GREAT MINDS IN FINANCE

COLIN READ

THE PUBLIC FINANCIERS

Ricardo, George, Clark, Ramsey, Mirrlees, Vickrey, Wicksell, Musgrave, Buchanan, Tiebout, and Stiglitz

The Public Financiers

Great Minds in Finance

Series editor: Professor Colin Read

This series explores the lives and times, theories and applications of those who have contributed most significantly to the formal study of finance. It aims to bring to life the theories that are the foundation of modern finance, by examining them within the context of the historical backdrop and the life stories and characters of the 'great minds' behind them.

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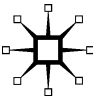

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Series Preface

When one mentions the word "finance" to an interested and engaged listener, there can be a wide range of different reactions. The word may elicit a yawn from those who think of finance as the mundane process of ensuring their family savings will afford them the quality of life they had hoped for in their retirement. Students of finance, at college or in life, think of the term as a mechanism for a battle of wits, with buyers and sellers of securities pitting themselves against each other to see who can profit best from the same information. A banker might be reminded of the financial prudent practices one employs with shareholder and depositor money by lending it back out to trustworthy businesses in the region, hopefully to earn a profit. And tax accountants and lawyers may think of the myriad of ways a corporation can organize to maximize owners' profits and minimize risk. Most listeners would prefer to relegate the intricacies of finance to an expert, as they would their legal or medical affairs.

Most people use the terms economics and finance interchangeably. This misconception is understandable. The formal discipline of economics defines the laws or principles that govern the choices we make in meeting our needs. The term economics is derived from the Greek word "oikos", meaning environment but also referring to one's house or life. It is combined with "nomics" from the Greek word "nomos" or "law of", to label the social science that studies our decisions in furthering our own interests.

To most people, these "economic" decisions are primarily thought of as financial because they often involve money. Households attempt to manage their income and wealth to ensure they are able to consume, in the present and the future, in ways that allow them to thrive. Such careful financial decisions that will govern our consumption now and in retirement are so critical for our well-being that it is natural for most people to consider finance as economics even though, more correctly, finance is a branch of economics that has significant and increasing relevance in the day-to-day and livelihood-defining decisions of us all and in the very function of the economy.

The field of finance is not mundane or routine. The discipline explains how value is created or destroyed, how markets allow individuals and institutions alike to plan for the long term, and how entities can

hedge the risk inherent in an uncertain world and over the business cycle.

This series describes the life, times, theories, and applications of the Great Minds who contributed to the modern formal study of finance. Their collective contributions address the various interpretations of finance not through dry exposition and even drier equations, but through intuition and context, and a few equations and diagrams. Readers may be those interested in the fundamental underpinnings of our stock and bond markets, college students who want to delve into the significance behind the theories, and the experts who constantly look for ways to more clearly understand what they do so they can better relate to their clients and communities. The series provides important insights of Great Minds in finance within a context of their life and times. In doing so, I hope to bring life to the theories that are the foundation of modern finance.

This series covers the gamut of the study of finance, typically through the lives and contributions of Great Minds upon whose shoulders the discipline stands. From the significance of financial decisions over time and through the cycle of one's life, to the ways in which investors balance reward and risk, from how the price of a security is determined to whether these prices properly reflect all available information, and to the ways a corporation can create value and a market can measure it, we will delve into the fundamental questions and answers in finance. We will delve into theories that govern personal decision-making, those that dictate the decisions of corporations and other similar entities, and the public finance of government.

Some of the theories we describe may appear abstract and narrow. Others may seem obvious, once they are presented. A successful theory must be sufficiently narrow to make strong conclusions, but broad enough to be useful. A theory that is general to the extreme will draw weak conclusions of little utility. The best theories draw the strongest possible conclusions from the weakest set of assumptions. And a successful "unifying" theory in finance can replace a large number of lesser theories and concepts, just as physicists hold out for a unifying theory that can draw together their isolated understandings from a variety of specialties.

By focusing on the Great Minds in finance, we draw together the concepts that have stood the test of time and have proven themselves to reveal something about the way humans make financial decisions. These principles that have flowed from individuals who are typically awarded the Nobel Memorial Prize in Economics for their insights, or perhaps

shall be awarded someday, allow us to see the financial forest for the trees.

While one might assume that every financial expert would be well versed in these fundamental theories of finance, such is not always the case. An investor can succeed through sheer intuition without having studied the insights of theorists over a century of financial discovery. Mathematicians and physicists are increasingly employed to develop techniques that recognize patterns in numbers with little regard or understanding of the underlying forces that explain these patterns. Furthermore computer experts can design algorithms that allow great banks of servers to constantly poke and prod the market to induce, and then profit from, movements in prices of stocks or bonds. By capitalizing on such shifts in prices milliseconds before others take notice, these algorithms can garner pennies, or fractions of pennies, at a time, thousands of times an hour, to yield huge profits.

These practitioners do not depend, or even care about the fundamental principles that drive markets and govern decision-making in the long run. To them, the long run expires within a week or a day. Such "technical analysis" is decidedly transient and short term. In fact, a steady and predictable investment opportunity based on well-known and well-understood information is simply insufficiently volatile to yield quick profits.

Unfortunately, such technical analysis, which depends only on price dynamics in the short term, has emerged as the lucrative Holy Grail of modern finance. It allows the most skilled practitioners to make money when markets are rising or falling. However, it reveals nothing about how financial decisions should be made in the long run to satisfy an economy's need for capital, investment, reward, and reduced risk. Nor does it make our economy more efficient. Rather, technical analysts devote a great deal of talent, energy, and effort as they clamor for others' pieces of a fixed economic pie.

The giants who have produced the theories and concepts that drive financial fundamentals share one important characteristic. They have developed insights that explain how markets can be used or tailored to create a more efficient economy. They demonstrate how individuals can trade risk and reward in the same way that a supplier might trade with a consumer of a good. They explain the reason for corporations, and also show why corporations can become too big. Through this process of analysis, all sides win. Greater efficiency is a tide that lifts all boats. These pioneers of finance explain how tools can be used to create greater market efficiency and even suggest the creation of new

tools to create efficiency enhancements that may have proven elusive otherwise.

From a strictly aesthetic perspective, one cannot entirely condemn the tug-of-war of profits created by the technicians, even if they do little to enhance, and may even detract from, efficiency. The mathematics and physics of price movements and the sophistication of computer algorithms is fascinating in its own right. Indeed, my university studies began with a Bachelor of Science degree in physics, followed immediately by a PhD in Economics. However, as I began to teach economics and finance, I realized that the analytic tools of physics that so pervaded modern economics has strayed too far from explaining this important dimension of human financial decision-making. To better understand the interplay between the scientific method, economics, human behavior, and public policy, I continued on in my studies toward a Master of Accountancy in taxation, an MBA, and a Juris Doctor of law.

As I taught the economics of intertemporal choice, the role of money and financial instruments, and the structure of the banking and financial intermediaries, I recognized that my students had become increasingly fascinated with investment banking and Wall Street. Meanwhile, the developed world experienced the most significant breakdown of financial markets in almost eight decades. I realized that this once-in-a-lifetime global financial meltdown arose because we had moved from an economy that produced goods to one in which a third of all profits by 2006 in the US were nebulous gains made in financial markets, with little to show but pieces of paper representing wealth that had value only the public ever remained ready to buy them.

