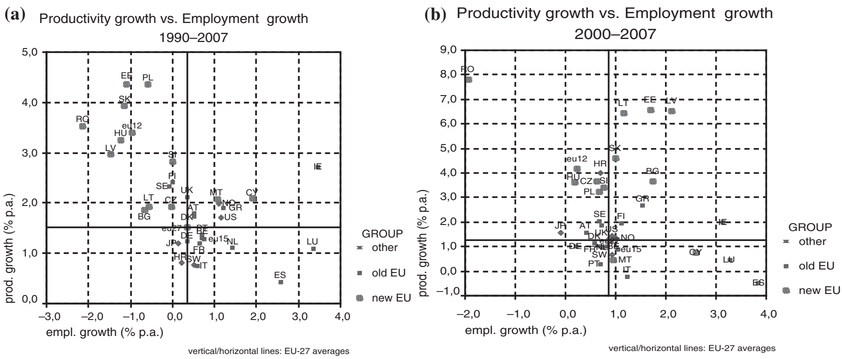

Figure 4.A3 (a) Productivity vs. employment growth 1990–2007 (b) Productivity vs. employment growth 2000–2007

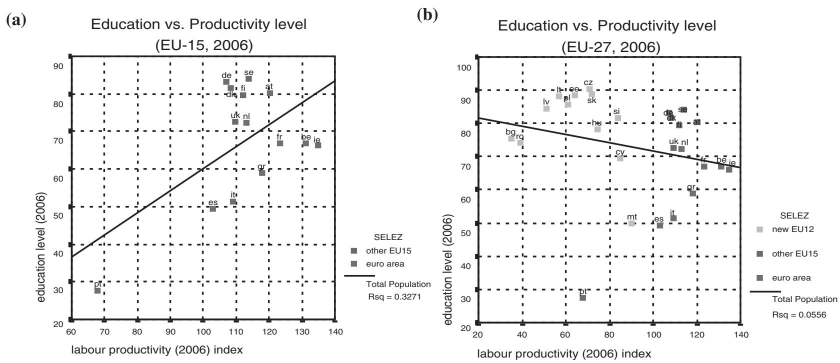

Figure 4.A4 (a) Education vs. productivity level (EU15, 2006) (b) Education vs. productivity level (EU-27, 2006)

Notes

1. Strongly export-oriented countries have been particularly affected by huge decline in global manufacturing demand/production.
2. Even at present, despite the financial crisis started in US, the 2009 forecasts (OECD, June 2009) highlight a greater GDP decline in most EU countries with respect to US. Not to speak of Chinese and Indian growth that will surely remain positive (and relatively large) also in the 2009 year of world recession.
3. Moreover, in Chapter 3 different proxies for 'human capital' have been used (primary, secondary and tertiary education) and the estimation strategy – based completely on conditional convergence – was also different.

4. Many papers analyse the relationship or co-movement between GDP and employment (for example, Signorelli, 2005) and obtain some evidence also for productivity dynamics.
5. See Lucas (1988), Aghion and Howitt (1998), Krueger and Lindahl (2001), Benhabib and Spiegel (1994, 2005), Hanushek and Welch (2006).
6. Countries with a greater shadow economy normally have lower ‘regular’ employment rates (Perugini and Signorelli, 2004). For a focus on the informal economy in transition countries, see Belev (2003).
7. In addition, for comparison purposes, we included some non-members. The symbols used in the graphs are as follows: Austria AT, Belgium BE, Bulgaria BG, Cyprus CY, Czech Republic CZ, Denmark DK, Estonia EE, Finland FI, France FR, Germany DE, Greece GR, Hungary HU, Ireland IE, Italy IT, Latvia LV, Lithuania LT, Luxembourg LU, Malta MT, Netherlands NL, Poland PL, Portugal PT, Romania RO, Slovak Republic SK, Slovenia SI, Spain ES, Sweden SE, United Kingdom UK; for non-members: Croatia HR, Japan JP, Norway NO, Switzerland SW, United States US.
8. We used Maddison data: *The Conference Board and Groningen Growth and Development Centre*, Total Economy Database, January 2008.
9. The four quadrants are defined in relation to the EU-27 average values, but the graph shows both EU-15 (old members) and EU-12 (new members) averages.
10. An equivalent analysis concerning *productivity per hour* – that is GDP per total worked hours – shows similar tendencies.
11. Since for some countries and some years the data were missing, they were estimated according to the trends resulting from the Barro and Lee (2000) database, http://www.cid.harvard.edu/ciddata/ciddata.html.
12. This confirms previous empirical results devoted to convergence in Europe, across both countries and regions (an absolute β-convergence in productivity across all European regions was found in Marelli, 2007). Instead, the more recent research by Marelli and Signorelli (2010), found that, in the eight NMS (since 2004), there has been *convergence across countries* but *divergence across regions* (at the NUTS-3 level) within the same countries.
13. Results concerning beta-convergence are available upon request.
14. Since the index is not computed for the ‘old’ European countries, we conventionally set its numerical value at 4, for all of them.
15. See Sala-i-Martin and Artadi (2004).
16. Almost all EU-27 countries are included in the sample: the only exceptions are the small countries of Luxembourg, Malta and Cyprus (for which scores were obtained by an indirect method).
17. R&D influences not only labour productivity but, to an even greater extent, total factor productivity directly (the dynamics of which have also been rather heterogeneous in European countries).
18. In this case, Hausman’s test ($\chi^2(2) = 2.65$, $p > \chi^2 = 0.266$) suggests that random effects are to be preferred. However, when R&D is incorporated in a regression including both education and the GCI index, the coefficient of R&D is positive but no longer significant (equation [2f]).
19. For a recent review, see Kruger (2008).
20. It remains significant even when included jointly with education and the GCI index.
21. Generally, there are 15 of them, except for Bulgaria (nine sectors are available) and Romania (only five).

22. Empirical literature in this field is more micro-oriented, although focusing on the labour market effects of business cycles: see the pioneering work of Davies, Haltiwanger and Schuh (1996). However, according to the authors, structural change is much more intense within industries than between industries, even at a detailed level of sector disaggregation.
23. It remains positive and significant in alternative specifications where the dependent variable is productivity *per hour*.
24. The same link holds when we add the usual regressors: education and EBRD (in levels), although the second variable is not significant (equation [4d]).
25. Some transition countries (the Baltic states, Slovakia, Bulgaria) have moved to a 'virtuous' model; Romania is the only country still closely adhering to an 'intensive' model.
26. Notice that in three countries (Portugal, Spain and Italy) the education level is particularly low, matching their low productivity level.
27. See also European Labour Network for Economic Policy (2008).
28. At both firm and aggregate levels, a decline in production is (usually) not immediately accompanied by employment reductions. 'Labour hoarding' practices are followed for many reasons, also in order to maintain the level of human capital (that is, a certain number of trained employees) helpful to better face the following phase of recovery.

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5
Trade-off between Productivity and Employment in Transition Countries: An International Comparison

Misbah Tanveer Choudhry and Bart van Ark[1]

1. Introduction

In order to attain long-term sustainable economic growth, creation of employment opportunities along with promotion of higher productivity is a basic essential. Policy makers in developed, developing, emerging and transition economies are emphasizing the need to improve workers productivity. However, at the same time it needs to be considered that labour productivity will be increased by the substitution of capital intensive methods for labour intensive methods in production processes, leading to a potential loss of jobs.

Although productivity gain can lead to job losses as technological progress leads to efficient utilization of resources, this productivity gain can also lead to employment creation due to expansion of new product markets. The new jobs may be created in different areas, sectors and industries. Sectoral shifts of employment have been taking place in all regions of the world. On balance an increase in employment is more prominent in the services sector, but with considerable variation among different regions of the world. Similarly, the composition of the labour force, human capital development, investment in physical capital goods and adoption of information and communication technology (ICT) is also changing over time. This transition process takes time and a trade-off can be expected between employment growth and productivity growth during this period.

This chapter focuses on the productivity and labour force participation trade-off in dynamically changing economies with particular focus on transition and developing countries. The hypothesis is that there will be a trade-off in productivity growth and employment due to structural changes in the short and medium run. However, in the long run, the economy will benefit from these structural changes as higher productivity is combined with employment growth. The chapter investigates whether this development can be verified for all regions of the world or whether it is specific to some countries belonging to particular income groups. The chapter provides an international comparison of this trade-off between different regions as well as by different income groups of the world. Below we analyse (i) the relationship between productivity and employment for transition and developing economies belonging to different income groups; (ii) the impact of gender and different age groups of labour force on the productivity–participation trade-off; and (iii) possible reasons that explain the differences in the trade-off across regions and income groups. The chapter also looks at the requirements for the transformation of short-term trade-offs into long-term positive influence for sustainable growth in transition and developing economies.

To investigate the intensity of the trade-off between productivity and participation, we use a panel approach for 45 countries across the world for the period of 1980–2005 and the sub-period of 1995–2005. We find that there is trade-off between labour productivity and labour participation for all regions and income groups of the world. The intensity of this trade-off varies for economies belonging to different regions and income groups. The trade-off increases as we move from high income developed economies to upper-middle, lower-middle and lower income developing and emerging economies. The analysis shows that during 1995–2005, the trade-off has reduced for all regions, except for the transition economies of Central and Eastern Europe (CEE) and it has become almost insignificant for high income group and upper-middle income group economies.[2] We also find that the impact of female participation is negative and significant during 1980–2005. However, during the period of 1995–2005, female participation has a negative impact on productivity for a period lasting three years and becomes insignificant thereafter. Moreover, our results show that the impact of the participation of younger workers is negative and significant on productivity during 1980–2005.

The chapter is structured as follows: Section 2 explores the overview of employment–productivity relationship. In Section 3, the patterns of employment productivity trade-off have been analysed across region and time periods at macro level. Empirical analysis of this trade-off by applying panel analysis is presented in Section 4. Impact of gender and age of workers on trade-off has been analysed in Section 5. Section 6 discusses the reasons which can explain the diversity in productivity participation trade-off across different regions of the world. Finally Section 7 summarizes the findings and suggests policy recommendations to handle this trade-off.

2. The relationship between employment and productivity

We start with a basic relation where output is considered as a multiplicative term of employment and productivity. A given level of output can be achieved either with high productivity and low employment (that is, the employment intensity of economic growth is low) or, in contrast, with low productivity and high employment (a high-employment intensity). The important question is whether an increase in productivity necessarily implies a decline in employment. In fact, it is not always the case as there are other sources such as better capacity utilization, efficient use of inputs, and training and skill development of labour, which lead to an increase in productivity. In this case, the productivity can grow without reducing the employment.

Similarly, there may be 'displacement effects' that occur due to expansion of market share with increase in productivity level of a particular firm. There can be a prompt employment decrease in other competing firms, so displacement effects should be kept in mind while focusing on the net impact on employment. Moreover, whenever productivity increases with mechanization, there may be a less demand of labour (for example in the agriculture sector) but at the same time there will be more labour demand due to expansion of output and related activities of mechanical developments (as in the manufacturing sector of developing countries). Although the immediate impact may be a slight decline or displacement in labour demand, market forces will compensate through output expansion and demand for new products in the longer term.[3] For evaluating the productivity–employment trade-off, both the time framework and the response of markets, and institution, towards productivity increase are important. There are compensating mechanisms through which productivity growth in a particular sector can affect output and employment growth at the aggregate level. These compensating mechanisms work through decline in product prices, increased wages, increase in investment and overall employment and new products through innovation (International Labour Organization, 2005). It is important to investigate if these compensating factors play a positive role in the long run, especially in emerging and transition economies.

3. The trade-off between productivity and employment

Theoretically, when net participation rate is associated with employment growth then productivity participation trade-off follows directly from the neoclassical production function (Broersma, 2008). Under decreasing returns to labour, any increase in employment rate will reduce the capital per worker, which will in turn lower the output per worker. Another theoretical argument to the productivity participation trade-off is based on skilled heterogeneity among workers. New entrants into the labour market are less skilled than those already employed. An increase in labour participation will imply the decline in labour productivity (McGuckin and van Ark, 2005). Another related explanation for this possible trade-off is that high growth rates of labour make it difficult to exploit the benefits from new technologies which help to boost labour productivity (Beaudry and Collard, 2003).

To evaluate the productivity and participation trade-off, we analysed the cross section of 45 countries from all over the world for the period of 1980–2005. In our sample, nearly 70 per cent of countries are developing and emerging economies and they belong to different income groups.[4]

We start our analysis with an identity reconciling per capita income and labour productivity through labour intensity and participation

$$\left(\frac{Y}{P}\right) = \left(\frac{Y}{H}\right) \cdot \left(\frac{H}{E}\right) \cdot \left(\frac{E}{P}\right) \tag{5.1}$$

where

$$\left(\frac{E}{P}\right) = \left(\frac{E}{L}\right) \cdot \left(\frac{L}{P_{15-64}}\right) \cdot \left(\frac{P_{15-64}}{P}\right) \tag{5.2}$$

where Y is GDP, P is population, H is hours work , L is labour, P_{15-64} is working age population and E is the number of employed persons. In our detailed econometric analysis, we use the broader participation rate in terms of the share of employed persons in the total population instead of the narrower definition of the population aged 15–64 years. This is done intentionally as employment rate is widely available and less subject to measurement differences across countries. Moreover, the working age population (15–64 years) measure is somewhat arbitrary because people older than 64 years may still be working. Data for identity in equation (1) is drawn from the total economy database of the Conference Board and the Groningen Growth and Development Centre (GGDC), Key Indicators of Labour Market (KILM) and World Development Indicators (WDI).

3.1. Descriptive analysis

We consider the annual percentage growth rates of the series to be stationary and continue our analysis based on them. Most economies represent developing countries and lack data on annual hours worked for these economies. So we will use the GDP per employed person as a measure of labour productivity.

The data is represented graphically by a scatter plot of initial level of labour productivity and its annual average growth during 1980–2005 in Figure 5.1. There are many countries with low initial productivity level and high annual growth in productivity representing a catching up phenomenon, that is, Malaysia, South Korea, China, Thailand and Turkey. However, there are also economies in the sample that are a prey of a low productivity trap, that is, Zambia, Zimbabwe and Madagascar, Peru, Syria, Brazil, Ecuador and Kenya. There is also variation in labour productivity growth performance among transition economies. For example, Albania with quite a low initial productivity level showed reasonable annual productivity growth while Bulgaria

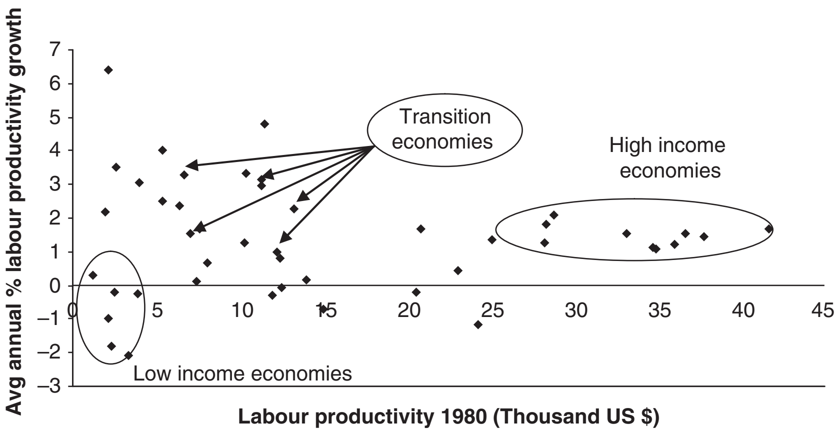

Figure 5.1 Relationship between labour productivity levels (1980) and growth of labour productivity (1981–2005).

did not perform well during the period under analysis (see Figure 5.1). In the next section we will discuss the possible reasons for variation in productivity performance across different regions and income groups.

An assessment of the long-term interaction between employment growth and productivity growth for sample countries is presented in Figure 5.2. Although a negative relationship can be seen between employment and productivity growth, there is, however, quite a variation across countries. Most countries are in the northeast quadrant of the diagram showing both productivity and employment growth. At one end there are China, South Korea and Malaysia, which show evidence of both productivity and employment growth. On the other hand there are economies mostly from Africa, Latin America and Middle East in the southeast quadrant of Figure 5.2. These economies showed high employment growth accompanied by poor performance in productivity which implies that there is a high rate of under-employment in these economies. There are also four countries in the northwest quadrant of Figure 5.2 which showed negative employment growth during 1980–2005. All these economies are transition economies as pointed out by the circle in Figure 5.2. These economies experienced a rapid decline in employment during the 1990s with productivity gains related to a contracting economy because of the collapse of the former socialist regimes, leading to a huge shake-out of employment from unproductive enterprises and the beginnings of markets liberalization.

Another way to explore the productivity participation trade-off is to look at the decomposition of output growth by the change in employment and productivity (see Table 5.1). The regional growth rates are calculated by unweighted average growth rates in sample countries belonging to a

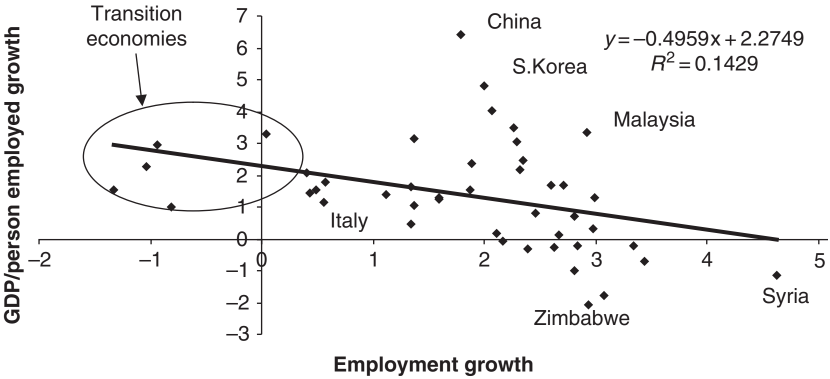

Figure 5.2 Relationship between employment growth and labour productivity growth (1981–2005).

particular region. In most cases we can observe a negative relationship between employment and productivity growth in different regions, that is, in Europe, Africa and Middle East and North Africa.

One can also notice that in *Africa* output growth by decade is mainly due to employment growth with very low productivity except for 1960–1970. In Europe, productivity growth is mainly responsible for the output growth over the four decades up to 2000. However, the situation is reversed in the recent past (2000–2005). In *Transition economies*, output growth is mainly because of high productivity growth which is due to a rapid decline in employment in these economies. Only Bulgaria and Hungary showed slightly positive growth in employment during 2000–2005 while the other economies in the sample showed negative employment growth during 1980–2005. The *Southeast Asian* region showed positive employment and productivity growth during the last decade, with productivity growth dominating employment growth. Similarly, in *South Asia* both employment and productivity growth are moving together positively since 1980s.

Although productivity growth varies across different regions, there is a reasonable diversity with regard to productivity growth within the regions. Figure 5.3 shows a comparison of the Labour Productivity Index (LPI) for transition economies with Western Europe and United States. In *Europe*, all the economies showed an upward trend in productivity. A focus on the transition economies reveals that they made rapid advances in productivity growth during 1990s. Poland, coming from a relatively low level of productivity, underwent a rapid structural transformation, which lead to an increase in productivity level. However, Poland still has a relatively high unemployment rate and much lower labour productivity as compared to the EU average. Albania's LPI started to move up from 1997 onward with a

Table 5.1 Output Decomposition by Employment and Productivity 1960–2005 by Region

	Africa			*East Southeast Asia*			*Europe*		
	Output growth	Empl. growth	Product. growth	Output growth	Empl. growth	Product. growth	Output growth	Empl. growth	Product. growth
1960–1970	5.00	2.46	2.53	6.21	2.52	3.69	5.29	0.64	4.65
1970–1980	3.11	2.71	0.39	6.35	2.68	3.66	3.27	0.35	2.92
1980–1990	2.11	3.36	–1.25	5.66	2.85	2.8	2.38	0.59	1.79
1990–2000	1.48	2.77	–1.29	4.78	1.53	3.25	2.32	0.85	1.47
2000–2005	2.95	2.1	0.85	5.04	1.44	3.6	1.76	1.23	0.53
	Middle East & North Africa			*North America*			*Transition Economies*		
	Output growth	Empl. growth	Product. growth	Output growth	Empl. growth	Product. growth	Output growth	Empl. growth	Product. growth
1960–1970	4.89	1.65	3.24	5.22	2.49	2.72	5.11	1.30	3.82
1970–1980	6.87	2.76	4.11	5.38	3.59	1.79	3.54	0.96	2.58
1980–1990	3.92	3.1	0.81	2.3	2.52	–0.22	0.07	0.30	–0.22
1990–2000	3.89	2.88	1.01	3.03	1.58	1.45	0.80	–1.86	2.66
2000–2005	3.63	2.51	1.12	2.33	1.67	0.66	4.86	–0.94	5.80
	South America			*South Asia*			*Oceania*		
	Output growth	Empl. growth	Product. growth	Output growth	Empl. growth	Product. growth	Output growth	Empl. growth	Product. growth
1960–1970	4.81	2.03	2.77	4.38	1.86	2.52	4.28	2.48	1.81
1970–1980	4.21	2.47	1.73	3.17	2.38	0.78	2.69	1.52	1.16
1980–1990	1.23	3.19	–1.96	4.88	2.21	2.67	2.51	1.09	1.41
1990–2000	3.81	1.52	2.27	4.86	2.02	2.84	3.16	1.43	1.72
2000–2005	3.75	2.72	1.03	5.24	2.76	2.47	3.31	2.4	0.91

Source: The Conference Board and the Groningen Growth and Development Centre, Total Economy Database, version 2008.

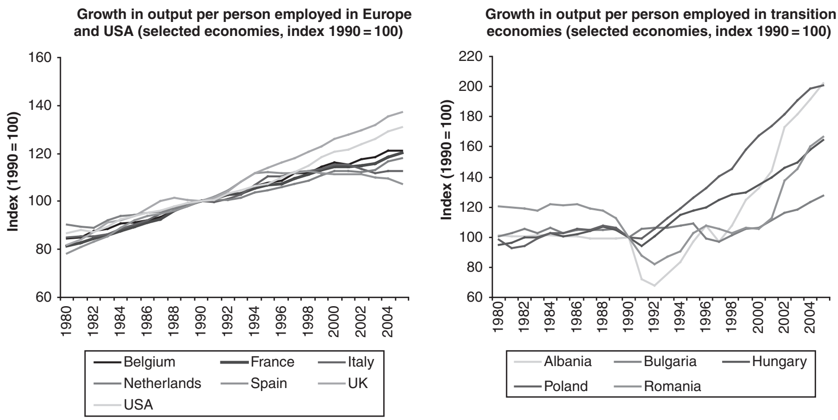

Figure 5.3 Growth in output per person employed in different regions 1980–2005 (selected Economies, Index 1990 = 100).

sharp rise in this index. Bulgaria's performance is the poorest with respect to labour productivity growth, but the unemployment rate is the second lowest as compared to other transition economies. Romania showed an upward trend in productivity index after 2002 with high growth during 2002–2005. In most transition economies, high labour productivity growth is the result of a rapid shake-out of employment from non-competitive plans leading to a decline in employment during the transition process.

Table 5.2 provides the breakdown of labour productivity growth into effects of labour force participation and GDP per capita by region and with a detailed breakout for transition economies. It appears that the relationship between labour force participation and labour productivity tends to be negative in most of the cases as can be seen from the poor performance with regard to productivity in Africa and South America. Moreover, in all regions except for East and Southeast Asian economies, per capita income growth has increased during 1995–2005 as compared to 1980–1995. In most cases, productivity growth is driving the improvements in per capita income around the world.

In transition economies, there is a strong negative relationship between participation and productivity. Labour productivity during 1995–2005 was rapid compared to the period of 1980–1995; whereas the impact of the active population share on per capita income is slightly positive. Table 5.2 also indicates that the impact of participation, whether it is measured as employment rate or labour force participation rate, on productivity is negative or very low.

Productivity growth and changes in labour intensity can also be viewed from a comparative perspective by focusing on relative levels. We present relative performance of transition and low income economies in labour

Table 5.2 Decomposition of Labour Productivity into Effects of Labour Force Participation and GDP per capita, 1980–2005, Annual Average percentage Growth

Region/Area	*GDP per Person Employed (%)*	*Effect of Employment as a per cent of labour force (age 15–64) (in % points)*	*Effect of labour force as per cent of working age population (age 15–64) (in % points)*	*Effect of Active population (age 15–64) as a per cent of total population*	*GDP per Capita (%)*
Africa					
1980–1995	−1.775	−0.028	0.030	0.293	−1.480
1995–2005	0.384	−0.093	−0.157	0.388	0.523
Southeast Asia					
1980–1995	3.479	0.131	0.111	0.640	4.361
1995–2005	3.038	−0.337	0.200	0.308	3.208
Europe					
1980–1995	1.782	−0.375	0.153	0.244	1.804
1995–2005	0.904	0.540	0.560	−0.040	1.964
Middle East and North Africa					
1980–1995	0.812	0.045	0.056	0.628	1.541
1995–2005	1.207	−0.142	0.159	0.930	2.154
North America					
1980–1995	0.260	−0.349	0.504	0.378	0.792
1995–2005	1.072	0.162	0.067	0.410	1.711
Oceania					
1980–1995	1.529	−0.460	0.214	0.177	1.460
1995–2005	1.174	0.583	0.304	0.139	2.199
South America					
1980–1995	−0.042	−0.801	1.109	0.433	0.699
1995–2005	1.188	−0.584	0.695	0.441	1.740
South Asia					
1980–1995	2.875	−0.231	−0.263	0.266	2.647
1995–2005	2.616	0.323	−0.170	0.652	3.421
Transition Economies from Eastern and Central Europe					
Albania					
1980–1995	0.20	0.01	−0.66	0.35	−0.13
1995–2005	8.24	−1.14	−1.61	0.38	5.87
Bulgaria					
1980–1995	0.58	−0.65	−0.83	0.10	−0.80
1995–2005	1.63	2.96	−1.40	0.35	3.44
Hungary					
1980–1995	1.50	−0.95	−1.30	0.32	−0.50
1995–2005	3.36	0.71	−0.08	0.21	4.21
Poland					
1980–1995	1.75	−0.83	−0.99	0.05	−0.03
1995–2005	4.89	−0.22	−0.81	0.67	4.47
Romania					
1980–1995	−0.90	−1.33	0.25	0.46	−1.60
1995–2005	5.61	−1.59	−1.41	0.34	2.87

Source: TCB/GGDC Total Economy Database (2008) with GDP converted to US $ at 1990 GK.

productivity and per capita income as a percentage of the US level in Figure 5.4 below for the period 1975 and 2005. It shows that the average GDP per capita and labour productivity in transition economies is about one third of that of the US level in 2005; however, this gap has narrowed as compared to 1975. Moreover, comparison of transition economies with lower income economies shows that transition economies show much higher levels of per capita income and productivity as compared to the lower income economies. In the case of lower income group economies, the gap has widened further with respect to relative productivity in 2005 as compared to 1975.

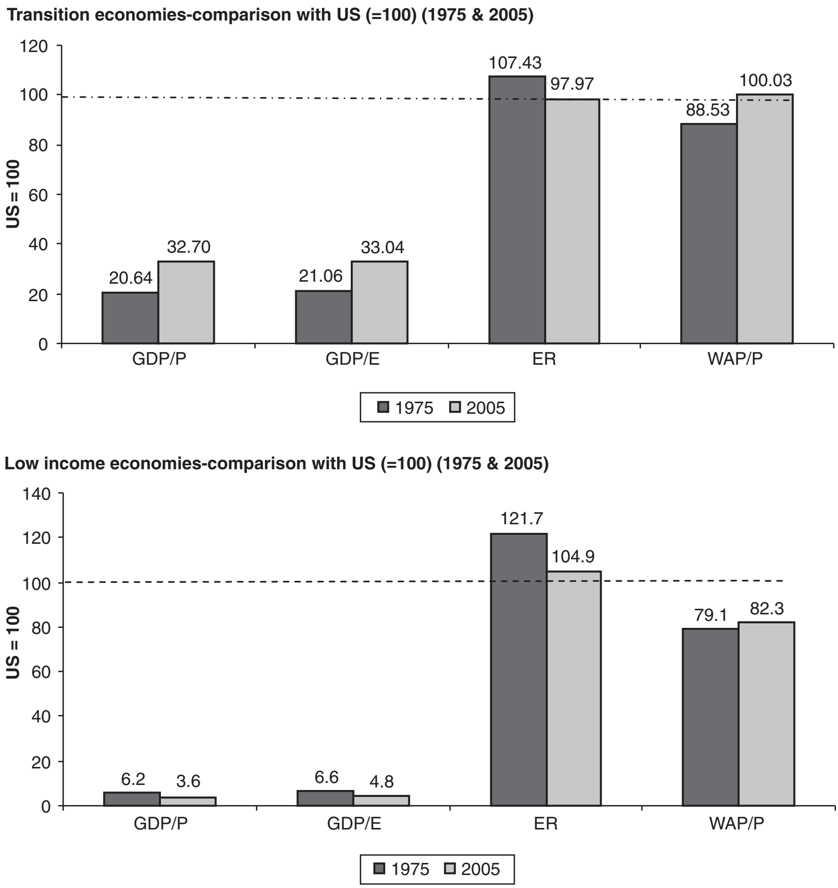

Figure 5.4 Comparison of per capita income, productivity and labour market indicators with US (=100) (1975 and 2005).

Note: GDP/P = per capita income, GDP/E = labour productivity, ER = employment rate, WAP/P = ratio of working age population to total population.

To analyse the impact of financial and economic crises (2007–2009), the latest trends in growth in labour productivity, employment and output for the different regions of the world are presented in Table 5.A1 in the appendix. The current global financial crisis, which started in 2007, has led to a decline in output growth in most of the economies around the world. Labour productivity growth reduced for all income groups in 2008, which resulted in a decline in output growth. The Conference Board (2009) shows that world productivity growth slowed sharply in 2008 and is set to decelerate further in 2009 as the global recession deepens. However, this crisis is more severe for high income developed economies than for emerging economies. Generally, the pro-cyclical nature of productivity growth (higher in boom period and lower in recession) can be observed from Table 5.A1. The regional level analysis suggests that the impact of crisis differs widely across regions and depends upon various factors, for example, country reliance on international trade, dependence on natural resources, financial liberalization of banking system and fiscal resources at government disposal (The Conference Board, 2009). Although the productivity growth is affected in almost all regions, the adverse effects of the financial crisis are more visible in developed regions, that is, North America, Western Europe and Japan. There is a significant decline in employment and productivity growth in these regions, for example, labour productivity growth in high income economies declined from 1.38 in 2006 to 0.57 in 2008. A particular focus on transition economies from Central and Eastern Europe shows that the performance of these economies remained relatively satisfactory until 2008. The fastest productivity growth in transition economies was observed in Romania with 7.07 per cent followed by Albania with 6.76 per cent growth in 2008. Hungary showed the poorest performance of growth in output, employment and productivity in 2008, among the transition economies. In 2009, the global crisis resulted in a rapid decline in output, job losses and high unemployment rates in most economies, but the productivity effect in Central and Eastern European economies is relatively low so far as compared to Western Europe. However, for coming out of the recession and to achieve a sustainable productivity growth, there is a need for investment in tangible and intangible capital and proper government response around the world.

4. Empirical analysis

The empirical strategy focuses on the relationship between productivity and participation. We follow the methodology adopted by McGuckin and van Ark (2005), mainly because we are not only interested in the intensity of trade-off between employment and productivity growth but also in the duration of this trade-off. As discussed above for equation (5.1) we start with a simple accounting identity that includes per capita income. So we can rewrite the identity in equation (5.1) as

$$\left(\frac{Y}{H}\right) = \frac{\left(\frac{Y}{P}\right)}{\left(\frac{H}{E}\right)\cdot\left(\frac{E}{P}\right)} \tag{5.3}$$

Rewriting equation (3) in terms of growth as

$$\Delta\log\left(\frac{Y}{H}\right) = \Delta\log\left(\frac{Y}{P}\right) - \Delta\log\left(\frac{H}{E}\right) - \Delta\log\left(\frac{E}{P}\right) \tag{5.4}$$

Since this is an identity, it cannot be estimated in order to assess the effect of a change in either right hand side variable to labour productivity growth. At least one variable has to be omitted to estimate this effect and therefore we skip GDP per capita. In addition hours worked are highly correlated with per capita income which will result in problem of endogeniety. To avoid this we moved both per capita income and H/E to residual term. So our equation for estimation in restricted form is:

$$\Delta\log\left(\frac{Y}{H}\right) = \beta_0 + \beta_1\Delta\log\left(\frac{E}{P}\right) + \varepsilon \tag{5.5}$$

For estimating this model we use overlapping[5] panels of different time spans ranging from annual data to ten years. Each equation is estimated without and with initial productivity levels (taken at the beginning of each time span) and country specific fixed effects. Our final equation for estimation is

$$\Delta\log\left(\frac{Y}{H}\right) = \beta_0 + \beta_1\Delta\log\left(\frac{E}{P}\right) + c^*D_j + d^*\left(\frac{Y}{H_{j,t0}}\right) + \varepsilon \tag{5.6}$$

Where j stands for the country and t stands for time span over which the growth is measured. The measurement time span will consist of one, two, three, five, seven and ten years. As mentioned in the previous section, the employment to population ratio is used to measure the labour force participation and will be referred to as the employment rate from here onward. GDP per employed person is our measure for labour productivity and our data is from the Conference Board and the Groningen Growth and Development Centre, as Choudhry and van Ark (2009).

We applied a panel estimation approach to measure the relationship between the employment and productivity growth. The basic panel analysis results are presented in Table 5.3a and 5.3b where growth in labour productivity is a dependent variable and the change in the employment rate

Table 5.3a Effect of Change in Employment/Population Ratio on Growth in Value Added per Person Employed

	1980–2005		*1995–2005*	
	Uncontrolled I	Controlled II	Uncontrolled III	Controlled IV
Annual	–0.682	–0.705	–0.689	–0.353
	(12.06)**	(12.63)**	(8.18)**	(4.04)**
2-year	–0.600	–0.636	–0.795	–0.485
	(10.07)**	(11.00)**	(9.56)**	(5.59)**
3-year	–0.586	–0.616	–0.774	–0.34
	(9.46)**	(10.36)**	(8.67)**	(3.54)**
5-year	–0.577	–0.639	–0.941	–0.386
	(8.77)**	(10.41)**	(9.30)**	(2.29)**
7-year	–0.517	–0.634	–1.05	–0.328
	(7.43)**	(9.03)**	(9.21)**	(2.50)**
10-year	–0.455	–0.78	–	–
	(5.79)**	(10.84)**		

Notes: Controlled regressions include country fixed effects and initial level of labour productivity. The coefficient of initial level of labour productivity is not reported here.
The grey areas are preferred results. Absolute value of *t* statistics in parentheses.

** significant at 1 per cent, * significant at 5 per cent.

Table 5.3b Effect of Change in Employment/Population Ratio on Growth in Value Added per Capita

	1980–2005		*1995–2005*	
	Uncontrolled	Controlled	Uncontrolled	Controlled
Annual	0.349	0.327	0.36	0.695
	(6.182)**	(5.901)**	(4.31)**	(8.05)**
2-year	0.431	0.401	0.256	0.562
	(7.25)**	(6.67)**	(3.10)**	(6.57)**
3-year	0.445	0.416	0.276	0.695
	(57.20)**	(7.063)**	(3.11)**	(7.29)**
5-year	0.454	0.367	0.105	0.626
	(6.91)**	(6.08)**	(1.04)	(5.38)**
7-year	0.512	0.342	0.05	0.66
	(7.36)**	(5.46)**	(0.04)	(5.12)**
10-year	0.577	0.156	–	–
	(7.343)**	(2.216)**		

Notes: Controlled regressions include country fixed effects and initial level of labour productivity. The coefficient of initial level of labour productivity is not reported here.
The grey areas are preferred results. Absolute value of *t* statistics in parentheses.

** significant at 1 per cent, * significant at 5 per cent.

is our independent variable. To evaluate the change in this trade-off over the past decades we estimate the model for two time periods, 1980–2005 and 1995–2005. We estimate the trade-off between participation and productivity with and without control variables. The first and third columns in Table 5.3a and 5.3b show the results of simple regressions without any control variable. The second and fourth columns show the regression results with controls. We used the initial productivity level and country fixed effects as control variables. Table 5.3a provides the results for the impact of participation on labour productivity (GDP per employed growth). There is a strong trade-off between participation and productivity and it remains significant even after ten years both in controlled and uncontrolled estimation results see Table 5.3a. During 1995–2005, the trade-off between participation and employment is still significant statistically but its economic impact has decreased.

Table 5.3b presents the result of the impact of increased participation on per capita income growth. The impact of the employment rate (employment to population ratio) is positive and significant for nearly all time spans (measurement intervals) in the uncontrolled regressions as well as the controlled regressions, see Table 5.3b. The positive impact of participation on per capita income is higher in the recent time period of 1995–2005 as compared to 1980–2005 (see column 4 in Table 5.3b). Regression results with controls (grey area in Table 5.3a and 5.3b) are our main results as they include the country specific fixed effects which capture the impact of unobserved variables in our model.

Our finding of the existence of the trade-off between labour productivity and participation growth rate is in consonance with previous studies (Beaudry and Collard, 2002; Belorgey et al., 2006; Becker and Gordon, 2008). However, all these studies focused on the existence of trade-off between employment and productivity among highly developed and industrialized economies only. In the case of developed economies panel, this trade-off is short term and fades away in less than five years (McGuckin et al., 2005; Broersma, 2008). As in our sample of 45 countries, most economies are developing countries so the trade-off persists even after ten years for the period 1980–2005. Sub-period analysis of 1995–2005 shows that this trade-off becomes weaker as compared to coefficients of whole period analysis. The elasticity estimates for the employment–productivity trade-off range from -0.32 to -0.78 in all cases. This means that the increase in productivity is not by definition translated in an increase in per capita income in case of developing and low income economies.[6]

5. The impact of age and gender on the trade-off

To evaluate the trade-off between productivity and participation, not only quantitative but also qualitative factors of labour force are important. In other words, along with an increase in labour force participation, its distribution by gender and by different age groups and skill level of labour force play a significant role in the determination of this trade-off as well. Data on the education level of the employed labour force is not available for most of the developing economies, but we can evaluate the impact of gender and different age groups on the productivity participation trade-off. As data on the employment rate is not available by gender and by different age groups, we will use information on female labour force participation and participation by different age groups provided in KILM by the International Labour Organization 2007. Some caution is needed in interpreting these results because the model is estimating the impact of female participation and of different age groups on overall labour productivity level, and not specifically for the productivity level of that group.

The impact of female participation on productivity growth is negative and significant for nearly all time spans during the period 1980–2005. This trade-off exists up to three years for the recent time period 1995–2005 (see the first two columns in Table 5.4). After three years the trade-off for females becomes insignificant. The negative impact of female participation is probably due to a lack of education and skills, less experience (that is, more entry and exit from labour market due to family responsibility) and an overrepresentation of jobs in low productivity sectors.

Young and aged workers are considered to be less productive on average than middle aged workers (see McGuckin et al., 2005). The estimation results

Table 5.4 Effect of Change in Labour Force Participation on Value Added per Employed Growth

	Females		*15–24 years old*		*55–64 years old*	
	1980–2005 I	1995–2005 II	1980–2005 III	1995–2005 IV	1980–2005 V	1995–2005 VI
Annual	−0.31	−0.23	−0.27	−0.06	−0.13	−0.11
	(4.82)***	(2.88)***	(5.65)***	(1.16)	(3.11)***	(1.77)*
2-year	−0.33	−0.27	−0.33	−0.10	−0.04	−0.11
	(4.04)***	(2.17)**	(4.97)***	(1.17)	(0.70)	(1.17)
3-year	−0.36	−0.43	−0.37	−0.17	−0.04	−0.19
	(3.64)***	(2.47)**	(4.29)**	(1.40)	(0.69)	(1.53)
5-year	−0.35	−0.46	−0.43	−0.25	−0.05	−0.23
	(2.65)**	(1.54)	(3.57)***	(1.34)	(0.53)	(1.14)
7-year	−0.41	−0.54	−0.43	−0.08	−0.05	−0.24
	(2.45)**	(0.87)	(2.76)***	(0.18)	(0.53)	(0.68)
10-year	−0.10	–	−0.34	–	−0.002	–
	(0.40)		(1.48)		(0.014)	

Note: As mentioned in Table 5.3.

** Significance at 1%; * Significance at 5%.

indicate that the impact of the participation of young workers (aged 15–24 years) on productivity is negative and significant (see column three in Table 5.4). This may be because of the lack of practical experience among the new entrants in labour market. After 1995, this trade-off is no more significant (see column four in Table 5.4). Similarly, aged workers participation impacts the productivity negatively for all time spans (see the last two columns of Table 5.4).

The estimation results by income ranges and for different regions are presented in Table 5.5. We can observe that during the period 1980–2005 the trade-off between productivity and participation remained significant for all time spans for all income categories, except for high income group economies. In the latter group, the trade-off between participation and productivity fades away in less than five years. When we consider the sub-period of 1995–2005, there is no trade-off for high income economies and upper-middle income economies during this period.

A comparison of our results (for high income group economies) with the findings from Belorgey et al. (2006), shows that our estimated coefficient of participation on productivity is considerably smaller (-0.17) than their estimate of (-0.37). The comparison of our high income group results with the analysis by McGuckin et al. (2005) for 36 OECD countries shows quite a similarity in terms of coefficient value (-0.21) as well as for the period of this trade-off. Our analysis also suggests that this trade-off disappears in less than five years for the high income economies. Broersma (2008) also presents similar findings in Europe and Anglo-Saxon countries.

A focus on transition economies (CEE) reveals that the trade-off between participation and productivity is quite high in these economies, but less as compared to low income and lower-middle income group economies; see bottom panel of Table 5.5. Another thing to note is that in all regions and income groups the trade-off during the period 1995–2005 has become weak, but in the case of the transition economies it has increased further as compared to the previous period. This increase in the intensity of the trade-off for transition economies during the past decade is mainly due to the end to the central planning era and the subsequent market liberalization. A comparison of transition economies' trade-off with other regions shows that it is lower in intensity as compared to the low income developing economies of Africa and South Asia but high compared to Western Europe.

6. Factors affecting productivity participation trade-off

During the past decade there has been an intense debate about the opposite development in the growth rates of labour productivity in Europe and the United States. The literature has highlighted various sources explaining the divergent growth performance. These included differences in physical and

Table 5.5 Effect of Employment/Pop Growth on Labour Productivity (GDP/Employed) Growth by Income Group

	High Income Economies		*Upper Middle Income Economies*		*Lower Middle Income Economies*		*Low Income Economies*	
	1980–2005	1995–2005	1980–2005	1995–2005	1980–2005	1995–2005	1980–2005	1995–2005
Annual								
E/P								−1.508
Growth	−0.171	0.035	−0.56	−0.36	−0.987	−0.802	−1.679	(3.91)**
	(3.03)**	−0.4	(4.94)**	(2.53)*	(9.78)**	(5.46)**	(5.91)**	
								0.69
								(5.95)**
2- years								
E/P								
Growth	−0.147	−0.1	−0.367	−0.21	−1.08	−0.58	−1.83	−0.88
	(2.96)**	−0.14	(3.01)**	−1.25	(10.17)**	(3.57)**	(6.19)**	(2.56)*
3- years								
E/P								
Growth	−0.111	−0.03	−0.33	−0.21	−1.18	−0.54	−1.78	−0.92
	(2.38)*	−0.44	(2.57)*	−1.06	(10.53)**	(3.15)**	(4.57)**	(2.29)*
5-years								
E/P								
Growth	−0.059	−0.09	−0.445	−0.36	−1.22	−0.48	−2.16	−1.78
	−1.37	−1.15	(3.21)**	−1.45	(10.77)**	(2.45)*	(4.33)**	(2.36)*
7-years								
E/P								
Growth	−0.002	−0.12	−0.46	−0.28	−1.18	−0.37	−1.76	−1.14
	−0.06	−1.13	(3.26)**	−1.24	(10.34)**	−1.68	(3.62)**	−1.2
10-years								
E/P								
Growth	−0.08	–	−0.58	–	−0.916	–	−1.74	–
	−1.27		(3.74)**		(10.41)***		(3.27)**	

Table 5.5 (Continued)

Effect of Employment/Population Growth on Labour Productivity (GDP/Employed) Growth by Region								
	Transition Economies		*Europe*		*Africa*		*South Asia*	
	1980–2005	1995–2005	1980–2005	1995–2005	1980–2005	1995–2005	1980–2005	1995–2005
Annual								
E/P	−0.74	−0.93	−0.37	−0.28	−3.55	−2.21	−1.04	−0.81
Growth	(3.90)****	(4.38)**	(6.04)**	(2.27)*	(6.81)**	(2.96)**	(9.24)**	(4.65)**
2-years								
E/P	−0.66	−0.77	−0.356	−0.13	−3.09	−0.59	−1.11	−0.7
Growth	(3.90)**	(3.00)**	(6.63)**	−1.26	(5.25)**	−0.84	(9.34)**	(3.81)**
3-years								
E/P	−0.63	−0.61	−0.331	−0.08	−3.16	−1.04	−1.1	−0.57
Growth	(3.59)**	(2.06)**	(6.49)**	−0.9	(5.14)**	−1.24	(7.71)**	(3.03)**
5-years								
E/P	−0.66	−0.85	−0.34	−0.05	−3.53	−3.52	−1.58	−0.52
Growth	(3.60)**	(1.87)	(7.28)**	−0.51	(6.03)**	(3.13)*	(8.65)**	−1.53

Notes: These regressions are based on overlapping panel and include initial level of labour productivity and country specific fixed effects.
High Income Economies: Australia, Belgium, Canada, France, Italy, Japan, Netherlands, New Zealand, South Korea, Spain, Hungary, UK and USA.
Upper-middle Income Economies: Argentina, Brazil, Bulgaria, Chile, Malaysia, Mexico, Poland, Romania, South Africa and Turkey.
Lower-middle Income Economies: Albania, China, Colombia, Ecuador, Egypt, Indonesia, India, Morocco, Peru, Philippines, Sri Lanka, Syria, Thailand and Tunisia.
Low Income Economies: Bangladesh, Kenya, Madagascar, Nigeria, Pakistan, Tanzania, Zambia and Zambia.

human capital investment, particularly higher investment in ICT, and multi-factor productivity growth in the United States (Ark et al., 2009), diversity in time and pace of structural transition and labour markets reforms (Nicoletti and Scarpetta, 2003; Gust and Marquez, 2004), dissimilarity in innovation and workplace changes (Bresnahan et al., 2002) and variation in the employment pattern in two regions, that is, part time work and the labour market entry of low skilled workers. Low skilled workers hold relatively simple jobs with a low output per hour worked (Beaudry and Collard, 2003; Cavelaars, 2004; Cette, 2004).

In this study, the focus is on the transition and low income developing economies. The possible factors affecting the productivity–participation trade-off in different regions of the world may be summarized as follows:

- *Structural Transition*: structural change which represents the shift of resources from low to high productivity activities often results in short- and medium-term losses of jobs due to restructuring efforts (van Ark et al., 2004). Developing and low income economies still mainly depend on agriculture for employment generation and this sector is less productive compared to other sectors because of high under-employment. The productivity–participation trade-off is therefore worst for most of the African and South Asian countries where the agricultural sector in many cases still accounts for half to more than two thirds of total employment. In transition economies employment in the agriculture and industry sectors has reduced, while it increased in the services sector during the period 1994–2005. Today the services sector accounts for two thirds of total employment in Hungary and more than half of employment in Bulgaria and Poland. On the other hand, in Albania, the agricultural sector is still responsible for 58 per cent of total employment in the country. This pattern of structural transformation provides some explanation for the trade-off differential across different regions.
- *Informal Sector*: structural transformation is time intensive and occurs in different ways for various countries. Migrant workers from villages mostly find their earnings in informal employment. The informal sector promotes employment growth at the expense of productivity growth. As a result the informal sector has reasonable economic activity but also substantial under-employment. The average productivity level in the informal sector is lower as compared to the formal sector due to the high share of workers with lower education attainments (Boeri and Garibaldi, 2006). During the 1990s, 60 per cent of new jobs in Latin America were created in the urban informal sector, 90 per cent in Africa and 40–50per cent in Asia. The gender specific dimension reflects that women comprise 60–80 per cent of total informal unemployment, mainly concentrated into a narrow range of low skilled and low paid jobs (World Employment Report 2004).

- *Employment by gender*: employment by gender and by skill level is also responsible for the productivity–participation trade-off disparity across regions. Female economic participation tends to be negatively linked to productivity. This is mainly because female workers mostly work part time, have less work experience due to entries and exits from market and they have a low education level, especially in the case of developing economies. There is a wide disparity with regard to education level in different income groups. In high income countries, the average years of schooling for females are 9.5 in comparison with 3.42 years in low income economies (Barro and Lee 2000). In transition economies, gender disparity with regard to employment and education is not very high. Moreover the services sector is a major employer of female workers. In transition economies, the services sector accounted for 60 per cent of female employment in 2005.
- *Information and communication technology*: The positive role of ICT development in productivity enhancement in high income countries is widely discussed in literature. When looking at ICT per capita expenditure and number of personal computers per 1000 persons as a proxy for development of ICT in an economy, South Asia and Africa's performances are miserably poor with regards to ICT development, which is also reflected with low productivity for these regions. In transition economies, the average per capita IT expenditure during 2000–2005 is US $223.58, which is high compared to other regions of Africa, South Asia and MENA (WDI, 2007). Comparison with Western Europe shows that per capita ICT expenditure is seven times lower in transition economies. Similarly during the period 1990–2005 availability of personal computers per 1000 persons in transition economies is almost six times lower in comparison with Western Europe.
- *Capital formation*: Physical capital is also responsible for the productivity differential among different economies of the world. Gross capital formation as a percentage of GDP remained the lowest for Africa and South Asia during 1980–2005. The East Asian region showed the highest rate of capital formation as compared to other regions during the same period. Comparison of capital stock per worker tell a similar story and shows it is the lowest for South Asia and Africa (Heston et al., 2006). In transition economies capital stock per worker is higher than for low income economies, but still it is only one third of Western European countries. However, in recent years the rate of gross capital formation in CEE countries has exceeded that of Western economies.

In addition to the above factors, sound institutional development and strong macroeconomic conditions are necessary to support the mechanism to transform the short-term trade-off in the employment–productivity trade-off to a long-term realization of sustainable growth with high productive employment generation.

7. Summary and policy conclusions

This chapter has analysed the existence of a trade-off between productivity and participation for the period 1980–2005 and the sub-period 1995–2005, across different regions of the world. We find that trade-off exists in most parts of world but its strength varies across countries and different income ranges. Moreover, this trade-off becomes insignificant or very low in 1995–2005 as compared to the period 1980–2005 in all economies, except for transition economies. In developed or high income economies the trade-off is weak and low compared to other income groups. This implies that in developing economies along with the emphasis on labour productivity growth there should be some short-term and medium-term arrangements for the productive absorption of the existing and new entrants of workers. Regional analysis shows that Africa is stuck in a low productivity trap because of unproductive employment growth, whereas the Southeast Asian region performed well with positive employment and productivity growth during the period under analysis.

We find that this diversity in the pattern of trade-offs can be explained by differences in structural transformation phases and dissimilar labour market institutions between transition and developed countries. In transition economies, the shake-out of unproductive economic activities after the collapse of central planning has caused the trade-off to continue strongly even after 1995. However, as these factors are transitional and easier to remedy than the more structural issues in low income economies, it may be expected that the trade-off in transition economies will begin to fade after several years.

To reduce the productivity–participation trade-off in the short and medium term and to realize the long-term growth potential, there is a need for the working of market forces which allocate resources more productively and efficiently. While job growth may initially suffer, the productivity growth will bring prices down and create access to goods and services for a broader group of the population. As this creates new demand, the opportunities for creating productive jobs will ultimately increase, putting in motion a positive spiral of job and productivity growth. As this mechanism is not working automatically in transition and developing economies, there is a need to create an environment which can alleviate or reduce the negative short- and medium-term effects without affecting the long-term growth potential. This can be done by facilitating the creation of jobs in infrastructure and other investment enriching sectors or by developing a national strategy for productivity growth. However, focus should be on productivity enhancement along with employment growth as it will be the only way to achieve sustainable economic growth and a better standard of living in the long run.

Appendix

Table 5.A1 Growth of Labour Productivity, GDP and Employment by Region, 2006–2008

	2006	2007	2008	*Avg. 2006–08*
Labour Productivity Growth (GDP per persons Employed, annual average, per cent)				
South Asia	5.59	5.83	4.85	5.42
South America	1.83	2.51	1.95	2.10
Oceania	0.34	1.01	−0.95	0.13
North America	1.11	0.93	0.57	0.87
Middle East and North Africa	3.72	2.25	1.87	2.61
Central & Eastern Europe	4.26	3.77	3.72	3.92
Europe	1.09	0.98	0.77	0.95
Southeast Asia	4.52	4.75	2.66	3.97
Africa	2.05	2.27	0.91	1.74
Real GDP Growth (annual average, per cent)				
South Asia	7.63	7.27	6.27	7.06
South America	5.83	6.41	5.90	6.05
Oceania	2.43	3.32	0.19	1.98
North America	3.56	2.64	0.97	2.39
Middle East and North Africa	6.42	4.95	4.65	5.34
Central & Eastern Europe	5.98	5.31	5.02	5.44
Europe	2.89	2.76	0.82	2.16
Southeast Asia	5.79	6.42	4.07	5.43
Africa	4.36	4.59	3.20	4.05
Growth in Persons Employed (annual average, per cent)				
South Asia	2.23	1.37	1.37	1.66
South America	4.09	3.83	3.87	3.93
Oceania	2.08	2.29	1.14	1.84
North America	2.42	1.70	0.42	1.52
Middle East and North Africa	2.63	2.66	2.73	2.67
Central & Eastern Europe	1.67	1.50	1.28	1.48
Europe	1.79	1.77	0.82	1.46
Southeast Asia	1.23	1.61	1.37	1.40
Africa	2.27	2.27	2.27	2.27

Source: The Conference Board and the Groningen Growth and Development Centre, Total Economy Database, June 2009.

Notes

1. We are thankful to the participants of AIEL XXIII Conference on Labour Economics (2008) Brescia, Italy for providing useful comments and suggestions.
2. Transition Economies are taken as five economies from Central and Eastern Europe which include Bulgaria, Poland, Albania, Hungary and Romania.

3. There is considerable variation in short, medium and long term. Here we use 3–5 years for the short run, 5–20 years for the medium and long term and 20+ years for the very long term.
4. Economies are divided according to GNI per capita into three groups. The groups are: low income, $935 or less; lower-middle income, $936–3705; upper-middle income, $3706–11,455; and high income, $11,456 or more.
5. Overlapping time spans, are, for example, years 1–3, 2–4, 3–5, 4–6, to define growth periods for participation in the regression analysis.
6. To check the robustness of the relationship between participation and productivity growth we evaluated the impact of various participation indicators (raw employment growth, employment/labour force, employment/working age population, labour force/working age population and labour force to total population ratios). The results are available on request (see Choudhry and van Ark, 2009). These results reconfirm the existence of a strong trade-off between participation and productivity rate.

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Part II

Structural Change and Regional Performance

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6

Sectoral Structure and Productivity in the EU: New Member States' Adjustment to Structural Transformation

Tiiu Paas, Jüri Sepp and Nancy J. Scannell

1. Introduction

Sectoral change, an elemental fixture of modern market economies, is aligned with economic development and consistent with proceedings germane to globalization processes. Analyses of economic structures and their dynamics, undertaken as early as the first half of the twentieth century (see Fisher, 1935; Clark, 1940; Fourastié, 1949), continue to capture the fervent interests of researchers from disparate parts of the globe. The past is witness to sectoral shifts, and their direct and indirect effects on productivity having been analysed from multiple angles and subjected to a myriad of methodological tests (for example, Baumol, 1967; Peneder, 2002; Havlik, 2004, 2007; Burda, 2006; Breitenfellner and Hildebrandt, 2006; Bachmann and Burda, 2008). In the main, research results confirm that processes of tertiarization, namely the sectoral structural shifting toward service-based economies, are being experienced by an increasingly wider geographical audience.

The chapter affords empirical insights into the structural transformations undergone by EU countries during the recent decade. The method of principal component is employed in concert with regression analysis; on the basis of the resultant aggregated indicators of economic structure, three distinct sub-groups emerge among the EU-27 countries: (1) West and North European welfare countries with developed service economies (Sweden, Denmark, Finland, Germany and so on); (2) South European countries where tourism maintains a stronghold within the economic structure (Portugal, Greece, Spain); and (3) East and Central European countries where the production sector share is relatively large, albeit declining, and gradually yielding to business and service sectors (the Baltic States, Poland, Hungary and so on). The combination of the first two sub-groups constitutes the EU-15 countries, whose collective experience may prove a harbinger for the prospective development paths of the EU NMS. EU-12 countenances contemporary challenges to prevail over its deindustrialization phase and to deterministically segue from low to high value-added sectors. It behoves EU-12 countries to exhaustively scrutinize any potentiality germane to advancing tertiarization and to hone in on suitable strategies conducive to and which foster robust and sustainable economic development.

The chapter also features a comparative analysis of the Estonian economic structure vis-à-vis the EU. The Baltic States of Estonia, Latvia and Lithuania uniquely represent the only former Soviet Republics that duly claim membership of an enlarged EU. The Baltic States' favourable geo-coordinates flanked by the proverbial East and West, their market economy encounters amid a period of movements toward independence – an era demarcated by two world wars – and their legacies of cooperation with developed countries in proximity to the Baltic Sea, denote salient initial conditions intimately linked to the economic development of these states. Accordingly, lessons from the Baltic States may be expediently generalized to extend to post-socialist transition and European (re)integration processes, most conspicuously in a global context.

The chapter is laid out via a succession of seven cohesive sections inclusive of the introduction. The following section, Section 2, presents a brief literature review. Section 3 introduces the framework in which the analysis of sectoral structure is undertaken. Section 4 presents the results of elabourating and analysing the aggregated indicators that describe sectoral structure of the EU-27 countries. Section 5 discusses the typology of the countries and possible development patterns of the NMS. Section 6 discloses the results of examining the relationship between the aggregated indicators of productivity and sectoral structure. Section 7 concludes the chapter.

2. Literature review

The general evolutionary trends in sectoral structure are articulated by the so-called *three-sector hypothesis*, a hypothesis historically and inextricably linked with respective works of Fisher (1935), Clark (1940) and Fourastie (1949). The three-sector hypothesis prognosticates for a given economy its long-run evolution from an agricultural-based to an industrial-based and, in turn, to a service-based economic structure, an evolution formally christened the process of tertiarization (see also Bachman and Burda, 2008). Such progressions are identified by sectoral share modifications coincident with value-added creation and induced labour flows among sectors which, consequently, procreate new challenges for managing, in particular, a country's development of human capital and educational systems. Some manifestations of structural change are short run in nature reflecting temporary shifts of technological and innovative development. Other manifestations are more or less permanent.

Contentious debates persist with regard to both the determinants and outcomes of sectoral change (Fisher, 1935, 1945; Clark, 1940; Baumol and Bowen, 1966; Baumol, 1967, 2001; Fuchs, 1968; Schettkat and Yocarini, 2003, 2006). On the one hand, the growing employment and/or gross value added (GVA) share of service sector is deemed an indicator of yet a further stage of development in advanced economies succeeding mass industrialization. On the other hand, some researchers (Baumol and Bowen, 1966; Baumol, 1967; Fuchs, 1968) point to *collateral effects* owing to the growth of services manifest by deindustrialization, which effectively translates into changes in aggregate productivity growth.

The rise in share of services has been rationalized on the basis of various factors. Two familiar propositions have emerged to explain the increasing presence of services in a modern economy. The *hierarchy of needs* postulates a shift toward consumption of services as income rises. More precisely, Fuchs (1968) has shown that the share of services in overall employment follows a logarithmic curve against income per capita, a relationship that today continues to hold. Baumol's (1967) *cost disease* hypothesis, in contrast, maintains that important areas of service provision are technologically stagnant and hence experience rising relative prices, resulting in larger shares of expenditure and employment being concentrated in services. Pertinent explanations for the increase in the share of services also include the hypotheses of *externalization* and *innovation*. Relatively speaking, the former proposition points to labour division and to the newly independent status of supporting activities of (primarily logistical) production, whereas the latter proposition emphasizes expansion of a knowledge-capacious economy in principle, one conducive to demanders of services.

In short, the expansion of the service sector may be attributed to (1) a shift in the structure of final demand from goods to services; (2) changes in the inter-industry division of labour or (3) inter-industry productivity differentials (see also Schettkat and Yocarini, 2003). These aspects of sectoral shifts have been extensively analysed vis-à-vis the economic structure of various highly industrial economies. This chapter examines sectoral structure and its changes in, respectively, the industrial economies (EU-15 old member states) and in the transforming economies (EU NMS, also known as EU-12).

3. A framework for the analysis of sectoral structure: data and methodology

The service sector is today commonly perceived as the foremost sector in industrialized economies. According to International Labour Office (ILO) data, the service sector's share of total employment in the EU and other developed economies grew from 66.1 per cent in 1995 to 71.4 per cent in 2005, concurrent with a drop in the industry sector's share from

28.7 per cent to 24.9 per cent (ILO, 2006). The demonstrated sectoral shifts in employment as well as in GVA evidence the widening process of tertiarization throughout the EU-27 economies and, more broadly, worldwide. The industrialized countries of the EU-27 have effectively entered the stage of post-industrialized service economies, which in itself engenders certain effects of sectoral structure shifts on the aggregated productivity of a given economy.

Nascent stage research findings with regard to sectoral structural shifts among EU-27 countries after eastward enlargement have shown that the EU-12 states have exhibited impressive productivity vis-à-vis EU-15 states, catching up at the macroeconomic – and particularly manufacturing – level, yet EU-12 states' corresponding sectoral shifts appear to have imposed only negligible effects on EU-12 states' aggregate productivity growth (see Havlik, 2007, p. 10). These finding accentuate awareness that opportunities for economic growth vary as a function of sectoral structure. It follows that a scrupulous analysis of sectoral change is indispensable to an elaboration of models and holds prospects for unveiling preferred avenues for sectoral adjustment of national economies within regional and global contexts.

The sectoral structure of an economy can be analysed on the basis of a wide range of indicators (employment, value-added, GDP and so on). This chapter analyses sectoral structures of EU-27 economies mainly based on the sectoral share of value-added in GDP. Data for the analysis are assembled from the Eurostat figures on the sectoral structure of value-added in EU-27 member states in six economic sectors during the range of years 1995 to 2006, a period that demarcates the EU eastward enlargement processes. Table 6.1 presents the 6-level classification system of economic sectoral structure used in the Eurostat database.

Table 6.2 illustrates that the overall trends in sectoral change of the EU-27 economies are primarily captured by observable diminishing shares of both agriculture (S1) and industry (S2) sectors along with concurrent share increases in construction (S3) and service sectors (S4, S5 and S6). Like trends persisted in the midst of the prevailing global economic crisis. According to preliminary Eurostat data for the first quarter of 2009, with regard to value-added creation, the respective sectoral shares are estimated as follows: S1 (1.6 per cent), S2 (17.9 per cent), S3 (6.5 per cent), S4 (21.2 per cent), S5 (28.9 per cent), and S6 (23.7 per cent).

Underlying these noted overall trends can be revealed a host of disparate patterns of sectoral shifts among respective EU-27 economies, acutely perceptible when EU-15 is juxtaposed with EU-12. It may be concluded that by the mid-2000s the economic structures of the so-called old members of the EU, excepting Spain and Greece, become relatively similar to each other, a trend readily observable when assessing economic structure at the 6-level classification.

Table 6.1 Classification of Economic Sectors

Economic sectors	Sectors: aggregated alpha-numeric code and representative moniker	Classification code in the Eurostat database
Agriculture, hunting, forestry, fishing	S1 (Agriculture)	A–B
Industry (except contruction)	S2 (Industry)	C–E
Construction	S3 (Construction)	F
Wholesale and retail trade; repair of motor vehicles and household appliances, hotels and restaurants, tourism, transport, warehousing, communication	S4 (Trade)	G–I
Financial mediation, real estate, renting and business activities	S5 (Financial) services)	J–K
Public administration and civil defence; compulsory social insurance, education, health care and social welfare and so on	S6 (Public sector services)	L–P

Source: Eurostat data.

Table 6.2 The Share of Economic Sectors S1–S6 in Creating Value-Added of the EU-27 Countries, 1997–2008

	Year				
Sectors	1997	2000	2003	2006	2008
S1	2.8	2.4	2.2	1.8	1.8
S2	23.3	22.5	20.5	20.3	20.1
S3	5.6	5.6	5.7	6.2	6.5
S4	21.3	21.6	21.6	21.3	21.2
S5	24.7	25.9	27.1	27.7	28.0
S6	22.3	22.1	22.9	22.7	22.4

Source: Eurostat data, 2009.

In order to thoroughly survey the landscape of sectoral structure of the EU-27 economies, several methods of statistical analysis are employed. To start, the relationships among the initial sectoral indicators of the countries' economic structures are gauged by performing correlation analysis. Then, via factor analysis – method of principal component – the aggregated indicators characterizing the economic structures of the EU-27 economies are elaborated. In order to test the robustness of the result we estimate several factor models. We estimate a factor model based on cross-section data for three respective years, 1995, 2000 and 2005, as well as on pooled data, incorporating 27 countries over a six-year period from 2000 to 2006. In order to study the relationship between productivity and the aggregated indicators of sectoral structure, several regression models are estimated, sufficient to differentiate actual productivity from so-called potential productivity, defined as the productivity calculated on the basis of the influence of a sectoral structure characterized by aggregated indicators (designated as factors F1 and F2 in the present case), accounting for various institutional factors.

4. Aggregated indicators of the EU-27 economies' sectoral structure

Presented in Table 6.3 are the results of correlation analysis of the aggregated indicators that describe the share of economic sectors in creating GVA of the EU-27 economies. As rendered in Table 6.2, the construction sector (S3) reveals statistically important positive correlation with the trade sector (S4) and a negative correlation with public sector services (S6). The respective shares of sectors in financial services (S5) and public sector services (S6) in value-added are above average in countries where the role of agriculture (S1) and industry (S2) in creating value-added is relatively small. The share of value-added created in the sector of trade, tourism and so on (S4) is somewhat higher in countries where either the share of agriculture (S1) is relatively high or where the share of financial services (S5) is relatively low. These statistical results are not unanticipated, and inferences are not to be drawn from them with regard to causality vis-à-vis any given elements of sectoral structure. More appositely, results of the correlation analysis effectively mandate implementation of factor analysis

Table 6.3 Correlation Matrix of the Initial Indicators of the EU-27 Economies' Sectoral Structure Based on the Share of Value-Added in GDP, 1995–2005

	S1	S2	S3	S4	S5	S6
S1	1	0.261(**)	0.064	0.246(**)	−0.596(**)	−0.599(**)
S2	0.261(**)	1	−0.102	−0.298(**)	−0.536(**)	−0.473(**)
S3	0.064	−0.102	1	0.285(**)	−0.137	−0.218(**)
S4	0.246(**)	−0.298(**)	0.285(**)	1	−0.411(**)	−0.218(**)
S5	−0.596(**)	−0.536(**)	−0.137	−0.411(**)	1	0.294(**)
S6	−0.599(**)	−0.473(**)	−0.218(**)	−0.218(**)	0.294(**)	1

Source: Calculations based on the Eurostat data.
* The level of significance 0.05; ** the level of significance 0.01.

for elaborating aggregated indicators that describe sectoral structure of the EU-27 economies. In the course of probing the relationship between aggregated productivity and economic structure of the EU-27 countries by way of regression analysis, usage of aggregated indicators enables one to avert otherwise problematic multi-collinearity, and to estimate the level of potential productivity.

As mentioned earlier in the chapter, the aggregated indicators for describing the economic structure of EU-27 countries are obtained by using factor analysis, involving estimations of factor models on the basis of both cross-section data and pooled data of EU-27 economies. Vigilance was exercised with respect to monitoring robustness of results. For all cases, two aggregated indicators of an economic structure were extracted, factors F1 and F2. These two factors jointly account for approximately two-thirds of the variance of initial indicators of sectoral structure.

Presented in Table 6.4 is the factor matrix based on pooled data. Components of a factor matrix, namely factor loads, describe the correlations between the initial (measured) indicators – shares on sectors S1–S6 GVA in GDP – and the aggregated indicators of a sectoral structure.

Arguably the most challenging aspect in the course of conducting factor analysis is the articulation of an economic interpretation of the statistical results. To this end, the initial step entails analysing factor loads and imparting economic meaning and assigning suitable monikers to the respective aggregated indicators. The second step of factor analysis involves standardization of factor scores, scores which ascribe value to the aggregated indicators for every observation.

Table 6.4 The Matrix of Factor loads Describing Sectoral Structure of EU-27 Countries

	Aggregated Indicators (a.k.a. Factors or Latent Variables)	
	F1	*F2*
Sectors	*Factor Loads*	*Factor Loads*
S1	–0.786**	–0.211
S2	–0.745**	0.531**
S3	0.096	–0.642**
S4	0.188	–0.858**
S5	0.791**	0.213
S6	0.762**	0.127

Source: Calculations based on the Eurostat data.
** Level of significance 0.01.

In adherence to the initial step, we observe in Table 6.4 that factor F1 exhibits relatively high negative factor loads for initial indicators describing sectors S1 (agriculture) and S2 (industry) and relatively high positive factor loads for initial indicators describing sectors S5 (financial services) and S6 (public sector services). Based on these quantifications, we decided to interpret F1 as the factor describing the development level of a post-industrial service economy. With regards to F2, the relatively large negative factor loads are detected for sectors S3 and S4 (respectively, construction and trade sectors), whereas the relatively large positive factor loads are observed for sector S2 (industry). Herein we suppose that industry (S2) is a compulsory prerequisite for broad-based innovation. Additionally, most service areas of sectors S3 and S4 are deemed relatively passive in terms of innovation; they are rather net recipients of innovation spill-overs. Thus we decided to interpret factor F2 as the factor describing the environment for industry-based technological innovation.

Levels for factors F1 and F2 are respectively quantified by their corresponding factor scores. Annex 6.1 Figures 6.A1 and 6.A2, exhibit the dynamics of these factor scores over an interval of six years for each aggregated indicator, elaborated on the basis of pooled data (EU-27 countries during the period 2000–2005), whereas Figure 6.1 conveys the respective levels for each

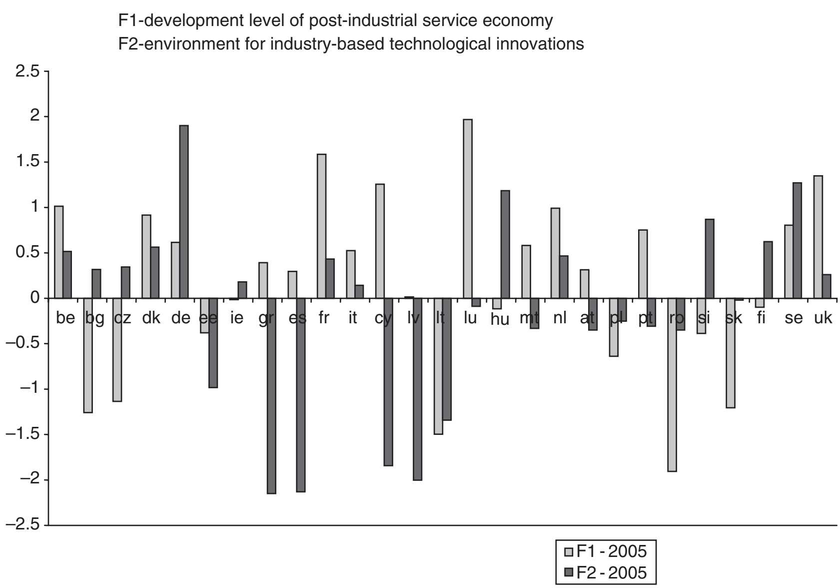

Figure 6.1 Factor Levels based on Factor scores of the aggregated indicators, Factors F1 and F2, of economic structure of the EU-27 countries, 2005

of the two aggregated indicators, factors F1 and F2, for each of the EU-27 economies' sectoral structures in a single year 2005. The level of factor F1 is seen to be relatively low across Central and East European countries that acceded to the EU.

An eyeballing of factor scores for factor F2 reveals, in comparison with the average European aggregate indicator, relatively and markedly lower factor levels for Southern Europe and Baltic countries. Such, however, does not appear to be the case for some Central European countries, such as Czech Republic, Hungary and Slovenia, whose factor levels are more in line with said average.

Inspection of Figure 6.1 factor scores within the purview of factors F1 and F2 readily lends itself to a discernible delineation of three economic structures comprising EU-27: one dominated by a strong service economy (Luxembourg, France and United Kingdom), a second dominated by industry and technology (Germany, Sweden and Hungary) and a third dominated by neither service nor industry components. As expected, most post-socialist countries are concordant with this third economic structure.

5. Typology of the countries and possible development patterns of the NMS

Discriminating on the basis of the six-year levels and dynamics of factor scores for factors F1 and F2 (see Annex 6.1) three distinctive groups of countries emerge from among EU-27 members:

(1) West and North European welfare countries with developed service economies (Belgium, Sweden, Denmark, Germany and so on);
(2) South European countries (the so-called *trading* economies) where tourism maintains a stronghold in the economic structure (Portugal, Greece, Spain); and
(3) East and Central European countries, where sector S2 (Industry) still maintains a relatively large share – albeit gradually declining and yielding to business and service sectors (the Baltic States, Poland, Slovakia and so on, that is, the *catching-up countries* as it were).

The first specified group of countries, comprised of West and North European countries with developed service economies, is set apart due to relatively high levels (in terms of factor scores) of F1. In these countries, and particularly in Germany and Sweden, industry (S2) assumes a stalwart stance in creating value-added. In this respect alone, this first grouping of countries is unambiguously differentiated from the second specified group of countries comprised mainly of South European economies in which the share of trade sector (S4) reigns supreme in creating value-added. The combination of these first two specified groups constitutes EU-15.

The third specified group of countries is populated by transition economies marked by uniformly low factor scores for factor F1, yet exhibiting non-uniform factor scores for factor F2. One explication relies on contemporary developments; given their recent construction boom, the Baltic countries are becoming more closely amalgamated with the countries of Southern Europe, whereas Hungary and Slovenia lie more in sync with Finland and Ireland. Of course, caution needs to be exercised in interpreting these results, acknowledging that at any given juncture the economies under observation are confronting different stages of their development and are also undergoing different phases of their business cycles.

Estonia's economic sectoral structure has been undergoing declining levels in both factors F1 and F2, with the trend occurring at a notably slower pace for F1. Given that the Estonian economic structure is characterized by an already low level of industrial and technological innovation as observed in Figure 6.1, one might pause to construe the implications of a predicted decline in its share of factor F1. In countries endowed with a developed industrial sector, positive externalities from industry-induced technological innovations typically spill over, albeit gradually, to other economic sectors, in turn establishing a fresh catalytic foundation for technological innovation and stimulating the genesis and offering of new services.

Prevailing wisdom holds that modern industry is instrumental in the infusion of innovative thinking into the realm of services. We shall refrain from speculation as to whether Estonia's destiny will follow the path of Luxembourg, that is, in terms of developing strong modern service sectors, which would include financial services. Understood is the difficulty of building a modern and internationally competitive service sector without undergoing the interim stage of a more complex state of industry (Hirsch-Kreinsen et al., 2005). Estonia's current economic structure and development trends may not lend themselves to fostering long-term competitiveness. Indeed, the sectoral structure of the Estonian economy may be evolving more similarly to those of Greece and countries of Southern Europe, rather than to that of Luxembourg. The evolutionary chronicle of Estonia's sectoral structure is by no means regarded as a peculiarity among NMS; it is predicted that the remaining two Baltic states (Latvia and Lithuania) as well as the majority of other NMS (post-socialist economies) will experience like trends.

The aforementioned country groupings, demarcated on the basis of the six-year levels of factor scores and enumerated from one through three, find general agreement with the country typology elaborated by Andreas Breitenfeller and Antje Hildenbrandt (2006). Having conducted analyses of the EU-15 economies' development over the period 1950–1998, Breitenfeller and Hildenbrandt (2006) confirmed the existence of four distinct groups of countries predicated on models of tertiarization: dynamic tertiarization, lagging tertiarization, managed tertiarization and catching-up tertiarization. Greece, Spain and Portugal followed the model of catching-up tertiarization, a model reflecting a general shifting toward the service sectors and one associated with rising per capita income chiefly due to EU accession. Here the countries had undergone intense deindustrialization and deagriculturalization processes much like those experienced by the NMS. Shifts to service-based economies also transpired in the CEE countries, though these shifts occurred much more rapidly than those of Greece, Spain and Portugal.

NMS countries bear some similarities with Southern European countries with respect to development of economic structure and observance of tertiarization processes. Nonetheless, NMS countries neither need to nor are practically able to follow the same development patterns followed by countries identified with the model of catching-up tertiarization. Global competitive development is on a fast track which, accordingly, calls for agile minds and unfettered innovators as well as flexible infrastructure in product and factor markets in order to support goals of high productivity and to satisfy commitments to sustainable economic growth.

6. The relationship between sectoral structure and aggregated productivity

In order to study the relationship between the sectoral structure and aggregated productivity of the EU-27 economies, we estimate regression models based on the Eurostat productivity data and the aggregated indicators of sectoral structure of the EU-27 economies. The basic regression equation is as follows:

$$Y_{it} = \alpha + \sum_{j=1}^{k} \beta_j X_{jit} + \sum_{j=k+1}^{k'} \beta_j D_{ji} + u_{it}, \qquad (6.1)$$

where

Y_{it} – aggregated productivity in the country i at time t (value-added per employee in euros; in year 2000 prices);

X_{jit} – explanatory variable characterizing sectoral structure of the country i at time t, factor scores of the aggregated factors F1 and F2 ($j = 1, 2; k = 2$);

D_{ji} – dummy variables, proxies that characterize some institutional factors: $D_{1i} = 1$ if country i is the NMS and D1i = 0 otherwise; D2i = 1, if small country (the population is 6 millions and less), $D_{2i} = 0$ otherwise;

α – intercept;

β_j – parameters of the explanatory variables;

$j = 0\,1, 2, \ldots k$ and k'; $n =$ sample size.

Table 6.5 Regression Models for Estimating Aggregated Productivity in EU-27 Countries

Intercept	$F1$	$F2$	$D1$	$D2$	R^2	$\hat{R}^2$
34,882.2	16,424.0	6,848.3	–		0.644	0.640
(1,084.73)	(1,070.3)	(1,068.4)	–	–	(0.000)	(0.000)
(0.000)	(0.000)	(0.000)				
46,684.0	7,506.7	3,981.0	−28,047.4		0.845	0.842
(1,104.5)	(950.8)	(735.7)	(1,995.5)	–	(0.000)	(0.000)
(0.000)	(0.000)	(0.000)	(0.000)			
34,479.1	16,454.3	6,929.2		1,047.6	0.645	0.638
(1,394.6)	(1,074.9)	(1,085.5)	–	(2,269.0)	(0.000)	(0.000)
(0.000)	(0.000)	(0.000)		(0.645)		
44,942.2	6,739.6	4,276.1	−31,156.1	7,926.6	0.871	0.868
(1,058.5)	(880.9)	(675.2)	(1,910.3)	(1,433.3)	(0.000)	(0.000)
(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		

Dependent variable: aggregated productivity measured as value-added per employee in euros (in year 2000 prices); $n = 162$.

The estimation results are presented in Table 6.5. The estimated regression models describe approximately 64 per cent to 87 per cent of the variability of aggregated productivity in EU-27 countries. The estimators show that factor F1, the development level of the post-industrial economy, and factor F2, the environment for technological innovations, are each related to productivity in the same direction. The productivity of new member states is below the EU average, *ceteris paribus*, while the productivity of small countries is somewhat higher than the EU average. Knowledge spill-overs are sometimes swifter in small countries stimulating innovations and cultivating conditions for productivity growth.

From at least one perspective, these evaluation results could plausibly be perceived as the potential, a.k.a. predicted, productivity that is, the productivity calculated on the basis of the influence of a sectoral structure characterized by aggregated indicators, factors F1 and F1, accounting for various institutional factors. Potential productivity is necessarily distinguished from actual productivity; in order to compare *potential* productivity with the value of its *actual* counterpart, standardized residuals are calculated. The results vary in some sense depending on whether or not, in addition to the sectoral variables, proxies for institutional conditions are taken into account (see Annex 6.2, Tables 6.A1 and 6.A2).

A comparable assessment of the potential productivity of the EU-27 economies reveals that the actual productivity of Estonia's economy is notably lower than the estimated level. In view of the results of the explanatory analysis and regression equation estimations, it is feasible to conclude that Estonia's economic structure and its sectoral changes most closely adhere to the model of catching-up tertiarization described by Andres Breitenfeller and Antje Hildebrandt (2006). This model summarizes the developments in sectoral structure experienced by countries that joined the EU at latter stages of enlargement, namely the southern enlargement round (for example, Greece, Spain and Portugal) and the eastern enlargement round (for example, post-socialist countries). Low labour oriented foreign direct investment substantially contributed to the sectoral shifts and the rise of productivity in post-socialist countries and, more specifically, in the NMS of the recent decade. Estonia, like other post-socialist countries, should acknowledge the macro nature and implications of any given economy's sectoral structure and, accordingly, draw profoundly on relevant lessons gleaned from prior rounds of EU enlargement.

7. Conclusions

Sizeable shifts in sectoral structure are identified with dynamics of share composition of economic sectors via value-added creation. The foremost common long-term tendency germane to developed economies can be described as a marked shift of sectoral structure away from production activities and toward service activities, formally branded the process of tertiarization. Foreseeable EU enlargement and globalization processes impose new uncertainties with respect to structural shifts particularly for EU-12 which, worthy of singling out, includes Estonia. Given the benefit of hindsight with regard to prior experiences with sectoral shifts among various EU countries, it behoves EU-12 members to systematically explore any potentiality germane to advancing tertiarization and to hone in on best-suited strategies conducive to and which foster robust and sustainable economic development.

In this vein, and in light of the featured heterogeneity and dynamics of sectoral structures of EU-27 economies, the latent variables, that is, the factors or aggregated indicators for describing the economic sectoral structure of EU-27 countries, were obtained by using factor analysis, involving estimation of factor models on the basis of both cross-section data and pooled data drawn from the EU-27 member data base. Vigilance was exercised with respect to monitoring robustness of results. For all cases, two aggregated indicators of economic structure were extracted – factor F1, designated the development level of the post-industrial service economy, and factor F2, designated the environment for industry-based technological innovation. Factors F1 and F2 jointly account for approximately two-thirds of the variance of initial indicators of sectoral structure.

On the basis of the resultant aggregated indicators of economic structure, three distinct sub-groupings emerge among the EU-27 countries: (1) West and North European welfare countries with developed service economies

(Sweden, Denmark, Finland, Germany and so on); (2) South European countries where tourism maintains a stronghold within the economic structure (Portugal, Greece, Spain); and (3) East and Central European countries where the production sector share is relatively large, albeit declining, and gradually yielding to business and service sectors (the Baltic states, Poland, Hungary and so on). Experiences among members of the first two groups combined, constituting EU-15, may prove a harbinger for the prospective development paths of the EU-12 whose members confront contemporary challenges in connection with weathering the deindustrialization phase and segueing from low to high value-added sectors.

Findings on the basis of comparisons made within sets of results garnered from explanatory analyses and from regression model estimations reveal a discernible escalation in productivity which cannot be ignored. Such findings exact prompt attention and render obligatory the conception of strategies designed to modernize the economic structure. Modernization of economic structure is, however, patently unachievable in the absence of national policies that otherwise endorse flexibility in labour markets, reward innovation, sponsor systematic investments in human capital, and implement proper migration measures.

In order to weather the fallout owing to the recent global economic crisis and to forge ahead with competitive development trends, each EU country is advised to allocate funds for investments that advance modernization of their respective economic structures, accounting for global economic conditions as well as idiosyncrasies and potentialities of the national economies. Estonia and other EU NMS must intensify efforts to develop systems of absorption and diffusion of knowledge, originating from both within and without catching-up economies, with an eye to improving productivity across all economic sectors. At the level of the firm, the suggested initiative necessitates implementation of at least two complementary activities: (1) nurturing a mind-set of change; and (2) supporting the process of building absorptive capacities of firms. Accordingly, investments must be continually earmarked for ongoing human capital development. Investments into education systems, particularly those devoted to science and engineering, should be coupled with the creation and growth of employment opportunities requiring germane skills. All EU countries must exercise vigilance with regard to the potential exodus of precious human capital, particularly amid circumstances of increasing unemployment and declining public expenditures, underscored by the challenges which the global economic crisis brings to bear.

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expressed in the chapter are solely those of the authors and, as such, should not be attributed to other parties.

Annex 6.1. Factor scores of Factor F1 and F2 in the EU-27 countries, 2000–2005: Figures 6.A1–6.A2

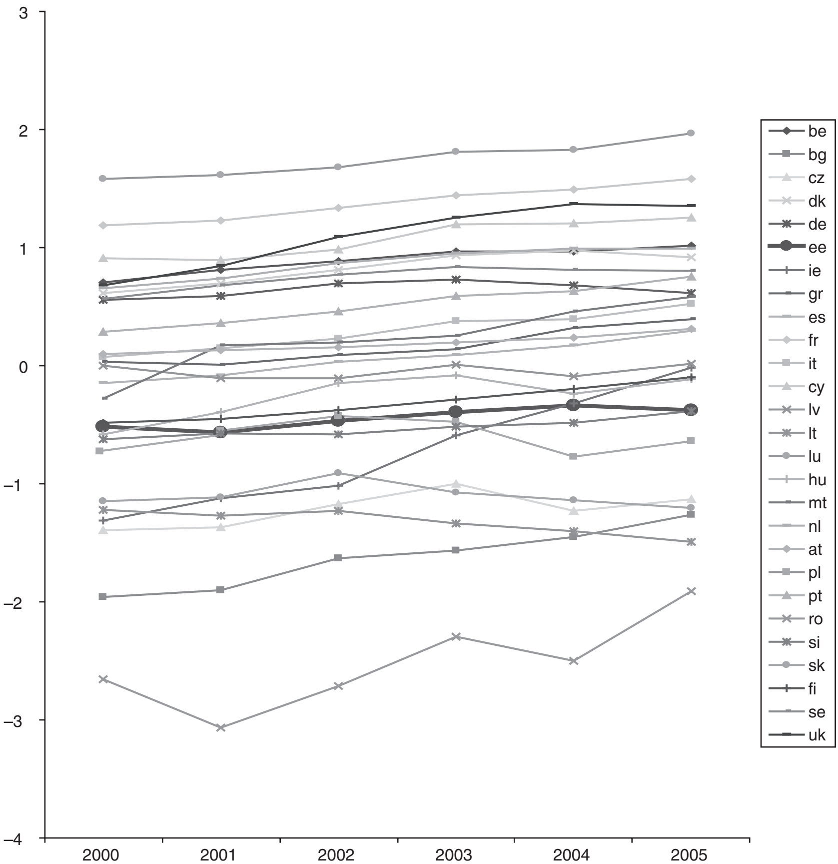

Figure 6.A1 Factor scores of Factor F1, the development level of post-industrial service economy in the EU-27 countries, 2000–2005

Source: Authors' estimations based on the Eurostat data.

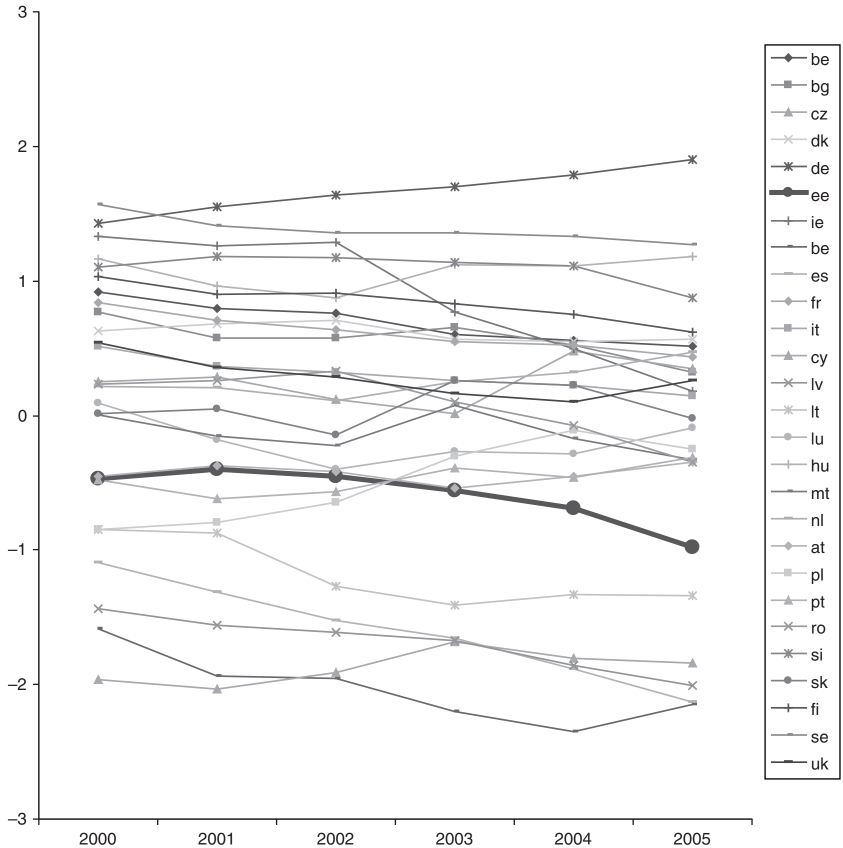

Figure 6.A2 Factor scores of Factor F2, environment for industry-based technological innovation in the EU-27 countries, 2000–2005
Source: Authors' estimations based on the Eurostat data.

Table 6.A1 Actual and Predicted Productivity in EU-27 Countries in 2005 (Estimations based on Factor scores of Factors F1 and F2)

Country	*Actual*	*Predicted*	*Residuals*	*Standardized residuals*[1]
Belgium	67,200.00	55,055.90	12, 144.10	0.90
Bulgaria	4,400.00	16,371.29	−11, 971.29	−0.88
Czech Rep.	12,000.00	18,603.71	−6, 603.71	−0.49
Denmark	56,400.00	53,778.41	2, 621.59	0.19
Germany	58,900.00	58,007.27	892.73	0.07
Estonia	9,200.00	21,919.88	−12, 719.88	−0.94
Ireland	56,100.00	35,870.43	20, 229.57	1.49
Greece	35,100.00	26,591.67	8, 508.33	0.63
Spain	36,200.00	25,140.97	11, 059.03	0.82
France	58,400.00	63,895.77	−5, 495.77	−0.41
Italy	47,700.00	44,474.38	3, 225.62	0.24
Cyprus	31,700.00	42,896.30	−11, 196.30	−0.83
Latvia	7,200.00	21,410.79	−14, 210.79	−1.05
Lithuania	6,700.00	1,125.48	5, 574.52	0.41
Luxembourg	76,300.00	66,615.97	9, 684.03	0.71
Hungary	13,500.00	41,085.21	−27, 585.21	−2.04
Netherlands	52,900.00	54,356.15	−1, 456.15	−0.11
Austria	62,100.00	37,643.47	24, 456.53	1.81
Poland	13,200.00	22,655.77	−9, 455.77	−0.70
Portugal	25,000.00	45,106.46	−20, 106.46	−1.48
Romania	5,100.00	1,180.72	3, 919.28	0.29
Slovenia	25,500.00	34,493.95	−8, 993.95	−0.66
Slovakia	10,700.00	14,962.05	−4, 262.05	−0.31
Finland	58,700.00	37,528.16	21, 171.84	1.56
Sweden	53,700.00	56,817.65	−3, 117.65	−0.23
UK	43,400.00	55,055.90	12, 144.10	0.90

Source: Authors' estimations based on the Eurostat data.

Table 6.A2 Actual and Predicted Productivity in EU-27 Countries in 2005 (Estimations based on Factor scores of Factors F1 and F2 and dummies D1 and D2)

Country	*Actual*	*Predicted*	*Residuals*	*Standardized residuals*[2]
Belgium	67,200.00	56,342.93	10,857.07	1.21
Bulgaria	4,400.00	10,446.86	−6,046.86	−0.67
Czech Rep.	12,000.00	11,489.53	510.47	0.057
Denmark	56,400.00	55,799.42	600.58	0.07
Germany	58,900.00	58,871.96	28.04	0.003
Estonia	9,200.00	11,875.45	−2,675.45	−0.30
Ireland	56,100.00	47,288.56	8,811.44	0.98
Greece	35,100.00	41,064.53	−5,964.53	−0.67
Spain	36,200.00	40,418.17	−4,218.17	−0.47
France	58,400.00	60,312.24	−1,912.24	−0.21
Italy	47,700.00	51,189.03	−3,489.03	−0.39
Cyprus	31,700.00	20,730.51	10,969.49	1.22
Latvia	7,200.00	10,774.76	−3,574.76	−0.40
Lithuania	6,700.00	2,066.36	4,633.64	0.52
Luxembourg	76,300.00	61,111.14	15,188.86	1.69
Hungary	13,500.00	22,479.80	−8,979.80	−1.00
Netherlands	52,900.00	55,981.00	−3,081.00	−0.34
Austria	62,100.00	47,647.84	14,452.16	1.61
Poland	13,200.00	12,834.26	365.74	0.04
Portugal	25,000.00	51,094.66	−26,094.66	−2.91
Romania	5,100.00	2,935.98	2,164.02	0.24
Slovenia	25,500.00	19,199.62	6,300.38	0.70
Slovakia	10,700.00	9,515.91	1,184.09	0.13
Finland	58,700.00	48,423.86	10,276.14	1.15
Sweden	53,700.00	57,790.69	−4,090.69	−0.46
UK	43,400.00	57,845.70	−14,445.70	−1.61

Source: Authors' estimations based on the Eurostat data.