I decided to shift my research from academic research in esoteric fields of economics and finance and toward better understanding of markets by the educated public. I began to write a regular business column and a book that documented the unraveling of the Great Recession. The book, titled *Global Financial Meltdown: How We Can Avoid the Next Economic Crisis*, described the events that gave rise to the most significant economic crisis in our lifetime. I followed that book with *The Fear Factor*, which explained the important role of fear as a sometimes constructive, and at other times destructive influence in our financial decision-making. I then wrote a book on why many economies at first thrive, and then struggle to survive in *The Rise and Fall of an Economic Empire*. Throughout, I try to impart to you, the educated reader, the intuition and the understanding that would, at least, help you to make informed decisions in increasingly volatile global economies and financial markets.

As I do so, I also hope to impart to you how individuals born without great fanfare can be regarded as geniuses in their lifetime. The lives of each of the individuals treated in this series become extraordinary, not because they made an unfathomable leap in our understanding, but rather because they looked at something in a different way and caused us all to forever look at the problem in this new way. Their combination of novelty and creativity is the measure of their genius.

Preface to This Volume

This book is the sixth in a series of discussions about the Great Minds in the history and theory of finance. While the series address the contributions of significant individuals to our understanding of financial decisions and markets, this volume discusses the role and design of our tax system and the objectives of our governments that employ these public finances.

Public finance received scant attention among English-language scholars until the latter half of the 20th century. Suddenly, the discipline blossomed through the Great Minds of William Vickrey, James Mirrlees, and James Buchanan, who researched and reminded us of the Great Minds who came before them. They built upon the intuition of David Ricardo on rents and profits, the great debate between Henry George and John Bates Clark on the burden of public finance, and the elegant mathematics of Frank Plumpton Ramsey on optimal taxation. Together, their contributions established a new field of public finance.

Richard Musgrave helped introduce economic theorists and writers in German to us all, especially the ideas of the Swedish late 19th-century economist Knut Wicksell, whom the literature reinvented in the 1960s. Musgrave postulated various roles of government – public finance, remedy of market failures, the provision of public goods, and the distribution of income as legitimate goals of government that was fast-growing in developed countries following World War I. And Musgrave, Buchanan and Charles Tiebout showed how government operates, or should operate. Meanwhile, Ricardo, George, Ramsey, Vickrey and Mirrlees showed how we can fund these activities without creating other economic efficiencies. Finally, Joseph Stiglitz demonstrated that an optimal town can fully fund its public improvements through a 100% land tax. These Great Minds combined to create a new discipline and provided an explanation and perhaps even an impetus to the growing size and significance of the federal state in the 20th century.

Introduction

Mark Twain once said that the only two things certain in life are death and taxes. The great philosophers knew this. Almost as soon as political philosophers provided a rationale for government, others began to debate the purpose and appropriateness of taxes. Soon economists began to assert not only what taxes ought to support, but who ought to pay these taxes, and why. Intertwined in this discussion are the ways in which government spends the revenues they raise, to provide for public goods or to redistribute income.

While there was a less expansive role for government in the 19th century, much of the populist debate then centered around public finance and the incidence of taxes. This debate continues, but the role of public expenditure now captures the attention of 20th- and 21st-century citizens.

The upward trend in public expenditure over time and with economic progress was first observed by the German economist Adolph Wagner (March 25, 1835–November 8, 1917). He noted:

> The advent of modern industrial society will result in increasing political pressure for social progress and increased allowance for social consideration by industry.

Wagner hypothesized that economic growth is accompanied by an expansion of the range of economic responsibilities of the state, greater demand for income distribution, and increased need to police, protect, and regulate as the value of property and the size of the economy increases. With this tendency for larger government comes greater need to finance government. As government grows and there is a increase in the proportion of for public finance, as a share of gross domestic product, there is also a rise in the level of interest in public finance.

There are a number of ways to view the tax and fee revenues that constitutes the source of public finance. Legislators and political scientists seek a tax that is easy to impose and reliably raises revenue. Economists may use taxes to deter certain activities, such as the consumption of vices, and may use subsidies to encourage the production of other goods. The tax system is thus employed to internalize *externalities* – the external costs on other parties for actions such as pollution. Public financiers must then determine the proper balance between the production of goods that only government can provide efficiently, and the raising of sufficient revenue to pay for such production.

We begin our discussion with the various theories of public finance through the imposition of tax or the issuance of debt, which is merely the delayed imposition of additional taxes to a later time. We also describe the processes by which we determine who ought to pay these taxes. We first describe the intuition of David Ricardo, an early 19th-century self-taught economist who became independently wealthy in the bond markets of London and then parlayed his fortune into extensive real estate holdings and a position in the British Parliament.

Ricardo was fascinated with the ways in which progress bestows greater value on land, without any required action by the landlord. He proposed a heavy land tax on such unearned income as a way to capture such windfall profits. A few generations later, Henry George, another self-taught economist, created a populist movement around the idea of a 100% land tax, and steep taxes on monopolies. In doing so, he spurred a backlash among the propertied and also from John Bates Clark, one of the founders of modern American economics. Their debate allows us to better understand the differing assumptions made on each side of this contentious debate.

These early treatments were interesting and intuitive, but they were insufficiently rich to draw more subtle conclusions that would be necessary as the share of public finance in the gross domestic product increases. By 1841 in Great Britain, and 1861 in the United States, relatively modest personal income taxes were imposed. But, by the beginning of the 20th century, these income taxes were beginning to exceed property and other taxes and fees. New models became necessary to determine what types of taxes can be most easily levied and which will distort the economy most negligibly.

Frank Plumpton Ramsey, a brilliant young mathematician and philosopher, produced the first formal model of optimal taxation. He demonstrated that a sophisticated public finance authority could impose a goods tax on various industries to reduce the distortions of

monopoly production. Ramsey viewed the tax system as capable of reducing inefficiencies of other sorts, such as those which arise from private sector monopolies.

Twenty years later, William Vickrey observed that personal income taxes also create inefficiencies. Such taxes have the unfortunate consequence of discouraging the generation of earned income. Vickrey came up with a novel solution. If one could produce a tax schedule that individuals in each tax bracket could accept, without attempting to misrepresent their productivity and opt for a lower tax bracket, and a decreased contribution of their own effort, the public finance authorities could avoid the distortions of the income tax. James Mirrlees followed in 1971 with the mathematics that proved Vickrey's intuition. In doing so, Vickrey formulated, and then Mirrlees substantiated, the theory of asymmetric information and created a new strand of research in finance and economics.

While public finance is designed to address the expanding expenditure goals of government, we must also treat how to model the expenditures of government. First, Richard Musgrave described the range of legitimate roles of government. Then, in a book entitled *The Calculus of Consent* and in other writings, James Buchanan and his colleague Gordon Tullock described the motivations and calculations of elected officials. The question of what motivates production is easier to answer for the profit-maximizing private sector. However, the institution of government is political. If one were to impose the assumption of rationality in governmental decision-making, it might be in the rational, and some may say cynical, need of representatives to remain in elected office. Both Richard Musgrave and James Buchanan also reintroduced the public finance and public choice literature to a late 19^{th}-century German economist, Knut Wicksell, and established the theory of public choice as a new and exciting field of study.

We end our discussion with a novel and fascinating conclusion drawn by Charles Tiebout. Under certain assumptions, a town can be viewed much as the private producer of a bundle of goods and services. The Great Mind Joseph Stiglitz then demonstrated that such an optimal town can be publicly financed by the land rents that can arise from the public goods the town provides. In doing so, we return full circle to the prophecies of Ricardo and George that a 100% land tax can fund at least one goal of government, that of the provision of public goods.

Section 1

First Forays into Tax Incidence and Public Policy

I begin with the wisdom of David Ricardo and the ways in which he provided material for both sides of a debate that raged between Henry George and John Bates Clark at the end of the 19th century. This great debate started with America's first populist economics movement, and ended with the embracement of the neoclassical model of economics. An ideological battle has ensued ever since.