Notes

1. Standardized residuals $\hat{u}_i^* = \frac{Y_i - \hat{Y}_i(i)}{\hat{\sigma}(i)}, \hat{\sigma}^2(i) = \sum_{j=1}^{n} \hat{u}_j^2(i)/(n-k)$, k – the number explanatory variables, n – sample size. If $\left|\hat{u}_i^*\right| > 1.96$, then the observation could be considered as an exceptional.
2. Standardized residuals $\hat{u}_i^* = \frac{Y_i - \hat{Y}_i(i)}{\hat{\sigma}(i)}, \hat{\sigma}^2(i) = \sum_{j=1}^{n} \hat{u}_j^2(i)/(n-k)$, k – the number explanatory variables, n – sample size. If $\left|\hat{u}_i^*\right| > 1.96$, then the observation could be considered as an exceptional.

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7

The Emerging Economic Geography Setting in New EU Member States: A Comparative Account of Regional Industrial Performance and Adjustment

Dimitris Kallioras, George Petrakos and Maria Tsiapa

1. Introduction

The market-based process of economic integration, although it is perceived to generate higher levels of aggregate efficiency, can possibly be associated with higher levels of inequality. In spatial terms, this is believed to lead to regional imbalances, with less advanced regions possibly experiencing, in the integration process, weaker gains or even net losses, compared to their more advanced counterparts. Such types of argument are in variance with the neoclassical understanding of the operation of the spatial economy and contribute to an ongoing discussion among academics and politicians on the impact of integration on the growth potential of less advanced European Union (EU) regions.

New EU member-states (NMS)[1] that were former planned economies of the Eastern bloc provide a 'quasi-laboratory' environment for the examination of the spatial impact of the EU economic integration process. The experience of EU NMS is a unique situation, where relatively closed economic systems opened, almost at once, to the world economy and, at the same time, market mechanisms replaced central planning (Petrakos, 2008). Thus, given that EU NMS are characterized as lagging behind and structurally weak, understanding the factors behind their growth performance may provide valuable insight for both theory and policy, especially at a time when the European project is facing a number of challenges and European structural and cohesion policies are under scrutiny.

The chapter evaluates the emerging economic geography setting in EU NMS, and provides a comparative account with respect to regional industrial performance and adjustment. The analysis covers the period 1995–2005, incorporating both the early shocks and the recent trends that EU NMS have experienced. The analysis, also, focuses on the sector of industry (manufacturing), as this sector constitutes the main diffusion channel of the economic integration dynamics due to the displaceable character of its activities and the tradable character of its products, and due to the linkages that it retains with the other sectors of production being a consumer of intermediate goods and a producer of final goods. The main part of the analysis is based on data disaggregated at the Nomenclature of Territorial Units for Statistics (NUTS) III spatial level and the Nomenclature for Classification of Economic Activities (NACE) 2-digit structural level.

The next section of the chapter summarizes the most interesting aspects of the literature concerning the impact of economic integration, structure and geography on regional growth. The third section reports key aspects of EU NMS industrial experience with a critical discussion of its regional dimension. The fourth section detects the determinants of regional industrial performance in EU NMS. The last section of the chapter offers the conclusions.

2. Integration, structure and regional growth: A survey of the literature

There is widespread scepticism in the less advanced EU regions regarding their ability to adjust to the requirements of the emerging European space. Imperfect competition is deemed to result in an uneven distribution of the benefits of economic integration, due to the inability of the market to create conditions of optimum economic space. Such scepticism questions the neoclassical understanding of the operation of the economy.

Proponents of the neoclassical theory (Solow, 1956; Swan, 1956; *inter alia*) argue that economic integration is a long-term process that eventually leads to a reduction of regional inequalities, through the activation of three equilibrating mechanisms: declining marginal productivity of capital, interregional trade and interregional movement of production factors. Other schools of thought, however, such as the endogenous growth theories (Romer, 1986; Lucas, 1988; *inter alia*), the new trade theories (Krugman, 1979; Helpman and Krugman, 1985; *inter alia*) and the new economic geography (Krugman, 1991; Fujita, 1993; *inter alia*), claim that the costs and benefits of economic integration are unlikely to be spread out uniformly in space,[2] stressing the role of policies in balancing growth patterns.

Yet, EU experience (Brülhart and Torstensson, 1996; Amiti, 1999; Krieger-Boden, 2000; *inter alia*) does not seem to support the neoclassical claim. Core EU regions generate advantages, leading to differential growth performance, through the entrenchment of agglomeration economies[3] and operate as hubs for economic activities associated with increasing returns to scale[4] (IRS). Conversely, peripheral EU regions, facing high(er) transaction costs (despite the ongoing improvement of transportation and communication technology), mainly host economic activities associated with constant returns to scale (CRS).

Engaged in an integration process with distant and, possibly more advanced, partners, peripheral EU regions tend to develop the inter-industry type of trade relations.[5] This type of trade relations, which imposes a specific economic structure with specialization typically in labour-intensive or resource-intensive economic activities, is the outcome of the inability of peripheral and less advanced regions to compete with their more advanced counterparts in the markets for capital-intensive and knowledge-intensive economic activities (Brülhart and Elliott, 1998). Even though it provides an alternative (and perhaps the only feasible) route for the exploitation of the locally available skills, it is doubtful whether such a structural differentiation can produce long-term income convergence (Petrakos and Christodoulakis, 2000). Peripheral and less advanced EU regions, having weaker productive bases with a high share of sensitive, labour-intensive, sectors and unfavorable geographic coordinates, are struggling in the process of integration to redeploy their resources effectively in order to gain from the opening of markets[6] (Camagni, 1992).

The level and the type of specialization are, thus, essential parameters accounting for regional growth. In an open economy, the level of specialization is related to the export base of a region (North, 1955; Tiebout, 1956). Integration allows for greater specialization (since domestic demand for some products can be served by imports), allowing inherent and acquired comparative advantages to be exploited more intensively (Weinhold and Rauch, 1999). However, the positive impact of specialization on growth might be weaker in regions that are not specialized in sectors associated with IRS (Paci and Usai, 2000). Moreover, excessive specialization might convert possible industry-specific shocks into region-specific shocks with, overall, a negative effect on growth. A relatively high level of diversification, in contrast, might work as a safeguard as downturn movements in some sectors would not be as harmful to the local economy because human and other resources can be diverted to other existing and more secure alternatives (Acemoglu and Zilibotti, 1997). Furthermore, emerging opportunities in cases of increasing demand in specific sectors may not go unexploited, if even a small number of firms are present in the region (Feldman, 2000).

Presumably, the trade-offs arising from this literature generate dilemmas and questions about the mix of policies that may promote growth and at the same time decrease regional inequalities in the EU (Morgenroth and Petrakos, 2008). As excessive or increasing regional disparities may destabilize the EU politically, the role of regional policy becomes a significant and critical part of the integration process, largely bound to offset the effects of the other, market-driven, factors. Thus, the impact of economic integration on EU regions depends, to a large extent, on the balance, but also the synergies, between market dynamics and policy interventions.

3. The industrial experience of the new European Union member-states

EU NMS have been experiencing the processes of transition, from central planning to a free-market economy, and integration into the European economic space, as pre-conditions for historical (re)unification and catch-up with the affluent old EU member states (EU-15) coming from Western Europe (Petrakos and Kallioras, 2007). During the socialist period, EU NMS, being under the influence of the Soviet Union, were members of the Council for Mutual Economic Assistance (CMEA).[7] The dissolution of the CMEA, after the collapse of the Soviet Union, has led EU NMS to a state of economic isolation and, consequently, recession[8] (Rostowski, 1997; Salvatore, 2001). The prospect of EU accession turned out to be, under such circumstances, a one-way road[9] for EU NMS[10] (Daianu, 1995).

The enhancement of the EU NMS integration process has contributed to the reversal of EU NMS downturn trends (EBRD, 2001; Svenjar, 2002). Nevertheless, the income gap with the EU-15 countries remains wide, indicating the emergence of an 'east–west' pattern of development in the enlarged EU. This situation is even worse for the Balkan countries (that is, Bulgaria and Romania), indicating an eastwards shift of the maintained EU-15 'north–south' pattern of development (Petrakos, 2000; Petrakos et al., 2000; Petrakos, 2008). Furthermore, internal regional inequalities recorded significant intensification. Capital and western border regions enjoyed a relatively better performance, especially in the Central European countries, while peripheral and eastern regions had, in general, been worse (Figure 7.1) (Petrakos, 2001; Römisch, 2003; Petrakos et al., 2004). This suggests that externalities generated under the prospect of EU eastwards enlargement have redefined the European economic space, mostly favouring regions that are spatially close to the new market centre (Niebuhr and Stiller, 2002; Niebuhr, 2004; Topaloglou et al., 2005). This may, further, suggest that market forces do not incorporate any automatic spatial convergence mechanism. On the contrary, they tend to generate greater regional inequality, especially in the transition economies, which have not developed active regional policies. This evidence casts doubts on the claims of the neoclassical school, according to which markets have self-correcting mechanisms for regional imbalances.

The emerging, unbalanced, pattern of regional development in EU NMS turns attention to the study of EU NMS economic structures. Market forces and transition policies of openness, privatization and deregulation changed the old internal organization and external relations structures in ways often felt to be painful and forceful (Zisman and Schwartz, 1998; Cornett, 1999).

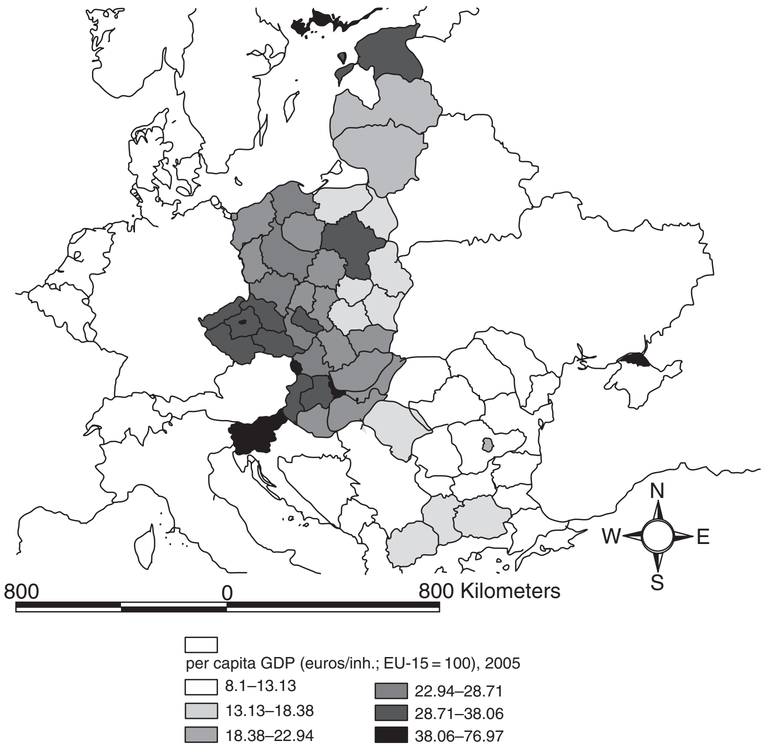

Figure 7.1 The geography of regional development in EU NMS, GDP per capita (€/inhabitant; EU-15 = 100), Year 2005
Source: Eurostat Regio Database.

The sector of industry (manufacturing), being a central element in the productive systems of the former regime (Gàcs, 2003), has undergone the most pressure (Landesmann, 1995; Bevan et al., 2001). The inefficiency of industrial enterprises in the international markets, a ramification of their inefficient management during the former regime (Landesmann and Abel, 1995; Bradley et al., 2004), has boosted the levels of unemployment and reduced the levels of real wages in EU NMS (Lavigne, 1998; Bornhorst and Commander, 2004). Yet, the majority of EU NMS regions experience the restructuring of their industrial bases, coupling increases in terms of relative industrial productivity (that is, the ratio of industrial GDP share to industrial employment share) with decreases in terms of industrial employment (Figure 7.2).

In addition to the diminution of industrial activities, during the period 1995–2005, EU NMS regions have experienced changes in the composition of industrial activities. The pattern of structural change reflects the

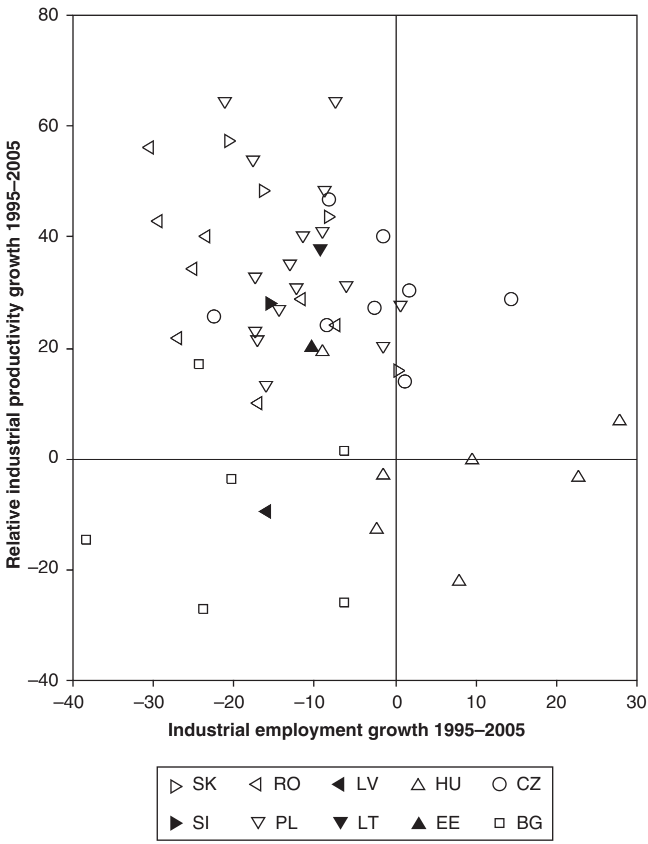

Figure 7.2 Relative industrial productivity change (%) and industrial employment change (%) in EU NMS regions, Period 1995–2005
BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.
Source: Eurostat Regio Database.

adaptability of EU NMS regions to the emerging economic conditions (Zielinska-Glebocka, 2005).

In an effort to capture the level of structural changes that took place in EU NMS regions during the period 1995–2005 the Coefficient of Structural Change (CSC), proposed by Havlik (1995), is estimated. CSC correlates (*CORREL*) the shares (*S*) of each industrial sector i $(i = 1, 2, \ldots, n)$ to the total industrial activity of region r under consideration, between an initial (base) year t and a final year $t + k$, under the formula: $CSC_{r,t\_t+k} = CORREL^{n}_{i=1}(S_{r,i,t}, S_{r,i,t+k})$. CSC takes values in the interval [0, 1]. Values close to 0 (that is, almost no correlation) indicate that significant structural changes have taken place during the period under consideration, whereas values close to 1 (that is, almost perfect correlation) indicate that almost no structural change has taken place. The estimation of CSC, in terms of industrial employment, reveals that each EU NMS region had a different reaction to the pressures of the emerging economic environment, experiencing its own level of structural adjustment (Figure 7.3). While some EU NMS regions have undergone a more severe degree of structural change, some others have undergone a modest one.

A further assessment of the nature of the emerging structural patterns in EU NMS regions is provided with the estimation of the Index of Dissimilarity in Industrial Structures (IDIS), proposed by Jackson and Petrakos (2001). IDIS estimates the sum (Σ) of the square differences between the shares (S) of each industrial sector i ($i = 1, 2, \ldots, n$) and the total industrial activity in region r under consideration and in a benchmark economy b, in a given year t, under the formula: $IDIS_{r\_b,t} = \sum_{i=1}^{n} [(S_{r,i,t} - S_{b,i,t})^2]$. IDIS takes values greater than (or equal to) 0. High values are associated with high levels of structural dissimilarity, whereas low values are associated with low levels of structural dissimilarity to a benchmark economy. Increasing values of IDIS diachronically indicate that the economies under comparison are becoming more dissimilar, whereas decreasing values indicate that the corresponding economies are becoming more similar. In the cases of peripheral

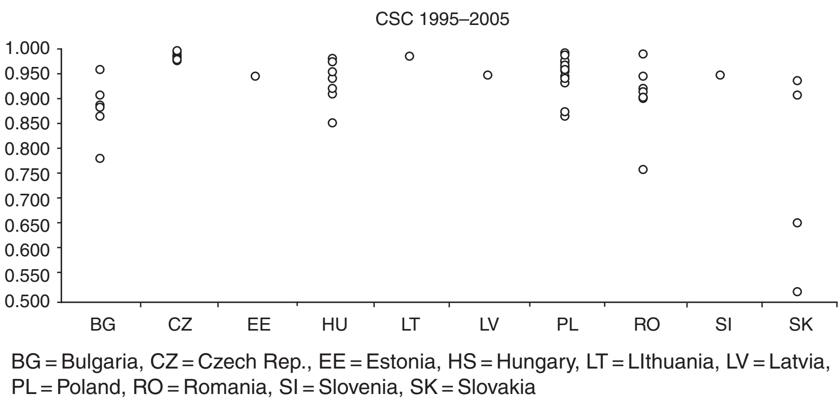

Figure 7.3 Structural changes (CSC; industrial employment) in EU NMS regions, Period 1995–2005
BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.
Source: Eurostat Regio Database.

and less advanced economies, increasing structural dissimilarity can be perceived as an indication of a negative (defensive) structural change, whereas decreasing structural dissimilarity can be perceived as an indication of a positive (offensive) structural change (Jackson and Petrakos, 2001). Defensive structural changes can be perceived as impulsive reactions to the conditions and requirements of an emerging economic environment, whereas offensive structural changes can be perceived as strategic choices (Petrakos and Kallioras, 2007; Kallioras and Petrakos, 2009). The estimation of IDIS, in terms of industrial employment, reveals that the majority of EU NMS regions have increased their deviation from the benchmark structural pattern of the average EU-15 economy, during the period 1995–2005 (Figure 7.4). This indicates that the majority of EU NMS regions have been experiencing an inter-industry type of economic integration, developing economic structures dissimilar from the respective (and dominant) EU-15 pattern.

Severe structural changes in EU NMS regions with relatively poor performance are an indication that structural change has, mostly, been an adjustment of a forceful and defensive nature, imposed by the need for internationalization and economic integration. Besides the significant reduction of industrial activity in weak regional economic bases, it seems that the process of economic integration has also altered significantly the composition of regional industrial activity. Weak and vulnerable or monostructure regions typically lost the greatest part of their industrial base that, being in capital-intensive sectors, was more exposed to international competition. Structural

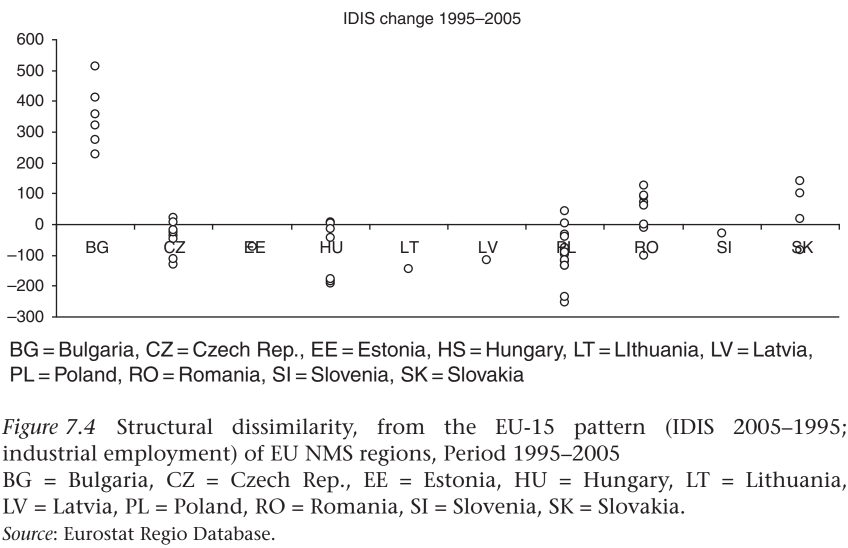

Figure 7.4 Structural dissimilarity, from the EU-15 pattern (IDIS 2005–1995; industrial employment) of EU NMS regions, Period 1995–2005

BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.

Source: Eurostat Regio Database.

change and industrial decline went hand in hand during the pre-accession period in a vicious cycle that resulted in less output, less employment and loss of existing sectoral specializations. Nevertheless, this was not a universal experience in the EU NMS area. A number of EU NMS regions, especially capital and western border regions of Central European countries, have done relatively well in terms of industrial performance and adjustment, benefiting from agglomeration economies, market size and proximity to Western markets (Resmini and Traistaru 2003; Petrakos and Kallioras 2007; Kallioras and Petrakos 2009).

4. The determinants of regional industrial performance in new European Union member states

The industrial experience of EU NMS regions indicates that a multidirectional relationship among industrial performance, integration, geography and specialization is currently taking place.

The unbalanced pattern of regional industrial development in EU NMS attests the spatial selectivity of the process of economic integration (Kallioras and Petrakos, 2009). The level of economic integration can be captured with the estimation of the Index of Industrial Integration (III), proposed by Petrakos and Kallioras (2007). III is estimated, in a first step, at the country sectoral level (since there are no trade data at the regional sectoral level) as the ratio of the trade transactions (*tr*) of a country *k* (region *r* under consideration belongs to country *k*) with a benchmark economy *b* and the world *w*, in each industrial sector *i* ($i = 1, 2, \ldots, n$), in value terms, in a given year *t*. Then, in a second step, III is 'regionalized' with the use of the respective employment (*e*) location quotient of region *r* under consideration (that is, the ratio of the share of each sector to the regional and the country industrial employment). Thus, III is estimated under the formula: $III_{r,t} = \sum_{i=1}^{n} \left[\left(tr_{k\_b,i,t} / tr_{k\_w,i,t} \right) \left(\frac{e_{r,i,t}/e_{r,t}}{e_{k,i,t}/e_{k,t}} \right) \right]$, and has values greater than (or equal to) 0. High values are associated with high levels of economic integration, whereas low values are associated with low levels of economic integration with the benchmark economy. The positive relation between the level of industrial employment per capita[11] and the level of III (the average EU-15 economy is the benchmark economy) (Figure 7.5) implies a two-way causality. Obviously, the industrially advanced EU NMS regions are the ones enjoying greater trade relations with EU-15 countries. These relations are growing stronger, in an ongoing integration context, with a positive (and statistically significant) impact of the level of industrial performance.

The spatial selectivity of the EU economic integration process favours certain types of EU NMS regions. The relative centrality or peripherality of EU NMS regions can be assessed with the use of a Gravity Index, following

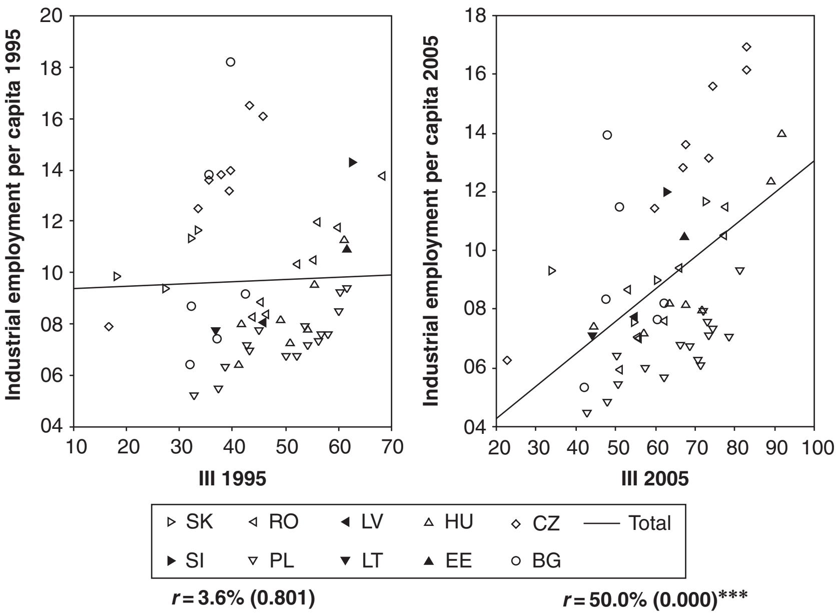

Figure 7.5 The relationship between the level of industrial employment per capita and the level of economic integration with EU-15 countries, Years 1995 and 2005
BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.
Sources: Eurostat Regio Database and Eurostat Comext Database.
*** statistically significant at the 1 per cent level.

Harris (1954). The Gravity Index describes geographic position as an increasing function of market size, proxied by the population *p* of the region *r* under consideration, and market potential, proxied by the populations *p* of the regions of a benchmark economy *b*, and as a decreasing function of transactions costs, proxied by the distance[12] *d* between the region *r* under consideration and the regions of a benchmark economy *b*, in a given year *t*. The Gravity Index takes the formula: $GRAV_{r,t} = \sum_{b=1}^{n} \frac{p_{r,t}p_{b,t}}{d_{r\_b,t}}$, and has values greater than (or equal to) 0. High values are associated with high levels of market size and/or potential, whereas low values are associated with respective low levels. The positive relation between the Gravity Index and III (Figure 7.6) provides support for theories stressing the importance of place and size. EU NMS regions with a relatively favorable geographic position (that is, the capital and the western regions border the EU-15 area) gained immediate access to the large market of the core EU-15 countries, being more integrated with the average EU-15 economy, with a positive impact on the level of industrial performance (diachronically the relation becomes

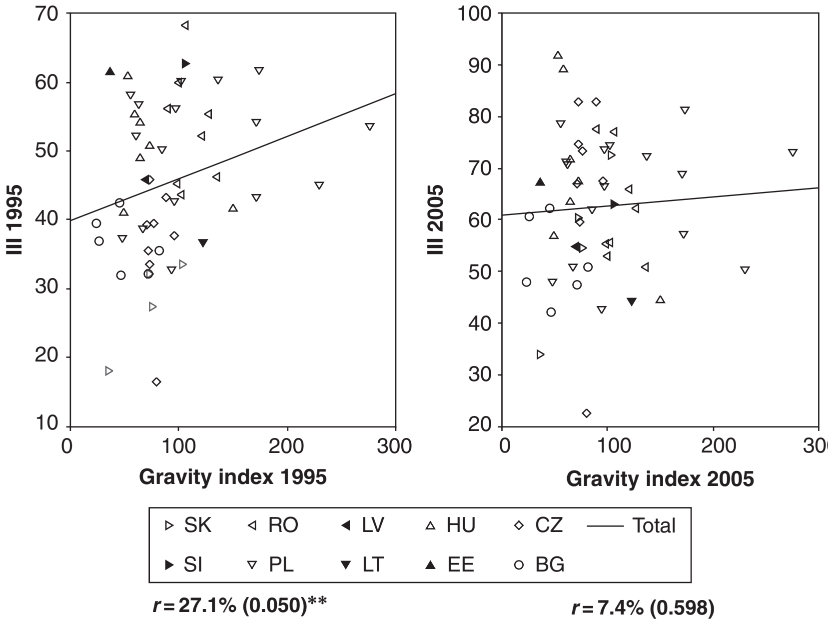

Figure 7.6 The relationship between the relative centrality/peripherality and the level of economic integration with EU-15 countries, Years 1995 and 2005
BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.
Sources: Eurostat Regio Database and Eurostat Comext Database.
** statistically significant at the 5 per cent level.

statistically insignificant). In contrast, the peripheral position, with respect to the EU-15 market, of many EU NMS regions has operated as a major impediment to industrial performance, at least at the outset of the process of economic integration.

The uneven impact of the process of economic integration on regional industrial structures has led to a variety of regional industrial specialization patterns. The level of regional specialization can be estimated with the use of the Absolute Theil Index of specialization, proposed by Theil (1972). The Absolute Theil Index takes into account the sum (Σ) of the products of the employment shares (e) of each industrial sector i ($i = 1, 2, \ldots, n$) and the total industrial employment in region r under consideration, and the natural logarithm of the product of the aforementioned shares and the number (n) of industrial sectors, in a given year t. The Absolute Theil Index takes the formula: $THEIL_{r,t} = \sum_{i=1}^{n} e_{r,i,t} \ln(n \cdot e_{r,i,t})$, and has values in the interval [0, ln(n)]. Values close to 0 indicate low levels of regional specialization, whereas values close to ln(n) indicate high levels of regional specialization.

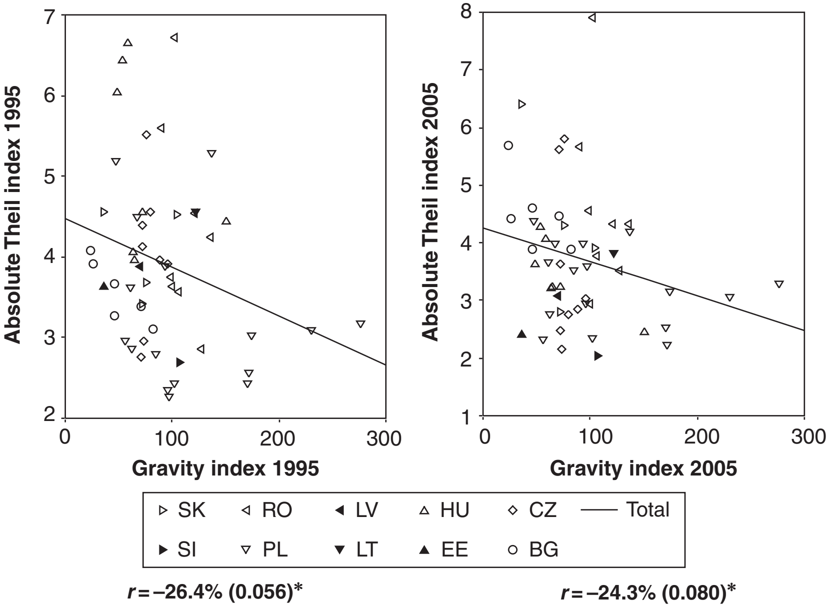

Figure 7.7 The relationship between the relative centrality/peripherality and the level of regional industrial specialization, Years 1995 and 2005
BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.
Source: Eurostat Regio Database.
* statistically significant at the 10 per cent level.

The negative (and statistically significant) relation between geography and the level of regional specialization (Figure 7.7) reveals that EU NMS regions with a relatively better geographic position have managed to diversify their industrial bases, attracting a variety of industrial activities, with a positive impact on industrial development. This finding challenges neoclassical theory, indicating that variety – and not specialization – is more likely to stimulate a better growth performance in less advanced regions. A greater diversity in the productive bases of less advanced regions may result in external scale effects through local input–output relations and may act as a safeguard against downturns in sectoral demand and possible asymmetric, industry-specific, shocks.

The emerging different levels of regional industrial specialization have, consequently, led to emerging different types of economic integration. The positive (and statistically significant) relation between the level of regional specialization and the level of structural dissimilarity with the average EU-15 economy (Figure 7.8) accentuates the benefits of diversification. EU NMS regions with a better geographic position (that is, the capital

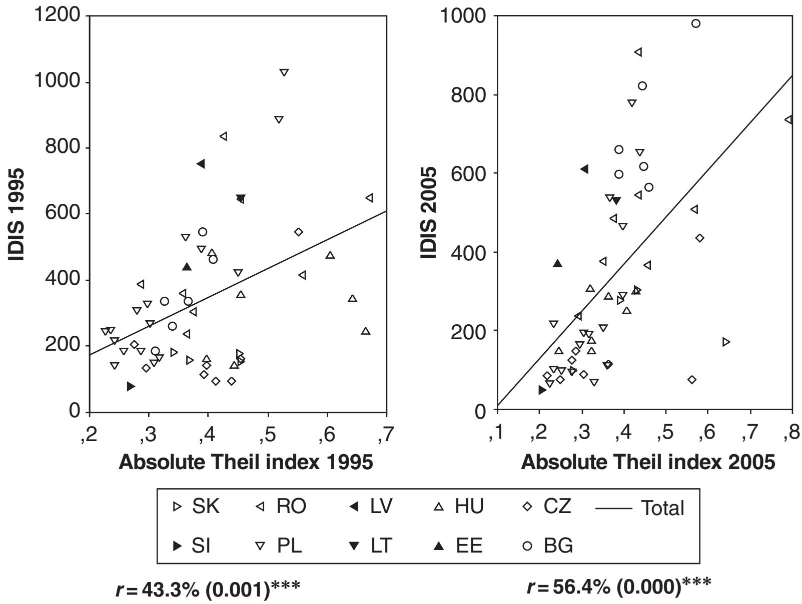

Figure 7.8 The relationship between the level of regional industrial specialization and the level of structural dissimilarity with the average EU-15 economy, Years 1995 and 2005

BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia.

Source: Eurostat Regio Database.

*** statistically significant at the 1 per cent level.

and the western regions border the EU-15 area), favoured by agglomeration economies, market size and proximity to Western markets, managed to diversify their industrial bases by attracting capital-intensive industrial activities.[13] Capital-intensity, associated with research and development and knowledge-based activities, accrues benefits for EU NMS regions allowing for the operation of intra-industry trade with EU-15 countries.

Of course, structural dissimilarity provides a more feasible route for the industrial development of less advanced regions. It is doubtful, however, whether this route can produce a long-term positive impact on regional performance. The negative relation between the level of structural dissimilarity with the average EU-15 economy and the level of industrial employment per capita (Figure 7.9) indicates that the intra-industry type of economic integration is not associated with high levels of industrial performance. The majority of EU NMS regions, being specialized in labour-intensive industrial sectors, are not able to capitalize on the opening of international markets. The relatively weak presence of capital-intensive sectors is a structural deficiency and this is, exactly, the reason behind their poor industrial performance.

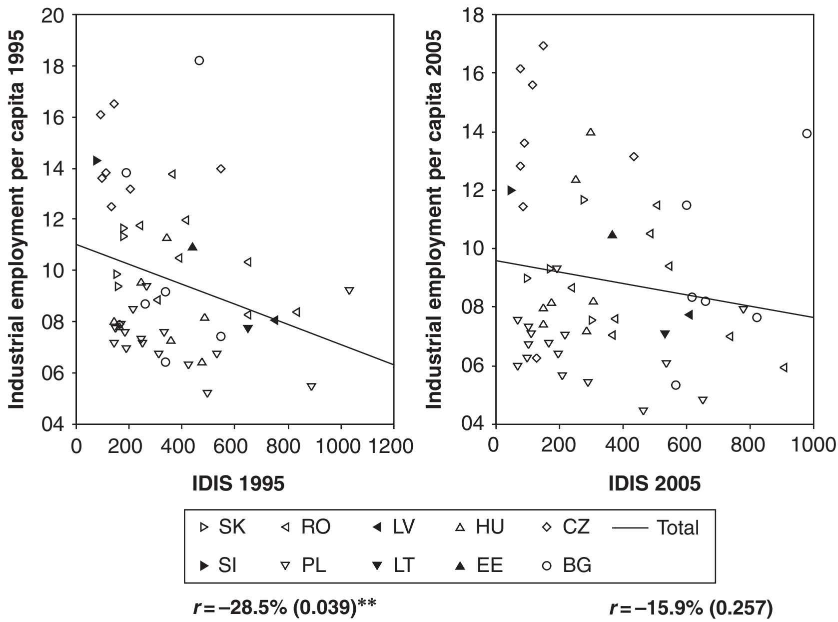

Figure 7.9 The relationship between the level of structural dissimilarity with the average EU-15 economy and the level of industrial employment per capita, Years 1995 and 2005
BG = Bulgaria, CZ = Czech Rep., EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, PL = Poland, RO = Romania, SI = Slovenia, SK = Slovakia
** statistically significant at the 5 per cent level.
Source: Eurostat Regio Database.

5. Conclusions

The detection of the determinants of industrial performance in EU NMS regions, during the period 1995–2005, has provided insight into the causes behind the emerging unbalanced EU NMS pattern of development. Capital regions and western regions that border the EU-15 area seem to be the relative winners since they have managed to combine a set of positive structural and geographical initial conditions with market dynamics. The majority of EU NMS regions, however, have followed a rather different path. Endowed with an unfavourable set of initial conditions and being peripheral in both the national and the European setting, these regions have been faced in the new economic environment with fewer opportunities and more threats. Unable to attract (or maintain) a critical scale of industrial activities, they have witnessed the collapse of large parts of their industrial bases, drastically cutting local demand and setting real restrictions on efforts and policies of indigenous growth.

These results explain earlier findings concerning the evolution of regional inequalities in the EU NMS area, casting doubts on the neoclassical framework of analysis. The EU NMS 'quasi-laboratory' environment for the examination of the spatial impact of the introduction of market forces into the economy seems not to be favourable to market-based theories of regional convergence. This, furthermore, provides a strong indication that the operation of EU NMS in the Single European Market (SEM) environment, and under the prospect of the adoption of the euro currency, may generate an overall (even more) negative environment.

Unavoidably, this becomes an issue for the EU regional policy agenda, which is, by definition, supposed to be primarily targeting the underperforming European regions (Morgenroth and Petrakos, 2008). Contemporary regional policies emphasize the role of human capital, knowledge, innovation and entrepreneurship for a successful growth performance. However, in most cases of underperforming regions, such factors are not only weak in the corresponding local bases but, to the extent that they can in fact be mobilized, they are still largely unable to allow these regions to break out from the underdevelopment trap. As a result, development strategies based on the experience of advanced regions may not only be misleading but also, in some cases, counterproductive for the underperforming regional economies (Petrakos, 2008). The fact that the issue of economic and social cohesion is as salient as ever, accentuates the need for a critical reassessment of the EU regional policy.

This need is even more evident now, in the interim of a severe global economic crisis. Although it is too early to judge, the only sure thing is that this crisis is going to hit EU regions in an asymmetric way. Concerning the EU NMS regions in particular, this crisis may signal the beginning of a new era of depression, and, possibly, the beginning of a new era of transition.

Notes

1. The notion 'EU NMS' includes Slovenia, Hungary, Slovakia, the Czech Republic, Poland, Latvia, Lithuania and Estonia, which became EU members in May 2004, and Bulgaria and Romania, which became EU members in January 2007.
2. Bringing the earliest explanatory approaches of economic space, such as the 'big push' (Rosenstein-Rodan, 1943), the 'growth poles' (Perroux, 1955) and the 'cumulative causation' (Myrdal, 1957), back to the forefront.
3. These are the cost-related benefits (such as spill-overs of know-how and tacit knowledge, forward and backward linkages, efficient labour market pooling) arising from the external environment of firms due to the expansion of their economic sector (localization economies) and/or due to the expansion of the city services (urbanization economies) (cf. Segal, 1976; Moomaw, 1981).

4. Returns to scale refers to changes in output subsequent to a proportional change in all inputs (that is, all inputs increase by a constant factor) used in the production process (cf. Carlino, 1979).
5. Inter-industry trade is conducted mainly between economies with different productive structures, whereas intra-industry trade is conducted mainly between economies with similar productive structures. The latter type of trade activity is considered to be more beneficial because it stimulates innovation and exploits economies of scale (Ruffin, 1999).
6. It should be noted here that low labour cost, a typical characteristic of less advanced economies, has lost much of its significance in relation to competition, mainly due to the operation of economies of time with the use of sophisticated management techniques (Best, 1990) such as, for example, just-in-time (cf. Ohno and Mito, 1988).
7. CMEA, an economic organization equivalent to – but more geographically inclusive than – the EU, was founded in 1949 and disbanded in 1991. The primary factor in CMEA formation appears to have been the objective of the Soviet Union to enforce its domination of the lesser countries of Central and Eastern Europe (cf. Bideleux and Jeffries, 1998).
8. Trade transactions under the CMEA were held in fixed (and artificially low) prices over periods of years. The exposure to international competition for global markets and the accordance with the international price system caused the contraction of trade activity among the former CMEA member states and contributed to the acute decline of output and employment (Hare, 1997; Zloch-Christy, 1998).
9. It is noteworthy that the process of EU accession was supported even when former communist parties regained the power in their countries, that is, Hungary and Poland (Thirkell et al., 1998).
10. The EU, aiming to expand its economic and political power, also started the necessary procedures in order to incorporate EU NMS. The signature of the European Agreements provided the legal background for the EU NMS gradual embedment in the EU. The accession of EU NMS to the EU was finalized in 2003.
11. This relation (and the respective following ones) also holds for industrial GDP per capita.
12. Distance is estimated between the centroids of the regions. In order to account for the intraregional distance of the region under consideration (that is, the distance between the centroid of the region under consideration and its boundaries), the square root of the size (in square kilometres) of the region has been weighted by the factor $1/\sqrt{\pi}$, according to the proposition made by Nitsch (2000).
13. Jackson and Petrakos (2001) classified the industrial sectors in three broad groups that grossly represent labour-intensive sectors (that is, food, beverages and tobacco, textiles and wearing apparel, leather products, wood products, paper, publishing and printing, other manufactured products), resource-intensive sectors (that is, fuel products, chemical products, rubber and plastic products, non-metallic mineral products, fabricated metal products) and capital-intensive sectors (that is, machinery [excluding electrical], electrical machinery and optical equipment, transport equipment), according to the participation of the factors of production in the production process. Labour-intensive industrial sectors produce mainly consumer final goods, resource-intensive industrial sectors produce mainly intermediate goods and capital-intensive industrial sectors produce mainly capital final goods.

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8

Is European Trade Integration Completed? Perspectives for CEE Countries

Frédérique Festoc-Louis and Nolwenn Roudaut

1. Introduction

For some 30 years, European construction occurred in a Europe divided into two sides: on the one hand, 'Western Europe' and capitalism, and on the other hand, 'Eastern Europe' and socialism. Trade between these two sides was reduced to a minimum. The breakdown of socialism in Eastern Europe at the end of the 1980s led to immediate negotiations between the two sides, and ended in the European Union (EU) enlargement to eight Central and Eastern European Countries (CEECs: Estonia, Hungary, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Slovenia) in May 2004, followed by the membership of two new countries (Bulgaria and Romania) in January 2007. The strong reorientation of trade from East to West, together with a rapid growth of trade between the EU and the CEECs, which will be pointed out in the second section of this chapter, led to a strong integration between Eastern and Western Europe. It therefore seems relevant to ask whether this integration process is completed, at least for some countries.

In the third section of this chapter, we thus propose a new estimation of trade potential between Eastern and Western Europe, taking into account recent econometric developments, in order to reach a conclusion on the degree of integration between the EU-15 and the CEECs. We hence use a gravity model to assess the 'theoretical' trade, or 'potential trade', by an out-sample approach, between the EU-15 and the CEECs. The gravity equation is estimated on a panel data of EU-15 countries over the period 1990–2005, using the Hausman and Taylor (1981) instrumental variable method.

The results, presented in the fourth and fifth sections, indicate that (i) some EU countries have already reached their trade potential with CEECs in 2005 (Germany, Spain and France); (ii) as far as Eastern European countries are concerned, some of them (mainly Central European Countries) should expect a limited increase of their exports to the EU; whereas (iii) some others (at the periphery) still have a great trade potential with the EU; and finally, (iv) there is still a large potential for more trade between the CEECs.

2. Evolution of East–West trade relations

2.1. From the 1950s to the 1980s: Strained relations

From the Second World War to the beginning of the 1980s, relations between Eastern Europe and the European Union, or even between Eastern Europe and the rest of the world, were very limited. The communist ideology imposed a particular viewpoint on the rest of the world: priority was given to trade between socialist countries, and in particular between members of the Council for Mutual Economic Assistance (CMEA, also called Comecon).[1] As a second priority, trade was directed to the third world, including countries engaged in socialist-oriented development. Finally, trade took place with capitalist countries. Progressively, Eastern European countries cut themselves off from the rest of the world and arbitrarily concentrated their trade on the Soviet market.

More precisely, relations between Eastern Europe and the European Union until the end of the 1980s can be split up into three sub-periods. Until 1964, these relations amounted to confrontations and deep ideological discrepancies, and thus trade was very limited. Then, Khroutchev showed his intention to negotiate: between 1965 and 1975, an acceleration of trade between East and West can be observed. However, as early as 1980, trade is once more reduced, for several reasons, mainly the enlargement of the EU to Greece, and later to Spain and Portugal, which led to trade diversion. The Eastern European countries' drive to reduce the external debt was also a factor, as well as the fact that Eastern European products did not meet world demand.

2.2. The 90s: A gathering

Since the fall of the Berlin wall in November 1989, changes have occurred very rapidly: the German reunification, the collapse of the USSR, the Europe Agreements and then the enlargement of the European Union to eight Central and Eastern European Countries (CEECs: Estonia, Hungary, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Slovenia) in May 2004, followed by the membership of two new countries (Bulgaria and Romania) in January 2007.

From the beginning of the transition from centrally planned to market economies, Eastern European countries have tried to find a foothold in the world economy, by breaking up the CMEA and by submitting very early applications to join the EU. The Europe Agreements, signed between each country and the EU at the beginning of the 1990s, were a first important step in bringing together the two sides of Europe, as they liberalized Western market access for Eastern European products. Immediately after, trade between

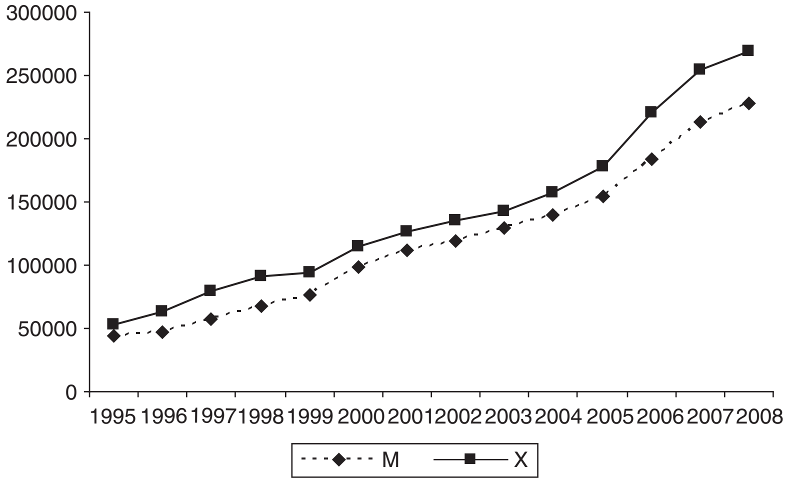

Figure 8.1 Evolution of trade between EU-15 and the ten CEECs (*Million euros, 1995–2008*)
Source: Eurostat
M: imports of EU-15 from the ten CEECs
X: exports of EU-15 to the ten CEECs.

the CEECs and the European Union increased very rapidly, as shown by Figure 8.1.