1
The Early Life of David Ricardo

David Ricardo was not the first political economist. But he was perhaps the first economist of the modern era. Where those who came before him, most notably Adam Smith (June 16, 1723–July 17, 1790), provided wonderful rhetoric with great flourishes of their pen, Ricardo was the first to convert intuition to a language that was amenable to mathematics and graphs. He also produced concepts that are still taught today – in almost precisely the same form as he had employed in his original presentations. While many have since attributed his ideas to other Great Minds such as Paul Samuelson (May 15, 1915–December 13, 2009), we can see so many roots of modern economics and public finance from his writings almost two centuries ago.

Once we understand his pedigree, perhaps his accomplishments appear at the same time all the more remarkable and predictable. For his story actually begins well before he is born. It is a story that overlaps with that of Franco Modigliani (June 18, 1918–September 25, 2004), who was to win the fourth Nobel Memorial Prize in Economic Sciences more than a century after Ricardo's death.

While Ricardo was born in London, his family had taken a circuitous route before arriving in the United Kingdom. His ancestors date back to before their expulsion as Sephardic Jews from Spain and Portugal in 1492. (The term *Sephardic* is derived from the Hebrew word for the nation of Spain.) Their expulsion occurred in the same year as Spain's Queen Isabella ordered Christopher Columbus and his ships, the *Nina*, *Pinta* and *Santa Maria*, to set sail on their voyage of exploration for the New World. As many as one-third of the crew of Columbus' ships were Jews. Other Sephardic Jews scattered across the Mediterranean Sea to other points in Europe.[1] Over generations, some remained in Spain and were forced to make a public conversion to Christianity, while continuing to practice their Judaism in private. Some of these *Marrano* Jews

eventually made their way from Spain to Amsterdam, a trade-oriented city known, even in the 16th and 17th centuries, for its religious tolerance. Some did so by way of Livorno, Italy, across the Mediterranean, where a healthy Jewish community had lived for some time.

By the mid-18th century, the Ricardo family had migrated from Spain via Livorno in Italy, and they had subsequently established themselves in Amsterdam. Other Sephardic Jews were to remain in Livorno. From these ancestors came Amedeo Modigliani (July 12, 1884–January 24, 1920), the great 19th- and 20th-century sculptor and artist, and his cousin, the Great Mind Franco Modigliani (June 18, 1918–September 25, 2003), who was to be awarded the Nobel Memorial Prize in Economic Sciences in 1985.

Joseph Israel Ricardo, the grandfather of David Ricardo, was a stockbroker and leading figure at the Amsterdam Bourse. He and his family enjoyed a comfortable living. Joseph had many children, first as a product of his marriage to Hannah Israel, who died in 1725, four years after their marriage, and as a result of his subsequent marriage to Hannah Abaz (1705–November 19, 1781), whom Joseph married in 1727.

Two daughters and four sons resulted from Joseph's second marriage. Three of the sons also went on to become stockbrokers, including the youngest son, Abraham Israel Ricardo.

Born in 1733 in Amsterdam, Joseph's son Abraham first established himself in Holland, but by 1760 he had transplanted himself to London, England to help with the running of his father's expanding cross-channel business. He and his father had been investing heavily in what the father of political economy, Adam Smith, referred to as the *English Funds*, fueled by borrowing by England to pay to fund the Seven Years' War which had first erupted with France in 1756. Holland remained neutral during the war, and over the period it used its neutrality to expand trade significantly with England. Abraham Ricardo represented in London many Dutch interests over these war years.[2] He was an active and respected trader on the Stock Exchange of London who, like his father, amassed a considerable wealth.

Nine years after his arrival in London, Abraham met Abigail Delvalle (1753–October 22, 1801), a young woman of 16 years of age – two decades his junior. Abigail was the eldest of eight children born to Abraham Devalle (1726–1785) and Rebecca Henriques de De Sequeira (1737–1787). The Devalles were well-established English merchants and importers, and central figures in the Sephardic Synagogue in London.

Abraham Devalle and Rebecca Henriques de De Sequeira, David Ricardo's maternal grandparents, had married on September 20, 1751.

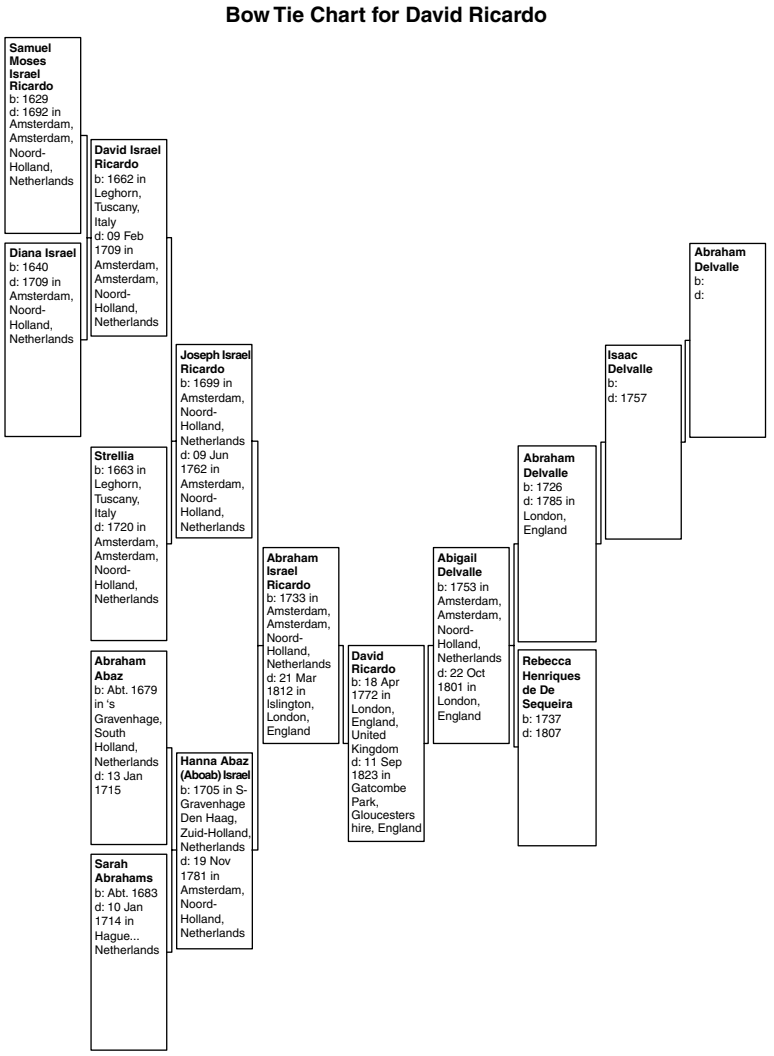

Figure 1.1 Ancestors of David Ricardo

Less than two years later, Rebecca had given birth to their first daughter, Abigail. Widely regarded as a beautiful child and young woman, Abigail was raised in the Synagogue and became acquainted with Abraham Ricardo not long after Ricardo became established in London's Jewish community.

Abraham and the 16-year-old Abigail married on April 30, 1769. Together, they had at least twenty children, of whom six daughters and nine sons reached adulthood, and fully two-thirds of the nine sons followed in the footsteps on their father and grandfather and became stockbrokers.

The third child of Abraham and Abigail, David Ricardo, was born on April 18, 1772, shortly after his parents' third wedding anniversary. By this time, his family had achieved a modest degree of wealth in the financial and mercantile markets of London, and David grew up in comfortable circumstances, even though he received a common education at the neighborhood school during the lean war years, rather than the private education afforded others of his family's stature.

When David was a young boy, the family suffered the years of the 4th Anglo-Dutch War that ran from 1780 to 1784. The Dutch had been the prevalent economic power in the 17th century, but Britain grew rapidly in power and influence in the mid- to late 18th century, in equal parts because of its alliance with the Dutch and its prominent role as the engine of the Industrial Revolution. English economic and military ascendancy led to a growing resentment among the Dutch. A Dutch treaty with a recently independent United States increased the tensions between the two former European allies. In an effort to restrict trade with the United States, the British exercised its new-found economic and military clout by attempting to convert the Dutch Republic to a British protectorate. The two nations each diverted considerable resources to achieving a doubling in the size of their respective seafaring fleets at that time, even if, after four years of conflict, the war ended in a stalemate.

Once peace was restored, David Ricardo resumed his education with his father's relatives who had remained in Amsterdam. While there, David was expected to learn the family financial trade and custom between the two nations, the Dutch language, and Jewish traditions in preparation for his Barmitzvah at the age of 13.

After a few years of religious and formal education in Amsterdam, David returned to his family home on Bury Street in London to continue his apprenticeship in the family business. The family then purchased a new home in Bow, about a mile north of the Thames River, and only a couple of miles from London's financial district at that time, and much closer to the heart of London.

In their new and prominent neighborhood, the 20-year-old David Ricardo met the eldest daughter of a well-known surgeon, Edward Wilkinson (1728–November 4, 1809), and his wife Elizabeth Patterson.

The daughter, Priscilla Ann Wilkinson (November 5, 1768–October 17, 1849), was raised as a Quaker to her devout family. The ensuing courtship and marriage of David Ricardo and Priscilla Ann Wilkinson, on December 20, 1793, was the cause of discord among the Ricardo family over issues of religious faith and David's break from the Jewish Synagogue and community in London.

The breach of faith between David and his father, instigated by his mother, was not permanent, although it did last until David's mother died in 1801 – almost a decade after David's marriage.[3] To be fair, however, the Wilkinsons were equally troubled by the youthful exuberance of David and Priscilla, and they also temporarily refused to support the young couple. Fortunately, David was already financially secure, and he did not need to rely on the wealth of his family.

It seems likely that Ricardo's separation from his faith was not caused entirely by his marriage to Priscilla. Like many intellectuals in that era, David Ricardo had already discovered the Unitarian faith, and he was attracted by both its liberalism and its intellectual leanings. Quakers had dissented from the more hierarchical leanings of the Catholic Church and the Church of England. Those who dissented still further often found themselves embracing Unitarianism. Many religious, philosophical, and economic liberals questioned the dictates of organized religion and embraced the Christian theological movement that asserted God is one entity, in contrast to the Holy Trinity, which defines God as being embodied in *The Father*, *The Son,* and *The Holy Spirit*. Unitarians accepted Jesus as the son of God, but they regarded him as a prophet rather than a god in his own right. Unitarians also rejected original sin and predestination, and permitted the Bible to be read in a metaphorical rather than a literal manner. As a consequence, it was considered one of the most liberal of all Christian churches, and permitted a diversity of interpretation and thought among its followers.

Then, as now, it was not unusual for liberal Christians to attend services with Quakers or Unitarians, as both religions espoused a substantial level of religious tolerance. Indeed, David's wife continued to attend Quaker gatherings, and she certified the birth of some of her children in the Quaker fellowship. By contrast, David remained uneasy with any religions that were more organized and hierarchical than Unitarianism.

David held considerable sway over the lives of his younger brothers, and many of them were to follow his example and marry out of their Jewish faith. His brother Moses (November 13, 1776–March 7, 1866), for example, married Fanny Wilkinson, one of Priscilla's younger

sisters, and became a partner in surgery with one of Priscilla's brothers, Josiah Henry Wilkinson. While this generation of Ricardos and Wilkinsons were close and intertwined, the generation did not typically retain close relationships with their respective parents. They had busy careers, cared for large families, and were distracted by many events at the national scale that shaped their lives. One of these, the conclusion of the Napoleonic Wars, was soon to determine Ricardo's fortune.

At the end of the 18th century, England was fearful of the prospects for a conflict with France. The French Revolutionary Wars from 1792 to 1803 transitioned into the Napoleonic Wars from 1803 to 1814. Fearing an invasion by Napoleon, militias formed in England, including in the Royal Lambeth Volunteers in the Ricardos' neighborhood just south of the Thames River and the financial district in London. When the Ricardo family moved farther east in London, to Bromley, David took a commission as Captain in the Bromley and St Leonards Corps on August 17, 1803.[4] His brother was the Corps surgeon. He also served with James Mill (April 6, 1773–June 23, 1836), the father of John Stuart Mill (May 20, 1806–May 8, 1873), an economist and the eventual co-founder of classical economics as inspired by David Ricardo.

In Bromley, South London, the Ricardos lived a comfortable, almost rural existence at that time. However, by the spring of 1812, the large Ricardo family, which had grown to include three boys and five girls, moved to an estate in the fashionable West End of the City at 56 Upper Brook Street, off Grosvenor Square. Ricardo commissioned Samuel Pepys Cockerell (1753–1827), the famous English architect who was a great-great nephew, and namesake, of the well-regarded diarist Samuel Pepys (February 23, 1633–May 26, 1703) to remodel his house, which had been built in 1729. This house was to be Ricardo's home for the rest of his life.

In the year that the Ricardos moved to Grosvenor Square, one of the most influential economists of the day, the Reverend Thomas Robert Malthus (February 13, 1766–December 29, 1834), had joined the King of Clubs, an exclusive club that met in London during this period. Already by this time, Ricardo had been drawn into membership of a scientific society called the Geological Society of London. Successful in business by the time he was in his thirties, Ricardo became a lover and patron of the humanities and sciences societies and, increasingly, this new social science of economics. Ricardo was nominated to the King of Clubs on June 7, 1817, and had helped found the Political Economy Club in April of 1821.[5]

Ricardo's fortune

By the early 1820s, David Ricardo had reached the pinnacle of the social, familial, financial, and intellectual circles of London. He did so not through the help of family money but through the exercise of his personal cunning. Years earlier, at the age of 14, upon his return from Amsterdam, David Ricardo's father had begun to teach David the workings of the London Stock Exchange. Shortly before his marriage in 1793, Ricardo was already listed on the Exchange ledgers for his trading in bonds of the Government of England. When he became estranged from his family later that year, however, colleagues he had come to know at the exchange helped establish him as a broker in his own right. The investment banking firm of Lubbocks and Forster offered him financial backing which he leveraged, in just a few years, to a fortune that exceeded the wealth of his father.

Ricardo was well respected within the London financial community. When two fraud scandals rocked the Stock Exchange, in 1803 and in 1814, the exchange looked to Ricardo for helping in resolving the problems and also the restoration of market confidence.

Ricardo did not act as a broker, however. Rather, he functioned as a jobber – what we would today term a market-maker. He used his own funds to quote prices for securities for sale or to purchase, primarily of bonds issued by the Bank of England or the East India Company. For each pound of securities traded for cash, about ten pounds of trade was done on time, with a promise to settle on one of eight settlement days each year. The jobber was hence both a trader and a banker.

Ricardo's key insight was his observation that other traders typically "exaggerated the importance of events".[6] Ricardo became a student of human nature and emotion, and he profited from it. He also recognized that markets suffer significant overshooting in their oscillations toward equilibrium. His observations of human nature and trading informed him in ways almost unparalleled among all but some of the profession's most successful economists, including the Great Minds Irving Fisher (February 27, 1867–April 29, 1947) and John Maynard Keynes (June 5, 1883–April 21, 1946), both of whom also traded actively and professionally. His financial acumen would soon allow him to accrue a vast fortune.