Whereas extra-EU trade has multiplied by less than three between 1995 and 2008, trade between the CEECs and the EU has been much more dynamic, since it has multiplied by more than five over the same period.

2.3. The relations today

In 2005, about 60 per cent of the CEECs exports were directed to Western markets, and 57 per cent of their imports came from the EU-15, which confirms the strong trade integration between these two sides, initiated in the nineties. It is however worth noting that, if the share of the EU-15 in CEECs trade is very high, it has begun to show a downward trend over for the past ten years (Table 8.1), which raises a question already asked in Festoc (1997): did the CEECs trade reorientation towards the EU-15 go too far at the beginning of the nineties?

Trade relations between Eastern and Western Europe have always been asymmetric, and it is still the case today: the EU is by far the CEECs first trading partner, whereas these ten countries still account for less than 6 per cent of the Western European exports in 2005. Finally, it can also be pointed out that trade with the EU is concentrated on a small number of countries: Poland, the Czech Republic and Hungary, which represent 67 per cent of

Table 8.1 Share of the EU-15 in CEECs exports, 1995 and 2005, in %

	Slovenia	*Estonia*	*Hungary*	*Latvia*	*Lithuania*	*Czech Rep.*	*Slovakia*	*Poland*	*Romania*	*Bulgaria*
1995	70.4	68.9	70.4	70.7	58.3	61.5	43.8	72.5	58.5	64.0
2005	55.4	58.8	63.8	53.2	40.4	63.5	55.9	62.0	58.1	50.0

Source: CHELEM.

total trade between the CEECs and the EU. On the western side, Germany has rapidly substituted to Russia as the CEECs first trading partner.

2.4. Is trade integration completed?

As previously argued, the share of the EU-15 in the CEECs trade has declined. Hence, the following question can be raised: at the beginning of the years 2000, is trade integration between Eastern and Western Europe completed? After a strong trade reorientation towards the European Union, Eastern European countries seem to be starting out on a second adjustment stage: a new trade reorientation, towards other partners, neglected in the 1990s. In particular, one can observe a marked growth of trade between Eastern European countries.

To deal with this question, we found it useful to assess the 'theoretical' trade, or 'potential' trade, between the EU-15 and the CEECs, and to compare this with the observed trade flows: this method is based on gravity models, which have proven to be the most accurate tool for the explanation and prediction of bilateral trade flows.

2.5. The need for a new estimation of trade potentials

Many studies have already attempted to assess potential trade between the EU and the CEECs, from the beginning of their transition. A first wave of estimations (Collins and Rodrik, 1991; Havrylyshyn and Pritchett, 1991; Winters and Wang, 1991; Baldwin, 1993) led to the conclusion that there was a strong trade potential between Eastern and Western Europe, but those studies were based on data prior to the beginning of the transition. Subsequently, Gros and Gonciarz (1995), Schumacher (1995–1996), and Festoc (1997) took the transition period as reference, and their results showed that trade potential was limited between those partners. The question of potential trade within Central and Eastern European Countries has received much less attention since the beginning of the nineties. For instance, Jakab, Kovacs and Oszlay (2001) focus their estimations only on Poland, the Czech Republic and Hungary, whereas Paas (2003) concentrates on the Baltic Sea Region, but there are very few studies dealing with recent evolution of intra-CEEC trade and its potential.

Meanwhile, econometric methodology has significantly improved over the past ten years. On the one hand, it is now generally admitted that panel data have to be used for estimations (Matyas, 1997, 1998; Egger, 1999). On the other hand, as explained by Peridy (2006), Carrère (2006) or Serlenga and Shin (2004), the Hausman Taylor instrumental variables method should be used to estimate gravity equations, in order to take into account time invariant variables, such as the geographic distance between partners.

This is why we propose a new estimation of trade potential between Eastern and Western Europe and within Eastern Europe, taking into account recent econometric developments, in order to reach a conclusion on the degree of integration between these countries.

3. The model and its estimation

3.1. The gravity equation

To estimate potential trade flows, we use a gravity equation. In its simplest form, this equation expresses bilateral trade flows across pairs of countries and includes, as explanatory variables, the income and population of both trading partners and the distance between their economic centres. Additional explanatory variables are included depending on assumptions that are made regarding market structures. Gravity equations perform well in analysing international trade flows; we owe their theoretical foundations to Bergstrand (1985, 1989), Baier and Bergstrand (2001) and Evenett and Keller (2002). The model used here combines the new trade theory (initiated by Helpman and Krugman, 1985) and recent theoretical developments related to trade costs, as described in Anderson and van Wincoop (2003, 2004).

The standard gravity model is derived from a framework in which firms in monopolistic competition (product differentiation at firm level) maximize profits, and consumers maximize utility with CES preferences.[2] Equilibrium trade flows can be described by the following equation:

$$X_{ij} = \frac{Y_i Y_j}{Y_w}\left(\frac{T_{ij}}{P_i P_j}\right)^{1-\sigma}, \text{ with: } \quad \begin{cases} P_j^{1-\sigma} = \sum_i P_i^{\sigma-1}\theta_i T_{ij}^{1-\sigma} \\ P_i^{1-\sigma} = \sum_j P_j^{\sigma-1}\theta_j T_{ij}^{1-\sigma} \end{cases}$$

X_{ij}: Exports of country i to country j
$Y_{i(j)}$: GDP of country i (j)
Y_W : World GDP
T_{ij} : Trade costs between i and j
$P_{i(j)}$: Aggregated implicit equilibrium prices in country i (j)
σ : Consumer elasticity of substitution
$\theta_{i(j)}$: GDP shares of i (j) in the World GDP

It is necessary to specify correctly the trade costs function between i and j. Classical variables used in most articles to define the barrier-to-trade function T_{ij} are the following: the geographical distance between the two partners (D_{ij}), the existence of a common border (A_{ij}) and of a common language (L_{ij}). Most authors also add a variable which indicates if the country is landlocked ($E_{i(j)}$); others, like Carrère (2006), introduce indicators of infrastructure levels ($INF_{i(j)}$).[3] The barrier-to-trade function between countries *i* and *j* can be expressed as:

$$T_{ij} = D_{ij}^{\delta_1} INF_i^{\delta_2} INF_j^{\delta_3} L_{ij}^{\delta_4} E_i^{\delta_5} E_j^{\delta_6} A_{ij}^{\delta_7}$$

Expected signs are: $\delta_1 > 0$, $\delta_2 < 0$, $\delta_3 < 0$, $\delta_4 < 0$, $\delta_5 < 0$, $\delta_6 < 0$, $\delta_7 < 0$.

In order to estimate implicit prices, which are unobservable, some authors (Rose and van Wincoop, 2001; Feenstra, 2003; Peridy, 2006) suggest the introduction of country effects. A temporal dimension is most often introduced.

Finally, the following gravity equation is estimated for the EU-15 countries, over the 1990–2005 time period:

$$\begin{aligned} \ln X_{ijt} = {} & \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_4 A_{ij} + \beta_5 E_i + \beta_6 E_j + \beta_7 L_{ij} + \beta_8 UE_{it} \\ & + \beta_9 UE_{jt} + \beta_{10} EURO_{it} + \beta_{11} EURO_{jt} + \beta_{12} \ln INF1_{it} + \beta_{13} \ln INF1_{jt} \\ & + \beta_{14} \ln INF3_{it} + \beta_{15} \ln INF3_{jt} + \beta_{16} \ln POP_{it} + \beta_{17} \ln POP_{jt} + \eta_{ij} + \omega_t + \upsilon_{ijt} \end{aligned}$$

where $UE_{i(j)t}$ and $EURO_{i(j)t}$ stand for the country *i*(*j*) belonging respectively to the European Union and to the Euro-zone in the year *t*. The country size is introduced via the population variable $POP_{i(j)t}$. Two levels of infrastructures, $INF1_{i(j)t}$ and $INF3_{i(j)t}$, are considered. A detailed description of the variables can be found in Appendix 8.A1.

The error term has three components. The bilateral term η_{ij} is specific to each pair of countries[4] and is supposed to be constant over time, ω_t captures any temporal effect and υ_{ijt} is the classical error term, supposed to be normally distributed.

Heterogeneity is introduced in the gravity equation via the η_{ij} term. Because of cultural, political, historical factors, and so on, a specific country will export at different levels to two partners, even if these two partners have exactly the same characteristics (GDP, POP, Distance and so on). Thus, omitting η_{ij} in the model may introduce a heterogeneity bias.

3.2. Econometric method

As noted previously, estimation on cross section data, largely used in the past, did not allow for taking into account the unobservable heterogeneity between country pairs. This heterogeneity is introduced in panel data models. Our equation is estimated for the EU-15 countries, over the 1990–2005 time period.

Potential trade levels are evaluated by an *out-sample* procedure. First, the gravity model is estimated on UE-15 data. Then, the estimated values of the parameters are used to evaluate trade relations between countries out of the sample and the EU-15. The difference between the observed and predicted trade flows is interpreted as unrealized trade potential.

Potential trade can also be estimated by an *in-sample* procedure. In this case, the gravity equation is estimated on all the countries, and the difference between trade achieved and potential trade is defined by the residuals of this equation. The drawback of this approach is that any misspecification of the model is reflected in the error term, and then in the potential trade figure. Moreover the choice of the *out-sample* procedure is reinforced by the fact that trade relations between UE-15 countries can be considered as a steady-state toward which CEEC countries should theoretically converge.

The two classical estimation techniques for panel data models are the Within method and the Random method. In our case, these two methods differ on the hypothesis made on the specification of the bilateral effects[5] η_{ij}. In the absence of endogenous explanatory variables, the Random method provides the most efficient estimators. However, as bilateral effects can be interpreted as a time invariant propensity to exchange between two countries, a possible correlation of this effect with some regressors, distance for example, is more than likely. Ignoring this will lead to biased estimates. This being the case, the Within estimator, less efficient but unbiased, is preferred.[6] However, by construction, the inclusion of fixed bilateral effects makes it impossible to estimate the coefficients of time invariant variables in the Within model. The instrumental variable method proposed by Hausman and Taylor (1981) allows us to solve these problems[7]: all parameters are identified and estimators are unbiased even if some explanatory variables are endogenous. This estimation procedure is based on the construction of an instrument matrix based on exogeneity conditions assumed on the explanatory variables of the model.

This study's estimations results are presented in Appendix 8.A2. As a first step, a Within model is estimated. As a second step, a Random estimation is performed. A Hausman test performed between the two estimators indicates that the hypothesis that there are no endogenous variables in the model is rejected. The use in a third step of the Hausman-Taylor method (HTIV) is then justified. Another Hausman test between the Within and the HTIV estimators enables us to test the validity of the exogeneity conditions (Overidentification test). The non rejection of the null hypothesis indicates that the instruments used to calculate the HTIV estimator can be considered as exogeneous. Endogeneous variables are distance, GDP levels and infrastructure levels.

4. Trade integration between the EU-15 and the CEECs

The equation described in Section 2 has been estimated over the period 1990–2005 for the 15 original members of the EU. As previously explained, the method is *out-sample*, which enables us to assess the main determinants of trade among Western European countries. The 'potential' (also called 'theoretical') volume of trade between the CEECs and the EU is then defined as the volume of trade that would prevail if trade was explained by the same factors determining trade between the EU-15 in the model. It is obtained by taking the coefficients of the variables in the model, and plugging in CEECs' actual values of the variables.

The ratio of actual to potential trade enables us to assess the trade integration between the CEECs and the EU. The high ratio of actual to potential Eastern European exports to the EU indicates high level of trade integration and implies that the CEECs have managed to compete successfully in the EU markets. These ratios show us to what extent we can anticipate increased trade between the CEECs and their trading partners within the EU: a low (high) ratio means a weak (strong) use of the trade potential and hence a low (strong) trade integration. In order to compare the evolution, the results are given for two years (1995 and 2005). Detailed results are available upon request.

4.1. Export potential of the EU-15 to the CEECs

Table 8.2 indicates actual to potential trade ratios for exports from the member countries of the EU-15 to the CEECs in 1995 and 2005. First, we can observe that trade integration between Germany and the CEECs is the greatest as the potential level of exports was already reached in 1995, and largely exceeded in 2005. This result had already been observed in many studies carried out in the nineties. Then, France and Spain had the highest ratios in

Table 8.2 Export Potential of EU-15 Members to the CEECs, in %

Country	*1995*	*2005*
Germany	121.2	198.3
Austria	5.3	7.2
Denmark	7.2	11.9
Spain	32.4	81.4
Finland	1.3	1.7
France	38.3	79.7
Greece	7.2	7.4
Ireland	13.2	16.2
Italy	45.1	65.7
Netherlands	26.1	63.7
Portugal	5.4	17.3
United Kingdom	39.7	54.8
Sweden	8.4	14.2
UEBL	24.1	53.1

Source: Authors' calculations.

2005, reflecting a strong integration between these partners and the CEECs: it is worth pointing out that these ratios increased strongly between 1995 and 2005, from less than 40 per cent to about 80 per cent.

Italy, the Netherlands, the United Kingdom and the UEBL (Belgium plus Luxembourg) achieve more than half of their potential exports towards the CEECs. On the other hand, the most important sources of Eastern European trade expansion with the EU-15 are to be found in trade with Finland, Austria and Greece. These results can be explained by geographical reasons: proximity of the Baltic countries for Finland, the central position of Austria (several common frontiers and short distances from many CEECs) and proximity to South East Europe for Greece. Last, it can be observed that the EU-15 countries are mostly integrated with Central European countries (Hungary, Poland and the Czech Republic).

4.2. Export potential of the CEECs to the EU-15

As in the previous section, some striking facts can be highlighted. Let's start again with the export potential to the whole region (Table 8.3). Two groups of countries can be observed. On the one hand, some countries were already quite well integrated with the EU-15 in 1995, and this integration had become even more pronounced in 2005: this is the case of Hungary Poland and the Czech Republic, and to a lesser extent Romania. On the other hand, there is still an important export potential for the Baltic countries, Bulgaria, Slovenia and Slovakia.

Detailed results also indicate that the EU-15 countries which are most integrated with the CEECs, that is Germany, France and Spain, are also those countries with which potential to actual export ratios of the CEECs are the highest. We can hence conclude that trade integration between Germany,

Table 8.3 Export Potential of the CEECs to EU-15 Countries, in %

Country	*1995*	*2005*
Bulgaria	17.2	25.7
Estonia	0.8	1.8
Hungary	44.9	89.3
Latvia	7.0	9.0
Lithuania	9.8	15.8
Poland	48.7	75.0
Romania	33.3	57.6
Czech Republic	43.9	85.3
Slovakia	4.2	9.9
Slovenia	14.4	13.5

Source: Authors' calculations.

Table 8.4 Germany's Share in CEECs Exports to the EU-15, in %

	Actual share		*'Theoretical' share*	
	1995	*2005*	*1995*	*2005*
Bulgaria	23.8	21.4	8.5	10.5
Estonia	13.4	8.4	0.9	1.4
Hungary	48.9	47.5	9.4	12.2
Latvia	25.0	13.5	7.2	9.8
Lithuania	30.8	17.9	11.4	14.9
Poland	54.5	41.9	17.2	21.8
Czech Republic	63.2	49.6	23.6	29.2
Romania	34.1	25.9	10.9	13.6
Slovakia	54.7	51.9	2.2	2.9
Slovenia	44.9	34.7	11.8	15.1

Source: Authors' calculations.

France and Spain on the one side, and Poland, Hungary and the Czech Republic on the other side, is a bilateral integration.

4.3. The leading position of Germany in trade between the EU-15 and the CEECs

As mentioned before, Germany rapidly substituted Russia as first trading partner of the CEECs, as it is today (and by far), their first trading partner within the EU. We were interested in checking whether this trade concentration on Germany is to be expected in the future: therefore we calculated the 'potential' share of Germany in CEECs imports and exports, and then compared this result with the actual share (Table 8.4). Results point out that between 1995 and 2005, the observed share of Germany in East European exports was reduced, whereas the 'theoretical' share had increased: the weight of Germany in the CEECs' trade thus seems to decrease and to converge on its theoretical value.

5. Trade integration within the CEECs

As mentioned before, Eastern European countries seem to be starting on a second adjustment stage, after a strong trade reorientation towards the EU: one can observe a strong increase of intra-regional trade (Table 8.5). We thus use our estimations to predict this intra-regional trade and to answer the following question: should mutual Eastern European countries' trade increase?

Our results lead to several remarks (Table 8.6). First, ratios of actual to potential trade are lower when calculated between CEECs than those calculated between the CEECs and the EU-15. This means that there is a great

Table 8.5 Share of the CEECs in Total Exports, 1995 and 2005, in %

	Slovenia	*Estonia*	*Hungary*	*Latvia*	Lithuania	*Czech Rep.*	*Slovakia*	*Poland*	*Romania*	*Bulgaria*
1995	5.5	12.0	10.4	8.5	13.6	24.3	45.7	7.4	3.5	3.7
2005	12.1	17.3	14.4	22.2	25.6	19.9	30.4	16.1	11.7	7.3

Source: CHELEM.

Table 8.6 Export Potential within the CEECs, in %

Country	*1995*	*2005*
Bulgaria	0.8	2.6
Estonia	1.6	6.0
Hungary	8.8	24.2
Latvia	0.9	3.7
Lithuania	1.6	6.7
Poland	6.6	24.8
Romania	1.6	9.7
Czech Republic	38.8	54.8
Slovakia	24.4	25.2
Slovenia	2.5	5.7
TOTAL CEECs	7.5	15.8

Source: Authors' calculations.

potential for more intra-regional trade eastwards. Second, Hungary, Poland, the Czech Republic and Slovakia have started to converge towards their 'theoretical' trade value (important increase of the ratios between 1995 and 2005), whereas the other Eastern European countries are still far from it.

6. Conclusion

Our chapter has proposed a new estimation of the potential trade of the Central and Eastern European countries. From a methodological point of view, we have introduced recent econometric developments in order to use a proper specification of the gravity equation. Our results point out that European trade integration is under way, but not completed yet for all countries. On the Western side, Germany often exceeds its potential, and its weight in CEECs' exports should be reduced. France and Spain are also close to their trade potential with the CEECs in 2005. On the Eastern side, Central European Countries are more integrated in the European economy than the other CEECs, and more mutual intra-regional trade eastwards can be anticipated.

On the one hand, CEE countries have managed to cope with the competitive pressure and market forces within the EU until 2005, but on the other hand they have become increasingly dependent on EU markets, and in particular on German market. This is why they are particularly affected by the collapse in global manufacturing and by the sharp decline in international trade flows induced by the financial crisis since the second half of 2008. The economic outlook of the CEEs has deteriorated sharply with the deep recession in their main trading partners (for instance, the German real GDP is expected to contract by about 5.5 per cent in 2009) and the contraction of exports.

Appendix

Table 8.A1 Sources and definitions of the data

X_{ij}	Exports of country *i* to country *j*, m US \$ Source: CEPII – Chelem
$Y_{i(j)}$	GDP of country *i* (*j*), m US \$ Source: CEPII – Chelem
D_{ij}	Geographic distance between countries *i* and *j* Source: CEPII
A_{ij}	$A_{ij} = 1$ if the countries *i* and *j* share a common border, 0 otherwise
$E_{i(j)}$	$E_{i(j)} = 1$ if the country *i* (*j*) does not have a direct access to the sea, 0 otherwise
L_{ij}	$L_{ij} = 1$ if the countries *i* and *j* share a common language, 0 otherwise
$UE_{i(j)}$	$UE_{i(j)} = 1$ if country *i* (*j*) is a member of the EU, 0 otherwise
$EURO_{i(j)}$	$EURO_{i(j)} = 1$ if country *i* (*j*) is a member of the euro area, 0 otherwise
$INF1_{i(j)}$	Density of paved roads in country *i* (*j*) Source: Euromonitor
$INF3_{i(j)}$	Number of telephone lines per capita in country *i* (*j*) Source: Euromonitor
$POP_{i(j)}$	Population of country *i* (*j*) Source: Euromonitor

Table 8.A2 Estimate results of the gravity equation

	Within	*Random*	*HTIV*
GDP ($\ln Y_i$)	0.242	0.372	0.247
	(5.77)***	(8.90)***	(6.06)***
GDP ($\ln Y_j$)	0.116	0.106	0.114
	(4.34)***	(3.89)***	(4.38)***
Border effect (A_{ij})		0.293	0.106
		(2.19)**	(0.16)
Distance ($\ln D_{ij}$)		−1.095	−1.872
		(16.35)***	(4.48)***
i is landlocked (E_i)		−0.532	−0.723
		(3.94)***	(1.18)
j is landlocked (E_j)		−0.252	−0.430
		(1.87)*	(0.70)
Common language (L_{ij})		0.254	−0.525
		(1.55)	(0.68)
EU (EU_i)	0.050	0.101	0.057
	(2.38)**	(4.87)***	(2.78)***
EU (EU_j)	0.048	0.094	0.054
	(2.28)**	(4.52)***	(2.62)***
EURO-zone ($EURO_i$)	0.093	0.087	0.092
	(5.67)***	(5.18)***	(5.78)***
EURO-zone ($EURO_j$)	0.045	0.040	0.045
	(2.77)***	(2.39)**	(2.81)***
Infrastructures (roads)	−0.188	−0.269	−0.192
($\ln INF1_i$)	(1.07)	(1.70)*	(1.13)
Infrastructures (roads)	−0.367	−0.365	−0.368
($\ln INF1_j$)	(2.10)**	(2.32)**	(2.18)**
Infrastructures (telephone)	0.046	0.253	0.081
($\ln INF3_i$)	(0.73)	(5.01)***	(1.36)
Infrastructures (telephone)	0.261	0.548	0.296
($\ln INF3_j$)	(4.34)***	(12.50)***	(5.23)***
Population ($\ln POP_i$)	−0.071	0.199	−0.027
	(1.02)	(3.96)***	(0.42)
Population ($\ln POP_j$)	0.201	0.552	0.243
	(3.06)***	(13.23)***	(3.99)***
Constant	3.340	1.767	15.545
	(2.19)**	(1.39)	(4.47)***
Number of observations	2912	2912	2912
Number of bilateral relations	182	182	182
R-squared	0.69		

Table 8.A2 (Continued)

	Within	*Random*	*HTIV*
Test bilateral effects ($\eta_{ij}=0$)	F (181.2703)= 89.24 Prob > F = 0.0		
Test time effects ($\omega_t=0$)	F (15. 703) = 18.40 Prob > F = 0.0	$\chi^2(15)=$ 166.07 Prob $>\chi^2=0.0$	$\chi^2(15)=$ 279.77 Prob $>\chi^2=0.0$
Hausman test (Within versus Random)		$\chi^2(27)=$ 3522.70 Prob $>\chi^2=0.0$	
Hausman test (Within versus HTIV) 'Overidentification test'			$\chi^2(27)=8.14$ Prob $>\chi^2=0.99$

*** Significant at the 1 per cent level, ** Significant at the 5 per cent level,
* Significant at the 10 per cent level.
Standard errors are in parenthesis.
Time dummies are not reported in order to save space.
Hausman-Taylor endogenous variables $= \ln Y_i$; $\ln Y_j$; $\ln INF1_i$; $\ln INF1_j$; $\ln INF3_i$; $\ln INF3_j$; $\ln D_{ij}$

Notes

1. Created in January 1949 by Bulgaria, Hungary, Poland, Romania, Czechoslovakia and the USSR and dissolved in June 1991.
2. See Anderson and Van Wincoop (2003), Baier and Bergstrand (2002), Brun, Carrère, Guillaumont and de Melo (2002) for a complete description of the model.
3. In Carrère (2006), the level of infrastructure is evaluated as the average of the density of roads, railways and the number of telephone lines per capita.
4. It can be shown that introducing an exporter effect and an importer effect, in addition to the bilateral effect, is a special case of the model with bilateral effects only (Egger and Pfaffermayr, 2003).
5. Time effects are supposed to be fixed. These fixed effects allow us to control for any 'business cycle' effect, or change in prices (FUEL, by example).
6. Presence of endogenous explanatory variables will be checked by a Hausman test.
7. This method is used by Peridy (2006), Carrère (2006), Serlenga and Shin (2004), Brun et al. (2002), among others.

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Part III

Income Inequality and Labour Market Evolution

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9
Is the Kuznets Hypothesis Valid for Transition Countries?

Olga Demidova

1. Introduction

The aim of this chapter is to validate the Kuznets hypothesis which states that the inequality in the distribution of income increases at lower levels of income and then decreases once a threshold level of per capita income is reached for the transition countries.

The chapter is organized as follows: Section 1 holds the review of the main literature devoted to testing the Kuznets hypothesis. Section 2 pursues the following objectives: to test the Kuznets hypothesis on the theoretical level; to determine the conditions on which the inverted-U dependence of the Gini index on the mean income might take place; and to give an economic interpretation of the mathematical results. Section 3 contains the empirical results confirming the Kuznets hypothesis for transition countries and Russian regions. The GDP per capita in the majority of transition countries and in the most Russian districts did not reach the corresponding turning point and therefore we expect an increase in the inequality in the distribution of income for these countries and regions. Section 4 concludes the chapter with some policy implication suggested.

2. Review of the main literature

More than 50 years ago Kuznets suggested that a relationship existed between income distribution and economic growth as a measure of economic development. The central question of his famous paper (Kuznets, 1955) was: 'Does the inequality in the distribution of income increase or decrease in the course of country's economic growth?' The main idea of the article was: 'In the early phases of industrialization in the undeveloped countries income inequalities will tend to widen before the levelling forces become strong enough first to stabilize and then to reduce income inequalities'. The conclusion he made was later referred to as 'The Kuznets hypothesis'. Graphically, the relationship between the measure of income inequality (usually the Gini index) and the measure of economic development (usually GDP per capita) can be shown as a curve in the form of a letter U turned upside down.

Godoy et al. (2004) have noted 'the Kuznets hypothesis has been used by economists to explain patterns of inequalities across and within nations'. Many investigators test the Kuznets hypothesis using cross-sectional data (Adelman and Morris, 1973; Paukert, 1973; Ahluwalia, 1976; Lydall, 1977; Loehr, 1981; Papanek and Kyn, 1986; Deininger and Squire, 1998 and so on). Most studies follow the parametric quadratic specification by regressing the Gini index on GDP per capita, its squared term and a set of socio-economic variables.

Findings of a positive coefficient on the GDP per capita variable and a negative coefficient on its squared term are considered supportive of the inverted-U Kuznets hypothesis. But the conformity in models with parametric quadratic (or higher degree) specification estimated by using the cross-sectional data is usually quite low. That is why researchers use the panel data (Barro, 2000; Iradian, 2005; Lee, 2006; Adams, 2008 and so on) or apply nonparametric methods for the data analysis (Mushinski, 2001; Huang, 2004; Huang and Lin, 2007).

Some authors note that the nature of the relationship differs according to a country's level of economic development and divide countries into two groups (developed and less developed) as a prerequisite to testing the Kuznets hypothesis. Savvides and Stengos (2000) used the threshold regression model. Sukiassyan (2007) remarks that the existing literature on the inequality and economic development 'has virtually ignored transition economies' and 'paper fills an important gap on the theme'. The author indicates that the effect of inequality on growth is negative for the transition economies of Central and Eastern Europe and the Commonwealth of Independent States.

This chapter continues the theme of relationship between the measure of income inequality and economic development for transition countries.

3. Theoretical and empirical approach

3.1. Theoretical approach

Suppose the population of a country is organized from high to low per capita incomes and is then divided into n number of equal groups.

Let X_1 be the income per capita of the poorest group, X_n be the income per capita of the richest group,

$$X_1 < \ldots < X_n;$$

$Z = \frac{1}{n}\sum_{i=1}^{n} X_i$ is the mean income;

$p_i = \frac{X_i}{\sum_{j=1}^{n} X_j}$ is the income share of i-th group, $i = 1, \ldots, n$,

The Gini index G is the most often used measure of income inequality. It can be computed as twice the area between the 45-degree line and the Lorenz curve multiplied by 100 per cent. Lorenz curve graphs cumulated income shares versus cumulative population shares.

One can show that

$$G = \left(1 - \frac{1}{n} - 2\frac{n-1}{n^2} \cdot \frac{X_1}{Z} - 2\frac{n-2}{n^2} \cdot \frac{X_2}{Z} - \ldots - \frac{2}{n^2} \cdot \frac{X_{n-1}}{Z}\right) \cdot 100\% \tag{9.1}$$

$$\text{or } G = \left(1 - \frac{1}{n} - 2\frac{n-1}{n} \cdot p_1 - 2\frac{n-2}{n} \cdot p_2 - \ldots - \frac{2}{n} \cdot p_{n-1}\right) \cdot 100\% \tag{9.2}$$

Thus G linearly depends on $X_1, \ldots, X_{n-1}$ and inversely on Z. The Gini index G also linearly depends on the income shares $p_1, \ldots, p_{n-1}$. The coefficients of the income shares $p_1, \ldots, p_{n-1}$ are negative and their absolute values decrease as the number of the income share (and the corresponding income) increases.

Remark 1. For the case of quantile groups ($n = 5$) from formula (9.2) it follows that

$$G = 100\% \cdot (0.8 - 1.6p_1 - 1.2p_2 - 0.8p_3 - 0.4p_4) \tag{9.3}$$

Generally, the Gini index G is a function of n variables: $X_1, X_2, \ldots, X_{n-1}, Z$.

Note that

$$\frac{\partial G}{\partial Z} = 2 \cdot \left(\frac{n-1}{n^2} \cdot X_1 + \frac{n-2}{n^2} \cdot X_2 + \ldots + \frac{1}{n^2} \cdot X_{n-1}\right) \cdot \frac{1}{Z^2} \cdot 100\% > 0,$$

$$\frac{\partial G}{\partial X_i} = -2 \cdot \frac{n-1}{n^2} \cdot \frac{1}{Z} \cdot 100\% < 0, \quad i = 1, \ldots, n-1$$

Hence, the Gini index increases as the mean income increases and decreases as the income of any income group with number $1, \ldots, n-1$ increases provided that other factors remain constant.

In general, the graph of the function G coincides with n – dimensional manifold $\tilde{G}_n$.

Suppose γ is a smooth curve on the manifold $\tilde{G}_n$, γ_{GZ} is the projection of the curve γ onto the plane GOZ, γ_{XZ} is the projection of the curve γ onto

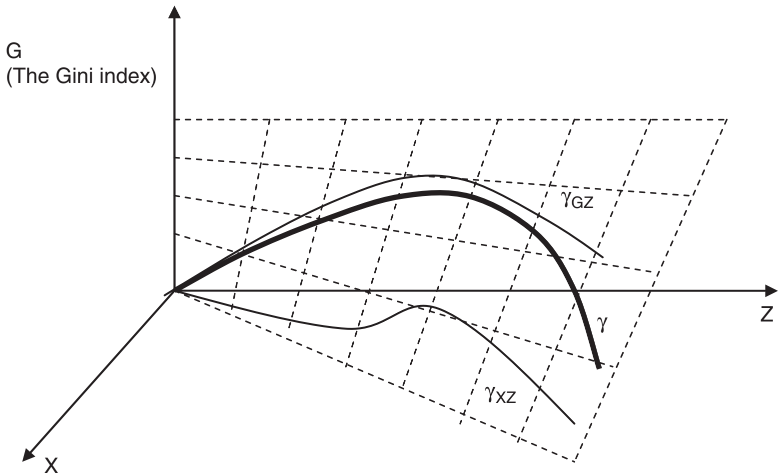

Figure 9.1 The curve on the manifold and its projections

the plane X_1OZ (Figure 9.1) with γ_{GZ} being the inverted U-curve. We keep only variables Z and X_1 for simplicity. It is quite interesting to determine the form of the curve γ_{XZ} in this case.

Let the curve γ_{GZ} be presented as $G=g(Z)$. Suppose that

$$\begin{cases} g'(Z)>0 \text{ for } 0 \le Z < Z^*, \\ g'(Z^*)=0, \\ g'(Z)<0 \text{ for } Z > Z^* \\ \text{and } g''(Z)<0 \end{cases} \tag{9.4}$$

where Z^* is so called turning point.

Substituting $g(Z)$ for G and zero for $X_2, \ldots, X_{n-1}$ in (9.1), we obtain expression for the curve γ_{XZ}: $X_1=\varphi(Z)$, where

$$\varphi(Z)=\frac{1}{2}Z\left(n-\frac{n^2}{n-1}g(Z)\right) \tag{9.5}$$

Differentiating both sides (9.5) two times, we obtain

$$\varphi'(Z)=\frac{1}{2}\left(n-\frac{n^2}{n-1}g(Z)\right)-\frac{n^2}{2(n-1)}\cdot Z\cdot g'(Z), \tag{9.6}$$

$$\varphi''(Z)=-\frac{n^2}{2(n-1)}(2g'(Z)+Zg''(Z)) \tag{9.7}$$

Substituting Z^* for Z in (9.6) and (9.7) and note that $g'(Z^*)=0$, we get

$$\varphi'(Z^*) = \frac{1}{2}\left(n - \frac{n^2}{n-1}g(Z^*)\right) \tag{9.8}$$

$$\varphi''(Z^*) = -\frac{n^2}{2(n-1)}Z^* g''(Z^*) \tag{9.9}$$

Using (9.5) for Z = Z*, we get $\varphi(Z^*) = \frac{1}{2}Z^* \cdot \left(n - \frac{n^2}{n-1}g(Z^*)\right)$, hence

$$\varphi'(Z^*) = \frac{\varphi(Z^*)}{Z^*} \tag{9.10}$$

Taking into account (9.6) (9.7) and (9.4), we obtain

$$\varphi'(Z) > 0 \textit{ and } \varphi''(Z) > 0 \textit{ for } Z \geq Z^* \tag{9.11}$$

From (9.9) (9.10) (9.11), we get the following graph for the function $\varphi(Z)$ (Figure 9.2). Function $\varphi(Z)$ is convex for $Z \geq Z^*$.

Remark 2. If $g(Z)$ is a polynomial of degree k then $\varphi(Z)$ is also a polynomial with degree $k+1$. For example if $g(Z)$ is a quadratic function then $\varphi(Z)$ is a cubical function.

Remark 3. If the projection of the curve γ onto the plane GOZ has an inverted-U form, then the projection of this curve onto any plane X_jOZ ($j = 2, \ldots, n-1$) has the same form as function $\varphi(Z)$ (Figure 9.2).

Remark 4. Suppose $G = g(Z)$ where $g(Z)$ has an inverted-U form. Then the relationship between p_i, $i = 1, \ldots, n-1$ and mean income Z is U-shaped. It follows from (9.2).

Let us state the main result of this section. In order for the Gini index to start dropping from a certain level of the mean income Z^*, it is essential for the income of low-income groups to increase with the mean income growth. In particular, for the Gini index to decrease quadratically, the income of the most low-income group X_1 must increase cubically.

Remark 5. The main theoretical result remains true in the case of violation of the conditions $g'(Z) > 0$, $g''(Z) < 0$ for $0 \leq Z < Z^*$ in (9.4). In this case the g function graph has a more complicated form than an inverted U-curve.

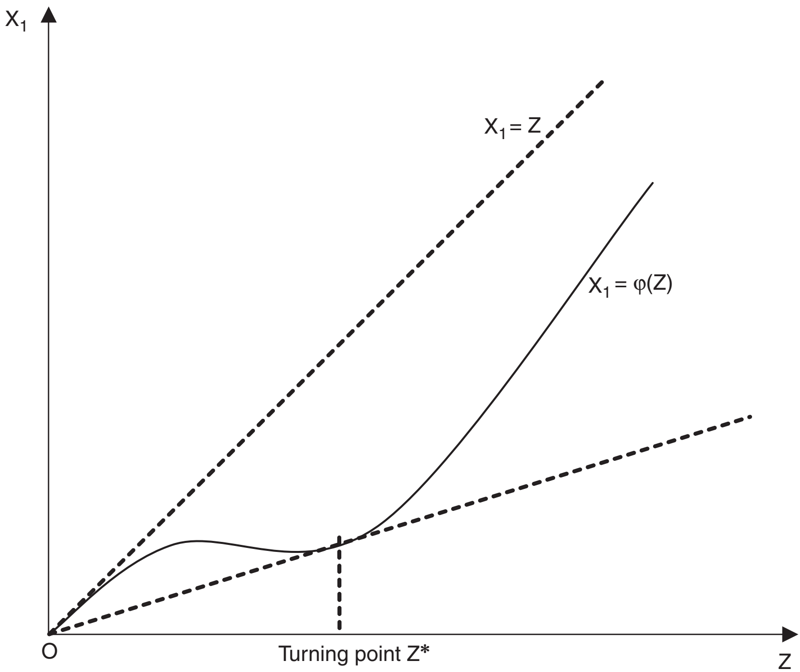

Figure 9.2 Projection on the plane X_1OZ

3.2. Empirical approach

Suppose we have a sample for m countries. Let us denote the set of observations for i – th country by $A_i = (X_1^i, X_2^i, \ldots, X_{n-1}^i, Z^i, G^i)$, $i = 1, \ldots,$ m, where X_j^i is an income per capita of the j – th group in the i – th country, $j = 1, \ldots, n - 1$, Z^i is the mean income in the i – th country, G^i is the Gini index for the i – th country. Then points $A_1, \ldots, A_m$ belong to the manifold $\tilde{G}_n$. This set of points is a proxy for the curve γ. Using the projections of the points A_1, …, A_m onto the planes GOZ and X_1OZ we estimate the functions $g(Z)$ and $\varphi(Z)$. First, we would try to estimate the parameters of the functions $g(Z)$ and $\varphi(Z)$ using quadratic and cubical specification correspondingly. If the regression coefficients are insignificant, we can use nonparametric specification.

4. Empirical results

4.1. Data and variables

The first data set used in this study (Appendix, Table 9.A1) is taken from the Human Development Report (2007/2008), CIA World Factbook, World

Development Indicators. Twenty nine transition countries were chosen. 'One attractive feature of this group of countries is that their starting points were remarkably similar. Yet, they subsequently have experienced substantial divergence in growth rates and income inequality' (Sukiassyan, 2007).

For each of the countries, three variables are considered. Those include the Gini index (denoted by GINI, a measure of inequality), the GDP per capita (PPP USD, denoted by GDP, a proxy for the mean income), and the 10 per cent low- income share (denoted by P10_). We also create the new variable X10_ – the income per capita of the low- income 10 per cent share, where $X10\_ = 0.1 \cdot P10\_ \cdot GDP$.

The second data set is from a panel of 84 Russian regions during the 2001–2007 periods (www.gks.ru). We use the coefficient of funds (denoted by INEQ, a measure of inequality) as a dependent variable and real income per capita (denoted by INCOME), measured as a ratio of per capita average money income and minimum subsistence level (a value estimate of a consumer basket (approved by the Federal Decree) and compulsory payments and dues). Consumer basket includes a minimum set of food and non-food goods and services, which are necessary for people's health safety and ensure their life activities. Undoubtedly, the data for the regions of the same country are more homogeneous than for different countries and we can obtain more accurate results using these data.

4.2. Parametric models for transition countries

The traditional regressions have been estimated in the following specification:

$$GINI = \beta_0 + \beta_1 GDP + \beta_2 GDP^2 + \varepsilon \tag{9.1}$$

$$P10\_ = \beta_0 + \beta_1 GDP + \beta_2 GDP^2 + \varepsilon \tag{9.2}$$

$$X10\_ = \beta_0 + \beta_1 GDP + \beta_2 GDP^2 + \beta_3 GDP^3 + \varepsilon \tag{9.3}$$

We obtain the following estimated equations using the least squares method:

$$\begin{array}{lllll} GINI & = 34.83 & + 0.00046\, GDP & - 3.51 \cdot 10^{-8} GDP^2 & (9.4) \\ t & 11.42 & 0.76 & -1.45 & \\ p\text{-}value & 0.000 & 0.457 & 0.159 & \end{array}$$

$$R^2 = 0.227, F = 3.82, \text{ Prob } > \text{F} = 0.035,$$

$$\begin{array}{lllll} P10\_ & = 3.297 & - 0.00009\, GDP & + 3.97 \cdot 10^{-9} GDP^2 & (9.5) \\ t & 7.33 & -0.95 & 1.11 & \\ p\text{-}value & 0.000 & 0.35 & 0.276 & \end{array}$$

$R^2 = 0.052,\ \text{F} = 0.71,\ \text{Prob} > \text{F} = 0.499,$

$$\underset{\substack{t \\ p\text{-value}}}{X10\_} = \underset{\substack{0.21 \\ 0.839}}{139.47} + \underset{\substack{1.14 \\ 0.263}}{0.27}GDP - \underset{\substack{-0.11 \\ 0.914}}{2.23 \cdot 10^{-6}}\,GDP^2 + \underset{\substack{0.45 \\ 0.653}}{2.31 \cdot 10^{-10}}\,GDP^3 \tag{9.6}$$

$R^2 = 0.88,\ \text{F} = 64.72,\ \text{Prob} > \text{F} = 0.000,$

The outputs indicate that the regressions (9.4) and (9.5) are insignificant (for level of significance 0.01), however the positive sign of $\hat{\beta}_1$ together with the negative sign of $\hat{\beta}_2$ in estimated equation (9.4) and opposite signs of these coefficients in estimated equation (9.5) demonstrate support of the Kuznets hypothesis. Increasing the polynomial degree doesn't change the situation. The coefficients of the nonlinear powers of GDP per capita in estimated equation (9.6) are insignificant, but the positive sign of $\hat{\beta}_3$ supports our theoretical result as shown in the graph of the function φ(Z) in Figure 9.2.

4.3. Non-Parametric models for transition countries

The low conformity and insignificance of the polynomial regressions coefficients was the reason why we estimated the unknown relationship between the Gini index and GDP per capita (and two other relationships) using the following relationship:

$$GINI = m(GDP) + \varepsilon \tag{9.7}$$

$$P20\_ = m(GDP) + \varepsilon \tag{9.8}$$

$$X20\_ = m(GDP) + \varepsilon \tag{9.9}$$

The conditional expectation function, m (...) was estimated using the Nadaraya-Watson estimator and the Gaussian kernel. Figures 9.3–9.5 contain kernel regressions (9.7)–(9.9) results.

As seen from Figures 9.3–9.5, the Kuznets hypothesis is confirmed (with small deviations) for the transition countries. The deviations are the following: the GINI index dependence on GDP per capita is not monotonously increasing before reaching the turning point. In the Figure 9.3, the corresponding function first increases, then decreases, then again increases, reaches the turning point and decreases. The dependence of the 10 per cent low-income share on GDP per capita approaches a U-form, and the dependence of the 10 per cent low-income on GDP per capita looks similar to the graph of the φ function in Figure 9.2.

Some deviation of the practical results from the theoretical ones is observed at the edges, which is typical for kernel regression. This problem

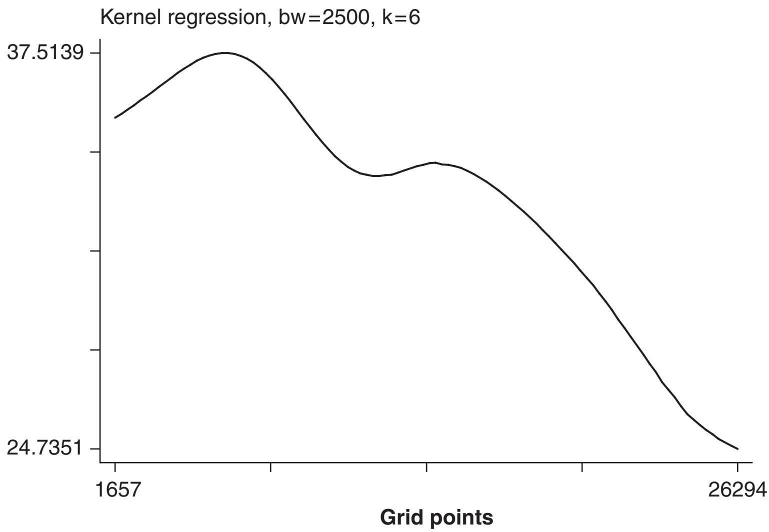

Figure 9.3 The estimated conditional mean of the Gini index on GDP per capita

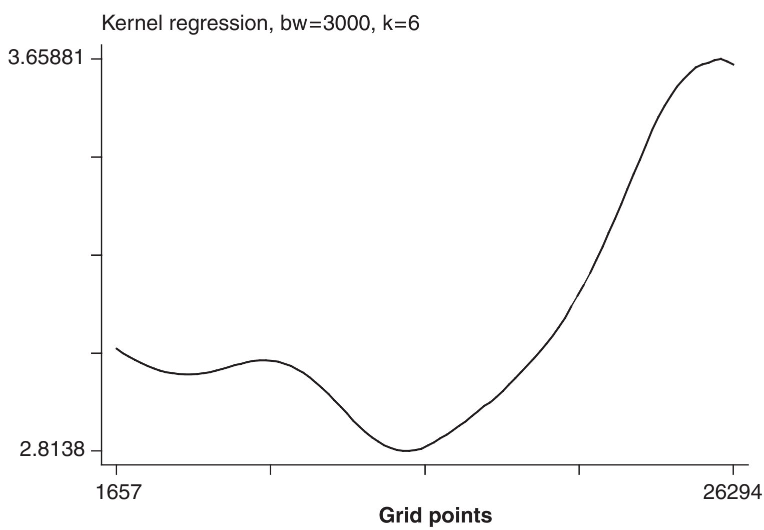

Figure 9.4 The estimated conditional mean of the 10 per cent low-income share on per capita GDP

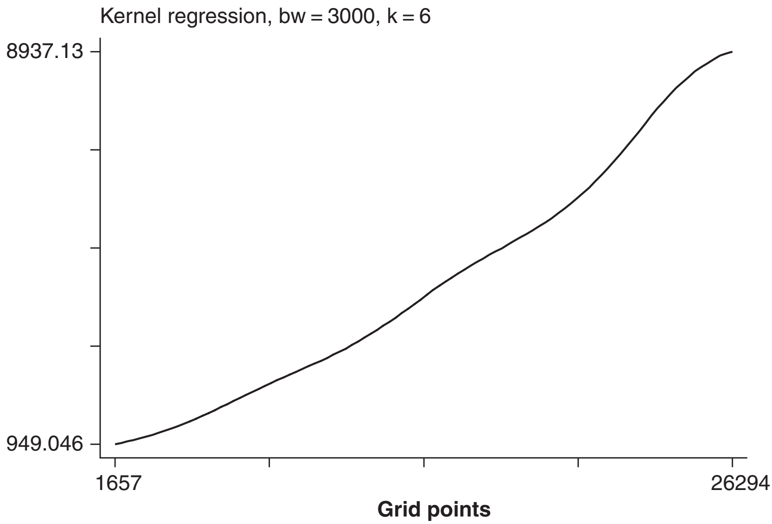

Figure 9.5 The estimated conditional mean of the poorest 10 per cent income per capita on GDP per capita

can be solved by using splines. Figures 9.6 and 9.7 contain the results of the third order spline smoothing.