2
The Times

Prior to the theories of Ricardo, the economic landscape had been shaped by Adam Smith's observations. Ricardo had been first exposed to Adam Smith's 1776 *Wealth of Nations* in 1799, when he was in his early twenties. Smith's writing gave Ricardo a context from which to organize his own observations of the functions of the market. Also, from Smith and Malthus came the notion of the law of natural prices, which Ricardo later repealed.

Ricardo also weighed in on the role of the money supply. In response to the mounting costs for England in their campaigns of the Anglo-French Wars and the Napoleonic Wars, Ricardo observed that the efforts by the Bank of England to suspend the convertibility of bank notes into gold, which was arguably intended to induce inflation, would also reduce the wealth of those who had purchased government bonds. By then, Ricardo was both a large trader and holder in bonds.

Ricardo responded to what he viewed as institutional market manipulation by writing his first article, 'The Price of Gold', which he published anonymously in *The Morning Chronicle* in 1809. He bolstered his non-interventionist argument a year later with his publication of the pamphlet *The High Price of Bullion, a Proof of the Depreciation of Bank-Notes*. This publication was to be most influential in the government circles in 1810. Over the first decade of the 19th century, Ricardo had become an advocate of a movement called *The Bullionists*, who argued that a gold standard ensures a steady money supply and moderated inflation. By this time he had developed what we now know as the *Quantity Theory of Money*. Such a quantity theory is intended to hold in check those who would seek to inflate the money supply to afford the government more resources with which to purchase arms, and a greater latitude for borrowing as it lowers the real value of government debt outstanding.

Ricardo and the other Bullionists remained concerned about the debilitating effect such manipulations may have on the integrity of financial markets.

Members of the House of Commons under the influence, and perhaps the financial advice, of Ricardo created the controversial and famous *Bullion Report to the British House of Commons* that reflected Ricardo's views. Ricardo followed up the report in his follow-up pamphlet, *Reply to Mr. Bosanquet's "Practical Observations on the Report of the Bullion Committee*,"published in 1811, which helped hold sway by diverting the British Treasury and Bank of England from their inflationary inclinations.

Ricardo was subsequently encouraged by his friend, James Mill, and also by Thomas Robert Malthus, to document his economic intuitions in a more complete manner. As a result, he followed up his works on the gold standard and the money supply with his March 1814 papers which dealt with profits accruing to capital, and then with his February 1815 publication influential *Essay on the Influence of a Low Price of Corn on the Profits of Stock; Shewing the Inexpediency of Restrictions on Importation*. He followed these up with his most well-known publication, entitled *On the Principles of Political Economy and Taxation*, published in April of 1817. This determined the principles by which a nation's product is divided between workers, capitalists, and landowners.

These years in the 1810's were productive for Ricardo, both financially and philosophically, but they were not without controversy. At the middle of the decade, in June of 1815, the Battle of Waterloo was fought to end the Napoleonic Wars once and for all time – and Ricardo's actions around this event were to attract considerable criticism.

Ricardo was 43 years old when the Battle of Waterloo was fought. One of Britain's most defining battles, it began on Sunday, June 18, 1815, in Waterloo, just a few miles south of present-day Brussels in Belgium. The British and Prussian armies, led by the Duke of Wellington, defeated Napoleon that day. The battleground was defined by Napoleon as part of a strategy to prevent the allied forces from invading France from Belgium. It marked the end of Napoleon's rule, and the beginning of a long period of peace for Great Britain. Just the year before, Britain also signed a treaty bringing to an end the War of 1812 with the United States. Following the battle, King Louis XVIII was restored to the French throne and Napoleon was exiled to Saint Helena, where he was to die six years later.

The lead-up to the battle was causing consternation and disruption in England's financial markets which were increasingly nervous about the outcome of the war with Napoleon. To reduce his own financial uncertainty, Ricardo had created an information network to provide

timely financial market to its subscribers from which he and his closest colleagues could profit, much in the manner of Michael Bloomberg in the 21st century. Ricardo's network informed him that the battle was coming to an end well before the information was widely available. Commentators at the time argued that he had traded on this private information in such a way as to imply to those with less information that Napoleon had won the battle. The resulting panic drove down the price of bonds, to which Ricardo responded by purchasing bonds, consistent with his observation that markets overreact to news. Once news of the Allied victory at Waterloo became known to the financial markets, the value of bonds that Ricardo had bought rose dramatically. In Ricardo's obituary in *The Sunday Times* on September 14, 1823 it was concluded that Ricardo earned perhaps a million pounds sterling in his trades that week.

As a result of these actions Ricardo had instantly achieved lifelong financial security. He subsequently retired and invested in real estate, with one of his more notable acquisitions being Gatcombe Park in Gloucestershire, a property which was more recently purchased by Queen Elizabeth II and is now occupied by her only daughter, Anne Princess Royal (Anne Elizabeth Alice Louise, born August 15, 1950). His financial security also afforded Ricardo increasing amounts of time and effort to devote to economics and politics.

3
The Theory

Ricardo invested his new-found substantial wealth in a way that was entirely consistent with his economic observations. He developed a personal theory of rent based on his observation that the growth of population, as famously espoused by Thomas Robert Malthus, puts increased pressure on the land around a city to expand cultivation. Ricardo noted that an *improving* society commands an increasing share of productive soil, and, in the process of progress, drives up the price of all cultivatable soils. The largest profits then go to those soils of highest fertility, while only insignificant profits accrue to land of marginal fertility at the lowest extent of cultivatable land. In any regard, those who work the land receive a competitive return sufficient to attract the units of farm capital and labor. These factors do not capture the rents that accrue to land owners because, unlike land, the resources like labor and capital are easily replicated.

In the creation of his theory of the distribution of returns to factors of production, Ricardo was the first to introduce into a formal model a concept that has represented the foundation of classical economics. Ricardo also introduced the notion of diminishing marginal returns – meaning that only the most fertile land receives the highest product. Land of decreasing fertility earns decreasing returns to its fertility, until the most marginal land receives a return that falls to zero. Meanwhile, the other factors receive their competitive return.

Note that these returns to land are also affected by the level of demand. If demand was so low that only the most fertile land would be employed, its return, or rent, is zero, even though the laborers who work the land must still be paid their subsistence wage. But, as demand increases, substandard land that previously could not justify even a zero rent becomes economically viable. Meanwhile, the return on the most

fertile land increases commensurately. Ricardo described the expansion of the use of land as "the gifts of nature which exist in boundless quantity".[1] But, as population grows, or the price for which the population is willing to pay for the fruits of the land grow, so do the rewards to land.

Through this analysis, Ricardo diverged from the prevailing view asserted by Smith more than forty years earlier. Smith had believed in the existence of 'natural' prices for the various factors that sum to represent the price of a commodity. Ricardo argued that the price of a fixed resource is unique in that its reward is in the form of the residual claim of any surpluses after the prices of the other variable factors of production are deducted. In effect, a high price of corn caused the high rents observed on some land, not the other way around. The prevailing theory he repealed was that the high rent of land produces the high prices for its product.

In addition, as demand increases and the amount of land in cultivation increases with it, these surpluses to land represent an ever-increasing share of the price of the agricultural product.

Ricardo also turned his eye to the return on other factors of production. Smith, and his contemporary, Thomas Robert Malthus, had argued that the natural wage rate was enough to ensure that workers could maintain a sufficient income to ensure subsistence. Ricardo allowed the wage rate, and the rate of return on capital, to adjust upward to increasing demand. He had in mind the notion that, as a society develops and accumulates greater amounts of capital, the labor that works the capital becomes increasingly productive. Hence, labor's wage, in proportion to its productivity, on the margin, also rises. In advancing this argument, he was describing the process that the Great Mind John Bates Clark would reinvent seventy years later in his establishment of the classical theory of production.

Ricardo recorded his postulates in his most well-known treatise, his *Principles of Political Economy and Taxation*,[2] published in 1817. Ricardo begins with his reformulation of a labor theory of value. He first outlined his assumptions:

- There are two sectors of the economy.
- Each sector has the same wage rate and the same profit rate.
- Capital employed in production is made up of wages only.
- Each production process may use differing types of equipment as capital in different proportions.

From this basic model, Ricardo defined rent as the "difference between the produce obtained by the employment of two equal quantities of

capital and labor". He believed that economic development increased the cultivation of poorer land, which, somewhat surprisingly, increased the rents earned by other landowners. Ricardo argued that this excess rent above the social cost of the factors employed should be viewed as a return to society, rather than to individual landowners. He was also the first to note that a tax, then, on such rents is the only non-distorting tax as it would not lead to price increases and would not diminish the return to the other factors of production.

A casual parsing of Ricardo's assumptions allowed the emerging socialists of his day to draw some interesting, but perhaps naïve, conclusions. Ricardo argued that the price of a good is exhausted in the rents to fixed factors it pays and in the wages it pays directly for labor employed, and indirectly for the capital it employed, which was itself constructed from labor. Socialists conclude, then, that labor produces the entire product, either directly or indirectly, whereas the profits accrue to the idle rich, the owners of fixed factors usurp some of this value. Such accumulation of wealth then prevents the wages of workers from supporting the price of the goods they must consume. This concept is reminiscent of the instabilities Thomas Robert Malthus had levied in that same era against the feasts and famines of capitalism. Authors from Thomas Hodgskin to William Thompson employed Ricardo's insights to develop models of the exploitation of workers. This analysis was also to motivate Karl Marx in his exploration of the theory of communism in the latter half of the century.

Near the end of Ricardo's century, the Georgists implicitly seized upon and elaborated Ricardo's observation on tax incidence. Taking Ricardo's notion of the social price still further, Georgists argued that all rent to land and other fixed factors of production belong to the society that induces the growth which created the rents. In his *Progress and Poverty*, published in 1879, George generously cited Ricardo's work. In his preface to the fourth edition of his book, George wrote:

> What I have done in this book, if I have correctly solved the great problem I have sought to investigate, is, to unite the truth perceived by the school of Smith and Ricardo to the truth perceived by the school of Proudhon and Lasalle; to show that laissez faire (in its full true meaning) opens the way to a realization of the noble dreams of socialism; to identify social law with moral law, and to disprove ideas which in the minds of many cloud grand and elevating perceptions.

The passage that most likely inspired George was in Ricardo's *Works* chapter entitled "Taxes on Rent." In this part of his collection, Ricardo

argued that such a land tax would be efficient, in that it would not distort other productive decision. It was also distributionally well targeted in that it would be absorbed solely by landlords who do nothing to make the land productive:[3]

> A tax on rent would affect rent only; it would fall wholly on landlords, and could not be shifted to any class of consumers. The landlord could not raise his rent, because he would leave unaltered the difference between the produce obtained from the least productive land in cultivation, and that obtained from land of every quality. Three sorts of land, No. 1, 2, and 3, are in cultivation, and yield respectively with the same labour, 180, 170, and 160 quarters of wheat; but No. 3 pays no rent, and is therefore untaxed: the rent then of No. 2 cannot be made to exceed the value of ten, nor No. 1, of twenty quarters. Such a tax could not raise the price of raw produce, because as the cultivator of No. 3 pays neither rent nor tax, he would in no way be enabled to raise the price of the commodity produced. A tax on rent would not discourage the cultivation of fresh land, for such land pays no rent, and would be untaxed. If No. 4 were taken into cultivation, and yielded 150 quarters, no tax would be paid for such land; but it would create a rent of ten quarters on No. 3, which would then commence paying the tax.
>
> A tax on rent, as rent is constituted, would discourage cultivation, because it would be a tax on the profits of the landlord. The term rent of land, as I have elsewhere observed, is applied to the whole amount of the value paid by the farmer to his landlord, a part only of which is strictly rent. The buildings and fixtures, and other expenses paid for by the landlord, form strictly a part of the stock of the farm, and must have been furnished by the tenant, if not provided by the landlord. Rent is the sum paid to the landlord for the use of the land, and for the use of the land only. The further sum that is paid to him under the name of rent, is for the use of the buildings, &c., and is really the profits of the landlord's stock. In taxing rent, as no distinction would be made between that part paid for the use of the land, and that paid for the use of the landlord's stock, a portion of the tax would fall on the landlord's profits, and would, therefore, discourage cultivation, unless the price of raw produce rose. On that land, for the use of which no rent was paid, a compensation under that name might be given to the landlord for the use of his buildings. These buildings would not be erected, nor would raw produce be grown on such land, till the price at which it sold would not only pay for all the usual

outgoings, but also this additional one of the tax. This part of the tax does not fall on the landlord, nor on the farmer, but on the consumer of raw produce.

There can be little doubt but that if a tax were laid on rent, landlords would soon find a way to discriminate between that which is paid to them for the use of the land, and that which is paid for the use of the buildings, and the improvements which are made by the landlord's stock. The latter would either be called the rent of house and buildings, or on all new land taken into cultivation, such buildings would be erected, and improvements would be made by the tenant, and not by the landlord. The landlord's capital might indeed be really employed for that purpose; it might be nominally expended by the tenant, the landlord furnishing him with the means, either in the shape of a loan, or in the purchase of an annuity for the duration of the lease. Whether distinguished or not, there is a real difference between the nature of the compensations which the landlord receives for these different objects; and it is quite certain, that a tax on the real rent of land falls wholly on the landlord, but that a tax on that remuneration which the landlord receives for the use of his stock expended on the farm, falls, in a progressive country, on the consumer of raw produce. If a tax were laid on rent, and no means of separating the remuneration now paid by the tenant to the landlord under the name of rent were adopted, the tax, as far as it regarded the rent on the buildings and other fixtures, would never fall for any length of time on the landlord, but on the consumer. The capital expended on these buildings, &c., must afford the usual profit of stock; but it would cease to afford this profit on the land last cultivated, if the expenses of those buildings, &c., did not fall on the tenant; and if they did, the tenant would then cease to make his usual profits of stock, unless he could charge them on the consumer.

Ricardo had clearly made the distinction between land itself and capital upon the land. His tax on land itself would be designed to strictly tax land profits, but not discourage the fixtures and capital that are associated with the land.

But while Ricardo was the first to describe a non-distorting tax and differentiate between productive and non-productive profits, his work remained unappreciated, and perhaps even actively ignored, by a young discipline and by the landed class with whom he rubbed shoulders at their estates.

4
The Later Life of David Ricardo

David Ricardo is considered to be the father of classical political economy theory, and one of the most influential economic thinkers of the pre-neoclassical era, ranking perhaps second only to Adam Smith in stature, but surpassing his predecessor in both rigor and intuition.[1] Ricardo was one of the first formal thinkers to advocate for the role of free trade and the significance of a well-managed money supply. In 1816, he had published a plan to return to the gold standard in an attempt to prevent England's central bank from manipulating the currency and causing inflation. By backing paper currency with gold, the nation was able toretain the benefits of paper money but without the uncertainties. Five years later, and two years after he became a member of Parliament, England adopted his proposal.