The results of the spline smoothing and the kernel regression are similar and confirm the Kuznets hypothesis.

Remark 6. We use an alternative measure of income distribution, namely, the ratio of incomes for 20 per cent richest and 20 per cent poorest people; the ratio of incomes for 10 per cent richest and 10 per cent poorest people (coefficient of funds) with the same result.

Remark 7. The dependence of the 20 per cent low-income share on GDP per capita also approaches a U-form. The dependence of the poorest 20 per cent income per capita on GDP per capita curve has the same form as the one for poorest 10 per cent income per capita.

According to Figures 9.3–9.5, the turning point is ca. 14,000 (GDP per capita, PPP constant 2005 international $). Only nine transition countries (Latvia, Croatia, Poland, Lithuania, Estonia, Slovak Republic, Hungary, Czech Republic and Slovenia) have a GDP per capita greater than the turning point. For this reason we can expect an increase in the Gini index for the other 20 transitional countries before they reach the turning point. The GDP per capita for Russia equals 13,873 (PPP constant 2005 international $). All countries with a greater GDP per capita have a Gini index smaller than

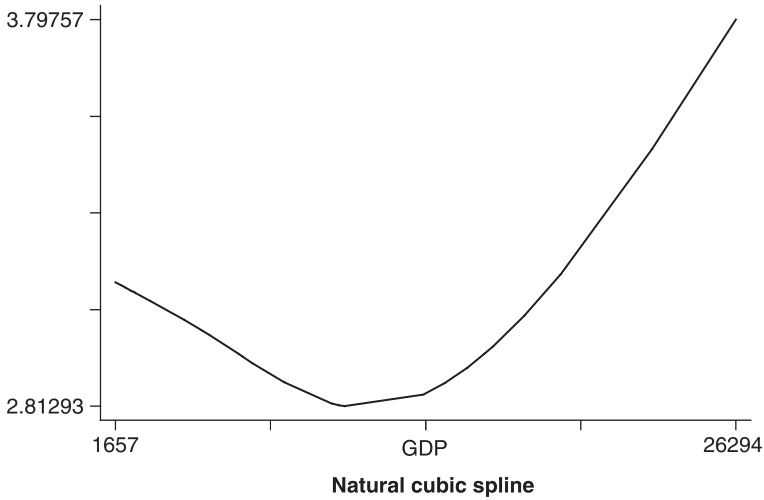

Figure 9.6 The spline smoothing of the 10 per cent low-income share on GDP per capita

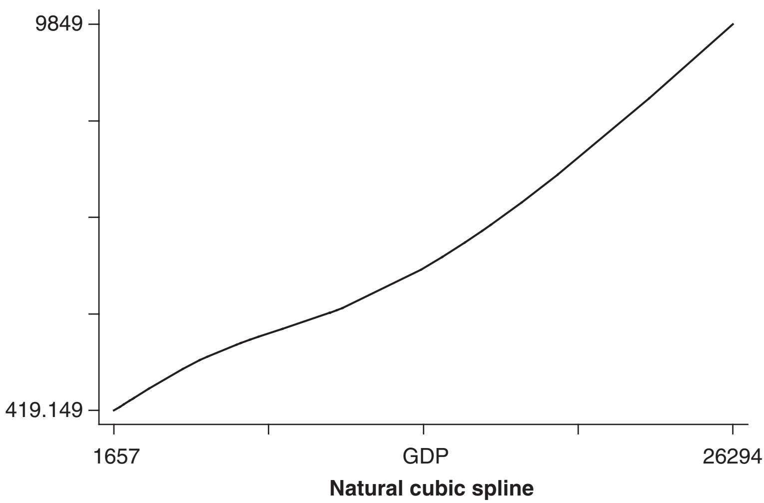

Figure 9.7 The spline smoothing of the poorest 10 per cent income per capita on GDP per capita

Russia. That is why we can expect a reduction of the inequality level in this country with an increasing GDP per capita after some increase. In the next section we will try to check this assumption using the panel data from Russian administrative districts.

4.4. Panel data models for Russian regions

Our basic empirical model is

$$INEQ_{it} = \mu + \beta_1 INCOME_{it} + \beta_2 INCOME^2_{it} + \alpha_i + \varepsilon_{it} \tag{9.10}$$

where i and t are the number of a region and time, respectively, i = 1, ..., 84, t = 2001, ..., 2007, $\varepsilon_{it} \sim IID(0, \sigma^2_{\varepsilon})$, α_i are constants for the fixed effects model and $\alpha_i \sim IID(0, \sigma^2_{\alpha})$ for random effects model.

The estimated equation with fixed effects is:

$$\begin{array}{lllll} INEQ = & 5.397 & +\ 4.057\ INCOME_{it} & -\ 0.353\ INCOME^2_{it} & (9.11) \\ t & 16.18 & 15.56 & -7.35 & \\ p\text{-}value & 0.000 & 0.000 & 0.000 & \end{array}$$

The F statistic for testing the significance of the individual effects is equal to 59.31, p-value = 0.0000, hence the hypothesis about the absence of individual effects is rejected.

The generalized least squares estimated random effects model is:

$$\begin{array}{llll} INEQ_{it} = & 5.544 & +3.73\ INCOME_{it} & -\ 0.248\ INCOME^2_{it} \\ z & 12.44 & 13.43 & -4.91 \\ p\text{-}value & 0.000 & 0.000 & 0.000 \end{array}$$

We perform a Breusch and Pagan Lagrangian multiplier test for choosing the best model between classical regression model with a single constant term and random effects model. The value of χ^2 test statistic is equal to 764.37, p-value = 0.000. We reject the null hypothesis in favour of the random effects model. Finally, for the Hausman test for fixed versus random effects the value of $\chi^2(2)$ test statistic is 173.98, p-value is equal to 0.000. We conclude that the fixed effects model is the preferred specification for the Russian data.

The coefficients of fixed effects model are highly significant and demonstrate support for the Kuznets hypothesis as the linear term is positive and the squared term is negative. 'The fixed effects model concentrates on a difference "within" individuals' (Verbeek, 2005, p. 347).

To reveal possible time effects we included a set of dummy variables for 2002, ..., 2007 years into the model and obtained the following result:

$$\underset{\substack{t\\ p\text{-value}}}{INEQ_{it}} = \underset{\substack{9.11\\0.000}}{4.55} + \underset{\substack{12.71\\0.000}}{5.003}\, INCOME_{it} - \underset{\substack{-8.58\\0.000}}{0.459}\, INCOME_{it}^2 - \underset{\substack{-2.61\\0.006}}{0.36}$$

$$d2002 - \underset{\substack{-4.48\\0.000}}{0.712}\, d2003 - \underset{\substack{-4.48\\0.000}}{0.653}\, d2004 - \underset{\substack{-4.73\\0.000}}{0.919}\, d2005 - \underset{\substack{-4.27\\0.000}}{0.97}$$

$$d2006 - \underset{\substack{-2.08\\0.000}}{0.515}\, d2007$$

All dummy variables' coefficients are significant and have negative signs. We can conclude that the inequality in Russian incomes decreases with time. At the same time, proceeding from the equation (9.11), we can see that turning point is 5.7 (minimum subsistence levels). But only the richest regions such as Moscow or Tyumenian region have this level of mean income. Consequently, for most Russian regions the growth in income inequality is observed, but the growth rate is decreasing.

Almost all the regions, except for the richest ones, have not yet reached such a level of mean income after which one can expect the decrease of the income distribution inequality.

4.5. Recommendations about inequality reduction in distribution of incomes

For the transition countries, incomes of the fifth quantile exceed incomes of the first quantile on the average in 5.48 times. One of the ways of income inequality reduction is redistribution of a part of incomes of the top quantile in favour of the poorest by means of a progressive scale of taxes for the fifth quantile and transfers to the first quantile.

Considering that $p_1 + p_2 + p_3 + p_4 + p_5 = 1$, from the formula (9.3) it is easy to obtain:

$$G = 100\% \cdot (0.8(p_5 - p_1) + 0.4(p_4 - p_2)) \tag{9.12}$$

If we reduce the incomes of the richest quantile group by θ per cent in favour of the poorest quantile (without changing incomes of the other groups) by means of taxes and transfers, incomes of the first quantile group will increase on $\frac{p_5}{p_1} \cdot \theta\%$. Using the formula (9.12), it is easy to show that in this case the Gini index will decrease by $1.6 \cdot \theta \cdot p_5$ %.

Table 9.1 contains the results of changes in the incomes of the first quantile and the Gini index as result of the reduction of the income by the fifth quantile on 1 per cent, 2 per cent, 3 per cent, 5 per cent, and 10 per cent.

Table 9.1 Results of Income Redistribution

	Reduction of income for richest 20%				
	1%	*2%*	*3%*	*5%*	*10%*
Poland					
increase in income the poorest 20%	6.00	12.00	18.00	30.00	60.00
decrease in Gini index	0.56	1.12	1.68	2.79	5.58
Bosnia and Herzegovina					
increase in income the poorest 20%	6.20	12.41	18.61	31.01	62.03
decrease in Gini index	0.68	1.37	2.05	3.42	6.85
Uzbekistan					
increase in income the poorest 20%	6.23	12.45	18.68	31.13	62.25
decrease in Gini index	0.71	1.41	2.12	3.54	7.07
Latvia					
increase in income the poorest 20%	6.28	12.56	18.84	31.40	62.79
decrease in Gini index	0.68	1.37	2.05	3.42	6.83
Lithuania					
increase in income the poorest 20%	6.29	12.59	18.88	31.47	62.94
decrease in Gini index	0.68	1.37	2.05	3.42	6.85
Estonia					
increase in income the poorest 20%	6.32	12.65	18.97	31.62	63.24
decrease in Gini index	0.69	1.38	2.06	3.44	6.88
Viet Nam					
increase in income the poorest 20%	6.43	12.86	19.29	32.14	64.29
decrease in Gini index	0.72	1.44	2.16	3.60	7.20
Russian Federation					
increase in income the poorest 20%	7.33	14.67	22.00	36.67	73.33
decrease in Gini index	0.70	1.41	2.11	3.52	7.04
Macedonia, TFYR					
increase in income the poorest 20%	7.41	14.82	22.23	37.05	74.10
decrease in Gini index	0.72	1.45	2.17	3.62	7.23
China					
increase in income the poorest 20%	8.00	16.00	24.00	40.00	80.00
decrease in Gini index	0.77	1.54	2.30	3.84	7.68
Georgia					
increase in income the poorest 20%	9.20	18.40	27.60	46.00	92.00
decrease in Gini index	0.74	1.47	2.21	3.68	7.36

We have considered only those countries in which the ratio of incomes for the richest 20 per cent and poorest 20 per cent of people is more than six. Just 1 per cent of the fifth group's income would increase income of the first group by 6–9 per cent.

5. Conclusion

In this section the basic theoretical and practical results obtained will be listed briefly. The point of the article is the validation of the Kuznets hypothesis which determines an inverted-U form for the relationship between measure of income distribution inequality and the mean income for transition countries. It has been shown that the Gini index is a function of the mean income and the incomes of all income groups except the richest group.

The proposal of an inverted-U shape for the Gini index on the mean income was formulated using the conditions for the first and second derivatives of certain functions. As a result of these conditions we can show the form of the dependence of the low-income group's income with the mean income. The drop in the Gini index after reaching the turning point is possible only when the low-income groups' income growth rising faster than mean income.

One possible way to increase the income of the poorest quantile group is repartition of the income of the richest quantile group to the first one with the help of progressive tax scale for the fifth quantile and transfers to the first quantile. For example, reduction of incomes by the fifth quantile by 3 per cent will allow to increase the income of the first quantile by 18–27 per cent and to reduce the Gini index more than by 2 per cent.

The cross section data of 29 countries confirm the validity of the Kuznets hypothesis for transition countries. For this group of countries the turning point of ca. 14,000 PPP USD was found. But 20 of 29 countries with transition economy have GDP per capita less than the threshold level after which a reduction in the inequality of the distribution of incomes is expected.

Among the countries with lower GDP per capita, Russia is the closest one to the turning point. We can expect reduction of the inequality level in this country with an increasing GDP per capita. The panel data for Russian regions also confirm the Kuznets hypothesis, but almost all the regions, except for the richest ones, have not yet reached such a level of mean income after which one can expect the decrease of the income distribution inequality.

Appendix

Table 9.A1 Inequality in Income or Expenditure

Country	Measure of income or consumption			Unequality measures		GDP per capita
	poorest 10% (20%)	*richest 10% (20%)*	*Survey year*	*GINI index*	*Survey year*	*PPP (constant 2005 international $), 2007*[a]
Albania	3 (8)	26 (41)	2005[a]	33	2005[a]	6707
Armenia	1.6 (9)	41.3 (43)	2003[a]	37	2006[b]	5377
Azerbaijan	6.1 (13)	17.5 (30)	2005[a]	36.5	2001[a,b]	7414
Belarus	3.6 (9)	22 (37)	2005[a]	27.4	2007[c]	10, 238
Bosnia and Herzegovina	2.8 (6.9)	27.4 (42.8)	2004[a]	56.2	2007[b]	7088
Bulgaria	3 (8.7)	25.5(38.1)	2007[b]	30.7	2007[b]	10, 529
China	2.4 (6)	31.4 (48)	2005[a]	47	2007[b]	5084
Croatia	3.6 (9)	23.1 (38)	2005[a]	29	2008[b]	14, 729
Czech Republic	4.3 (10.2)	22.4 (36.2)	1996[b,d]	26	2005[b]	22, 953
Estonia	2.7 (6.8)	27.7 (43)	2004[a]	34	2008[b]	19, 327
Georgia	1.9 (5)	30.6 (46)	2005[a]	40.8	2005[a]	4403
Hungary	3.5 (8.6)	24.1(38.7)	2004[a]	28	2005[b]	17, 894
Kazakhstan	3 (7.4)	25.9 (41.2)	2003[d]	30.9	2007[c]	10, 259
Kyrgyz Republic	3.6 (8.1)	25.9 (41.4)	2004[a]	32.9	2004[a]	1894
Lao PDR	3.7 (8.5)	27 (41.4)	2003[a]	33	2003[a]	2044
Latvia	2.7 (6.8)	27.4 (42.7)	2004[a]	36	2005[b]	16, 317
Lithuania	2.7 (6.8)	27.4 (42.8)	2004[a]	36	2005[b]	16, 659
Macedonia, TFYR	2.4 (6.1)	29.4 (45.2)	2003[a]	39	2003[a]	8350
Moldova	3.2 (7.3)	26.4 (43.1)	2003[b,d]	32.9	2007[c]	2409
Mongolia	2.9 (7)	24.9 (40)	2005[a]	33	2005[a]	3056
Poland	3 (7)	27.2 (42)	2005[a]	34.9	2005[a]	15, 634
Romania	1.2 (8)	20.8 (40)	2006[b]	32	2008[b]	10, 750
Russian Federation	1.9 (6)	30.4 (44)	2007[b]	42.2	2007[c]	13, 873
Slovak Republic	3.1 (8.8)	20.9 (34.8)	1996[b,d]	26	2005[b]	19, 342
Slovenia	3.4 (8.2)	24.6 (39.4)	2004[a]	24	2005[b]	26, 294
Tajikistan	3.2 (7.7)	26.4 (41.4)	2004[a]	32.6	2006[b]	1657
	3.4 (9)	25.7 (37)	2006[b]	27.3	2007[c]	6529
Uzbekistan	2.8 (7.1)	29.6 (44.2)	2003[b]	36.8	2003[b]	2290
Viet Nam	3.1 (7)	29.8 (45)	2006[a]	37.8	2006[a]	2455

a) *Source*: World Development Indicators, http://82.179.249.32:2391/ext/DDPQQ/report.do?method=showReport
b) *Source*: CIA World Factbook, www.cia.gov/library/publications/the-world-factbook/fields, date 14.05.2009.
c) *Source*: ROSSTAT, www.gks.ru/b gd/regl/B08_39/IssWWW.exe/Stg/05-04.htm
d) Human Development Report 2007/2008.

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10
Perceived Job Security in Transition Countries: A Comparative Perspective

Marco Facchinetti and Federica Origo

1. Introduction[1]

In the past decades the intensification of competitiveness due to market globalization and the growing role of Asian economies such as China and India, together with the spread of new Information and Communication Technologies (ICT), have generated new challenges in many developed countries. Adaptability and the capacity to respond rapidly to changes in demand and markets have become crucial for firms' survival, which have also made major changes to their organization, management style and work practices.

Many OECD countries are still trying to find an optimal way to combine the interests of the parties involved – employers and workers – through an equal sharing of the increased risk due to the new economic environment. In spite of their economic and institutional differences, these countries share the same main problem: how to promote sustainable economic growth, which entails maintaining high competitiveness and flexibility, as well as countering the increasing sense of job insecurity (OECD, 2003; Schmidt, 1999).

In the past decade, this feeling of insecurity has increased in many countries, regardless of their initial levels of employment protection legislation (Auer and Cazes, 2003). Even in the USA, where employment protection legislation is low and 'employment at will' has always been the norm, there has been a significant reduction in the average of employment duration (Neumark et al., 1999). Furthermore, the role of contingent work and temporary agency work has been continuously growing, while the downsizing of various industries has generated the so-called 'firing democratization' process, with lay-offs occurring throughout the occupational ladder, from middle (and top) managers to manual workers (Farber, 2003).

In light of the increasing share of temporary employment and the reforms of employment protection legislation carried out in many EU countries (albeit often 'at the margin'), the socio-economic debate in Europe has focused on the relationship between flexibility and security. In this regard, two opposite views seem to emerge: the 'trade-off' theory and the 'flexicurity' thesis (Muffels and Luijkx, 2005). The former hypothesis envisages the existence of a negative relationship between flexibility and security, especially for the weakest workers, such as the low-skilled and the young, for whom a high level of flexibility (mainly with the use of temporary contracts) has often been achieved by reducing their job security. Conversely, the 'flexicurity' thesis postulates that flexibility is not necessarily the opposite of security, and that they can both be increased through appropriate labour market policies and institutions (Madsen, 2002; Wilthagen and Tros, 2004). This model was first implemented in the Netherlands and Denmark, where the good results gained in terms of declining unemployment rates and increasing perceived security have been evidence in favour of the combination of high numerical flexibility, low employment protection legislation, a generous social security system, and effective labour market policies.

More numerical (external) flexibility is thus acceptable when appropriate labour market policies can ensure that workers have employment opportunities throughout their lives (EMCO, 2006). The flexicurity approach is also characterized by a shift from job security (the same job all life long) to employment security (any job all life long), thus highlighting the central role of lifelong learning in matching workers' skills with firms' needs.

In this regard, it is of particular interest to look at the experience of the Central and Eastern European countries, which since the beginning of the 1990s have sought to facilitate the adjustment of the business sector to increasing international competition by combining reduced levels of employment protection legislation with generous income support and job-search assistance for laid-off workers. However, dramatically rising unemployment levels during the transition phase made this system financially unsustainable, forcing policymakers to reduce unemployment benefits, also in order to favour the re-employment of job-seekers. There was then a shift from a sort of (albeit implicit) flexicurity model to a 'pure flexibility' policy (Cazes, 2008). Despite these reforms, in the early 2000s most Central and Eastern European countries were still recording poor labour-market performances, characterized by low participation and employment rates, persistently high unemployment rates in some countries (particularly Poland) and mainly among the young, and high levels of perceived job insecurity. The latter has also negatively affected labour-market turnover in recovery years by reducing voluntary quits and causing inefficient labour reallocation (Cazes and Nesporova, 2003; World Bank, 2005).

In light of these results, in 2002 the ILO launched a project in the area in order to increase both awareness and country-level research[2] on the desirability of balancing flexibility for firms with income and employment security for workers (Cazes and Nesporova, 2007).

Also the European Commission has recently emphasized the need to achieve an optimal balance between flexibility and security. The group of experts on flexicurity, set up by the European Commission in 2006 in order to issue a set of guidelines for the Member States, has recently published a report in which it reaches consensus on a definition of flexicurity which comprises four main components (European Expert Group on Flexicurity, 2007):

- flexible and secure contractual arrangements and work organizations, from the perspective of both the employer and the employee, also thanks to modern labour laws and modern work organization;
- active labour market policies (ALMP), which help people to cope with rapid organizational changes, unemployment spells and transitions to new jobs;
- reliable and responsive lifelong learning systems (LLL), to ensure the adaptability and employability of all workers;
- modern social security systems, which should be able to provide adequate income support and facilitate labour market mobility.

Given the main features of the flexicurity model, a central issue is how workers feel about their jobs and, more generally, about their employment status. There is in fact some evidence that perceived job security is one of the most important determinants of job satisfaction (Green et al., 2000, 2001; Theodossiou and Vasileiou, 2007), and that it influences overall well-being and workers' behaviour (Bockerman, 2004). Perceived job security seems also directly to influence productivity (Buchele and Christiansen, 1999). Moreover, Aaronson and Sullivan (1999) provide evidence on the link between the stagnation of wages in the USA and the decrease in job security during the 1990s. Finally, low job security may reduce consumption expenditure when it heightens uncertainty about future income (Benito, 2006; Stephens, 2003).

In recent years, the overall decrease in job tenure and the growth of temporary work have caused perceived job security to decrease in many European countries. However, recent studies have shown that temporary contracts per se are not necessarily associated with low perceived security or low job satisfaction. For example, using micro-data from the ECHP for 1995–2000, Ferrer-i-Carbonell and van Praag (2006) show that the effect of temporary employment on job satisfaction is quite different in Spain and the Netherlands, with a strong negative correlation between them emerging only in the case of Spain. One of the explanations provided by the authors for this result is the different level of uncertainty associated with temporary contracts in the two countries. Indeed, as mentioned above, The Netherlands are considered, together with Denmark, as a country where the flexicurity model has been successfully implemented.

Other studies point out that the negative impact of temporary contracts on job satisfaction emerges only for specific forms of temporary employment, such as seasonal jobs or temporary agency work, or for specific job aspects like career prospects (Bardasi and Francesconi, 2003; Booth et al., 2002; De Graaf-Zijl, 2005; De Witte and Naswall, 2003). Using micro data from the Eurobarometer survey and splitting workers into groups according not only to their employment contract (that is, permanent or temporary), but also to their perceived job security, Origo and Pagani (2009) show that what matters for job satisfaction is not just the type of contract, but mainly individual perceived job security, which may be independent of the type of contract. The 'temporary but secure job' seems preferable to the 'permanent but insecure job', showing that the length of the contract may be less important if the worker perceives that he or she is not at risk of becoming unemployed.

Despite these structural results, it is evident that the negative effect of holding a temporary contract on job security is stronger during economic downturns, provided that temporary workers are usually employed by firms as a 'buffer' to cope with business fluctuations. The most recent data available actually show that during the current economic crisis the share of temporary workers in total employment has been declining in many EU countries in 2008–2009, while unemployment has been increasing, especially in many Eastern and Mediterranean countries (Table 10.1). Furthermore, most of the EU countries registering the largest reduction in temporary employment are also characterized by the highest share of people declaring that the current economic crisis has been negatively influencing their personal condition (see the last column in Table 10.1). This indicator is particularly high for the Mediterranean and Eastern Countries, while it is very low for the Nordic ones and the Netherlands.

Despite the existence of such heterogeneity across EU regions, no direct evidence has been provided to date on the (different) effect of temporary employment on perceived job security in countries with different flexicurity models.

In light of these considerations, our aim in what follows is to shed more light on the possible interaction between flexibility and security, showing how the effect of temporary employment on workers' perceived job security can change depending on the model of flexicurity considered. Our main research hypothesis is that temporary employment may be less detrimental to perceived security if temporary workers live in a country characterized by the 'right' combination of flexibility and labour market policies.

Given this aim, the rest of the chapter is organized as follows: in Section 2 we briefly sketch the main features of the prevailing flexicurity models in Europe, discussing the possible links between these macro-models and the combination of flexibility and security at the workers' level. In Section 3 we present the data and the basic definitions used in the empirical analysis,

Table 10.1 Recent trends in the EU labour markets and the perceived impact of the current economic crisis

	Temporary employment (% of total employment)					*Unemployment rate*					*Perceived impact of the economic crisis**
	2005	*2006*	*2007*	*2008*	*2009Q1*	*2005*	*2006*	*2007*	*2008*	*2009 Q1*	*2009 Q1*
EU (25 countries)	14.5	15.0	15.1	14.7	–	8.0	7.1	6.3	6.2	7.4	22.8
EU (15 countries)	14.3	14.7	14.8	14.4	–	7.3	6.8	6.2	6.2	6.4	19.6
Czech Republic	8.6	8.7	8.6	8.0	–	7.9	7.1	5.3	4.4	5.2	13.0
Estonia	2.7	2.7	2.1	2.4	2.0	7.9	5.9	4.7	5.5	11.1	31.0
Latvia	8.4	7.1	4.2	3.3	–	8.9	6.8	6.0	7.5	14.6	34.0
Lithuania	5.5	4.5	3.5	2.4	1.6	8.3	5.6	4.3	5.8	13.4	33.0
Hungary	7.0	6.7	7.3	7.9	–	7.2	7.5	7.4	7.8	8.9	50.0
Poland	25.7	27.3	28.2	27.0	–	17.7	13.8	9.6	7.1	7.5	12.0
Slovenia	17.4	17.3	18.5	17.4	14.1	6.5	6.0	4.8	4.4	4.7	27.0
Slovakia	5.0	5.1	5.1	4.7	–	16.3	13.4	11.1	9.5	10.2	21.0
Eastern countries	**10.0**	**9.9**	**9.7**	**9.1**		**10.1**	**8.3**	**6.7**	**6.5**	**9.4**	**27.6**
Cyprus	14.0	13.1	13.2	13.9	12.3	5.3	4.5	3.9	3.7	4.7	31.0
Greece	11.8	10.7	10.9	11.5	11.3	9.8	8.9	8.3	7.7	–	49.0
Italy	12.3	13.1	13.2	13.3	–	7.7	6.8	6.1	6.7	–	27.0
Malta	4.5	3.7	5.1	4.3	–	7.3	6.9	6.5	6.0	6.5	33.0
Portugal	19.5	20.6	22.4	22.8	21.5	7.6	7.7	8.0	7.6	8.8	29.0
Spain	33.3	34.0	31.7	29.3	25.4	9.2	8.5	8.3	11.3	16.5	25.0
Mediterranean countries	**15.9**	**15.9**	**16.1**	**15.9**		**7.8**	**7.2**	**6.9**	**7.2**	**9.1**	**32.3**

Table 10.1 (Continued)

	Temporary employment (% of total employment)					*Unemployment rate*					*Perceived impact of the economic crisis**
	2005	*2006*	*2007*	*2008*	*2009Q1*	*2005*	*2006*	*2007*	*2008*	*2009 Q1*	*2009 Q1*
Austria	9.1	9.0	8.9	9.0	8.8	5.2	4.7	4.4	3.8	4.3	7.0
Belgium	8.9	8.7	8.6	8.3	–	8.4	8.2	7.5	7.0	7.2	17.0
France	14.1	14.1	14.4	14.2	–	8.8	8.8	7.9	7.4	8.6	23.0
Germany	14.1	14.5	14.6	14.7	–	11.1	10.2	8.6	7.5	7.4	10.0
Luxembourg	5.3	6.1	6.8	6.2		4.5	4.7	4.1	5.1	5.9	24.0
Netherlands	15.5	16.6	18.1	18.2	–	4.7	3.9	3.2	2.8	2.8	4.0
Continental countries	**11.2**	**11.5**	**11.9**	**11.8**		**7.1**	**6.8**	**6.0**	**5.6**	**6.1**	**14.2**
United Kingdom	5.8	5.8	5.9	5.0	5.4	4.8	5.4	5.3	5.6	6.8	17.0
Ireland	3.7	3.4	7.3	8.5	–	4.3	4.4	4.6	6.0	10.0	41.0
English-speaking countries	**4.8**	**4.6**	**6.6**	**6.8**		**4.6**	**4.9**	**5.0**	**5.8**	**8.4**	**29.0**
Denmark	9.8	8.9	8.7	8.4	8.8	4.8	3.9	3.8	3.3	4.7	4.0
Finland	16.5	16.4	15.9	15.0	13.1	8.4	7.7	6.9	6.4	7.2	3.0
Sweden	16.0	17.3	17.5	16.1	14.1	7.8	7.1	6.2	6.2	7.7	4.0
Nordic countries	**14.1**	**14.2**	**14.0**	**13.2**	**12.0**	**7.0**	**6.2**	**5.6**	**5.3**	**6.6**	**3.7**

Source: Eurostat and Eurobarometer
–data not available
* Share of people declaring that the current economic crisis is having very important repercussions on their personal situation.

whose main results are presented in the following two Sections (descriptive statistics in Section 4, econometric results and robustness checks in Section 5). The last Section concludes.

2. Flexibility and security: From macroeconomic models to microeconomic relationships

The relationship between flexibility and security has been traditionally investigated at the macroeconomic level, the aim being to classify the EU countries according to their prevailing mix of labour market and social policies.

One of these classifications has been recently proposed by the European Commission, which has considered four main variables intended to capture different dimensions of flexicurity at the country level: strictness of employment protection legislation (EPL) as a measure of numerical flexibility, expenditure on labour-market policies (LMPs, both passive and active) as a percentage of GDP as a proxy for security, percentage of participants in lifelong training programmes as a measure of employability, and average tax-wedge as a measure of the distortions created by the tax system (European Commission, 2006). The results of the principal component analysis carried out on the basis of these variables made it possible to cluster the EU countries into five main groups, corresponding to different flexicurity models: English-speaking countries (UK and Ireland), characterized by high flexibility (low EPL) and low security (due to low spending on LMPs); Continental countries (Germany, Belgium, Austria and France), with intermediate-to-low flexibility and intermediate-to-high security; Mediterranean countries (Spain, Portugal and Greece), combining low flexibility (high EPL) and low security; Nordic countries (Denmark, Sweden and Finland) and the Netherlands, with intermediate-to-high flexibility and high security. The Eastern European Countries (Czech Republic, Hungary, Poland and Slovakia) lie somewhere between the Mediterranean and the English-speaking countries in that they are characterized by very low levels of security combined with intermediate levels of flexibility.[3]

These clusters are quite robust to the methodology and the definition of the variables used: similar results have in fact been obtained by Muffels and Luijkx (2005) on the basis of more theoretical considerations on the main features of the prevalent welfare regimes in Europe, and by Nicoletti et al. (2000), who used separate measures of EPL for, respectively, regular and temporary jobs.[4]

Starting from these macroeconomic results, we claim that the relationship between temporary employment and perceived job security at the individual level is strongly influenced by the flexicurity model prevailing in the country where workers live. More specifically, individual perceived job security should be less correlated with the formal level of employment protection that characterizes workers' employment contracts in countries combining high numerical flexibility with a generous welfare system and effective labour market policies. From this perspective, temporary workers may not feel that their jobs are insecure if they are likely to be continuously in work, or if, should they lose their jobs, they can count on income stability thanks to generous unemployment benefits and are likely to re-enter employment rapidly. By contrast, temporary workers should feel particularly insecure if they are likely to lose their jobs and if the labour market is characterized by low flows out of unemployment (and thus by a high incidence of long-term unemployment) due, for example, to strict EPL or to low spending on LMPs.

Given the above classification of the flexicurity models, our main research hypothesis is that temporary workers feel relatively less insecure compared with permanent ones in the so-called 'flexicurity countries' (such as Denmark and the Netherlands), while they feel relatively more insecure in the Mediterranean countries.

3. Data and definitions

The core of the empirical analysis conducted in this study is based on individual data from the Fourth European Working Conditions Survey. This survey has been carried out by the European Foundation for the Improvement of Living and Working Conditions, and it covered 31 EU countries in 2005. The survey was designed to investigate the conditions of work across the EU Member States and other European countries, and it reports workers' points of view on a wide range of work-related issues, such as work organization, wage structure, working time, contractual arrangements, equal opportunities, training and job satisfaction. It also includes demographic and other background information like age, gender, education, family composition and, of course, country. Like many other individual socio-economic surveys, some questions required subjective evaluations on specific work aspects, such as work-related health, exposure to risk, work intensity, as well as perceived job security, which is the object of this study. Even if subjective measures may differ from objective ones, it is not necessarily true that the latter are always preferable to the former: in most cases it is the perceived reality that has social effects, not reality itself (Karppinen et al., 2006).

The target number of interviews was 1000 in all countries except the smallest ones (Cyprus, Estonia, Luxemburg, Malta and Slovenia), in which it was 600. The survey also provides sampling weights in order to enable reliable comparisons to be made across countries (for further details, see European Foundation for the Improvement of Living and Working Conditions, 2005).

For our empirical analysis, we used data from the EU-25 Member States, restricting our sample to workers aged 15–70 years. Furthermore, given the object of our analysis, we excluded workers with no contracts, whose economic and social situations were likely to differ substantially across countries. After also dropping the observations with some missing values for the relevant variables, we ended up with a final sample of 17,506 observations.

Appendix 10.A1 gives precise definitions of all the variables used in our analysis. Here we focus on the definitions of perceived job security and temporary employment.

Perceived job security is our key (dependent) variable. The precise wording of the relative question in the survey was: 'How much do you agree or disagree with the following statement: "I might lose my job in the next six months"'. The respondents could strongly agree, agree, neither agree nor disagree, disagree or strongly disagree with this statement. On the basis of this set of possible answers, we created a dummy variable for perceived job security according to which 'secure workers' were those who strongly disagreed with the statement, while 'insecure workers' were all the remaining individuals. Even though we used a strict definition for perceived security, more than 40 per cent of the sampled workers can be considered as 'secure'.[5]

The 'type of contract', our key independent variable, was evaluated by the question 'What kind of employment contract do you have?'. The possible answers were: an indefinite contract; a fixed-term contract; a temporary employment agency contract; an apprenticeship or other training scheme; no contract.

We considered as 'permanent workers' only those with indefinite contracts, while 'temporary workers' were those on fixed-term contracts, a temporary employment agency contract, an apprenticeship or any other training scheme. As mentioned above, we excluded from our analysis those workers who declared that they had no contract: without further information on the relation of these workers with their companies, and given the institutional differences across EU countries, the inclusion of this category could have made interpretation of the results more difficult. We then defined a dummy variable which took a value equal to one for temporary workers, 0 otherwise.

4. Descriptive statistics

Table 10.2 reports perceived job security by type of contract, gender, age and level of education. As expected, on average the share of secure workers is much higher among permanent workers (43 per cent) than among temporary ones (24 per cent): perceived security for permanent workers is thus almost two times higher than that of temporary ones. A statistically significant gap in perceived job security by type of contract is recorded for all the groups considered, regardless of gender, age and education.

Furthermore, within each type of contract, there are no marked differences between males and females, while more heterogeneity seems to emerge by age and by education. In the case of permanent workers, the youngest

Table 10.2 Perceived job security by type of contract and workers' characteristics (Incidence of secure workers)

	Type of contract		*TOTAL (c)*	*(b)–(a)*
	TEMPORARY (a)	*PERMANENT (b)*		
TOTAL	0.244	0.425	0.397	0.181
Means by:				
GENDER				
Males	0.243	0.419	0.394	0.176
Females	0.245	0.429	0.399	0.185
AGE				
< 30	0.249	0.380	0.339	0.131
30–49	0.242	0.430	0.407	0.188
> 50	0.238	0.441	0.421	0.203
EDUCATION				
Compulsory school	0.205	0.385	0.354	0.180
High school	0.216	0.381	0.355	0.165
University	0.334	0.533	0.504	0.198

Note: In the last column, the difference between permanent and temporary workers is always statistically significant (p-value$<$0.01).

workers exhibit the lowest level of security (38 per cent), while perceived security is slightly above the average for prime-age workers and older workers. There is thus some evidence of a positive relation between security and age for permanent workers, while no clear-cut relationship emerges for temporary ones (the share of secure workers is almost 25 per cent among the youngest ones, only slightly higher than that registered for the other age groups). As a result, the difference in perceived job security between permanent and temporary workers is lower for young workers than for older ones.

Education seems to be more closely correlated with perceived security, regardless of the type of contract considered: for both temporary and permanent workers, the share of secure workers substantially increases with the level of education, and particularly with a university degree. The share of secure workers with upper-secondary diplomas is in fact similar to that recorded for low-educated workers. Despite these differences, the gap in perceived security between permanent and temporary workers is similar across educational levels, which shows that the rate of increase in perceived security with education is largely the same for the two types of contract considered.

Figure 10.1 shows the difference in perceived job security between workers with temporary and permanent jobs (left panel) and the average perceived job security (right panel) across European countries. Countries are clustered according to the flexicurity models discussed in Section 2.

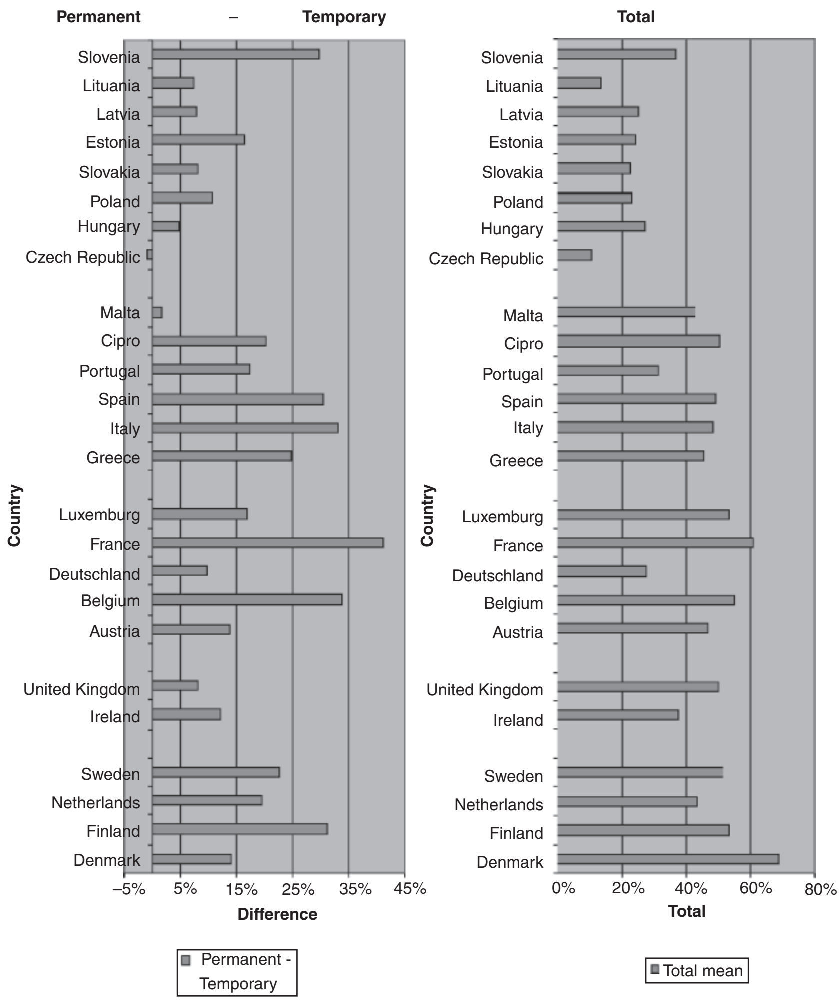

Figure 10.1 Perceived job security by type of contract and country

Regardless of the flexicurity regime, and with the sole exception of the Czech Republic, permanent workers are much more secure in all countries, and especially in France, Belgium and Italy. However, the size of the negative relation between perceived security and temporary employment varies significantly by country, as shown by the large differences depicted in the left panel. With a few exceptions in each group, common patterns seem to emerge within each flexicurity model, with relatively low differences among

English-speaking and Nordic countries (except for Finland) and larger differences among many Mediterranean countries. The relatively small difference in perceived job security by type of contract recorded in English-speaking countries is due more to the low perceived security of permanent workers (in line with the low employment protection legislation characterizing also permanent contracts in these countries) than to an exceptionally high level of perceived security among the temporary ones. Low gaps are also recorded for most Eastern countries, due mainly to the average low level of security prevailing in these countries, rather than to relatively high levels of security for temporary workers (as emerges from comparison between the left and right panel).

More in general, there is no clear-cut relationship between differences by type of contract and the average perceived job security, given that the countries with the highest levels of perceived job security comprise both countries with relatively low gaps by type of contract (such as Denmark) and some of the above-mentioned countries with large gaps (namely, France and Belgium).

5. Main econometric results

The aim of the empirical analysis was to study the determinants of perceived security, paying specific attention to the role of temporary contracts.

To this end, we estimated the following model:

$$Y_i = \alpha + \beta T_i + \rho X_i + \gamma_c + \varepsilon_i \tag{10.1}$$

where Y is our measure of perceived security for the i-th worker, T is the dummy for temporary contracts, X is a vector of controls, γ_c are country fixed effects and ε the usual error term.

Because of the binary nature of the dependent variable, we used a probit estimator to obtain the relevant parameters. Table 10.3 presents the main estimates of different specifications of the above model: first we controlled for, apart from the type of contract and country fixed effects, only personal characteristics (gender, age, education and family composition); then we added controls for firm characteristics (economic sector, firm size and tenure); finally, we also controlled for specific job-related characteristics (such as working hours and time schedules, wage structure, work practices, work-related health).[6] This last was our preferred specification, and we also used it to obtain the relevant estimates with contract duration (column 4 of Table 10.3) and by gender, age and education (Table 10.4).

Our estimates for the entire sample show a strong negative influence of temporary contracts on perceived security, with a significant negative coefficient (around 0.16 in absolute value) in the complete model. The estimated effect is robust to the model specification. Furthermore, this result also holds

Table 10.3 Estimates of the effect of temporary contract on perceived job security (Marginal effects from probit estimates. Dependent Variable: dummy equal to one if worker is secure)

	(1)	(2)	(3)	(4)
TEMPORARY	-0.182 *** (0.019)	-0.156 *** (0.021)	-0.156 *** (0.020)	–
Temporary contract lenght:				
Up to 3 months	–	–	–	-0.283 *** (0.059)
4–6 months	–	–	–	-0.278 *** (0.034)
7–12 months	–	–	–	-0.136 *** (0.033)
More than 12 months	–		–	-0.018 (0.048)
No exact duration	–	–	–	-0.179 *** (0.027)
Personal Characteristics	YES	YES	YES	YES
Firm Characteristics	NO	YES	YES	YES
Job Characteristics	NO	NO	YES	YES
Pseudo *R* squared	0.085	0.113	0.137	0.141
Log Likelihood	−10931	−10590	10304	−10259
No. of Observations	17506	17506	17506	17506

Note: Robust standard errors in brackets. * $p < 0.1$ ** $p < .05$ *** $p < .01$.

for all the sub-samples analysed, with no significant differences by gender (see Table 10.4). The estimated contract effect is slightly smaller for young workers (0.14 in absolute value), which is consistent with different expectations regarding job security by age, given also that in many countries temporary employment is often the first (obligatory) step in labour-market entry. Furthermore, the negative effect of temporary employment increases with education, and it seems particularly small in the case of low-skilled workers (0.1 in absolute value).

Given the definition of our dependent variable, it is also important to test whether the negative effect found above is influenced by the length of the (temporary) contract. Since secure workers are in fact those who strongly believed that they would not lose their jobs in the six months following the survey, it may be the case that the negative result found above is driven mainly by perceived security of workers on temporary contracts lasting less than six months. We then tested whether the negative effect of temporary employment on perceived job security changes with contract duration. More specifically, we divided temporary workers into five groups: those on very short contracts (no longer than three months, 6.7 per cent of total temporary

Table 10.4 Estimates of the effect of temporary contract on perceived job security by gender, age and education (Marginal effects from probit estimates. Dependent Variable: dummy equal to one if worker is secure)

	Gender		*Age*			*Education*		
	MEN	*WOMEN*	*YOUNG (<30)*	*PRIME AGE (30–50)*	*OVER 50*	*LOW SKILLED*	*MEDIUM SKILLED*	*HIGH SKILLED*
TEMPORARY	−0.153***	−0.161 ***	−0.139 ***	−0.172 ***	−0.154 **	−0.096 **	−0.162 ***	−0.183 ***
	(0.031)	(0.027)	(0.031)	(0.029)	(0.059)	(0.041)	(0.027)	(0.043)
Personal Characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Firm Characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Job Characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R squared	0.147	0.143	0.136	0.150	0.200	0.178	0.135	0.139
Log Likelihood	−4692	−5525	−2002	−5873	−2168	−1794	−5407	−2920
No. of Observations	8093	9413	3491	10098	3917	3325	9282	4899

Note: Robust standard errors in brackets. * $p < 0.1$, ** $p < .05$, *** $p < .01$.

workers), those on contracts lasting from four to six months (11.8 per cent), those on contracts lasting from seven to 12 months (31 per cent), those on very long contracts (lasting more than one year, corresponding to 15.6 per cent of total temporary workers) and those who did not specify (or did not know) the exact duration of their contracts (almost 35 per cent of temporary workers). The main estimates reported in column 4 of Table 10.3 show that, although short temporary contracts display the strongest negative effect on perceived job security, compared to permanent workers a statistically significant negative effect is also found for workers on contracts lasting from seven to 12 months, and for those who did not specify the exact duration of their (temporary) contracts. Only in the case of very long temporary contracts (lasting more than one year) is the negative effect very small and not statistically significant: the perceived job security of these workers is thus very similar to that declared by permanent workers.

Finally, in order to test whether the effect of temporary employment on perceived job security is influenced by the flexicurity model prevailing in the country where workers live, in Table 10.5 we report the estimates relative to temporary employment for some selected countries. Estimates for the Central and Eastern countries are reported in the first part of the table, while those for a selected group of Western countries, representing the corresponding different flexicurity models discussed in Section 2, are reported in the second panel.[7]

Our results highlight the existence of a great deal of heterogeneity in the effect of temporary employment on perceived job security across countries, particularly among the Eastern ones: our estimates in fact range from +0.02 in the Czech Republic (albeit not statistically significant) to −0.32 in Slovenia. These countries can then be clustered into two main groups: a first one (comprising, besides Slovenia, also Estonia, Lithuania and Slovakia), characterized by a statistically significant negative relationship between temporary employment and perceived security; and the remaining ones (besides the Czech Republic, also Latvia, Hungary and Poland), which exhibit no statistically significant relationship between these two variables, mainly due to the very low level of security characterizing also permanent workers in these countries (see again Figure 10.1).

The estimates for the selected Western countries are also highly heterogeneous, although always negative: they range, in fact, from −0. 04 in Denmark (not statistically significant) to −0. 36 in Italy. The negative effect of the temporary contract on perceived security is particularly high in Mediterranean countries (including France), which are characterized by a combination of both low flexibility and low security. By contrast, there seems to be no significant relationship between flexibility and perceived security in Denmark, which is the country considered a best practice in terms of flexicurity (hence with a combination of high flexibility and high

Table 10.5 Estimates for selected countries (Marginal effects from probit estimates. Dependent Variable: dummy equal to one if worker is secure)

a) Eastern European Countries

	CZ	*EE*	*LV*	*LT*	*HU*	*PL*	*SI*	*SK*
TEMPORARY	0.023	−0.195 ***	−0.050	−0.067 **	−0.012	0.001	−0.318 ***	−0.089 **
	(0.027)	(0.036)	(0.055)	(0.023)	(0.061)	(0.046)	(0.045)	(0.035)
Other controls:								
Personal characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Firm characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Job characteristics	YES	YES	YES	YES	YES	YES	YES	YES
No. of Observations	791	512	874	808	783	749	492	846
Pseudo *R* squared	0.187	0.112	0.100	0.134	0.069	0.117	0.207	0.146

b) Western European Countries

	DK	*NL*	*UK*	*DE*	*FR*	*ES*	*IT*
TEMPORARY	−0.043	−0.190 ***	−0.140 **	−0.131 ***	−0.325 ***	−0.203 ***	−0.354 ***
	(0.069)	(0.066)	(0.055)	(0.061)	(0.067)	(0.068)	(0.063)
Other controls:							
Personal characteristics	YES	YES	YES	YES	YES	YES	YES
Firm characteristics	YES	YES	YES	YES	YES	YES	YES
Job characteristics	YES	YES	YES	YES	YES	YES	YES
No. of Observations	818	876	717	848	854	708	645
Pseudo *R* squared	0.086	0.110	0.088	0.187	0.212	0.215	0.276

Note: Robust Standard Errors in brackets. * $p < 0.1$, ** $p < .05$, *** $p < .01$

social security) in Europe. This result is consistent with most of the macroeconomic literature, which emphasizes the excellent results in terms of labour market performance achieved by the 'Danish Golden Triangle' (Muffels and Wilthagen, 2002; Wilthagen and Tros, 2003, 2004). The other Continental countries and the UK occupy intermediate positions.

Comparison between the results obtained for the Netherlands with those for Denmark (two different examples of flexicurity models in Europe) suggests that not all the (macro) flexicurity models have the same effect on the microeconomic relationship between temporary employment and perceived job security. Accordingly, general support for flexicurity may not be enough to increase workers' well-being. Policymakers should consequently devote more effort to designing the proper (probably country-specific) combination of numerical flexibility, employment protection legislation, active and passive labour market policies.

5.1. Robustness check

In order to test the reliability of our main results, we performed a number of robustness checks by using alternative definitions of our variables of interest and/or alternative data-sets, which allowed further control to be made for the potential bias of unobserved heterogeneity.

We first checked whether our estimates were sensitive to the definition of perceived job security used. More specifically, we extended our original definition to include also workers who disagreed with the statement 'I might lose my job in the next six months'. The estimates of the relevant marginal effects with the new (broader) definition of perceived security by country are reported in Table 10.6. The last column also shows the marginal effect estimated for the EU-25 (and comparable with the marginal effect reported in column 3 of Table 10.3). Overall, although the estimated marginal effect is larger (in absolute value) than that estimated with our preferred definition, these new results confirm that the effect of temporary employment on perceived security is strongly influenced by the flexicurity model prevailing in the country where workers live. The estimated marginal effect is now negative and weakly statistically significant for Denmark, but its size is still much smaller than that estimated for the other countries, especially for the Mediterranean ones. Note also that all the Eastern countries now display negative and statistically significant marginal effects, whose size is larger than that estimated for Denmark. Among the Western countries, the only exception is the UK, which now displays a marginal effect more similar to that of Denmark.

As a second robustness check, we replicated our results by using an alternative data-set characterized by a different definition of job security. More specifically, we used the 2001 Special Eurobarometer on 'Social Exclusion and Modernization of Pension Systems'. Each survey of Standard Eurobarometer, which was established in 1973 with the aim of monitoring the

Table 10.6 Estimates with a larger definition of perceived job secuirty (Marginal effects from probit estimates. The dependent variable is a dummy equal to one for workers who strongly disagree or disagree with the following statement: 'I might lose my job in the next six months')

a) Eastern European Countries

	CZ	*EE*	*LV*	*LT*	*HU*	*PL*	*SI*	*SK*
TEMPORARY	-0.096^{**}	-0.404^{***}	-0.113^{*}	-0.173^{**}	-0.136^{**}	-0.155^{**}	-0.417^{***}	-0.271^{***}
	(0.045)	(0.070)	(0.067)	(0.064)	(0.069)	(0.060)	(0.068)	(0.060)
Other controls:								
Personal characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Firm characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Job characteristics	YES	YES	YES	YES	YES	YES	YES	YES
No. of Observations	791	510	873	810	783	749	492	842
Pseudo *R* squared	0.134	0.134	0.1	0.105	0.130	0.091	0.204	0.131

b) Western European Countries

	DK	*NL*	*UK*	*GER*	*FR*	*SP*	*ITA*	*EU-25*
TEMPORARY	-0.077^{*}	-0.310^{***}	-0.070^{*}	-0.188^{***}	-0.330^{***}	-0.281^{***}	-0.402^{***}	-0.212^{***}
	(0.048)	(0.078)	(0.041)	(0.075)	(0.062)	(0.066)	(0.074)	(– 0.021)
Other controls:								
Personal characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Firm characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Job characteristics	YES	YES	YES	YES	YES	YES	YES	YES
No. of Observations	818	874	717	865	854	720	643	17.506
Pseudo *R* squared	0.140	0.143	0.155	0.170	0.272	0.294	0.207	0.151

Note: Robust Standard Errors in brackets. $^{*}p < 0.1$, ** $p < .05$, *** $p < .01$

evolution of public opinion in the EU Member States, consists of approximately 1000 face-to-face interviews per Member State (except Germany: 2000, Luxembourg: 600, United Kingdom 1300, including 300 in Northern Ireland). The universe of the survey is citizens aged 15 years and over residing in EU countries. Special Eurobarometer surveys are aimed at investigating specific topics and are integrated into Standard Eurobarometer's polling waves. In the 2001 Special Eurobarometer, employees were asked a number of questions relative to their jobs, including the type of contract; they were also asked about the probability they assigned to losing their current jobs in the year following the survey. The data set also contains demographic and other background information, such as age, gender, nationality, marital status, occupation and education. Furthermore, although it provides less detailed information than the EWCS on working conditions, it contains more controls on work-related past events (such as injuries and unemployment spells), job expectations (also in terms of security, flexibility and career prospects), individual motivation (measured through the willingness to work even without the need to do so for a living), the importance and intensity of social relations, overall self-esteem.

These variables can be considered good proxies for personality and psychological characteristics, which are usually a primary source of unobserved heterogeneity (Origo and Pagani, 2009). We selected for our analysis the sub-sample of employees aged 15–70 years excluding members of the armed forces, corresponding to 6445 observations.

Workers with temporary contracts are those with seasonal, temporary or casual jobs and employees under contract for a fixed time period. Permanent workers are those hired on permanent contracts.

As mentioned above, in order to evaluate the degree of perceived security we used the 'probabilistic' question asking individuals about the probability they assigned to losing their jobs. The exact question was 'How likely or unlikely is it that you will lose your job for some reason over the next 12 months? Would you say it is very likely, quite likely, not very likely or not at all likely?'. The time window of the question was therefore wider than that considered in the EWCS (respectively, twelve and six months), and workers might therefore have been less assertive in expressing their opinions, thereby reducing the probability that they would choose the extreme values on the scale of possible answers. For this reason, we considered as 'secure' workers those stating that they were not at all likely or not very likely to lose their jobs in the 12 months following the survey.

The relevant estimates based on Eurobarometer data are reported in Table 10.7, in which we give the results obtained for the entire sample (EU-15) and the selected Western countries already considered in the previous tables. Unfortunately, Eastern countries were not included in this specific wave. The estimates in the first panel are those more comparable with the ones reported in the previous tables, since we included only controls for personal, work and job characteristics. In panel B we added further controls for local labour-market conditions and work-related past events. In order to check further for the potential effect of unobserved heterogeneity, we included also a set of controls for psychological characteristics in the last panel (see Appendix 10.A2 for the list and descriptions of the variables used).

Overall, the estimates in Table 10.7 confirm our previous results: temporary employment has on average a negative effect on perceived job security, but this effect varies significantly by flexicurity model: the estimated (negative) marginal effect is in fact small and not statistically significant in the case of Denmark, while it is much larger (in absolute value) in the other countries, particularly the Mediterranean ones. The estimated marginal effect for the UK is larger than that estimated for Denmark, but it is still not statistically significant. Furthermore, the results are quite robust to potential (usually unobserved) heterogeneity, since they do not substantially change even after controlling for personality and psychological characteristics.

6. Conclusions

In this study we have analysed the determinants of perceived job security in Europe, paying specific attention to the role of temporary contracts.

More specifically, we have empirically tested whether the negative effect of holding a temporary contract on a subjective measure of job security is influenced by workers' characteristics (such as gender, age and education) and by the (macro) flexicurity model prevailing in the country where workers live.

Using individual data from the Fourth European Working Conditions Survey, we have shown the existence of a strong negative influence of temporary contracts on perceived security.

No significant differences emerge on the estimated effect by gender, while some heterogeneity is evident by age and education.

The estimates for selected countries, representing different flexicurity models, show a great deal of heterogeneity: the effect of the temporary contract on perceived job security ranges from $+0.02$ in the Czech Republic (not statistically significant) to -0.36 in Italy.

Eastern countries can be clustered into two main groups: a first one (comprising Slovenia, Estonia, Lithuania and Slovakia) characterized by a statistically significant negative relationship between temporary employment and perceived security; and the remaining ones (the Czech Republic, Latvia, Hungary and Poland) exhibiting no statistically significant relationship between these two variables, mainly because of the very low level of security recorded also for permanent workers in these countries.

In Western Europe, the negative effect of the temporary contract on perceived security is particularly high in many Mediterranean countries, which are characterized by a combination of both low flexibility and low

Table 10.7 Estimates with Eurobarometer data, 2001 (Marginal effects from probit estimates. Dependent variable: Dummy equal to one if worker is not at all likely or not likely to lose his/her job in the following 12 months)

Panel A (controls for personal, firm and job characteristics)

	DK	*NL*	*UK*	*GER*	*FR*	*SP*	*ITA*	*EU-15*
TEMPORARY	–0.017	–0.146**	–0.099	–0.207***	–0.307***	–0.256***	–0.283***	–0.185***
	(0.065)	(0.088)	(0.079)	(0.067)	(0.090)	(0.085)	(0.124)	(0.023)
No. of Observations	496	349	495	825	431	292	284	5816
Pseudo *R* squared	0.193	0.1840	0.094	0.119	0.337	0.310	0.393	0.120

Panel B (as panel A + controls for local labour market conditions and work-related past events)

	DK	*NL*	*UK*	*GER*	*FR*	*SP*	*ITA*	*EU-15*
TEMPORARY	–0.009	–0.132**	–0.105	–0.166***	–0.286***	–0.287***	–0.253***	–0.174***
	(0.058)	(0.092)	(0.080)	(0.066)	(0.099)	(0.090)	(0.129)	(0.023)
No. of Observations	496	349	495	825	431	292	284	5816
Pseudo *R* squared	0.241	0.2380	0.116	0.132	0.368	0.364	0.440	0.134

Panel C (as panel B + controls for psychological characteristics)

	DK	*NL*	*UK*	*GER*	*FR*	*SP*	*ITA*	*EU-15*
TEMPORARY	–0.007	–0.129**	–0.067	–0.169***	–0.294***	–0.275***	–0.266***	–0.179***
	(0.050)	(0.086)	(0.079)	(0.068)	(0.106)	(0.090)	(0.131)	(0.023)
No. of Observations	496	344	495	825	431	292	284	5816
Pseudo *R* squared	0.317	0.3520	0.171	0.169	0.416	0.408	0.503	0.157

Note: Robust standard errors in brackets. *p < 0.1, **p <.05, ***p <.01. See Appendix II for the complete list of controls.

social security. By contrast, there seems to be no significant relationship between flexibility and perceived security in Denmark, which is the country considered as a best practice in terms of flexicurity in Europe. The other Continental countries and the UK occupy intermediate positions. These results are robust to changes of the definition of job security and to further controls for unobserved heterogeneity.

Comparison between the results obtained for the Netherlands with those for Denmark (two different examples of flexicurity models in Europe) suggests that not all the macro flexicurity models have the same effect on the microeconomic relationship between temporary employment and perceived job security. Accordingly, general support for flexicurity may not be enough to increase workers' well-being. Hence, policy-makers should devote more effort to design the proper (probably country-specific) combination of numerical flexibility, employment protection legislation, active and passive labour market policies.

The adoption of a proper mix of flexibility and security would also be crucial for coping with the unemployment effects of the current economic crisis and its subsequent effects on perceived security. Labour turnover should in fact be higher, but more efficient, in the so-called 'flexicure' countries, where perceived security is likely to be less influenced by the current recession.

Perceived security should be particularly carefully monitored in the Eastern countries, where in the past, even during recovery years, labour turnover has been low and highly inefficient owing to the high levels of job insecurity prevailing also among permanent workers. With respect to the 'pure flexibility' policy adopted to date by many transition economies in Central and Eastern Europe, the 'flexicurity' approach may therefore be an alternative means both to face business fluctuations and to favour long-term growth.

Appendix

Table 10.A1 Variables description and basic statistics

Name	*Description*	*Mean*	*Std. dev.*
TEMPORARY	1 if fixed term contract, temporary employment, agency contract, apprenticeship or other work-training scheme	0.155	0.362
Personal characteristics			
Female	1 if female	0.538	0.499
Age (ref: 30–50 years)			
<30	1 if <30 years	0.199	0.400
Over 50	1 if >50 years	0.224	0.417

Table 10.A1 (Continued)

Name	*Description*	*Mean*	*Std. dev.*
Level of education (ref: isced<3)			
High school diploma	1 if isced 3–4	0.530	0.499
University degree	1 if isced 5–6	0.280	0.449
Household size (ref: single)			
2-person household	1 if 2 people	0.265	0.441
3-person household	1 if 3 people	0.239	0.426
> 3-person household	1 if >3 people	0.357	0.479
Firm characteristics			
Sector of employment (ref: manufacturing)			
Agricolture	1 if agriculture and fishing (nace1)	0.018	0.134
Energy	1 if electricity, gas and water supply (nace3)	0.017	0.129
Construction	1 if contruction (nace4)	0.058	0.233
Trade	1 if wholesale and retail trade (nace5)	0.130	0.336
Hotels and restaurants	1 if hotels and restaurants (nace6)	0.033	0.180
Transport and communication	1 if transport and communication (nace7)	0.064	0.245
Finance and consulting	1 if financial intermediation and real estates (nace8–9)	0.101	0.301
Public Administration	1 if public administration and defence (nace10)	0.082	0.275
Education	1 if education and health (nace11)	0.230	0.421
Firm size (ref: less than 50 people)			
Firm size: 50–99	1 if 50–99 employees	0.324	0.468
Firm size: 100–499	1 if 100–499 employees	0.227	0.419
Firm size: >=500	1 if 500 employees or over	0.157	0.364
Tenure (ref: >2 years)			
<one year	1 if <1 year	0.104	0.305
1–2 years	1 if 1–2 years	0.264	0.441
Job characteristics			
Part-time	1 if part-time	0.153	0.360
Daily work time flexibility	1 if doesn't work the same number of hours every day	0.366	0.482
Weekly work time flexibility	1 if doesn't work the same number of days every week	0.225	0.418
Working at night	1 if works more than 9 times a month at night for at least 2 hours	0.068	0.252
Work on week-end	1 if works at least once a month on Sunday	0.291	0.454

Table 10.A1 (Continued)

Name	*Description*	*Mean*	*Std. dev.*
Work overtime	1 if works at least once a month for more than 10 hours a day	0.365	0.481
Payed overtime	1 if payed for extratime work	0.310	0.463
Special benefits	1 if remuneration includes special benefits	0.070	0.255
PRP scheme	1 if remuneration includes piece rate or productivity payments	0.092	0.288
Employees Stock ownership	1 if remuneration includes employees stock ownership plans	0.020	0.138
Pc users	1 if uses computer for almost all the working time	0.323	0.468
Unhealthy conditions	1 if exposed at work almost all the time to vibrations from hand tools or machinery or noise or high or low temperatures or breathing in vapours such as solvents and thinners, smoke or fumes or tobacco smoke from other people or handling with chemical products or radiations or painful positions	0.171	0.377
Mobbing	1 if personally subject at work to threats or physical violence	0.119	0.323
Discrimination	1 if subject at work to discrimination linked to nationality, ethnic background, disability, religion or sexual orientation	0.048	0.215
Job-rotation	1 if job involves rotating tasks between colleagues	0.007	0.084
Multiskilling	1 if job requires different skills	0.377	0.485
Team-working	1 if job involves all or part of the work in a team	0.629	0.483
Training	1 if have undergone training paid for or provided by the employer	0.334	0.472
Problem solving	1 if job involves solving unforeseen problems on your own	0.797	0.403
Work autonomy	1 if able to to choose or change order and methods of work	0.562	0.496
Assistance from superiors	1 if can get assistance from superiors if asked for	0.652	0.476
Work at very high speed	1 if works almost all the time at very high speed	0.684	0.465
Carrier opportunities	1 if agrees that job offers good prospects for career	0.304	0.460
Country of residence (ref: Denmark)			
Belgium	1 if Belgium	0.044	0.206
Czech Rep.	1 if Czech Rep.	0.045	0.208
Germany	1 if Germany	0.050	0.217
Estonia	1 if Estonia	0.029	0.169
Greece	1 if Greece	0.024	0.153
Spain	1 if Spain	0.041	0.199

Table 10.A1 (Continued)

Name	*Description*	*Mean*	*Std. dev.*
France	1 if France	0.049	0.215
Ireland	1 if Ireland	0.033	0.180
Italy	1 if Italy	0.037	0.189
Cyprus	1 if Cyprus	0.016	0.125
Latvia	1 if Latvia	0.050	0.218
Lithuania	1 if Lithuania	0.046	0.210
Luxembourg	1 if Luxembourg	0.029	0.167
Hungary	1 if Hungary	0.045	0.207
Malta	1 if Malta	0.017	0.130
Netherlands	1 if Netherlands	0.050	0.218
Austria	1 if Austria	0.040	0.197
Poland	1 if Poland	0.043	0.202
Portugal	1 if Portugal	0.041	0.197
Slovenia	1 if Slovenia	0.028	0.166
Slovakia	1 if Slovakia	0.048	0.214
Finland	1 if Finland	0.052	0.222
Sweden	1 if Sweden	0.054	0.223
UK	1 if United Kingdom	0.041	0.198

Table 10.A2 List of variables, Eurobarometer data

Name	*Description*	*Mean*	*Std. dev.*
Dep. Var: security	1 if not at all likely or not likely to lose the job in the following 12 months	0.741	0.438
Temporary	1 if seasonal, temporary or casual job and employees under contract or for fixed time period	0.112	0.315
Personal characteristics			
female	1 if female	0.431	0.495
Age groups (ref: 30–50)			
< 29	1 if age lower than 30	0.265	0.441
> 50	1if age higher than 50	0.167	0.373
education	Age when stopped full time education minus 6 (continuous)	12.448	3.779
married	1 if married	0.636	0.481
head	1 if contributes most to the household income	0.626	0.484
child5	1 if has a child under five years of age	0.175	0.380
Employer and job characteristics			
Firm size (ref: less than 10 people)			
size_1049	1 if 10–49 people	0.314	0.464
size_5099	1 if 50–99 people	0.102	0.302
size_100–499	1 if 100–499 people	0.161	0.367
size_500	1 if more than 500 people	0.113	0.317

Table 10.A2 (Continued)

Name	*Description*	*Mean*	*Std. dev.*
Sector of employment (ref: manufacturing)			
i_agriculture	1 if agriculture, hunting, forestry, fishing	0.006	0.075
i_mining	1 if mining and quarrying	0.002	0.050
i_electricity	1 if electricity, gas and water supply	0.010	0.101
i_construction	1 if construction	0.066	0.248
i_trade	1 if wholesale and retail trade repairs	0.145	0.352
i_hotels	1 if hotels and restaurants	0.036	0.185
i_transportation	1 if transportation and communications	0.068	0.253
i_finance	1 if financial intermediation	0.037	0.188
i_business	1 if real estate and business activities	0.075	0.263
i_pa	1 if public administration	0.092	0.289
i_services	1 if other services	0.232	0.422
Tenure (ref: less than 3 years)			
tenure_3 to 4	1 if 3–4 years	0.309	0.462
tenure 5 to 9	1 if 5–9 years	0.200	0.400
tenure 10	1 if equal or more than 10 years	0.365	0.481
part time	1 if part time job	0.165	0.372
flexitime	1 if the total number of hours workerd varies from week to week	0.421	0.494
skillmatch	1 if uses experiences, skills and abilities	0.737	0.440
use_ict	1 if the job involves the use of pc or automated equipment	0.525	0.499
job_extratime	1 if often has to work extratime	0.130	0.337
job_speed	1 if works almost all the time at very high speed	0.145	0.352
job_deadlines	1 if works almost all the time to tight deadlines	0.134	0.341
job_dangerous	1 if works always/often in dangerous or unhealthy conditions	0.111	0.314
team	1 if works in team	0.657	0.475
employee_involvement	1 if can take part in decision affecting his/her job	0.167	0.299
autonomy	1 if chooses order of tasks or how to perform them	0.175	0.349
training	1 if got training in the last five years paid by current or former emplo	0.408	0.492
multiskilling	1 if job requires multiple skills or keeping learning new things	0.257	0.378
vertical relations	1 if get support from management when there is pressure at work 1 if strongly agrees that is likely to get a better job in current	0.153	0.360
promotion_prospects	organization in the next 3 years	0.049	0.217
Local labour market conditions and work-related past events			
Residence (ref: rural area or village)			
small_town	1 if lives in small or middle sized town	0.377	0.485
large_town	1 if lives in large town	0.300	0.458

Table 10.A2 (Continued)

Name	*Description*	*Mean*	*Std. dev.*
local_u	1 if agrees that there is a lot of unemployment in the area in which lives	0.253	0.435
area_rep	1 if strongly agrees that the area in which lives has not a good reputa	0.040	0.197
localjob	1 if thinks that job opportunities in local area are very good	0.139	0.346
injury	1 if had an injury at work in the last five years	0.100	0.300
been_promoted	1 if have been promoted while with current employer	0.323	0.468
staff_reduction	1 if the number of people employed in the organization has been reduced over the last 3 years	0.251	0.433
been_unemployed	1 if unemployed in the last five years	0.181	0.385
Proxies for personality and psycological characteristics			
values	1 if finds that his/her values are very similar to those of his/her organization	0.114	0.318
proud	1 if very proud of working for his/her company	0.168	0.374
tired_physical	1 if often has headaches and/or muscular pains due to work	0.201	0.401
tired	1 if often exhausted and/or too tired after work	0.335	0.472
stressful	1 if work is often stressful and/or keep worrying about job problems after work	0.396	0.489
motivation	1 if thinks absolutely necessary to have a successful career	0.534	0.499
motivation2	1 if states continue to work if were to get enough money to live as confortably as would like	0.526	0.499
unsleep	1 if often lost much sleep over worry	0.157	0.364
worthless	1 if thinks of himself/herself as a worthless person	0.053	0.223
socialrel	1 if regularly meets friends, relatives and/or neighbours	0.827	0.378
union	1 if member of a trade union	0.249	0.432
member	1 if member of clubs, voluntary organization and/or political party	0.421	0.494
Political party (ref: left)			
pol_right	1 if right	0.141	0.348
pol_centre	1 if centre	0.354	0.478
pol_dk	1 if does not know	0.222	0.416

Table 10.A2

Name	*Description*	*Mean*	*Std. dev.*
Country of residence (ref: Italy)			
Belgium	1 if Belgium	0.026	0.160
Denmark	1 if Denmark	0.019	0.137
Germany	1 if Germany	0.262	0.440
Greece	1 if Greece	0.017	0.129
Spain	1 if Spain	0.094	0.292
France	1 if France	0.173	0.378
Ireland	1 if Ireland	0.008	0.088
Luxembourg	1 if Luxembourg	0.001	0.036
Netherlands	1 if Netherlands	0.039	0.194
Portugal	1 if Portugal	0.022	0.147
UK	1 if Unitied Kingdom	0.158	0.365
Finland	1 if Finland	0.011	0.102
Sweden	1 if Sweden	0.028	0.164
Austria	1 if Austria	0.022	0.147

Notes

1. We would like to thank the editors, Bruno Contini, Paolo Sestito and the participants at the XXIII AIEL conference (University of Brescia, September 2008) for their helpful comments and suggestions. The usual disclaimers apply.
2. A specific flexicurity country report was drawn up by national experts with the help of social partners in the cases of Bulgaria, Croatia, Hungary, Lithuania and Poland. See Cazes and Nesporova (2007) for the detailed results.
3. Italy is geographically part of the Mediterranean area and it is usually considered as having an inflexible labour market. However, in recent years it has significantly deregulated the use of temporary contracts, yielding a reduction in its overall EPL indicator. Italy is thus characterized by a higher level of flexibility than the other Mediterranean countries and, according to the EC classification, from this point of view it is more similar to the Eastern European countries.
4. In the latter case, a major exception is France, which is grouped with the Mediterranean countries instead of the Continental ones.
5. We replicated our analysis also using a broader definition of perceived security (that is, including those who disagreed with the statement among the secure workers). The main results are reported in Section 5.1.
6. The complete set of estimates is available from the authors upon request. We also tried to control further for the potential effect of unobserved heterogeneity by simultaneously estimating the probability of being a temporary worker and the perceived security equation. We used as an exclusion restriction the share of temporary workers by gender, age, level of education and country. Bivariate probit estimates for the temporary contract variable in the perceived security equation were similar to those presented in Table 10.2. Furthermore, the correlation of the unobservables of the two equations was low and not statistically significant (−0. 03, with a corresponding *p*-value of 0.8), thus enabling estimation of the two equations separately.

7. More specifically, we considered Denmark and the Netherlands as two benchmarks in terms of flexicurity, and we selected the UK for the English-speaking model, Germany and France for the Continental model, Spain and Italy for the Mediterranean one.

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11
Unemployment Convergence in Transition[1]

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1. Introduction

In a seminal paper Blanchard and Katz (1992) argue that over the long run labour markets should adjust towards a common equilibrium through two main channels. Either unemployed workers can undertake employment in regions where labour demand exceeds supply or capital can flow to low-wage locations to take advantage of lower labour costs. Therefore, one should observe convergence of regional unemployment rates. Naturally, the speed of adjustment may indeed be very slow – and differing – leading to relatively persistent unemployment disparities, as forcefully argued by Armstrong and Taylor (2000). Furthermore, 'new' shocks may arrive before the consequences of the previous ones are fully absorbed, which may foster the process of regional unemployment rates converging towards differentiated equilibria.

Transition on the other hand, consists of both symmetric and asymmetric shocks, thus providing a turmoil of reasons – potentially counteracting each other – to both product and labour markets. The easing of transition consequences frequently involves cushion financing to regions and sectors that are expected to experience most hardships. Finally, since in most mature democracies socioeconomic cohesion constitutes the main purpose of many policies, considerable resources are devoted to fostering convergence of income levels. This is true on both national and supranational level, with the EU targeting cohesion with several specialized funds (namely Cohesion Fund and European Social Fund). Differences in regional unemployment rates are often used to describe regional economic inequality, while relative labour market hardships often serve explicitly as discriminating factors in resources allocation. Understanding the persistency of regional unemployment differences helps to asses how effective regional policies have been.

Empirical strategy for verifying the convergence hypothesis developed so far are varied. The most obvious is the test of β convergence (unconditional and conditional). Finding β convergence corresponds to proving that *levels* of unemployment converge to a common target, while these levels themselves may be conditioned on structural parameters characterizing particular local labour market. Consequently, unconditional β convergence describes one common level for all regions, whereas conditional one allows for differentiated levels for groups of structurally similar communities. One can also inquire if the *dispersion* of unemployment lowers over time and this may be approached testing for σ convergence. Finally, one can try to investigate how persistent the regional unemployment rate *differentials* are, by applying the concept of stochastic convergence.

In this chapter we analyse unemployment rates for three transition economies experiencing very different unemployment evolutions over the past years: Czech Republic, Poland and Slovakia. The two latter are consistently scoring highest in the EU in as far as labour market hardships are concerned. Conversely, Czech Republic enjoys a more favourable situation. We resort to policy relevant NUTS4 level monthly data covering the time span of 1999–2007 for Poland, 1995–2007 for Czech Republic and 1997–2004 for Slovakia. By applying the variety of convergence analysis tools we intend to inquire about the dynamics of local labour markets evolutions. We demonstrate that these distributions are highly stable over time. Some evidence in favour of 'convergence of clubs' is supported by the data, but only for high unemployment regions. Moreover, regional differentials seem to be highly persistent, which strongly undermines the effectiveness of the cohesion policies implemented over the last decade. Whereas this last finding could potentially be attributed to relatively short time horizon, the conclusions concerning the dynamics do not seem to be all driven by temporary shocks.

The chapter is structured as follows. Section 2 focuses on the brief literature review in order to justify the use of multiple empirical strategies. These are outlaid in Section 3, while results for respective analyses are presented in Section 4. Section 5 concludes with some indications of future research directions.

2. Literature review

Transition economies typically experienced rapid growth of the unemployment rates due to profound restructuring. Naturally, these processes affected local labour markets asymmetrically, since regions were diversified with respect to industry composition and economic outlooks. Generally, in the literature regional unemployment disparities have been more at the core of interests for regional researchers than for economists [see Pehkonen and Tervo (1998) for Finland, Dixon, Sheplierd and Thomson (2001) for Australia and Gray (2004) for the UK], while to our best knowledge the transition context in convergence literature has not been explored[3]. In similar spirit Buettner (2007) demonstrated that regional unemployment disparities are indeed profound across most of the CEECs, including Czech Republic, Poland and Slovakia. Whereas substantial regional disparities in unemployment are found for pre-accession EU member countries as well as for accession countries, an empirical analysis accounting for spatial effects shows that regional wage flexibility is significantly higher for accession countries[4]. In an impressive volume on the evolution of the Czech labour market Flek, Galuscak, Gottvald, Hurnik, Jurajda and Navrati (2004) argue that over the period of 10 years, a transition from over-employment to under-employment may actually have occurred.

The process of employment restructuring in most formerly centrally planned economies consisted mainly of the reductions in employment with growing average job tenure as well as average time spent in unemployment or inactivity, cfr. Svejnar (2002). Dismissals – if compensated at all – found their outcome with hiring of young, better educated workers, but with standard obstacles youths when entering the labour markets in Europe. People who lost their employment usually became permanently unemployed or inactive Grotkowska (2006). In Poland for example, currently less than 13 per cent of the unemployed still retain the right to unemployment assistance, thus suggesting that most of the unemployed are either long-term unemployed (above 12 months) or have a long record of unstable employment.

Thus, on an individual level one can easily point to the ideal type of winners and losers in the transition process. However, in terms of regional analysis the 'conventional wisdoms' are no longer comparably relevant. Some of the highest unemployment regions are located relatively close to the 'growth poles', while regions typically considered to lag behind exhibit average labour market indicators. Scarpeta and Huber (1995), Góra and Lehman (1995), Lehmann and Walsh (1998) and more recently Newell and Pastore (1999), suggest restructuring and heavy industry location as main differentiation factors.

On the other hand, there are sound empirical and conceptual reasons for resorting to NUTS4 level when analysing transition labour markets. First of all, in all of the three analysed cases, actual labour market policies are performed independently by local labour offices – operating for NUTS4 units. Both activization instruments and cooperation with employers is settled in districts. Secondly, financing is allocated to NUTS4 regions based on the relative labour market hardships in each of these countries – more deprived regions have easier access to active labour market policies financing, with the main aim of targeting resources where they are mostly needed. Finally, one should be able to provide policy makers with clear policy recommendations at a regional and not target group basis, because problems of particular individuals at a labour market are frequently highly context specific, which implies no general tools will prove efficient.

For transition countries, studies from the beginning of the previous decade used fairly aggregate and not policy-relevant level data[5]. Moreover, at NUTS4 level none of the general findings concerning the determinants of unemployment levels and differentials hold. For example, rural NUTS4 regions tend to exhibit a whole spectrum of unemployment rates, with averages fairly similar to industrialized NUTS4 regions. Also, regions experiencing restructuring in the beginning of transformation perform currently both very well and very bad in terms of observed unemployment levels. Consequently, it seems that our understanding of the dynamic labour market processes experienced by the regions remains too superficial to provide satisfactory answers.

Finally, none of these studies takes into account that over the past 15 years local labour markets of the transition countries were subject to many other context-specific shocks, positive (for example, active labour market policies, sometimes specifically targeting one particular group of unemployed in a particular location) as well as negative (for example, currency crisis in Czech Republic, Russian embargo on Polish exports and so on).[6] Figure 11.1 presents the evolution of the unemployment rates in the three countries considered in our study.

In this chapter we attempt to fill the gap in the literature on the evolution of local labour markets in transition by inquiring about the dynamics at the policy relevant NUTS4 levels in Czech Republic, Poland and Slovakia.

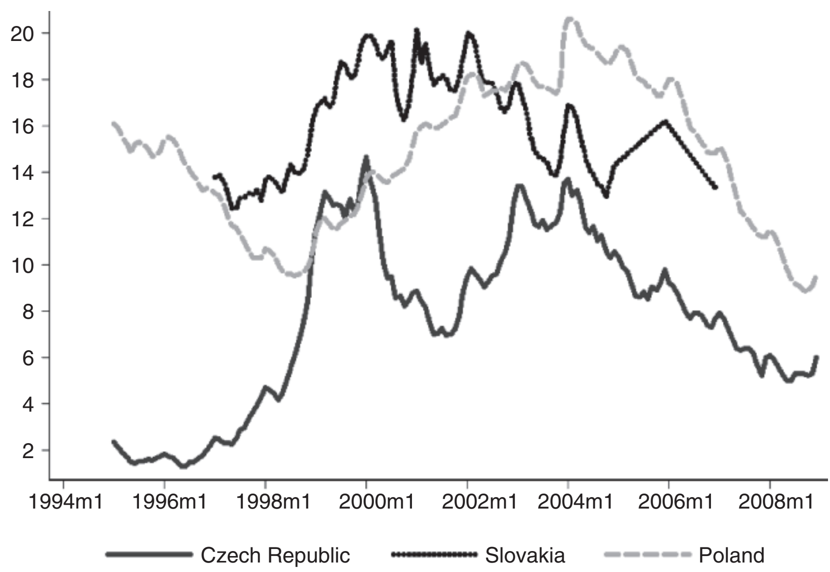

Figure 11.1 Unemployment rates in Czech Republic, Poland and Slovakia

3. Empirical strategies

One can imagine four main dynamic evolution patterns, as depicted by Figure 11.2. The first is suggested by unconditional convergence, implying evolutions are becoming alike both in terms of levels and in terms of the deviations from these levels (senario A). If the local unemployment rates exhibited such property, at national level cohesion would be fostered despite even relatively intense labour market hardships.

Secondly, convergence may still occur but to differentiated levels. Consequently, total sample deviations from average might persist, but within groups both levels and deviations converge (scenario B). In terms of policy evaluation, such findings may be interpreted as partially successful cohesion efforts (within groups) or a lack of success (if differences are driven by structurally disliked fundamentals).

Finally, data may exhibit divergence, either limited or explosive in terms of deviations (scenario C and D, respectively). Importantly, in the case of scenarios C and D, computed average contains no useful information concerning the behaviour of the unemployment rates. In addition, even in scenario B one should understand that the average computed is nonexistent, it is a statistical artefact of two (or more) group averages.

3.1. Convergence of levels

Convergence of levels is typically investigated through the β analysis. In its unconditional form (scenario A), in principle β convergence implies that the higher the level was in the beginning of the period, relatively the lower it should become throughout time. Consequently, one expects a negative β coefficient in a regression

$$\Delta x_{i,t} = \alpha_i + \beta x_{i,0} + \epsilon_{i,t} \tag{11.1}$$

which is equivalent to

$$x_{i,t} = \alpha_i + \tilde{\beta} x_{i,0} + \epsilon_{i,t} \tag{11.2}$$

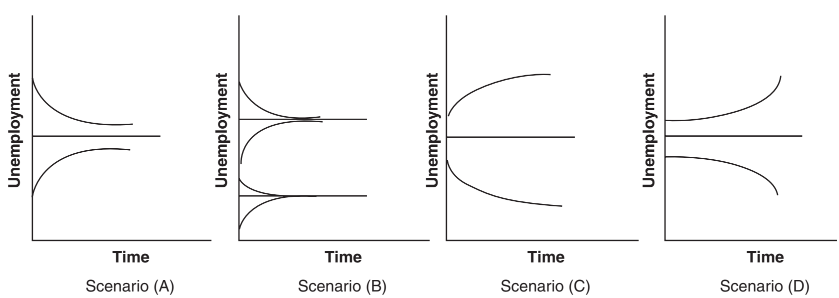

Figure 11.2 Dynamic evolution patterns

In this slightly more intuitive formulation, $\tilde{\beta}$ should not exceed unity in the case of convergence.

Imposing the constraint that all $i's$ need to converge to a unique level may be too demanding if $i's$ differ substantially in the underlying fundamentals. Therefore equation (11.2) may be tested in a conditional form, that is,

$$x_{i,t} = \alpha_i + \tilde{\beta} x_{i,0} + \gamma Z_{i,t} + \epsilon_{i,t} \tag{11.3}$$

where $Z_{i,t}$ denotes a set of variables differentiating the $i's$. Finding a below unity $\tilde{\beta}$ coefficient in equation (11.3) is equivalent to scenario B.

Unfortunately, regression analysis does not allow us to discriminate between scenarios C and D. Neither is it possible to effectively approach the situations in which some groups of $i's$ would exhibit convergence, while some others divergence. This is where σ approach can provide useful insights.

3.2. Convergence of variance

Kernel density estimates in general approximate an unknown density function for a random variable, basing on a finite number of observations drawn from this distribution. This estimator is continuous equivalent of the histogram. The values of the density function at some point are calculated as relative frequency of the observations in the nearest surrounding of this point (bandwidth window), while this relative frequency is estimated using a density function (kernel).

If the initial unemployment rate is defined by x, while the one for the current period by $x+1$, the distribution of $x+1$ conditional on x may be written down as:

$$f[x+1|x] = \frac{f[x, x+1]}{f_x[x]} \tag{11.4}$$

where $f_x[x]$ is the marginal distribution of the initial unemployment rate, while $f[x, x+1]$ represents the combined distribution of x and $x+1$. Estimating the conditional density function, both numerator and denominator of Equation (11.4) are replaced by non-parametric estimators. The combined distribution of initial and final unemployment distribution, that is, the denominator of equation (11.4), is thus estimated by:

$$\hat{f^A_{x_t,x_{t+1}}}[x] = \frac{1}{n} \sum_{i=1}^{N} \frac{1}{h_x h_{x+1} w_i^2} K \frac{x - (x+1)_i}{h_x w_i} K\left[\frac{(x+1) - (x+1)_i}{h_{x+1} w_i}\right] \tag{11.5}$$

where h_{x+1} is the bandwidth window for the final unemployment rate distribution, subscript A signifies the use of adaptive technique, while n is the number of observations and h_x denotes the bandwidth window for the initial unemployment rate with $K[.]$ representing the kernel function.[7]

This methodology has shorthand interpretative advantages. First of all, convergence/divergence may be easily detected from the graphs of the conditional density functions. Namely, vertical shape of this function suggests divergence, while horizontal vertical alignment is consistent with the convergence hypothesis. If the conditional density function follows the 45° line, overall density function exhibits stability, that is, an observation drawn randomly at one point in time is highly unlikely to move towards relatively higher or lower values in any preceding or subsequent point in time.

In order to get a better understanding of the dynamics of these processes, transition matrices can be computed. They represent essentially a non-continuous version of kernel density estimates, that is, given the boundaries for the groups of observations probabilities of changing the group to a higher or lower unemployment class are estimated.

3.3. Stochastic convergence

Based on the theoretical imperative of convergence advocated by Blanchard and katz (1992), Carlino and Mills (1993) suggest a time-series approach to test it. They argue that a crucial condition is required for a stochastic convergence, namely that shocks to relative local levels should be temporary only. Consequently, a testable hypothesis of local and national unemployment rates cointegration can be formulated:

$$\forall t : \lim_{s \to \infty} E(U_{i,t+s} - U_{j,t+s} | I_t) = constant \tag{11.6}$$

where U denotes respective unemployment rate and I_t is the conditioning information set[8]. This is empirically approached by testing for a unit root in

$$u_{i,t} = ln \frac{U_{i,t}}{\bar{U}_t} \tag{11.7}$$

Armstrong and Taylor (2000) suggest that if the speed of adjustment is slow while external shocks are strong, divergence may emerge as a statistical artefact in spite of effective convergence exhibited by the processes. Therefore, cointegration tests should encompass considerations for possible structural breaks. This last approach is applied by Bayer and Juessen (2006) for Germany and Gomes and da Silva (2006) for the case of Brazil.[9]

Unit-root tests are typically troubled by weak power. To circumvent this problem panel data unit-root tests are applied. Three most recently developed approaches to test stationarity in panel data include Breitung and Meyer (1994) (henceforth BM) Levin, Lin and Chu (2002) (henceforth LLC) and Im, Pesaran and Shin (2003) (henceforth IPS). The first two assume that each unit in the panel shares the autoregressive coefficient. It has been demonstrated that BM has better asymptotic properties for larger N and smaller T, while LLC has the opposite characteristics. When compared to the single ADF tests, both BM and LLC enjoy higher power by exploiting the cross-equation parameter restriction on the autoregressive parameter. By contrast, IPS assumes heterogenous adjustment paths, by formulating the alternative hypothesis to imply at least one non-stationary variable, but not necessarily all of them.

Unfortunately, each of these tests requires a balanced panel, which is not always feasible due to relatively frequent administrative changes in transition economies. Therefore, whenever forced to do so by the data, we will resort to a Fisher test that combines the $p - values$ from N independent unit-root tests, as developed by Maddala and Wu (1999). Based on the $p - values$ of individual unit-root tests, Fisher's test assumes that all series are non-stationary under the null hypothesis against the alternative that at least one series in the panel is stationary. Test allows us to specify either Phillips-Perron test or Augmented Dickey-Fuller test for each individual case.

4. Data and results

Policy relevant NUTS4 level data for registered unemployment are employed for Czech Republic, Poland and Slovakia. In total we use 77 units for Czech Republic, 374 units for Poland[10] and 79 units for Slovakia. Since these are registry data, they suffer from many well-known shortcomings, including underreporting or overreporting (for example, either due to forced passivity or in order gain access to social transfers, respectively). Unfortunately, for none of these countries LFS data can be reliably desaggregated to the NUTS4 level–they are only representative for NUTS3 in the case of Czech Republic and Slovakia and NUTS2 in the case of Poland.

Data cover periods January 1995 until June 2007 for Czech Republic, Jan 1999 until August 2007 for Poland[11] and January 1997 until October 2004 for Slovakia. The choice of time boundaries was dictated by the data availability and seems to bear no serious limitations for the possible results except for one obstacle. Namely, labour market evolutions have commenced in these countries in the early 1990s. Unfortunately, NUTS4 data prior to 1999 are not accessible for Poland as the administrative reform establishing this level of local authorities was only implemented as of this year (2009), while only in 2001 metropolitan municipalities were founded. For Czech Republic the consistency of data is destroyed by the change in unemployment definition prior to 1995. For Slovakia, the quality of data prior to 1997 after 2004 is not satisfactory since the definition of unemployment changed frequently. Hence, the data analysed commence roughly in the middle of the dynamic evolution patterns. Nonetheless, data sets cover periods of both increases and decreases in the national unemployment rates, which is depicted already by Figure (11.1). Although rather worrying as a labour market phenomenon, this is rather fortunate from the empirical point of view, since results do not risk to be driven by short-term uni-direction trends.

4.1. Levels – β convergence

In this section we report the results of a panel regression of unemployment in period t on the unemployment in the initial period (the β-convergence). This is done in both unconditional (simplified) and conditional (extended) framework. For each of the countries estimations were performed separately not to impose logically redundant constraint of the common size in the estimated coefficients. In the extended version, to control for low and high unemployment regions, a synthetic proxy was generated, indicating to which of the ten decimal groups a district belonged in the initial period. Since this measure is constructed on the basis of empirical distribution moments, it can take simply the values of 1–10, without hazarding the correctness of estimates due to non-linear or non-monotonic effects. To control for cyclicality as well as changing labour market conditions, overall nation wide unemployment rates were incorporated.

Summarizing, results are not susceptible to the method of estimation used. The sign and the size of the estimated coefficients remain essentially unaffected when possible heterogeneity in the data is controlled for (cross-sectional time-series FGLS with heteroscedastic panels instead of OLS with robust standard errors).

These findings (Table 11.1) clearly demonstrate strong divergence in all three countries, while the effect seems to be strongest for a country with lowest unemployment levels, that is, Czech Republic. In the case of Poland the size of divergence seems to decrease significantly for conditional analysis, while for both Czech and Slovak labour markets the estimate for the rate of divergence remains stable regardless of including the national labour market variables and decimal group indicators. In the case of Poland the divergence tends to be much more business cycle driven than for the other two countries. The β coefficient drops from 1.03 to approximately 0.5 when conditionality is allowed for, whereas for Czech and Slovak republics inclusion of nation wide trends seems to have no effect on the β estimates. Being located in the tenth decimal group boosts the divergence size by as much as approximately 20 percentage points in the case of Czech Republic, 18 percentage points in the case of Slovakia and an additional 2–3 percentage points for Poland.

4.2. Dispersion – σ convergence

To analyse the dynamics of unemployment rates dispersion kernel density estimates were calculated for immediate (month-to-month) and indirect (yearly, that is, 12-month) rolled transitions. Transitions are less likely to demonstrate stability if viewed from a 12-month horizon than directly for two adjacent periods, if the cohesion policy was to work.