David Ricardo is associated with many of the major concepts in modern economics. He even offered additional insights into public finance. In a manner analogous to the insights of the Great Minds John Burr Williams, Franco Modigliani, and Merton Miller more than a century later in the context of corporate finance, Ricardo suggested that, under circumstances similar to the caveats of the Modigliani–Miller Theorem, the choice of a government to finance spending by raising tax revenue or by issuing debt may have no differential consequences for the economy. His qualification in an intertemporal setting is that the result of debt financing or taxation will be the same if taxpayers access the same credit markets as does government and also if taxpayers are rational. More recently, Robert Joseph Barro (September 28, 1944–), the Harvard economist, reached the same conclusion. Indeed, Barro considers Ricardo to be one of his greatest influences.[2]

One of Ricardo's first recommendations as a member of Parliament was to repay England's entire national debt over just a few years through the introduction of a tax on property. Just as Henry George

had later advocated in 1879, Ricardo asserted that a tax on property would not diminish the level of total wealth. His argument was related to his assertion that debt or tax financing of government expenditures were neutral. He had argued that the propertied class earned income on interest from the National Debt, and the taxes levied on property would cover interest charges and amortization of the national debt. This argument is now known as *Ricardo's equivalence theorem*.

Ricardo also commented extensively on other aspects of tax incidence and the effect of taxes on capital accumulation. He surmised that any tax on capital have the tendency to reduce capital formation.

Ricardo had made the important distinction that the incidence of taxes does not rest solely with the category taxed. He argued "Taxes are not necessarily taxes on capital, because they are laid on capital; nor on income, because they are laid on income."[3] For example, if workers were paid a subsistence wage and that wage were taxed, the nominal wage would have to rise to maintain purchasing power. Ricardo argued that this tax was then borne by capitalists who employ the subsistence workers. This is a similar argument to the one he had made with regard to the neutrality of a tax or of debt financing for government expenditures since the propertied classes would ultimately pay – in one way or another.

Ricardo then reasoned that "a tax on rent would affect rent only; it would fall wholly on landlords, and could not be shifted to any class of consumers" (*Works*, vol. 1, p. 171). Meanwhile a tax on profits would raise prices because it would raise the price level of all products. He noted that "if a tax in proportion to profits were laid on all trades, every commodity would be raised in price" (*Works*, vol. 1, p. 205). Such a tax would have a differential effect on various classes. Subsistence workers would be compensated for the tax on products by an increase in their subsistence wage sufficient to maintain their minimum purchasing power. Ricardo noted "whatever raises the wages of labour, lowers the profits of stock; therefore every tax on any commodity consumed by the labourer, has a tendency to lower the rate of profits".[4] His sophisticated analysis of tax incidence was much more nuanced than any that came before him – and many more that have been developed since.

Free trade

In the present day Ricardo is perhaps best known for his theory of international trade. He remained a strong advocate of free trade, but for reasons that went well beyond Adam Smith's earlier argument for

voluntary exchanges. Ricardo felt that an explanation of trade patterns simply because of each trader's absolute cost advantages was not sufficiently subtle and rich. Instead, he offered an elaborate example of what we now call the principle of comparative cost. He described the concept through the example of trade in two commodities between Portugal and England. Consider the classic comparison between two commodities, cloth and wine.

Let us assume that Portugal had an absolute advantage in the production of both commodities in the sense that it could produce either commodity at lower cost than could England. Ricardo argued that there remained opportunities for mutually beneficial trade if Portugal specialized in the production of wine, in which it had a relatively larger absolute advantage. Meanwhile, England ought to specialize in the production of cloth, for which it has an absolute disadvantage, but in which its comparative disadvantage was smaller than its disadvantage in wine production. Trade in the two commodities would then enrich both trading nations. Ricardo's model remains one of the most profound yet simple concepts ever developed in economics.

Ricardo's intuition made him a staunch opponent of the policies of protectionism and mercantilism. He agreed with Adam Smith that mercantilist policies such as the British "Corn Laws," which were tariffs on the import of certain agricultural products, inappropriately encouraged cultivation on less productive domestic land. In turn, land rents would rise, and these surpluses to the landed gentry would divert capital away from industry and toward landlords. The resulting increase in demand for the luxury goods the idle rich purchase would rob a growing economy of investment and would lead to economic stagnation.

Perhaps consistent with his view that resources ought to earn their just rewards, Ricardo was also an abolitionist. He spoke out against the actions of the East India Company, which he regarded as advocating slavery and creating a "stain on the character of the nation." While England had abolished slavery at home, the husband of his sister Hanna, David Samuda, had owned a number of slaves in the British colony of Jamaica.

Ricardo died on September 11, 1823, from an ear infection that spread to his brain. At the time of his death, he was still residing in Gloucestershire at his country estate and parliamentary seat, Gatcombe Park. He left eight children, including three sons. Two of his sons, Osman Ricardo (May 25, 1795–January 2, 1881) and David Ricardo (May 18, 1803–May 17, 1864), were each to become members of Parliament. A third son, Mortimer Ricardo (August 10, 1807–April 21, 1876),

was to become, in adult life, an officer in the Life Guards and the deputy lieutenant for Oxfordshire, England. Ricardo's estate was estimated to be valued at £600,000 upon his death, which was a princely sum in his day.

Upon his death, Ricardo was buried in an ornate grave in the cemetery at the Saint Nicholas Church in Hardenhuish, a village outside the market town of Chippenham, Wiltshire, England. His gravestone reads "A Jew, born in Holland, he was one of the first free traders and a famous Radical in his day." His radical thought of that age, in the early part of the 19th century, now forms the basis of prevailing wisdom in the neoclassical model of economics.

5
The Early Life of Henry George

The first inkling of what would become a raging political debate in the United States and beyond, centered about the finances of the public sector, could not have begun in a more colorful way. In fact, there are few scholar-philosophers more fascinating than the iconoclast Henry George.

Henry George was born to what had been one of the newest philosophical and intellectual capitals of a new world. His grandfathers had migrated from the United Kingdom following the declaration and War of Independence of the United States, but before war again erupted with Britain in 1812. By the time the Eastern Seaboard of the United States was engulfed in the War of 1812, both Richard George and John Vallance had established families and were firmly established in the social fabric of Philadelphia, Pennsylvania.

Henry George's paternal grandfather, Richard George, was born in Yorkshire, England, in the period just before hostilities erupted between England and its American colonies. He was raised under the reign of King George III, a ruler who reigned longer than any other king of Great Britain, and who also ruled an empire that enjoyed many military victories, most notably over France and Napoleon, a great expansion of his empire into Africa and Asia, and one painful military loss to America.

Richard George had joined his majesty's navy, before eventually becoming a ship owner and master mariner in his own right. This vocation brought him to the new United States and to the port city of Philadelphia, on the Delaware River. Once having arrived, Richard George married into an established Philadelphia family when he wed Mary Reid. Together, they raised three children, including their youngest, Richard Samuel Henry George.