In this approach, axes correspond to the unemployment rate vis-a-vis a national average. The horizontal envisages the ‘current’, while the vertical

Table 11.1 Convergence of levels

Dependent variables	*Czech Republic*			*Poland*			*Slovakia*		
Initial unemployment (IU)	1.76*	1.76*	1.76*	1.03*	0.46*	0.44*	1.11*	1.11*	1.11*
National unemployment		1.39*	1.40*		1.11*	1.05*		0.66*	0.49*
Decimal group		0.18*	0.17**		0.53*	0.44*		0.11*	0.09*
Decimal group · IU		0.21*	0.19*		0.02*	0.03*		0.18*	0.11*
Constant	4.51*	−5.97*	−6.02*	4.83*	−10.93*	−9.28*	1.09*	−11.1*	−11.1*
No. of observations	11 538	11 538	11 538	32 578	32 578	32 578	7 365	7 365	7 365
No. of groups	77	77	77	428	428	428	79	79	79
R^2 within	n.a.	0.42	n.a.	n.a.	0.61	n.a.	n.a.	0.44	n.a.
R^2 between	n.a.	0.44	n.a.	n.a.	0.88	n.a.	n.a.	0.90	n.a.
χ^2 statistic	*	*	*	*	*	*	*	*	*
Hausman test	RE	RE	RE	RE	RE	RE	RE	RE	RE
Method	FGLS	OLS	FGLS	FGLS	OLS	FGLS	OLS	OLS	FGLS

Notes: FGLS estimation allows effectiveness even in the presence of AR(1) autocorrelation within panels and cross-sectional correlation and heteroskedasticity across panels. In either case, panel OLS estimates use robust standard errors. Whenever suggested by the data pattern in the conditional analyses time trend and its relevant powers included, but not reported (available upon request).

* and ** denote statistical significance at 1 per cent and 5 per cent levels, respectively. All χ^2 Wald statistics are highly statistically significant, *p-values* available upon request.

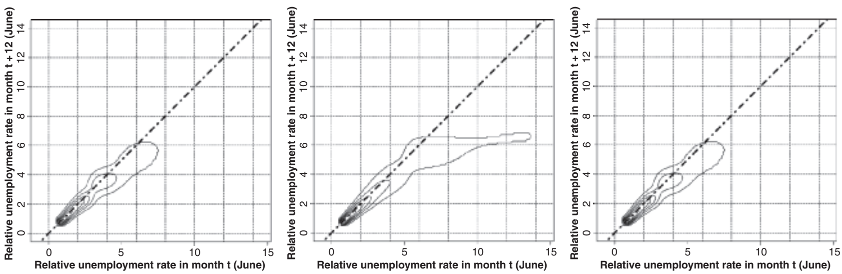

Figure 11.3 Kernel density estimates – Czech Republic

serves the 'next' period distributions. The contours demonstrate the relative intensity of the distributions at every point in this space[12]. In principle these shapes correspond to the relative density functions when transformed orthogonally.

The graphs in Figure 11.3 demonstrate estimates of kernel density functions for immediate (left panel) and 12-month rolled data untill 2001 and afterwards (central and right panel, respectively) for Czech Republic[13]. (Figure 11.4 and Figure 11.5 refer, respectively, to Poland and Slovakia) Visibly, in the case of immediate changes for the majority of the distribution no convergence pattern may be traced. The shape is located along the diagonal, demonstrating that distributions are highly stable over time. At the level of approximately five-fold the national unemployment rate the shape moves below the diagonal which suggests that highest unemployment districts were converging to slightly lower relative unemployment rates. However, this observation may be just a statistical artefact, since even

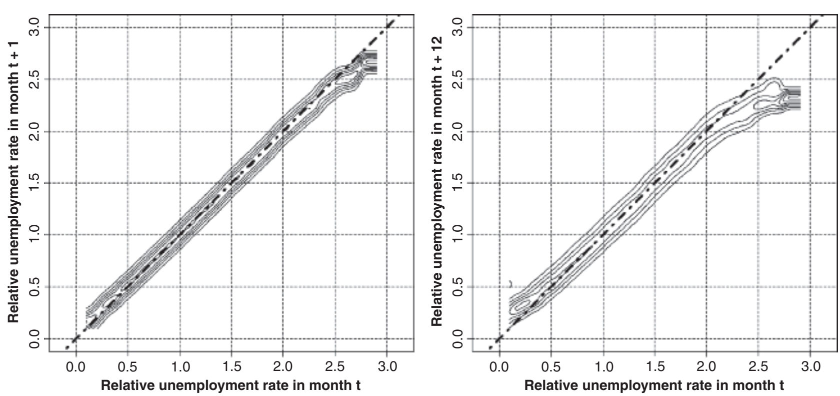

Figure 11.4 Kernel density estimates – Poland

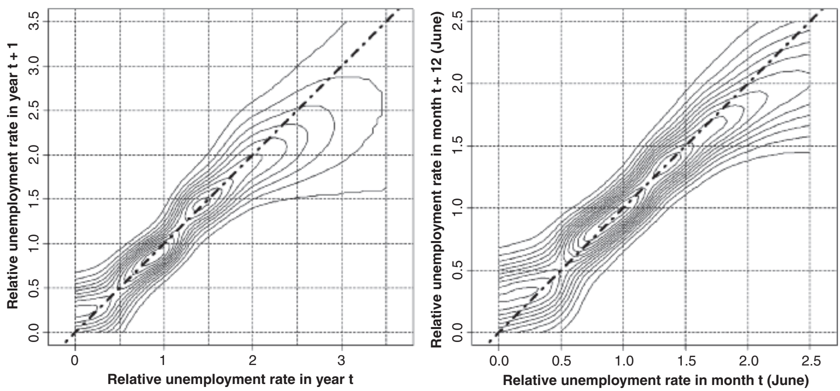

Figure 11.5 Kernel density estimates – Slovakia

small cyclical upswings in the national unemployment rates with stable high unemployment in these districts would produce exactly the same pattern. The results are thus consistent with the analysis of β convergence findings. Correspondingly, Table 11.2 reports the estimated transition probabilities.

Based on the figures in the left panel of Table 11.2 for Czech Republic, one can state that 'downgrading' is more likely than 'upgrading', since larger probabilities are found below than above diagonal. Very high and very low unemployment regions exhibit high persistence, while the middle ones tend to demonstrate higher mobility. This is especially visible when looking at the sixth and eighth decimal groups, which have virtually switched places. For both highest and lowest unemployment districts persistence seems to have strengthened remarkably over time (from 70 per cent to 82 per cent). At the same time, middle groups demonstrate even higher mobility in recent years than in the 1990s. Low values of the ergodic vector suggest high persistence, but it is visible that in the 1990s high unemployment groups were shrinking while low unemployment ones expanding, while in the twenty-first century the direction of these shifts is reversed.

In the case of Poland, since the national unemployment rate is consistently higher reaching even 20 per cent thresholds, the distribution is more condense. Instead of 15-times the average we do not observe levels higher than three-fold. Nonetheless, the shape is located strongly along the diagonal with no traces of convergence or divergence for direct transitions (left panel). In the case of 12-month rolled ones (right panel), for highest unemployment regions some convergence may be traced (convergence of 'clubs'). Similarly in the case of Czech Republic, higher unemployment regions tend to converge to slightly lower relative unemployment rates (this part of the shape is located slightly below the diagonal). However, as suggested earlier, this may result from positive trend in the national unemployment rate.

Table 11.2 Convergence of dispersions

	Czech Republic																			
	Direct monthly changes										*Rolled 12-month changes*									
hline	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	72	21	4	2	0	0	0	0	0	0	74	11	6	4	4	0	0	2	0	0
2	22	35	31	11	0	0	0	0	0	0	6	38	32	21	2	0	2	0	0	0
3	4	35	28	13	15	2	0	0	0	0	7	18	29	18	22	5	0	0	0	0
4	0	9	28	24	15	13	2	0	0	0	0	4	6	19	23	13	13	0	0	0
5	0	9	11	22	26	22	7	4	0	0	2	6	20	20	17	20	6	7	2	0
6	0	0	2	19	28	9	26	11	6	0	0	0	0	11	24	28	22	6	7	0
7	0	2	0	2	9	29	33	11	13	0	0	2	0	2	16	24	31	16	9	0
8	0	0	0	4	0	24	17	24	22	9	0	0	2	0	6	6	24	28	35	0
9	0	0	0	0	0	4	11	26	30	28	0	0	0	0	0	9	4	34	38	15
10	0	0	0	0	0	0	2	9	19	70	0	0	0	0	0	0	0	4	13	83
E	12	13	12	10	9	9	9	8	8	10	7	6	10	9	12	12	11	11	12	11

	Poland																			
	Direct monthly changes										*Rolled 12-month changes*									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	97	3	0	0	0	0	0	0	0	0	86	13	1	0	0	0	0	0	0	0
2	3	92	5	0	0	0	0	0	0	0	14	64	18	4	0	0	0	0	0	0
3	0	5	88	7	0	0	0	0	0	0	0	21	54	21	3	0	0	0	0	0
4	0	0	7	87	6	0	0	0	0	0	0	1	22	50	23	4	0	0	0	0
5	0	0	0	6	87	0	6	0	0	0	0	0	1	23	50	22	0	4	0	0
6	0	0	0	7	2	88	5	0	0	0	0	0	0	3	25	48	3	21	0	0
7	0	0	0	0	4	6	90	0	0	0	0	0	0	2	27	15	56	1	0	0

8	0	0	0	0	0	0	0	91	5	5	0	0	0	0	0	0	7	62	19	18
9	0	0	0	0	5	0	0	0	92	3	0	0	0	0	0	0	1	6	72	12
10	0	0	0	0	0	0	0	0	3	97	0	0	0	0	0	1	0	0	12	88
E	9	9	9	10	11	10	11	11	11	10	8	8	8	10	11	11	10	11	12	11

	Slovakia																			
	Direct monthly changes										*Rolled 12-month changes*									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1	97	3	0	0	0	0	0	0	0	0	93	7	0	0	0	0	0	0	0	0
2	3	89	7	0	0	0	0	0	0	0	13	67	16	4	0	0	0	0	0	0
3	0	3	83	8	0	0	0	0	0	0	0	20	61	16	4	0	0	0	0	0
4	0	0	9	78	12	0	0	0	0	0	0	2	13	52	27	7	0	0	0	0
5	0	0	0	11	77	10	1	0	0	0	0	2	22	38	25	5	4	0	0	
6	0	0	0	1	11	77	10	1	0	0	0	0	0	2	31	44	20	4	0	0
7	0	0	0	0	0	10	80	8	1	0	0	0	0	0	5	21	46	23	4	0
8	0	0	0	1	0	1	9	79	10	1	0	0	0	0	0	4	22	48	22	4
9	0	0	0	0	0	0	1	10	80	8	0	0	0	0	0	0	4	25	42	29
10	0	0	0	0	0	0	0	0	7	93	0	0	0	0	0	0	0	0	25	75
E	11	10	10	10	10	10	10	10	10	11	13	8	6	7	9	9	10	11	11	15

Notes: In the panel for Czech Republic table reports the probabilities in per cents. Boundaries for the decimal groups were given by 36.4, 49.6, 60.7, 73.9, 91.5, 113.2, 139.2, 180.9 and 243.2 per cent of the national unemployment rate in the case of prior to January 2001 data. For rolled 12-month transitions in the subsequent subperiod these boundaries were 40.5, 52.9, 66, 79.5, 98.9, 123.1, 154.2, 197.3 and 297.7 per cent. In the panel for Poland table reports the probabilities in percents. Boundaries for the decimal groups were given by 67.3, 80.9, 91.2, 101.4, 112.6, 123.6, 137.1, 154.5, and 176.7 per cent of the national unemployment rate in the case of monthly transitions. For rolled 12-month transitions these boundaries were 68.3, 81.3, 91.2, 101.2, 112, 123.6, 136.9, 154 and 176 per cent. In the panel for Slovakia table reports the probabilities in percents. Boundaries for the decimal groups were given by 43.5, 70.9, 83.2, 93.0, 103.7, 117.8, 132.7, 146.7, and 166.5 per cent of the national unemployment rate in the case of monthly transitions. For rolled 12-month transitions these boundaries were 42.8, 70.4, 82.8, 92.5, 103.9, 115.9, 132.3, 145.3 and 166.1 per cent.

In either case, they were computed based on the empirical distributions in the initial period.

Numbers to not add up to unity, because they were rounded to whole percentage points.

Line *E* denotes values for ergodic vector.

Especially in the case of regions, whose unemployment rates already exceed 40 per cent one might expect some boundaries as to how much more this rate may still increase. Therefore, although the ratio of highest to lowest relative unemployment has decreased from 25 in December 1998 to 7.5 six years later, this effect should be attributed to a general growth in national unemployment rate rather than effectively diminishing local differences.

Transition matrices intuitively confirm these findings. At the beginning of calculations, there were ten groups with poviats evenly distributed. On average 93 per cent of poviats remain in the same group on the monthly basis, while 68 per cent are likely not to change the decimal group for rolled, 12-monthly changes. Probabilities above the diagonal are slightly higher than the ones below, suggesting that moving to higher decimal group (group of higher unemployment) is more likely. Importantly, the majority of transitions on an annual basis happens around fourth to sixth decimal groups, mostly among themselves over nine years. For high unemployment regions the probability of remaining in the same decimal group reaches 70 per cent to 88 per cent over an eight-year period.

The ergodic values confirm the above statements. Namely, although the size of this effect is not very large, lower unemployment groups loose districts, while the higher ones gain. Since each decimal group had approximately 37 *poviats* on average or more, 1–2 per cent differences translate to six to eight districts. In addition, out-of-diagonal numbers are considerably smaller in the case of Poland, when compared to Czech Republic. This suggests that the distribution is far more stable. Graphically, this is exhibited by the thickness of the kernel density estimates – they are much thinner for Poland.

For Slovakia the regional differentials seem to be of even higher range than for Poland. The shape leans to the diagonal with small convergence among the highest and the lowest unemployment districts. For the former, however convergence seems to occur to relatively higher levels (shape lies above the diagonal), while for the latter the opposite seems to hold. Again, this effect should probably be attributed to the general trends, that is, the markets with largest hardships relatively improve with general worsening of the labour market outlooks. At the same time, those least struggling observe some increases in relative unemployment rates in the moments of employment contraction. Finally, when compared to Poland, the shape is considerably thicker suggesting less homogeneity, thus less conformity in responding to nation-wide shocks.

This last conclusion especially is corroborated by the analysis of the transition matrices. Out-of-diagonal percentages are much higher than in the case of Poland. Moreover, especially if 12-month rolled estimates are considered (right panel), lower unemployment decimal groups districts consistently loose, while higher unemployment ones consistently increase. Although, again as in the case of Czech Republic, decimal groups contained on average only few districts, 11 per cent to 15 per cent transition for the tenth group suggests that over the 1997–2004 time span, this group grew from approximately eight to 12 districts, which is by all means considerable. In addition, there seems to be a lot of rotation in the middle-range groups, with diagonal values of approximately 50 per cent. This effect can stem from two phenomena – either middle range groups experience a lot of volatility or their unemployment rates remain fairly stable over the nation-wide range. For groups eight and nine the latter seems to be the case, while for groups four to seven it is rather the former.

Summarizing, one can compare this analysis to the following exercise: considering the ranking of the districts along their relative unemployment rates we tried to inquire whether they switch places in the ranking, like the steps of a ladder. We already know from the β analysis that this ladder – if anything – gets wider in terms of unemployment levels. σ analysis inquired into the mobility of local labour markets in nation-wide distributions. In the case of Czech Republic transitions seem to be more frequent, but at the same time less sustainable – movements up and down the ladder occur for the same districts. For Poland, there appear to be virtually no movements – if anything, *poviats* move to higher unemployment levels. For Slovakia analysis suggests reduction of low unemployment clubs and considerable volatility in the middle range. In all three cases, however, kernel density estimates failed to provide evidence in favour of general convergence.

Unfortunately, σ convergence analysis does not permit assessment of the absolute scale of the differentials persistence. This shortcoming of the kernel density estimates comes directly from their nature – one needs distributions (relative unemployment levels) to estimate them. To see how these differentials behave across time, stochastic convergence analysis is applied.

4.3. Stochastic convergence

As discussed earlier, stochastic convergence essentially implies that one should confirm random walk hypothesis in the analyses of the relative (local) unemployment rate univariate time series. In order not to exclude scenario B from Figure 11.2, one can impose weaker constraint of trend stationarity with a constant to account for potentially differentiated steady state levels. In order to assure validity of the results one needs to control for sufficient number of lags. In as far as number of lags is concerned, we followed the findings of Bayer and Juessen (2006), who typically found two to maximum four lags on annual data. Hence, we universally imposed 36 monthly lags. In most cases up to eight lags was supported by data. Table 11.3 below reports the results of this analysis.

Table 11.3 Stochastic convergence

	Czech Republic	*Poland*	*Slovakia*
Total number of districts	78	374 (428)	77
No. of observations	11 550	32 579	7 426
Multivariate ADF (MADF)	0.00	0.00	0.00
Fisher (Phillips-Perron)	0.00	0.00	0.00
Fisher (ADF)	0.78	1.00	0.37
No. of null rejections at 5%	45	71	45
LLC for panel time-balanced	0.00	0.26	1.00
No. of observations	10 472 (76)	24 500 (370)	4606 (73)
Trend	No	Yes (2)	Yes (2)
Structural breaks	No	No	No
LLC for panel unit-balanced	0.00	1.00	1.00
No. of observations	11 324 (77)	26 305 (379)	5451 (79)
Trend	No	No	No
Structural breaks	No	No	No
IPS for panel time-balanced	0.049	1.00	0.334
No. of observations	10 716 (76)	24 420 (370)	6205 (73)
Trend	No	No (2)	No (2)
Structural breaks	Yes (4)	Yes (2)	Yes (2)
IPS for panel unit-balanced	0.014	0.469	0.872
No. of observations	9 856 (77)	16 297 (379)	6715 (79)
Trend	No	No	No
Structural breaks	Yes (4)	Yes (2)	Yes (2)
Non-stationarity	Not rejected	Not rejected	Not rejected

Notes: Optimal number of lags obtained by sequential $t-tests$ as suggested Ng and Perron (1995). Structural breaks forced on data based on the analysis of national unemployment rate behaviour. Indication 'no' with reference to trend and structural breaks implies that specification with these components consistently failed to reject the null of non-stationarity.

To obtain time-balanced panels periods for which not all units are yet available were eliminated (hence, maximum possible time series length). To obtain unit-balanced panels, units for which data is not available for all periods were eliminated (hence, maximum possible abundance of districts).

MacKinnon $p-values$ reported.

We first report multivariate augmented Dickey-Fuller (MADF) panel unit-root test [as specified by Sarno and Taylor (1998)] on a variable that contains both cross-section and time-series components. The MADF test is a generalization of the test in which a single autoregressive parameter is estimated over the panel[14]. Findings suggest that the null hypothesis is strongly rejected. Similarly, Fisher's test as developed by Maddala and Wu (1999) does not require a balanced panel. Combining the $p-values$ from N independent unit-root tests, Fisher's test assumes that all series are non-stationary under the null hypothesis against the alternative that at least one series in the panel is stationary. The results of ADF version of this test clearly demonstrate that the null hypothesis of non-stationarity cannot be rejected for all three countries. More importantly, in the Phillips-Perron version of this test, when the null hypothesis is that all variables in the panel contain a unit-root, and the alternative is that at least one of the variables in the panel was generated by a stationary process, we find strong rejection of the null in the case of all three countries, which suggests that regions are strongly diversified in the underlying dynamics. This is further confirmed if one analyses the number or cases in which null was rejected. Approximately two thirds of Czech and Slovak districts exhibit stationarity, while in the case of Poland this share drops to as low as approximately 20 per cent.

As frequently raised, Fisher-type test may have too little power to effectively reject the non-stationarity in all relevant cases. This is why reportedly more powerful IPS and LLC tests were applied as well. Unfortunately, this had to come at the expense of data reductions, since these tests require balanced panels.[15] Results seem to be consistent with the unbalanced tests outcomes. However, in the case of Czech Republic the null was consistently rejected, while in the case of Slovakia and Poland data suggest strong persistence of regional unemployment rate differentials despite inclusion of trend and allowing for structural breaks.

5. Conclusions

The main purpose of this chapter was to inquire into the convergence patterns of local labour markets in three transition economies: Czech Republic, Poland and Slovakia. Our findings suggest that whenever job prospects get better across the whole country, already disadvantaged regions benefit less in each of the examined countries. Further, regions with both very high and very low unemployment show signs of high persistence and low mobility in the national distribution, while the middle ones tend to demonstrate higher mobility and essentially no regional unemployment differentials persistence. For Czech Republic transitions seem to be more frequent, but at the same time less sustainable, while movements up and down the ladder occur frequently for the same districts. For Poland and to some extent Slovakia, there appear to be virtually no movements – if anything, districts move to higher unemployment levels.

Returning to the scenarios discussed in the opening of this chapter, it seems that this chapter provides evidence in support of stylized patterns presented in Figure 11.6. In the case of Czech Republic, rejection of non-stationarity is the weakest. This may follow from both relatively lower unemployment levels and relatively high proportion of districts not experiencing labour market hardships. There are quite a few districts in the case of which non-stationarity is associated with significantly lower than average unemployment, which suggests that differentials persistence found is generally a positive sign. At the same time, some districts with generally more

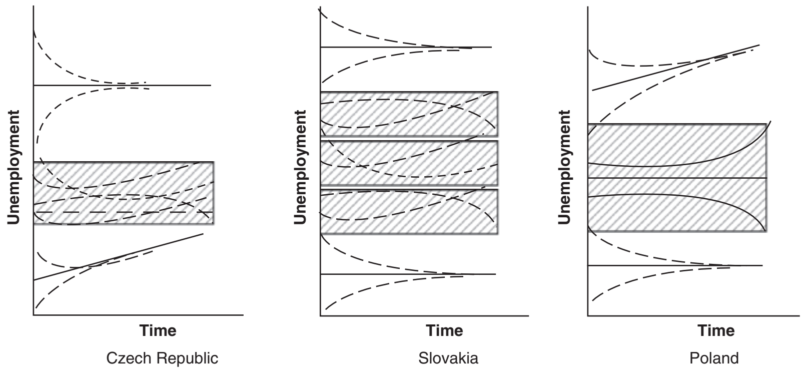

Figure 11.6 Stylized facts based on findings

profound labour market problems seem to remain at higher thresholds, with relatively high stability in the composition of the tenth decimal group. In the second subsample (time span 2001–2007), diagonal values are extremely low (ranging between 17 per cent and 38 per cent for second to eighth decimal groups), which suggests there is relatively high mobility in the middle range allowing up and down grading even within the four closest groups. While this mobility should be rather attributed to the national unemployment rate movements within 2 per cent to 15 per cent boundaries, Czech districts seem to maintain stability in absolute levels.

The picture seems different for the two countries with a relatively more difficult labour market situation. In the case of both Slovakia and Poland non-stationarity was strongly rejected. For the latter this is true for mainly high unemployment districts, while for the former low unemployment ones demonstrate high differential persistence as well. At the same time, Slovakia seems to demonstrate higher mobility in the mid-range, while for Polish districts diagonal values are higher and off-diagonal values considerably lower, especially for 12-month rolled analysis. Over the analysed period in both these countries highest unemployment regions demonstrate convergence of 'clubs'. Although the fact that shape is located slightly below the diagonal seems to suggest relatively lower relative unemployment rates, this effect should be attributed to the fact that these levels have decreased significantly in time (national averages moving from 10 per cent to 20 per cent thresholds in the case of Poland and from 12 per cent to 20 per cent for Slovakia).

There are some evident shortcomings of our study, though. Firstly, due to data limitations it was not possible to cover the whole transition period. The relevant district data for earlier years do not exist or have too low quality. Therefore, the time-span is relatively short, especially in the context of stochastic convergence studies in the literature (Bayer and Juessen (2006) use 40 years for Western Germany, Gomes and da Silva (2006) have at disposal 22 years, while Camarero, Carrion-i Silvestre and Tamarit (2006) study the validity of the hysteresis hypothesis with yearly unemployment rates data from 19 OECD countries for the period between 1956 and 2001). Consequently, our results should be interpreted with caution.

At the same time, in search of integrity with actual policy developments, data used are desagregated to NUTS4 level. The findings of this chapter effectively suggest that the very notion of 'national' unemployment rate is highly uninformative for these countries. Namely, the average is actually only a statistical operation on strongly differentiated processes with sometimes even diverging dynamics.

The findings of this chapter provide some insights with reference to the potential geographical distribution of the adverse, externally driven macroeconomic shocks. Namely, we find evidence that in all of the three analysed countries, negative macro-level shocks are sustained or even magnified in real terms in the already most disadvantaged regions. At the same time, recovery – if occurring at all – happens rather late and is characteristic for regions occupying the middle of the unemployment distribution ladder. Current global financial turmoil – affecting obviously Czech Republic in a stronger way than Slovakia or Poland – is thus likely to observe these outcomes. On the other hand, the effects of this global economic crisis are much weaker than the Russian crisis of 1997 or the economic slowdown of 2001, for the time being.

This chapter also has some important policy implications. Namely, NUTS3 authorities in Slovak and Czech Republics and NUTS2 in Poland do not seem to use the fact that they distribute the active labour market policies financing in an effective way. Each of Polish NUTS2 and most of Czech and Slovak NUTS3 regions contain districts from highest unemployment groups. Financing should be geared towards alleviating the situation in most deprived regions by fostering higher effectiveness. Also, national authorities do not seem to exert sufficient monitoring activities promoting improvements in most deprived regions.

Although rather indirectly, this research demonstrates that either these activities lack necessary effectiveness, or are largely inappropriate. To inquire into this issue in-depth a theoretical framework would need to be developed.

Notes

1. Authors would like to thank David Katrencik for making available the data on Czech Republic and Slovakia along with many useful comments. Michal Alexeev, Roger Bivand, Badi H. Baltagi, Ryszard Kokoszczynski and Boris Najman as well as participants of WNE UW, CEEERC and Indiana University seminars for valuable comments. Usual disclaimer applies.

2. Corresponding author: jtyrowicz@wne.uw.edu.pl. Part of the research has been performed while Joanna Tyrowicz has been a visiting researcher at IZA, whose support is gratefully acknowledged.
3. Most recently, Huber (2007) surveys empirical literature on the regional labour market developments in transition countries. Boeri and Terrel (2002) inquire if these differentials could be explained on the grounds of the optimal speed of transition theory (see Ferragina and Pastore (2008) for an extensive review).
4. However, Buettner (2007) research used differentiated levels for desaggregation (pre-reform NUTS2 for Poland. Although the paper is not explicit, this suggests that the data set ends with December 1998, essentially only the middle of transition, current NUTS3 for Slovakia and current NUTS4 for Czech Republic).
5. With the exception of Newell and Pastore (1999) who work on LFS data, all of the above studies for Poland use 49 voivodships (comparable to the current 44 regions at NUTS3 level), which currently are not even equipped in any authorities, let alone public employment service bureaus.
6. See Martin (2006) for a case study of the impact decline in Danube transport is believed to have had on employment in all riparian countries, namely: Austria, Bulgaria, Croatia, Germany, Hungary, Moldova, Romania, Slovakia, Ukraine, Serbia and Montenegro as well as some nonriparian ones.
7. The assumption about the kernel function only concerns the properties of the nearest surrounding of each point (within the bandwidth windows) and not the distribution as a whole. We used Gaussian density function. Although the choice of the kernel function has evident but in fact only slight impact on the way the unknown density functions are estimated, it is the bandwidth window that essentially drives the results. Silverman (1986) provides the procedures for finding optimal bandwidth, subject to differentiated kernel functions, basing on standard deviations and inter-quartile differentials (independently for all vectors in the case of multidimensional distributions).
8. To be precise, this is a conditional stochastic convergence formula. Unconditional version would require the limit to approach zero. However, such a condition would discriminate between scenarios A and B, classifying B as non-convergence. Allowing a non-zero constant, permits to account for across regions differentiation. Although we do not subscribe to the idea of regional amenities by Marston (1985) as laid out also in Blanchard and Katz (1992) that more interesting regions will be burdened with higher unemployment because people have higher utility of living there anyway, we acknowledge that there are numerous structural reasons for regional disparities to persist, especially in the ten-years time horizon, as is the case in this chapter.
9. Bayer and Juessen (2006) perform a unit-root test on regional unemployment rate differentials using Mikrozensus data for West Germany over the 1960–2002 time span. They find moderate evidence in support of the convergence hypothesis, namely when controlling for structural breaks unit-root is rejected for the majority of regions. Similarly, Gomes and da Silva (2006) for the six metropolitan regions of Brazil find strong evidence of hysteresis and unemployment regional differential persistence, especially strong for the case of Rio de Janeiro.
10. Administrative reform of 1999 has introduced the current structure of NUTS4 levels with the exemption of large cities, whose administrative units were separated from the non-agglomerations only as of January 2001.
11. Observing Figure 11.1 one sees a significant increase in the unemployment rate in December 2003 in the case of Poland and Slovakia. As of January 2004 new,

lower census data from 2002 were applied to calculate the size of the labour force. The data have not been re-calculated by CSO for the whole sample, but – for the purposes of comparison from 2004 onwards – December 2003 data were changed. This change had solely statistical character and does not reflect any labour market process. This effect is controlled for in further research.

12. The actual value would have to be depicted in a three-dimensional space, but graphs obtained this way are less clear.
13. Computational power of both R-CRAN and SAS are too low to enable calculations over the whole sample period. The split was chosen as to allow both subperiods to cover both increases and decreases in national levels – see Figure 11.1.
14. In contrast, it allows for higher order serial correlation in the series and allow the sum of autoregressive coefficients to vary across panel units under the alternative hypothesis. This test involves verifying for each equation if the sum of the coefficients of the autoregressive polynomial is unity. The null hypothesis consists of the joint test that this condition is satisfied over the N equations. Under the null hypothesis, all of the series under consideration are realizations of nonstationary stochastic processes. The test's null hypothesis should be carefully considered. It will be violated if even one of the series in the panel is stationary. A rejection should thus not be taken to indicate that each of the series is stationary.
15. LLC imposes a single autoregressive parameter over all units in the panel but utilizes a variant of fixed effect panel estimation. This test may be viewed as an Augmented Dickey-Fuller (ADF) test when lags are included, with the null hypothesis that of non-stationarity. IPS in turn estimates the $t - test$ for unit roots in heterogeneous panels. It allows for individual effects, time trends, and common time effects. Based on the mean of the individual Dickey-Fuller $t - statistics$ of each unit in the panel, the IPS test assumes that all series are non-stationary under the null hypothesis. Lags of the dependent variable may be introduced to allow for serial correlation in the errors. Unlike the LLC test, which assumes that all series are stationary under the alternative, IPS is consistent under the alternative that only a fraction of the series are stationary.

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12
Structural Change and Regional Labour Market Imbalances in Transition

Floro Ernesto Caroleo and Francesco Pastore

1. Introduction[1]

The new century has brought unprecedented change to the economic and political geography of the European continent. Most former socialist countries in Central and Eastern Europe have already joined the European Union. Other countries in the area are likely to follow in the near future. Entering the EU and opening up to world trade, Central and Eastern European countries are undergoing what Fabrizio, Leigh and Mody (2009) have called a second transition, after that from a planned to a market economy. In addition, they are exposed to many potential sources of structural change. For instance, the global financial crisis due to the explosion of the speculative bubble linked to subprime loans is changing the composition of industry in every country. All these dramatic changes are already generating consequences on local labour markets. Often entire regions of Europe and of the United States are put under distress because of this and governments are called for immediate action. Thinking of the way of working of structural change and how it affects the labour market is of policy relevance particularly in the aftermath of the global financial crisis. In fact, as noted, for instance, in a recent report for the Australian government (Howard, 2009), looking at past experiences of intervention against structural unemployment might help preventing sectoral shifts from generating permanent shocks to the employment rate.

The aim of this Chapter is to summarize recent research ideas and outcomes on how the changing political and economic map of Europe has affected local labour markets in new EU member states. Given the strong similarities with regional imbalances in old EU member states, some comparison with the latter will be also provided. Due to the topicality of the issue and its relevance also for the EU policy, it is not surprising that a vast literature exists and that several authors have already provided surveys of it

(Boeri, 2000; Boldrin and Canova, 2003; Huber, 2007; Marelli and Signorelli, 2007; Ferragina and Pastore, 2008; Caroleo and Pastore, 2010).

This survey brings to the fore and discusses especially those contributions that elaborate on the microeconomic foundations of structural change and its spatially asymmetric impact on local labour markets in new EU countries. Structural change has been long neglected as an explanation of unemployment in general and of regional unemployment in particular, but the availability of new data banks and the specific nature of economic transition in new member states has brought again this issue to the fore, suggesting that it might provide an explanation also of several typical features of regional imbalances in old member states. The literature recalled here provides theoretical reasoning and empirical evidence to suggest that this might be the case.

In addition, this study witnesses the changed perspective of research on regional imbalances on such issues as labour and capital migration. In the traditional way of thinking, the migration of inputs was supposed to play an important part in the adjustment process causing conditional convergence in the long run (Todaro, 1969; Blanchard and Katz, 1992; Barro and Sala-i-Martin, 2004). In the more recent literature, migration, especially of high skill workers, is a cause of further divergence among advanced and backward regions. This is because higher returns to production factors are expected to happen in those regions where these factors already concentrate. Economies to scale and social returns to human capital explain this in turn (Reichlin and Rustichini, 1998; Funck and Pizzati, 2003; Moretti, 2004).

The eastward enlargements of the EU will also have important policy implications. The increasing emphasis of the EU on antitrust law and the implementation of the Maastricht Treaty suggest refuting fiscal incentives as a means to favour investment in lagging regions. Moreover, the fact that most of the regions in the new member states are backward is bound to dramatically influence not only the institutional framework of the EU, but also regional policy. For instance, access and distribution conditions for Structural and Cohesion Funds will completely change.

The EU funds remain roughly of the same amount, but new member states claim their share. This implies more careful definition of the objectives and targeting of the interventions. Recent theories suggest investing the EU funds to strengthen the endowment of human capital of backward regions. This implies innovation policy and investment in the educational sector. The only constant in the discussion about instruments of regional policy is the role of infrastructures.

The outline of this chapter is as follows: Section 1 brings to the fore the motivation of this specific survey as compared to previous surveys: it lies in the asymmetric role of structural change. Section 2 discusses the main results of the empirical literature on regional job and worker turnover across EU countries. Section 3 highlights the role that trade and FDI have on regional labour market differences. Section 4 asks and answers the question whether migration is reducing or reinforcing regional unemployment differences. Section 5 highlights the important role of human capital as a factor of divergence. The last two sections draw some policy implications by looking at the national and EU regional policy, as well as at passive and active labour market policy. Some concluding remarks follow.

2. The labour market impact of structural change

Previous surveys of the literature on regional labour market differences in Central and Eastern Europe give important insights on several aspects of the regional dimension of transitional labour markets. Boeri (2000) argues that despite massive structural change in the beginning of transition, labour reallocation across regions in new member states has been relatively low pointing to labour supply constraints due to rigid labour market institutions to explain high local unemployment. Bornhorst and Commander (2006) provide detailed and systematic cross-country empirical evidence relative to different dimensions of labour market flexibility in six transition countries. The evidence is in favour of the hypothesis that labour market flexibility is low, but not lower than the EU average. However, in their view, this is already enough evidence to explain the low convergence of regions in new member states.[2] Ferragina and Pastore (2008) appeal to the Optimal Speed of Transition Literature (Aghion and Blanchard, 1994; Boeri, 2000) to argue that regional unemployment differences may be due either to similar labour reallocation across regions with a different unemployment rate, in which case high local unemployment is due to low job creation rates unable to absorb the initial asymmetric shock, or to persistently higher labour reallocation in high unemployment areas due to the inability to create stable jobs. They find that the evidence available in the literature relative to the first decade of economic transition, back in the 1990s, is in favour of the latter hypothesis and argue that this is due, in turn, to the competitive advantage of urban as opposed to peripheral regions in attracting trade and capital flows from abroad, due to their higher human capital endowment and several positive location factors. Besides, a recent contribution by Munich and Svejnar (2009), based on estimates of matching function in a number of mainly Eastern European countries, shows that industrial restructuring is still a major cause of local (and national) unemployment in many cases, although in some countries low demand and inefficient matching are also important factors.

Huber (2007) focuses on the empirical literature on regional developments in new member states and provides a detailed analysis of previous findings on several aspects of regional developments in transition countries. He concludes that capital cities and regions closer to EU-borders developed better and, in addition, that increased integration has also contributed to divergence. Spillovers within countries, however, tend to be small. Regional disparities are also unlikely to diminish through internal labour migration, wage flexibility and capital mobility. Migration is lower in most transition economies than in the EU and capital mobility tends to reinforce existing regional disparities. Only wage flexibility is higher in transition countries than in most European labour markets.

Little attention was lent in these previous studies on comparison between old and new member states. Canova and Boldrin (2003) are the exception, but they mainly consider the EU regional policy and the degree of labour market flexibility, respectively. The specific focus, and one of the main arguments, of their survey is to show that, notwithstanding important differences, the labour market dynamics experienced in new member states is similar to that traditionally witnessed in the old backward regions of Southern Europe. As several Authors (see, among others, Boltho, Carlin and Scaramozzino, 1997; Sinn and Westermann, 2006; Kostoris Padoa-Schioppa and Basile, 2002; Caroleo, 2006) put it, the transition has yield, among other things, another Mezzogiorno, which includes not only the Eastern Länders of Germany, but arguably also the peripheral regions of other new member states as well. In both old and new EU regions, labour market imbalances depend on massive and perpetual industrial restructuring with dramatic and persistent labour market consequences. In new member states, the engine of persistent industrial restructuring is the economic transition from a planned to a market economy, whereas in old member states it is the process of globalization, the EU integration and the ensuing process of technical and organizational change. It is likely that the factors that fuel structural change in old member states will also fuel structural change in new member states in a near future.

In the old member states, regional labour market differences have further increased since the early 1980s as a consequence of the process of de-industrialization and the move towards the post-fordist model of an economy based on advanced services. This implies a reshuffling of capital and labour resources from agriculture and large businesses operating in the traditional manufacturing sector to small firms in the ICT and advanced services sectors (Caroleo and Destefanis, 2006; Marelli, 2006). In the new member states, this process has been chaotic along with the move to a market economy.

Structural change caused by a slump is often thought to have a cleansing effect, by pushing non-competitive firms out of the market. This is expected, in turn, to generate a reduction in employment and a consequent increase in productivity as soon as new more efficient firms are established (Caballero and Hammour, 1994). This was also one of the main predictions of the benchmark Optimal Speed of Transition model: newly established buoyant private firms were expected to reduce unemployment in a relatively short period of time and raise the average productivity rate by absorbing low productivity workers fired from state-owned firms (Aghion and Blanchard, 1994).

The prediction that structural change is conducive to increases in productivity has shown to be too optimistic. Extensive literature emphasizes the massive size of the restructuring process itself, which was unable to be absorbed in a short time (Carlin and Mayer, 1992; Lehmann and Walsh, 1999; Berthold and Fehn, 2003; Newell and Pastore, 2006).

Moreover, labour hoarding in state-owned firms has remained sizeable for many years, especially in those new member states were the privatization process has been slow. The social hardship of the transformation and the opposition of labour unions have been factors (Boeri, 2000). Despite increasingly hard budget constraints, state-owned firms have preferred to maintain unproductive workers, paying them via wage arrears and inter-firm loans (see, among others, Pinto, Drebentsov and Morozov, 2000; Gara, 2001; Stiglitz, 2001).

All these factors, including labour hoarding have slowed down the privatization process, therefore preventing the increase in employment. According to mainstream economics, the transition in the Eastern regions of Germany has also been slowed down by the federal government's attempt to expand the social market economy and to export the Western welfare system to the East without adapting it to the different context. This choice has caused dramatic consequences, including tensions about the state budget and the welfare system itself. Similarly, according to Boeri (2000), also in other Central and Eastern European countries, the implementation of passive income support schemes and the presence of rigid labour market institutions have reduced the process of job creation.

According to this standpoint, unemployment had, consequently, already reached two-digit levels in many transition countries in the mid-1990s, and still remains high. The standard reason for increasing unemployment is that structural change is painless only when labour markets are without frictions. However, the labour market is tied to the free operation of market forces. Extensive literature highlights, among other things, the role of rigid wages and legislation protecting employment, non-employment subsidies and early retirement schemes as factors affecting labour supply decisions (see, among others, Boeri, 2000; World Bank, 2001; Rutkowski and Przybila, 2002; Funck and Pizzati, 2002, 2003).

In addition, all over the European continent, this process has led to a dramatic polarization of economic activities and population to urban areas, which have grown in size as a consequence (EU, 2007). Development poles have emerged in the capital cities, causing a further impoverishment of rural areas, but the typical problems caused in the labour market by rapid urbanization have also emerged: congested labour markets, need for additional social services, increased demand for education and training, and so on.

3. Regional job and worker turnover

According to the well-known Krugman hypothesis, the higher the degree of labour turnover, the lower the unemployment rate across countries. As Blanchard and Summers (1986) claim, a higher degree of cyclicality of the hiring rate is behind fluctuations in the United States unemployment rate. Burda and Wyplosz (1994) note that, European countries differ in terms of the degree of cyclicality of hiring and firing rates. While some EU countries follow US trends, others, instead, have a cyclical firing rate. Layard, Nickell and Jackman (1991) summarize this research partly confirming the hypothesis that a low job finding rate is behind high unemployment rates, due to the increase in long-term unemployment and its persistent impact on average unemployment.

Translating the Krugman hypothesis to a regional level, high unemployment regions should be those regions where the degree of job finding is lower. Low unemployment regions, in turn, are those where the process of job creation is boosting. This hypothesis has also been at the core of the debate on regional unemployment in transition countries (for a survey, see Ferragina and Pastore, 2008).

Some authors (such as Boeri and Scarpetta, 1996; Boeri, 2000; World Bank, 2001; Rutkowski, 2003) see high local unemployment as a consequence of low labour market dynamism. In fact, high unemployment would concentrate in rural areas, where a small number of job opportunities would force jobless people towards non-employment (unemployment or inactivity) or the hidden economy (Boeri and Garibaldi, 2005).

Other authors, such as Newell and Pastore (2006), find evidence that unemployment regions are those where the degree of worker turnover is higher, not lower. Lehmann and Walsh (1999) also argue that labour turnover is linked to the level of human capital. Where human capital is interchangeable, workers do not oppose restructuring, which takes place generating unemployment, but also fast output recovery.

Ferragina and Pastore (2008) suggest the existence of an empirical law: the high degree of labour turnover in high unemployment regions is caused by industrial restructuring. Therefore, demand side and industrial policy might be more effective than labour supply policy. Vice versa, when a low unemployment rate is related to low labour turnover, then labour supply constraints are behind high unemployment. In this case, supply side policy such as a reduction in passive income support and training policy are the solution to boost job finding by non-employed workers. This might also hold in old member states where unemployment rate imbalances are dramatic. In the case of Italy, for instance, Contini and Trivellato (2006) and Naticchioni, Rustichelli and Scialà (2006) find that the traditionally high unemployment regions in the South have a higher (not a lower) degree of turnover compared to low unemployment regions in the North.

4. The impact of trade and FDI on regional labour markets

Can trade expansion help EU backward regions step up the pace of job creation? This is a complex issue, often discussed in policy debate, but still neglected in scientific literature (Suedekum, 2003). Overman and Puga (2002) and Puga (1999, 2002) argue that international trade and inflow of capital from abroad tend to reinforce, not to weaken the existing pattern of unemployment. In other words, consistently with the post-Keynesian hypothesis of cumulative causation and the 'New Economic Geography' theories of location with economies of scale, trade and FDI are factors of regional divergence, not convergence. In addition, the unemployment level of a region is more related to that of her neighbouring regions (independent of the country to which they belong) rather than to that of other regions of the same country (club convergence).

In fact, despite the short-term costs of adjustment to trade liberalization, in a number of new member states that successfully integrated into global markets, export-led growth has eventually brought large employment dividends. However, due to the strong polarization of FDI, employment dividends have been localized in more advanced, urbanized regions (Fazekas, 2000, 2003; Newell, Pastore and Socha, 2002; Martin, 2003; Basile, 2004).

Several old and new member states find it difficult to make trade a driver of employment creation and growth. This holds particularly for countries, such as Italy, Spain and Greece, whose exports are concentrated in low value added, slow-growing products, poorly linked to global production networks and FDI flow. Indeed, previous evidence suggests that while the impact of trade expansion on employment is highly significant in countries that are large FDI recipients, trade adds little to job creation in countries that receive only small amounts of FDI.

Several questions are now under investigation. After controlling for other structural determinants of employment, is there a positive medium-term relationship between international trade and FDI openness, on one hand, and employment growth, on the other hand? Is this relationship verified whatever the level of development and for trade in manufacturing as well as in services?

To meet the employment challenge, along with continuing trade liberalization, companion policies would need to strengthen the investment climate and upgrade the quality of trade-related services, so as to improve the attractiveness of countries as a place to invest. After the past emphasis on macroeconomic stabilization, a new growing body of literature is focusing on corporate governance, institutional microeconomic framework, social capital and crime rates as factors able to affect FDI location. Basile (2004) provides an enlightening analysis of the factors that are able to boost FDI expansion in backward Italian regions. He demonstrates by simulation that Southern provinces (with high unemployment rates) have a high potential attractiveness, which might be implemented with a strong investment in public infrastructures. Foreign acquisitions are affected not only by supply of acquisition candidates, but also by the other location characteristics, such as the demand level, public infrastructure, stock of foreign firms and unit labour costs.

In his case study of Ireland, Barry (2003) shows that FDI have been a crucial difference with respect to Spain, Portugal and Southern Italy, able to explain the country's convergence to the EU income levels. The author shows that a high and increasing supply of skills, a high expenditure to increase the country's infrastructures, but also a lower than EU average tax rate have been factors able to attract investment from abroad.

5. Is migration reducing or reinforcing regional unemployment differences?

In the early 1990s, a number of influential contributions re-launched the role of internal migration as a tool to achieve convergence in unemployment rates. Blanchard and Katz (1992) find that labour mobility, as driven by the need to escape unemployment in depressed areas rather than by higher wages in booming regions, has been decisive in achieving regional convergence in unemployment rates across the United States. However, Decressin and Fatás (1995) suggest that because of low migration in old EU member states (if any) unemployment convergence across regions was achieved through an increase in inactivity rates in high unemployment regions.

OECD (1995) and Bornhorst and Commander (2006) note that the available information on labour mobility in new member states points to very low interregional flow, which further declined during transition. Gross migration rates are similar to those typical of low mobility EU countries, such as Spain and Italy. As a consequence, the net migration flow is positive in low unemployment regions, as would be expected, but the rate is low and therefore insufficient to compensate large unemployment differentials (see also Kertesi, 2000; Boldrin and Canova, 2001, 2003; Rutkowski and Przybila, 2002; Paci et al., 2010).

Fidrmuc (2004) adds that gross migration, both inbound and outbound, is more sizeable in developed than in peripheral regions, suggesting that migration might contribute to increasing, not reducing regional differentials, by pooling high skill workers in developed regions and separating them from depressed regions.

The debate has also addressed the issue of factors hindering internal migration. The research on the wage curve suggests that wages do respond to local labour market conditions also in new member states (Blanchflower, 2001; Blanchflower and Oswald, 2005). An interesting consideration relative to the Italian Mezzogiorno is whether there is a wage curve in Italy and whether wage differentials are able to generate sufficient incentives for regional migration (Lucifora and Origo, 1999; Devicienti, Maida and Sestito, 2003).

What is the reason for low interregional mobility in Europe? In the early 1990s, together with linguistic and cultural differences, the high cost of housing and a poorly functioning rental market were decisive factors in the EU. In transition countries, these were also the consequence of several factors, such as the dominance of owner-occupied housing, the lack of clarity over property rights and the absence of long-term housing finance. Nonetheless, there is currently no systematic analysis of these factors.

In addition, Boeri (2000) and Rutkowski and Przybila (2002) also ascribe low labour mobility to differences in reservation wages by skill and the mismatch between the unskilled workers residing in high unemployment regions and the demand for skilled work in low unemployment areas. In rural areas, the low-skilled unemployed tend to flow to non-participation, rather than to unemployment, which occurs in urban areas. These studies (Huber, 2004; Bornhorst and Commander, 2006) suggest that low participation rates might be the way by which transition countries will absorb negative shocks in the long-run, as in the case of old member states depicted in Decressin and Fatàs (1995).

These studies confirm the extraordinary similarity of the causes and consequences of regional unemployment in old and new member states. One common factor of the low internal migration is the increasing attractiveness of international migration. The effects of this last on regional unemployment imbalances are ambiguous though, since, as Bonin et al. (2007) and Zimmermann (2009) note, migration is more and more selective in favour of skilled labour. Consequently, there is an increasing risk that international migration is causing a brain drain from high to low unemployment and from backward to advanced regions and countries.

6. Human capital as a factor of regional convergence

The accumulation of human capital is one of the major determinants of economic growth and development (Mankiw, Romer and Weil, 1992). In the last decades, theoretical and empirical literature has analysed this issue in depth providing interesting and innovative results. On the wake of these results, new studies have recently focused more specifically on the role of human capital accumulation in spurring growth and convergence between regions.

Discussion is also quickly developing on the mechanisms through which human capital might cause or, conversely, hinder regional convergence. Generalizing the Nelson and Phelps catch-up model of technology diffusion, Benhabib and Spiegel (1994, 2005) claim that cluster is more realistic than absolute convergence because human capital is not only a productive factor, but also an engine of technological innovation. They show that education plays an important role in the catch-up process. A recent strand of literature also suggests that human capital concentration in urbanized regions is an important competitive factor to attract FDI in advanced sectors and reduce the cost of restructuring, as the case of Ireland and of several transition countries has shown (Lehamnn and Walsh, 1999; Newell, Pastore and Socha, 2002; Barry, 2003; Walsh, 2003; Fazekas, 2003; Jurajda and Terrell, 2009).

Moreover, Izushi and Huggins (2004) find that those European regions with a higher level of investment in tertiary education also tend to have a larger concentration of ICT sectors and research functions. These regions have low unemployment rates. Di Liberto and Symons (2003), World Bank (2004) and Newell (2006), among others, note a strong negative correlation between regional unemployment rates and the share of workers with a high level of education in Italy and in Poland.

Complementarity between high technology industries and human capital generates persistence in unemployment differentials with respect to depressed rural areas. And this result may be reinforced by migration and commuting flows, as noted in Firdmuc (2004).

Moretti (2004) finds evidence of social returns to human capital in more developed urban regions in the USA. Causing economies to scale, this would tend to reinforce, not to weaken, regional imbalances. However, while several studies find evidence of social returns to human capital in other EU countries (for Italy, Ciccone, Cingano and Cipollone, 2006; Dalmazzo and de Blasio, 2007), Jurajda (2005) does not find evidence of such economies of scale in the case of the Czech Republic.

7. Benefit systems and their interaction with ALMP

Income support and/or pro-active schemes have been at the core of the debate on old and new member states as instruments to facilitate labour turnover and ease the social consequences of structural change. In the Aghion and Blanchard (1994) model, unemployment benefits play an important role, that of a temporary pit stop during the reallocation process. Conversely, Boeri (2000) claims that passive income support from the state has made unemployment persistent.

Only since the late 1990s, when transition seemed to have become irreversible and state budgets were suffering dramatic imbalances, the debate has shifted from the issue of gradualism versus shock therapy to that of the optimal design of labour market institutions. Two streams of literature have emerged. Echoing an on-going debate in mature market economies (OECD, 1994; and the ensuing literature), some scholars (Boeri, 2000) started pointing at passive schemes not only as a threat to financial and monetary stability, but also as a disincentive to work and, therefore, a factor for slowing down reforms. Boeri (2000) claimed that the right sequence for implementation of non-employment benefits should be the opposite of that actually followed: governments should have started from low passive income support schemes to facilitate the flow from the state sector to non-employment and back to employment in the private sector. Only at a later stage, when unemployment was really involuntary, governments should have provided income support to the losers of transition, namely those who were actually not employable in the private sector.

Other scholars (Micklewright and Nagy, 1999, 2002; Lehmann and Walsh, 1999) advocated that the sequence of reforms was correct and that income support schemes in the early stages of transition were indeed necessary to help people bear the dramatic early stages of the transformation.

There is widespread consensus on the fact that a shift from passive to proactive schemes is necessary to boost the job finding rate and reduce the unemployment rate. As Boeri and Lehmann (1999) note, if skill mismatch is mainly responsible for low outflows from unemployment, then offering training and retraining courses to the unemployed might mitigate the problem. Active labour market policy is also called for reducing the gap of work experience between youths and adults. Fiscal incentives for hiring the long-term unemployed, on-the-job training and a number of other schemes are becoming more and more common all over Europe, although evaluation of their net impact on job finding rates is not always positive (Martin, 2000; Peters et al., 2004; Kluve et al., 2006; OECD, 2006; Lehmann and Kluve, 2010). In addition, macroeconomic evaluation suggests that proactive schemes may have asymmetric effects at a regional level, especially when regional economic structure differ markedly within countries (Altavilla and Caroleo, 2006).

8. National and EU regional policy

To compensate for the deflationary and asymmetric effects of EU monetary policy, especially after the introduction of the Euro, the EU is enforcing Structural and Cohesion Policy. Past experience of the implementation of EU regional policy has had mixed success. However, surely the eastward enlargement will put further constraints on the EU budget.

In spite of national *and* EU regional policy, though, old and new member states experience remarkable and persistent regional inequalities (Decressin and Fatas, 1995; Elhorst, 2003; Ferragina and Pastore, 2008; Bornhorst and Commander, 2006). Boldrin and Canova (2001, 2003) have questioned the need itself of EU regional policy, suggesting that it is totally ineffective in reducing regional disparities. Regional policy should therefore be abolished or conceived only as a redistributive tool to transfer wealth from rich to poor regions.

This position has provided fodder for debate. On the one hand, some scholars have attempted to quantify the impact of EU regional policy on regional convergence (see, among others, Garcia-Solanes and Maria-Dolores, 2002; several contributions in Funck and Pizzati, 2003; Marelli and Signorelli, 2007). On the other hand, others have suggested that EU regional policy should be based on new growth and new economic geography theories. It should be re-launched on the basis of the fact that funds should be carefully spent, increasing the local level of human and social capital, of expenditure in research and development, and of infrastructures (Martin, 2003).

Much emphasis has been put on comparison of cases of successful implementation of EU regional policy. As already noted, the case of Ireland has stimulated a good deal of attention: much emphasis has been posed on the role of EU regional policy and on fiscal incentives to attract investment from abroad (Barry, 2003).

The EU imposes strong constraints on the introduction of fiscal incentives on a territorial basis as they are considered to be in contrast with EU competition law. However, there is a large stream of literature, especially rooted in the debate on the Italian Mezzogiorno, on optimal fiscal incentives to favour the localization of (also foreign) new investment in backward regions. Now, the local attractiveness of backward regions is also a consequence of the low quality of infrastructure and public services, which fiscal incentives should counterbalance.

9. Concluding remarks

This chapter has summarized the main effects of economic transition and the subsequent EU enlargements on EU local labour markets. We have found that structural change has been a major cause of regional unemployment differentials in old and new member states. In fact, it is correlated to high labour turnover and local unemployment. Generally speaking the factors considered to favour regional convergence were until recently labour and capital mobility as well as human capital as a factor of endogenous development. The evidence provided in the available literature suggests that labour and capital resources tend to concentrate in advanced regions. This is not because of state failure or rigid labour market institutions, but rather because of the higher returns enjoyed by labour and capital in advanced regions where they tend to pool. In other words, regional divergence is a consequence of market failure.

Such market failure calls for policy intervention aimed at preventing the tendency of structural shocks to labour demand in some sectors or regions to translate into permanent unemployment. Above all, policy intervention should be aimed at preventing the shocks from emerging in the first place. Nonetheless, once the crisis has generated real consequences, as the experience of many countries confirms, micro-economic policy, especially pro-active measures, are the best tool to absorb local unemployment. This type of policy intervention is, in turn, particularly important in view of the global financial crisis and of the labour market consequences it is likely to cause.

Notes

1. Previous versions of this chapter have been presented as papers in seminars at the XXII Conference of AIEL (Naples, September 2007), V International Conference in Honour of Marco Biagi (University of Modena and Reggio Emilia, March 2007), at the II IZA workshop on: 'EU Enlargement and the Labour Markets' (Bonn, September 2007), at the ERSA 2008 Meeting (Liverpool, August 2008) and at a workshop of the Magyar Nemezety Bank (The Central Bank of Hungary, Budapest, August 2008). We thank Vera Adamchik, Marcello Signorelli, Mieczyslaw Socha for comments on earlier versions of this paper. We also thank Giuliana Rando for careful English editing. However, the usual disclaimer applies.
2. For a survey of the literature on income convergence, see Marelli and Signorelli (2007). In addition, using NUTS4 level data from 1999 to 2006, Tyrowicz and Vójcik (2009) find that, despite market forces and cohesion financing schemes, the regional distribution of unemployment in Poland is extremely stable over time and shows only weak clubs convergence.

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13

Youth Unemployment in Transition Countries and Regions

Cristiano Perugini and Marcello Signorelli

1. Aims and scope of the chapter

The reduction of youth unemployment and the building of employment pathways is a key target of the European Employment Guidelines, within the framework of the European Employment Strategy. Beyond promoting more and better investments in human capital, the Guidelines, within the framework of the European Employment Strategy, also include targets for reducing early school leaving and a 'new start' within six months of unemployment for unemployed young people. Youth employment issues have also been given a higher profile in the Commission's Strategic Guidelines for Cohesion for the period 2007–2013 as well as in the new European Social Fund regulation. In particular, in the 2007 Communication on promoting young people's full participation in education, employment and society, the Commission stressed the need to promote youth labour market integration in the larger context of general employment policies ('flexicurity'). Lastly, the Commission has adopted (April 27, 2009) a new EU strategy – entitled 'Youth: Investing and Empowering' highlighting that (1) young people are one of the most vulnerable groups in society, especially in the current economic and financial crisis and (2) in our ageing society, young people are a precious resource;[1] in addition, the new strategy emphasizes the importance of youth work and defines reinforced measures for a better implementation of youth policies at the EU level.[2]

In the first part of this chapter we provide some key theoretical background and literature review. The existing literature usually considers youth labour markets and regional (sub-national) labour markets as separate topics, and/or analyses single countries or separate geographic areas. An innovative aspect of this study is the empirical analyses of regional (NUTS-2 level) differences and changes in youth unemployment rates, especially focusing on the peculiarities of transition countries (new EU member states) with respect to the Western group of EU countries. In particular, after some basic descriptive analysis, we investigate econometrically regional youth unemployment rates determinants, by means of dynamic spatial panel techniques (1999–2006). The analysis is carried out for 248 EU regions, distinguishing the two samples of Western and Eastern regions, in order to stress the peculiarities of the Eastern regions. The final section provides some concluding remarks.

2. Youth labour market and transition: main empirical and theoretical literature

We only consider here a small part of the extensive empirical literature on the determinants of labour market performances and dynamics in Europe by focusing on: (i) youth labour markets and (ii) regional labour markets. More specific aspects and contributions are covered in section 4.1 which illustrates the explanatory variables used in the empirical models and their expected effects on the youth labour market.

As regards youth labour market analysis, a preliminary methodological point concerns the definition of 'youth'. Although official statistics tend to focus on the group aged 15–24 years (as we do here), there is a considerable debate about the pros and cons of various definitions of youth and their consequences in the study of labour market performance and dynamics (see, for example, Lefresne, 2003; O'Higgins, 1997). We briefly review below some of the innovative researches carried out in the European context. To our knowledge, the only study dealing with youth labour market at regional level for the EU is Green et al. (2001), in which activity rates (therefore the supply side) of young people in NUTS2 regions are described and explained using demographic, economic, education, labour market structural features and the role of the family. As regards the empirical literature not specific to regional analyses, which also takes into account theoretical aspects, Caroleo and Pastore (2007) focus on the role of the 'youth experience gap' as a key factor in explaining youth unemployment, and classify EU countries into five groups according to the mix of policy instruments (including various degrees and types of labour market flexibility), of educational and training systems, passive income support schemes and fiscal incentives. Quintini et al. (2007) also investigate changes in the school-to-work transition process in OECD countries by highlighting the persisting differences between youth and adult unemployment rates (the former is generally more than twice as high as the latter). Clark and Summers (1982) analyse the determinants of the higher flows in and out of unemployment for young compared with adult people. O'Higgins (2005) examines trends in the youth labour market in developing and transition countries, and highlights the main difficulties of integrating young people into 'decent work'. He also stresses the importance of considering (i) the 'quality' of youth employment in terms of wages, weight of the informal sector and underemployment, and (ii) the existence of 'state dependence' concerning the complex role of 'child labour' (for example, ILO, 2002) and the persistence of youth unemployment (Heckman and Borjas, 1980; Ryan, 2001). Some authors focus on the role of short-term contract regulations (Nunziata and Staffolani, 2007), the impact of institutional settings (Bassanini and Duval, 2006; Kolev and Saget, 2005; Neumark and Wascher, 2004), in particular minimum wage regulations (Neumark and Wascher, 1999) and temporary jobs (Booth et al., 2002; Quintini and Martin, 2006). Many authors explicitly consider the effects of demographic composition and changes: for example, Flaim (1990) shows the negative effect of the 'baby boom' on unemployment rates; Shimer (1999) finds that a larger youth population share reduces the total unemployment rate and raises labour force participation by young people. Korenman and Neumark (1997) analyse the influence of the youth share of the population on youth unemployment, concluding that its role is overwhelmed by the effects of aggregate economic conditions.

Many other papers especially focus on youth labour market performance in transition countries (Godfrey, 2003; O'Higgins et al., 2001; Pastore, 2007; Roberts, 2001; Roberts and Fagan, 1999).

The literature on Western EU regional labour markets is very extensive (among many others, Decressin and Fatàs, 1995; Elhorst, 2003; Overman and Puga, 2002; Perugini and Signorelli, 2007) and we focus here on the contributions directly related to transition countries. As shown by Kornai (1980, 1992), the situation before transition was characterized by a chronic labour shortage (over-employment with low productivity), especially in the most developed and industrialized CEECs. The same author (Kornai, 2006) also highlights the fact that unemployment emerging in the early stage of transition was largely unexpected in its main features (two-digit levels and wide regional differences)[3]. A part of this literature focuses on sigma and beta regional convergence. Boeri and Scarpetta (1996) show the large increase in regional labour market disparities, others (Gorzelak, 1996; Petrakos, 1996; Römisch, 2003) present evidence of the sigma divergence of unemployment, wages and GDP per capita in Central and Eastern European countries. Marelli (2004, 2007) considers both sigma and beta convergence in old-EU and new-EU (transition) countries. As regards the literature which also contains theoretical perspectives, Ferragina and Pastore (2006, 2008) present interesting surveys and results explaining the high and persistent disparities in regional unemployment rates in relation to the optimal speed of transition theory (Aghion and Blanchard, 1994; Boeri, 2000). Huber (2007) surveys the empirical literature on regional labour market development in transition, focusing on the evidence of increasing regional disparities and polarization of capital cities and regions closer to EU borders. An additional survey on the 'mystery' of regional labour market performance differentials can be found in Elhorst (2003).

Some authors have highlighted the importance of regional differences in initial conditions: Scarpetta (1995) showed that transition negatively affected especially those regions in which planned economy concentrated most economic activities (particularly in the manufacturing sector); Gorzelak (1996) stressed the importance of geographic distance from the core of Europe. Other authors focus on the role of the degree of restructuring, affected by the depth and speed of reform processes: Newell and Pastore (2000) showed that, when unemployment is positively related to workers' reallocation across regions, spatial unemployment differentials increase, the main reason being the different pace of industrial change. In order to explain regional unemployment, Boeri (2000) focused on the geographical immobility of workers, mainly caused by lack of housing in potential destination areas, and on the existence of wage rigidities. Similarly, Fidrmuc (2004) noted the scanty role of migration in reducing regional disparities in the CEECs. Many other authors have attempted to identify the complex mechanisms of regional labour market adjustment in transition (see, for example, Bornhorst and Commander, 2006; Gacs and Huber, 2005; Huber, 2004).

3. Youth labour market conditions in European countries and regions

Before considering descriptive statistics at regional level, we briefly highlight that the youth unemployment rates in the ten CEECs are quite high and diversified, but generally decreasing in 2008 with respect to 1999 (Figure 13.A1 in Appendix). However, in the same period the youth to total unemployment rates ratios increased (Figure 13.A2), suggesting the growing importance of youth unemployment problem.

As for regional data on youth unemployment rates, the Eurostat online database refers to 47 regions from the nine new EU members of Central and Eastern Europe (CEE-9)[4] and 241 regions from the old EU-15 countries, plus Cyprus and Malta (this set is named WEST-17). All data are available from 1999 to 2006. The list of variables and their definitions are presented in Table 13.A1 of the Appendix. We focus here on regional total, male and female youth unemployment rates (YUR, MYUR and FYUR, respectively), for which we first provide the traditional descriptive statistics for CEE-9 regions.[5] We employ the United Nations definition of young people, that is, the 15–24 years age group which, although quite rigid, may be considered reasonable and useful for comparisons across time and space (O'Higgins, 2005). This definition implies that, as those included may have at most a first-stage tertiary education level (corresponding to ISCED 5b level), the highest levels of formal education (5a and 6) are excluded. In interpreting empirical evidence, it should be borne in mind that YURs are affected by all the problems related to general unemployment rates.

Mean MYUR in Eastern regions (Table 13.A2) followed a U-inverted path, exceeding 28 per cent in 2002; instead the median value was very unstable until 2003, after which a decreasing trend started. MYUR dispersion also followed a U-inverted shape, decreasing from 2002; the top/down gap was about 4, half of the WEST-17 sample (the highest value was for the Slovak region Východné Slovensko and the lowest the Czech Jihozápad).

Compared to the situation in Western regions, average gender differences were much lower in CEE regions, with median FYUR significantly below MYUR in most of the years considered (Table 13.A3). The two samples (CEE-9 and West-17) show a U-inverted shape and a decreasing trend, respectively, with spectacular distances between the top and bottom of distributions: in 2006, in the Polish region of Swietokrzyskie, the FYUR was 7.5 times that of Prague; the FYUR in Voreio Aigaio, Greece, was 18 times that of Zeeland, Netherlands.

A feature common to both CEE-9 and WEST-17 regions is that male and female average unemployment rates decreased slightly (about 1 per cent), whereas the median level increased (by about 2 per cent). Some interesting results emerged from correlation analyses. In particular, FYUR and MYUR were positively related, although more weakly in dynamic terms; therefore, when a particular regional youth labour market performance is poor, it affects both male and female segments indiscriminately. Moreover, and consistent with extensive literature (see, for example, Kolev and Saget, 2005; O'Higgins, 1997), the youth labour conditions closely reflect general labour market performance: correlations between youth and general unemployment rates ranged between 0.66 and 0.91 in the two samples and were again lower in dynamic terms. We also emphasize the unsurprisingly negative and significant correlations between youth unemployment and youth employment rates. Therefore, for example, reductions in youth unemployment rates are only partly translated into increases in youth employment rates, essentially due to the dynamics of participation rates. This relationship is weaker in Western regions and in dynamic terms.[6] Finally, a strong temporal persistence of regional youth labour market performance emerged by correlating youth unemployment rates at the beginning and end of the study period.

Empirical studies also suggest explicit consideration of the spatial autocorrelation of regional labour market performances (see, for example, Elhorst, 2003; Decressin and Fatàs 1995; Overman and Puga 2002). Consistent with this evidence, Table 13.A4 shows positive and significant spatial autocorrelations for youth unemployment rates in both samples.[7]

4. The determinants of regional unemployment rates in Europe

In this section we provide econometric estimates of the determinants of youth unemployment rates, especially for CEE-9 regions. We first describe the data and variables and their expected relationship with youth unemployment rates (Section 4.1). The objective here is to give only a general idea of the possible effects exerted by various factors, which may be quite complex, controversial, strongly dependent on regional context (for example, Eastern versus Western members) and on the unemployment segment (male versus female). Section 4.2 presents the econometric approach, the empirical model and the results.

4.1. Data sources, explanatory variables and their expected effects on youth unemployment rates

As already mentioned, due to the constraints of data availability, we are able to consider here only a few of the potential factors affecting youth labour market performance. We use as dependent variables male and female youth unemployment rates in the period 1999–2006 for 47 regions of Eastern (CEE-9) and 201 regions of Eestern (WEST-17) Europe. Mainly drawing on the Eurostat Regio dataset (the only exception is Lab_comp, supplied by Cambridge Econometrics), we built a panel dataset and considered the explanatory variables listed in Table 13.A1 of the Appendix.[8] The first set of explanatory variables considered refers to regional industry structure and is primarily composed of the employment shares of six NACE subsectors.[9] In addition, we included among the explanatory variables a turbulence index (TURB), which grows as the regional sectoral structure changes over time, and a traditional measure of relative specialization (dissimilarity – or Krugman – index) which compares the sectoral distribution of employment in relation to that of the whole sample considered, and grows as the regional industry mix becomes more specialized than the average level. Lastly, we considered statistic information recently released by Eurostat which is the share of persons occupied in the science and technology sectors (HRST) out of the total population. This may be considered as a proxy for labour demand for highly skilled workers (independent of their formal level and education) and therefore of the skills/knowledge intensity of labour demand (Eurostat, 2007).

Considering our definition of 'youth' (persons aged 15–24 years), it may be expected that regional structural sectors biased towards low-skilled/low compensation sectors are those more inclusive of young inexperienced (Caroleo and Pastore, 2007) and low-skilled workers (Quintini and Martin, 2006). Therefore, labour demand biased towards scientific and technological skills (HRST) should harm this cohort of the workforce.

As regards the impact of industry concentration/diversification (Krugman index), we rely on the approach followed, for example, by Frenken et al. (2007), who basically emphasize how sectoral variety can generally reduce unemployment risks since, as in the basic portfolio theory (Markowitz, 1952), diversification allows adverse shocks to be absorbed less painfully (Duranton and Puga, 1999; Munro and Schachter, 1999). Since young workers may usually be viewed as a relatively more sectorally mobile workforce segment, a variety of employment opportunities may contribute to enhancing their job opportunities. Instead, more specialized regions are more exposed to asymmetric shocks; at the same time, they may be characterized by higher concentrations of knowledge and abilities specific to the leading industries.

As regards the index of industrial turbulence (TURB), sectoral reallocation processes are usually accompanied by an increase in structural unemployment in certain labour segments, and this may negatively affect youth employment, both directly and indirectly. The restructuring process that accompanied transition in Eastern Europe followed many different trajectories, related to the position assumed by the regional economic system in the international division of labour (see, among many others, Huber, 2007; Ferragina and Pastore, 2008). In these countries, the effects on youth unemployment of different speeds of firm restructuring has also been analysed (Kolev and Saget, 2005), although with no clear empirical evidence: a slow process may have preserved existing jobs and the welfare of senior workers at the expense of young people; at the same time, rapid restructuring may generate the already discussed structural unemployment effects, with an even worse net outcome.

The second important set of explanatory variables is composed of two indicators (Part_y and Temp_y) aimed at representing the importance of the two 'options' of part-time (part_y) and temporary (Temp_y) employment.[10] Temporary and part-time jobs are very and increasingly common when young people enter the labour market for the first time (see, for example, Quintini et al., 2007, for empirical evidence in OECD countries). This is clearly because these contracts ensure higher flexibility on the labour demand side with regard to output fluctuations, reduce the risk related to information asymmetry on the non-observable quality standards of the worker (OECD, 2004) and usually pay lower wages (Booth et al., 2002). In addition, according to a mainstream approach to youth unemployment, temporary and part-time jobs offer the opportunity of bridging the so-called experience gap. This empirical and theoretical evidence suggests a negative relationship between diffusion of these contractual options and unemployment rates; however, much depends on the fact that these jobs are or are not strict substitutes for permanent or full-time jobs, which is ultimately related to the general conditions of the labour market. Some empirical evidence and sound theoretical positions (Caroleo and Pastore, 2007) highlight that: (i) increased flexibility has a selectively positive impact on unemployment, favouring only the most skilled and motivated job-seekers; (ii) short-term contracts only contribute to filling the generic knowledge gap, since firms have no incentive to invest in specific human capital; and (iii) short-term contracts are not always a stepping-stone to permanent positions, but rather a low-quality employment trap (Booth et al., 2002).

Unemployment rates clearly depend on participation rates in the workforce, since an exogenous increase in labour supply may exceed available jobs and result in higher unemployment. However, it is well-known that this relationship is quite ambiguous, since high unemployment may discourage participation in the labour force and, in the case of youth, suggest, for example, staying in education and improving one's job prospects. Consistent with other empirical works (for example, Korenman and Neumark, 1997), we use here a measure of the youth/adult population ratio (Young) to control for this crucial supply side determinant of youth unemployment (O'Higgins, 1997, 2001).

The level of per capita GDP (in PPP) was also included, to represent the regional level of development in the cross-section sense and an indicator of general cyclical economic conditions on the time dimension. Extensive empirical and theoretical literature has highlighted the strong responsiveness of youth unemployment rates (higher than that for adult UR) to changing economic conditions; this is partly due to supply side factors, that is, young people are more likely to quit their jobs voluntarily than older people, even during recessions (O'Higgins, 1997). However, demand-side considerations are undoubtedly prevalent, since firing a young worker in adverse cyclical conditions is relatively easier, due to weaker protection of youth employment and lower costs (in terms of training and knowledge investments) suffered by firms.

We were also able to consider, as a control variable, a regional measure of labour compensation per employee, which is unfortunately not available for the youth segment. This prevents us from examining the important effects of the adult/youth wage gap, which would also supply important information on the complementarity/substitutability of the two labour inputs (O'Higgins, 1997). Other control variables included in the analysis are the average number of hours worked per week and population density. The former, if assumed proportional for the youth and adult segments, should be positively related to youth (and adult) unemployment; the latter should capture the urban/rural scale and account for the consumer and producer amenities typical of urban areas not already controlled for (we have already explicitly considered some features associated with urban areas, that is, attraction of youth via the Young variable, industry diversification, high-skilled labour demand).

4.2. Econometric approach and key results for CEE-9 regions

Within the family of data panel econometric techniques, our approach must simultaneously consider: (i) the time persistence of our dependent variables; (ii) the spatial structure of the dependent variables; and (iii) the possible endogeneity of various explanatory variables. The approach best addressing the three points simultaneously is the system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998; Roodman, 2006). It allows: (i) dynamics to be introduced into the panel model, therefore yielding unbiased and consistent outcomes even with relatively short time panels; (ii) consideration of the potential endogeneity of explanatory variables; and (iii), as shown by Hong et al. (2008), it can be employed in order to include the spatially lagged dependent variable in a dynamic model, thereby eliminating this otherwise potential and powerful source of omitted variable bias (Anselin, 1988, 1999).

The dependent and explanatory variables are those defined in Table 13.A1. The time- and spatially-lagged dependent variables are included in the set of regressors; Pc_GDP, Temp_y, Part_y, Self and Lab_com, and the spatially-lagged dependent variables are assumed to be endogenous.

In system GMM estimator, the original equations in levels are added to the system of first-differenced equations with the technical gains of additional moment conditions and increased efficiency. As the consistency of the system GMM estimator depends on whether a selected set of lagged level and first-differenced values of the explanatory variables are valid instruments in the regression, proper specification tests are employed.

Outcomes of the estimation are available for both CEE-9 and West-17 groups of regions, but we essentially consider the results for the first group (Tables 13.A5 and 13.A6 in Appendix).[11] As a premise, we note that, due to the low number of regions (47), caution is necessary in interpreting and commenting on this empirical evidence.

First of all, for both genders, levels of development and increasing general urban features do not play significant roles. Conversely, growing specialization in agriculture provides job opportunities for youth. One possible explanation can be related to prevailing low-skilled labour demand by the primary sector and to diffusion of seasonal jobs and 'underemployment' phenomena. However, this evidence is also associated with the detrimental role of manufacturing. Probably, the still large excess of labour supply in Eastern regions can fulfil labour demand by industrial firms, which therefore prefer hiring adult and relatively experienced workers, crowding out youth employment which partly turns towards residual occupations in agriculture. As in Western regions, perhaps because of the intrinsic features and preferences of labour supply of young women, a strong presence of traditional market services reduces women's unemployment. Contrary to what happens in the West, growing sectoral concentration reduces the probability of being unemployed for young men, but industry reallocation processes are not significant for both sexes.

As regards features specific to the labour market, the association between temporary contracts and lower unemployment is generally confirmed for both genders, although with varying levels of significance. Similarly, self-employment prevalently assumes the usual positive coefficient. Instead, it is surprising that the spread of part-time work does not generally play a significant role, especially for female unemployment. Lastly, the prevailing non-significance of the other labour market variables in the FYUR model (Hours, Lab_comp, Young) should be noted. As regards MYUR, contrary to expectations, higher Lab_comp and Young seem instead able to reduce unemployment, but the significance of their coefficient is not stable.

5. Conclusions

Although the lack of regional data for some crucial variables imposes extreme caution, we can derive some final remarks and policy implications from the outcomes obtained. First of all, it seems to be extremely important that the various levels of policy interventions (European, national, regional and local) should maintain a particular focus on 'youth unemployment' and 'regional disparities', as clearly suggested by the following simple evidence: (i) youth unemployment rates persist at a high level; (ii) regional MYUR and FYUR variability is remarkable in both Eastern and Western Europe; (iii) the 'unemployment problem' in the EU – dramatically worsening with the current global recession after a decade of significant improvements – is mainly due to youth unemployment. Moreover, although empirical data are not yet available, it is likely that the current recession will significantly worsen youth labour market conditions, also considering the usually high responsiveness of youth employment to economic cycles. Considering the huge territorial differences, we argue that exchange of complete information on the 'best practices' of regional youth labour policies, as already recommended by the European Employment Strategy, should be further reinforced. However, the close correlations between youth and general labour market performance also indicate considering the possible economic and labour policies targeted to young people in a much more general framework of economic and labour market dynamics. The 2009 world recession is particularly affecting Eastern EU countries (see Chapter 1 in this book), especially those more open to international trade (for example, the Baltic states), and it is producing increases in both total and youth unemployment rates; in this situation the counter-cyclical macroeconomic policies are obviously playing the key role in supporting aggregate demand, employment levels and human capital investment. However, the macroeconomic and social sustainability of the 'exit strategy' will crucially depend, also for Eastern EU countries, on the effectiveness of integrated economic and labour policies avoiding that the increase in 'cyclical unemployment' is transformed in higher 'structural unemployment' as a result of so-called 'hysteresis' effects.

Further important points emerging from the empirical analysis are: (i) the strong persistence over time of youth labour market performance, and (ii) its clear-cut spatial dependence. The first point should increase awareness that, if potential labour market weaknesses are left free to unfold, the price to be paid will be high for a long period of time; the other side of the coin is that policy efforts aimed at increasing labour market performance, if successful, may be able to produce durable outcomes, and this time pattern of benefits should be carefully considered when assessing the present costs of policy interventions. The above outcomes seem particularly important – in terms of policy implications – in the current (2009) situation of world recession for the increasing (youth and total) unemployment that could partly persist for several years. It is of crucial importance to adopt economic and labour policies for limiting the increase in youth (and total) unemployment rates and temporarily support income for unemployed without reducing their effort in searching for a (new) job. A significant decrease in employment rates is expected in 2009 and 2010 notwithstanding, in the short term, the fact that firms are trying to maintain trained workers (over the levels justified by the current production levels) in order to preserve their 'human capital' and to better face the next recovery. It is obvious that this strategy ('labour hoarding') – in a context of low labour demand – will further exacerbate the negative effect of global recession on youth segment ('new entrants').

The second point (spatial autocorrelation), indicates that supra-regional aspects (for example, institutions in a broad sense) do matter in shaping labour market performance and that policy design should carefully consider the true spatial extent and interactions which take place at regional level. In addition, spatial autocorrelation is usually synonymous with spill-over effects, and supra-regional policymakers should be careful to avoid possible free-riding temptations by regional policy levels, which are largely responsible for the design and implementation of active labour interventions.

The results of econometric analysis also show that the effects on youth unemployment rates can rarely be generalized, and often diverge when we distinguish by gender segments. First, it should be noted that the previous implications in favour of integration between labour and institutional and development policies are confirmed by the econometric results, showing highly significant and positive effects (especially in Western regions) of better development levels and dynamics in reducing unemployment rates.

As regards the role of structural factors, empirical evidence reveal: (i) the unemployment-reducing role of primary activities, which probably still play an important role in absorbing low-skilled workers; and (ii) the negative role of manufacturing. This may be due to the fact that general labour market conditions in Eastern regions are severe, and a significant number of the many unemployed adults are probably former manufacturing workers displaced by technical and structural restructuring during transition. Their relative abilities and skill endowment increase the relative cost of hiring unskilled and inexperienced young workers, thus crowding the former out.

If we consider the role of 'flexibility at the margin', policies favouring the spread of temporary employment seem to have a fairly generalized positive effect on youth labour market performance, whereas growing recourse to part-time options, contrary to what happens in Western regions, does not favour lower youth unemployment. The study of the various and complex effects of the types of 'flexibility' on youth labour market performance was beyond the scope of this chapter, but may be the specific object of future research which, with proper statistical information (large scale longitudinal data), should in particular try to better understand the role played by these contracts in favouring access to permanent job positions.

During the current (2009) crisis, labour market conditions are sharply deteriorating and firms are especially reducing temporary employment (also in order to minimize the loss in terms of human capital investment); this further suggests that the key point for permanently reducing youth unemployment is especially related to the implementation of effective school-to-work transition institutions, instruments and policies.

Appendix

Table 13.A1 List of Variables, Definitions and Availability by Gender

	Acronym	*Definition*		*Availability of data by gender*
	YUR (MYUR, FYUR)	Unemployment 15–24/Labour force 15–24		t, m, f
	AB*	Employment AB/total employment		t
	CDE*	Employment CDE/total employment		t
	F*	Employment F/total employment	IND_j	t
α	GHI*	Employment GHI/total employment		t
	JK*	Employment JK/total employment		t
	LQ*	Employment LQ/total employment		t
	TURB**	Turbulence index		t
	Krugman***	Krugman concentration index		t
	HRST	Employment in HRST/active population		t
β	Pc_GDP	GDP in PPP per inhabitant		t
	Dens	Population/Squared km		t
χ	Temp_y ****	Temporary employment 15–24/population 15–24		t, m, f
	Part_y ****	Part-time employment 15–24/population 15–25		t, m, f
	Self	Self employment/population 15–64		t
	Hours	Hours worked per week		t
	Lab_comp	Labour compensation per employee (000 euro 1995)		t
	Young	Population 15–24/population 15–64		t, m, f

* Nace classification

**$TURB_{r,t} = \frac{1}{2} \cdot \sum_h \left| q_{r,h,t} - q_{r,h,t-1} \right|$

where $q_{r,h,t}$ and $q_{r,h,t-1}$ are the shares of employment in subsector h on total employment in region r, time t and $t-1$, respectively.

***$KRUGMAN_r = \frac{1}{2} \cdot \sum_h \left| q_{r,h} - q_{eu,h} \right|$

where $q_{r,h}$ is the share of employment in subsector h on total employment in region r, and $q_{eu,h}$ is the corresponding average at European Level.

**** calculated assuming that the share of young temporary and part-time workers (male and female) on total sector employment at regional level is the same as the national one.

Table 13.A2 Descriptive Statistics for Male Youth Unemployment Rate (MYUR)

	1999	2000	2001	2002	2003	2004	2005	2006
				CEE-9				
Mean	23.84	25.64	27.17	28.40	27.08	27.82	25.89	21.95
Median	22.06	25.44	23.98	26.14	23.17	26.28	24.46	23.94
Minimum	8.38	7.79	7.84	6.42	7.74	11.35	10.05	8.41
Maximum	51.08	51.34	49.85	57.31	52.41	53.16	47.60	35.39
Coeff. Var.	0.400	0.406	0.475	0.491	0.474	0.397	0.401	0.361

Table 13.A3 Descriptive Statistics for Female Youth Unemployment Rate (FYUR)

	1999	2000	2001	2002	2003	2004	2005	2006
				CEE-9				
Mean	23.71	25.39	26.95	28.59	27.87	27.52	25.96	23.94
Median	21.78	24.06	22.93	24.25	24.13	22.89	23.32	24.07
Minimum	6.67	6.97	6.67	7.84	7.69	7.03	7.69	5.15
Maximum	55.53	45.84	51.33	55.44	51.98	49.15	44.83	39.49
Coeff. Var.	0.461	0.476	0.515	0.506	0.500	0.466	0.438	0.398

Table 13.A4 Dynamics of Moran's Spatial Correlation Index in EU-26 Regions

	1999	2000	2001	2002	2003	2004	2005	2006
				CEE-9				
MYUR	0.231	0.355	0.400	0.459	0.495	0.393	0.422	0.397
FYUR	0.309	0.447	0.492	0.517	0.597	0.577	0.594	0.485
				WEST-17				
MYUR	0.272	0.266	0.283	0.292	0.260	0.276	0.259	0.237
FYUR	0.439	0.386	0.403	0.39	0.385	0.43	0.431	0.392

Note: All correlations are significant at 1%.

Table 13.A5 Determinants of MYUR in CEEC-9 Regions (dynamic panel estimates, system GMM, 1999–2006)

	1	2	3	4	5	6
$MYUR_{(t-1)}$	0.430**	0.434**	0.262*	0.240*	0.139	0.330*
MYUR (spatial lag)°	0.738**	0.718**	0.986***	1.009***	1.440***	0.970***
Pc_GDP°	−0.002**	−0.001	0.001	0.000	0.001	0.001
Dens	0.000	0.019**	0.000	0.002	0.001	0.001
AB	−1.711***	–	–	–	–	–
CDE	–	1.949***	–	–	–	–
F	–	–	0.403	–	–	–
GHI	–	–	–	−0.472	–	–
JK	–	–	–	–	−3.541**	–
LQ	–	–	–	–	–	−0.411
Krugman	−75.438***	−287.601***	−77.009**	−86.268**	−158.372***	−89.544
Turb	89.239	72.770	7.967	−21.325	−2.301	−14.636
Hrst	0.477	0.389	−0.533	−0.467	−0.314	−0.579
Temp_y_er_m°	−2.088***	−2.372***	−0.590	−0.508	−0.671	−0.480
Part_y_er_m°	4.008***	5.364***	1.460	1.069	2.217	0.832
Self_er°	3.377***	3.983***	1.066	0.880	2.066**	1.121*
Hours°	2.244	2.525	2.465	2.336	6.517*	1.402
Lab_comp°	−3.715	−5.655**	−3.674**	−3.127**	−2.105	−3.185*
Young_m	0.479	−1.117	−1.900**	−1.657*	−1.456*	−1.932*
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
const	−74.188	−100.823	−45.491	−29.365	−218.715	10.566
No. of obs.	329	329	329	329	329	329
No. of groups	47	47	47	47	47	47
F test	53.93***	38.02***	16.14***	33.81***	34.66***	30.76***
AB test AR1	−0.590	−1.030	−0.870	−0.600	−0.200	−0.380
AB test AR2	−0.530	0.860	0.090	0.100	−0.420	−0.210
Sargan Test	0.180	0.060	0.340	0.490	1.040	0.580

*, **, *** = significant at 10, 5 and 1%, respectively; ° = assumed endogenous.

Table 13.A6 Determinants of FYUR in CEEC-9 Regions (dynamic panel estimates, system GMM, 1999–2006)

	1	2	3	4	5	6
$FYUR_{(t-1)}$	0.764***	0.832***	0.908***	1.095***	0.927***	0.931***
FYUR (spatial lag)°	0.576***	0.529***	0.580**	0.065	0.550**	0.403
Pc_GDP°	–0.000	–0.000	–0.001	0.000	–0.001	–0.000
Dens	–0.003	0.003	–0.003	0.003	–0.002	–0.004**
AB	–1.019***	–	–	–	–	–
CDE	–	0.830***	–	–	–	–
F	–	–	1.022*	–	–	–
GHI	–	–	–	–0.814***	–	–
JK	–	–	–	–	0.645	–
LQ	–	–	–	–	–	0.502*
Krugman	–7.861	–81.775**	–22.135	–7.367	11.069	9.881
Turb	27.972	–9.080	–34.765	–87.246**	–39.405	–28.959
Hrst	–0.640	0.084	0.225	0.052	0.186	0.098
Temp_y_er_f°	–0.810***	–0.908***	–0.527***	–0.341*	–0.282	–0.378**
Part_y_er_f°	0.906	0.774	–0.039	–0.764	–1.511*	–0.667
Self_er°	2.194***	1.817***	0.936	–0.190	0.596	0.639
Hours°	–0.251	–0.601	–1.139	–2.146**	–2.156**	–0.939
Lab_comp°	1.189	–0.133	1.299	0.414	1.116*	1.698**
Young_f	0.215	–0.548	–1.199*	–0.471	–1.453*	–1.126*
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Const	3.735	2.365	44.234	113.487***	100.192**	33.581
No. of obs.	329	329	329	329	329	329
No. of groups	47	47	47	47	47	47
F test	318.94***	563.74***	362.63	683.86	393.53***	426.14***
AB test AR1	–1.170	–1.770*	–2.890***	–2.830***	–2.280**	–2.830***
AB test AR2	–0.750	0.340	0.850	0.960	0.770	1.770*
Sargan Test	11.180	6.140	5.330	3.130	4.480	5.530

*, **, *** = significant at 10, 5 and 1%, respectively; ° = assumed endogenous.

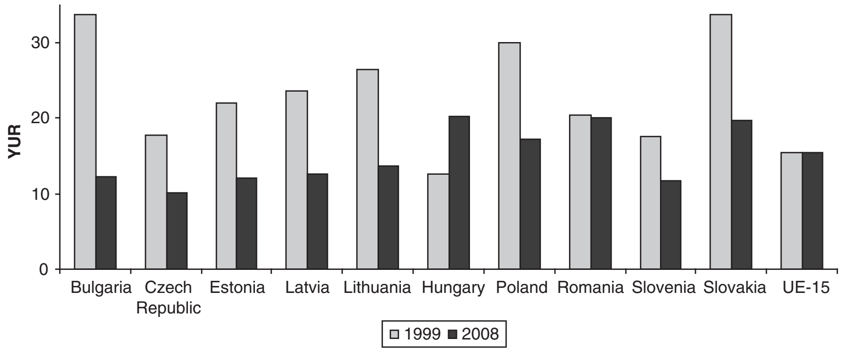

Figure 13.A1 Youth (15–24) unemployment rates in CEE countries and UE-15

Note: Due to lack of data in initial year, Bulgaria refers to 2000, while – as for data of the final year – Romania refers to 2007.

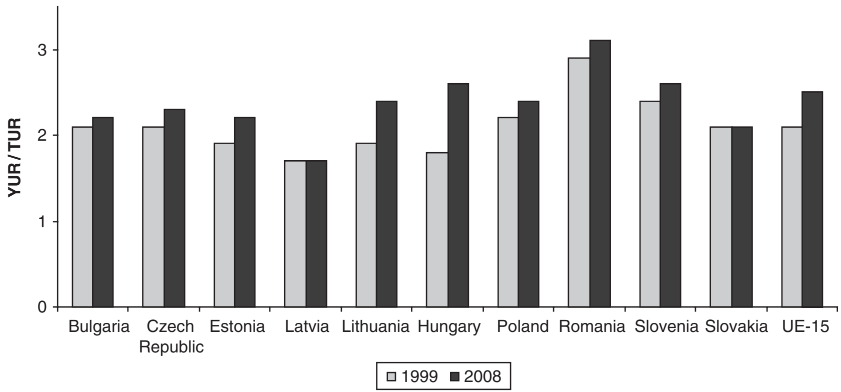

Figure 13.A2 Youth/Total unemployment rates in CEE countries and UE-15

Note: Due to lack of data in initial year, Bulgaria refers to 2000, while – as for data of the final year – Romania refers to 2007.

Notes

1. The young generation is a dwindling resource, whose present share of 20 per cent of the population is projected to fall to 15 per cent by 2050. Also for that reason youth are a very precious resource, and the current economic and financial crisis especially highlights the need to nurture young human capital.
2. The new strategy includes both short- and long-term policies affecting Europe's young people, particularly youth education, employment, creativity and entrepreneurship, social inclusion, health and sport, civic participation and volunteering.
3. In addition, the initial (and optimistic) theoretical models of transition presumed – wrongly – that it would have only lasted a short time.
4. Bulgaria was excluded, due to many missing data on various variables.
5. Descriptive statistics on West-17 regions are available upon request.
6. O'Higgins (2005) stresses that the falling rates of labour force participation by young people may be due to increasing levels of participation to education (see also Domadenik and Pastore, 2006, for the case of Eastern European countries). For this reason, employment rate indicators have obvious limitations when referred to young people, especially if the 15–24 year definition is adopted.
7. We considered here as spatial weights the inverse geographical distance between the capital (or most populated) city of the regions.
8. Among the most important missing information we mention: youth labour mobility, youth wages and education levels, and the various important specific institutional settings, which are problematic when considering a regional panel analysis (Caroleo and Coppola, 2005). Their non-explicit consideration here is also connected with our econometric approach (see Section 4.2), which can account for spatial patterns spontaneously emerging from the data.
9. AB (agriculture, hunting, forestry and fishing); CDE (total industry, excluding construction); F (construction); GHI (wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods; hotels and restaurants; transport, storage and communications); JK (financial intermediation; real estate, renting and business activities); and L to Q (public administration and defence, compulsory social security; education; health and social work; other community, social and personal service activities; private households with employed persons; extra-territorial organizations and bodies).
10. These data are directly available at regional level without any age disaggregation, which is however available at national level: therefore, regional youth and part-time employment rates have been proxied, assuming that the share of young temporary workers (male and female) on total sector employment at regional level is the same as the national one.
11. Results for West-17 regions are available upon request.

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