The family of Captain George was to become relatively prosperous-during this time in which the United States became free to trade with a

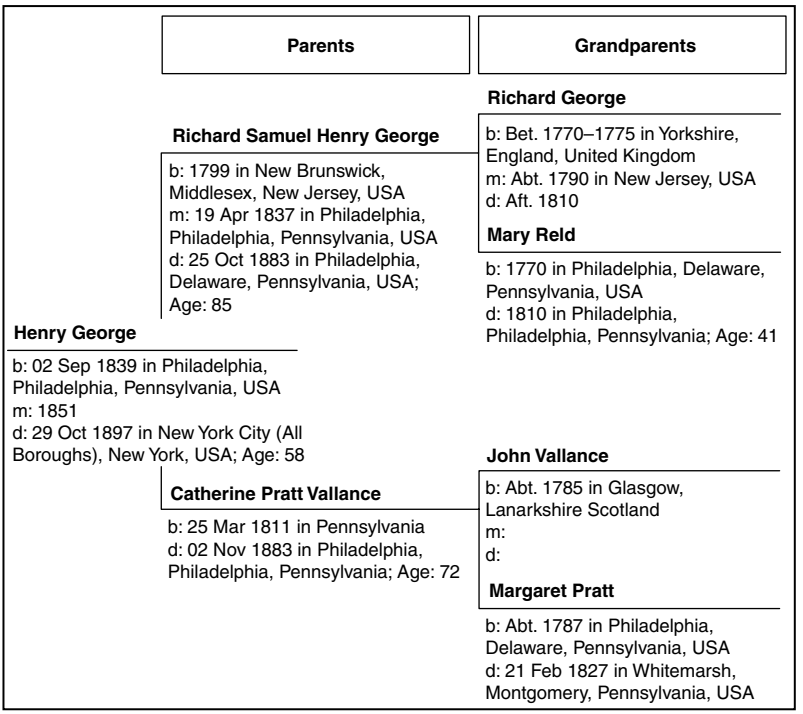

Figure 5.1 Ancestors of Henry George

world that was expanding rapidly during the acceleration of the Industrial Revolution. The family prospered and was cared for by servants for a time, at least until the youngest son Richard entered his teenage years and war once again erupted with Great Britain in 1812. Shipping through adjacent waterways to the Philadelphia area was a pathway toward the heart of American government in nearby Washington, DC. The George family was in the geographical center of political foment and military strategy for a young nation.

On the maternal side of Henry George's lineage, his grandfather, John Vallance, was born a little later than Richard George, following the War of Independence, in Glasgow, Lanarkshire, Scotland. Mr. Vallance had been trained at an early age as an engraver, and took his skills to the intellectual and cultural capital of the new United States at a young age. There he became even more ensconced in Philadelphia civic life, both because of his skill as a craftsman and also because he made an advantageous marriage.

John Vallance's wife, Margaret Pratt, was a member of one of Philadelphia's most prominent families. The family name could be traced back a couple of generations earlier to their association with the noted Philadelphia printer, inventor, and statesman, Benjamin Franklin and the influential Philadelphia families of the day. The Pratt family and John Vallance had rubbed shoulders with the vibrant craft and artisan scene of Philadelphia in the relatively peaceful thirty-plus-year period between the War of Independence and the War of 1812.

Unfortunately, both John Vallance and Margaret Pratt Vallance were to die while they were relatively young. Margaret died at the age of forty, two decades and two months before the marriage of her daughter, Catherine Pratt Vallance. But while a young Catherine would not enjoy the company of her mother beyond her 16th birthday, she was nonetheless part of an extended Vallance family. Left motherless and fatherless, she lived in relative comfort within her extended family.

Catherine Pratt Vallance, the daughter of a prominent engraver, and Richard Samuel Henry George, the son of a shipowner and master, were both required to forge their own way in the world following the misfortunes of their parents. Catherine Vallance had run a school with her sister, Mary. Richard had married young and lost his wife, but not before the birth of a daughter, Harriet, in 1833. With the loss of his wife, he sought care and education for his suddenly motherless daughter, placing her in the care and schooling of the Vallance sisters. There, the 38-year-old Richard became closely acquainted and enchanted with his daughter's teacher. Their relationship deepened and Richard married Catherine in Philadelphia on April 19, 1837, shortly after her 26th birthday.

By the time they became more closely acquainted, Richard had been familiar with Catherine for some time. In the 1830s, Richard had married and established himself squarely in the Philadelphia middle class through his job at the Philadelphia Customs House. Later in the decade, he became a publisher of works on behalf of Philadelphia's Episcopalian Church, and had partnered in his enterprises with Thomas Latimer, the husband of one of Mary and Catherine's sisters.

The Georges and the Pratts were ensconced in the world of small commerce, education, faith, and intellect and found themselves at the heart of respectable Philadelphia's civic life at the time. They were also hard-working and industrious, but the new and fast-growing family of Richard and Catherine George was certainly not wealthy; indeed, at times, they flirted with poverty as the parents strove to support nine children and a sister-in-law.[1]

Richard George had given up publishing by the 1840s under the unrelenting pressures of larger publishers. By 1848, he had returned to the modest, but consistent salary his former Customs house job had to offer.[2] His salary of $800 per year was spread thin across a large family. While they may have wanted for the affluence of previous generations, they made do during this time.

The George family lived in some comfort, but maintained little distance from poverty. The economic pressures created by the maintenance of a large family were less looming than their association with the Church and its Puritanical leanings. The growing family was a loving one that lived modestly, but still prized education.

Born on September 2 in 1839, Henry George, the young couple's firstborn, was raised in a family with a devout father, who was a layperson of the church, and a mother an adherent to its teachings. Yet the young Henry George seemed less interested in the faith than in other intellectual pursuits. As a young person, he had developed a strong aversion toward slavery, which was the looming issue of public debate in Philadelphia during his teenage years in the early 1850s. Many in his area, wedged firmly between the North and the South, acquiesced to slavery, but young Henry could not. Henry's youthful opinions annoyed his father, who had found rationale for slavery in the Bible. Some of his youthful indiscretions, in smoking and drinking, also raised his father's ire. Henry George was on a path to grow up fast.

After only a couple of years of formal school and coaching past grammar school, and at the young age of 15 years, Henry George was ready to strike out on his own. Captain Miller, a parishioner at Henry's church, had been promoted to become the captain of his own vessel, the *Hindoo*. Young Henry talked his way into an entry-level position on the ship. Henry George left Philadelphia a boy and, after a trip across three oceans and back, returned a man a little more than a year later.

Upon his return home, Captain Miller commended young Henry to find more agreeable and profitable work on land. Henry George took Captain Miller's advice and followed in his father's footsteps when he found work as a printer's apprentice. He believed that such a vocation would create opportunities for him anywhere that valued a newspaper. But, with the Panic of 1857, young Henry found it increasingly unlikely he would realize his goal of journeyman printer by the age of 21, still more than three years in his future. At the age of 17, Henry sought the second major change in his life.

George had read about the lure of American's West. The California Gold Rush had attracted a generation of adventurous men from around the world, followed by another gold rush in the Fraser Canyon of British

Columbia. Henry's cousin, James, had gone West, and Henry vowed to join him. He had no means to get there. Meanwhile, his father harbored hope that Henry would secure a good government job. These stars aligned when the family used their political connections to have Henry appointed to the service of a new federal ship that would soon set sail for San Francisco. A promise of a good salary and profession was enough to entice Henry, at least temporarily, into government service and his return to sea.

In late 1857, Henry set sail on the *Shubrick*, the first steam-powered lighthouse tender, and the first to be sent to the West Coast of the United States. He arrived in San Francisco in the late spring of 1858, on May 27, at the age of 18. Upon his arrival, he met up with his cousin James and they almost immediately began to concoct a plan to parlay the riches of the Fraser Canyon Gold Rush into their own fortune. The cousins quite accurately realized that few became rich from the California Gold Rush that had begun nine years earlier, except those who had provisioned the prospectors.

Henry and James George set their sights on the hardware and outfitting business in Victoria, Vancouver Island, British Columbia. There, boats destined for camps along the Fraser River would first stop to be outfitted for gold mining. With the help of James' wife, Ellen, they were able to convince the *Shubrick*'s captain to release Henry from service to the ship and his government. Such contract-breaking was not unusual at that time on the West Coast as many a seaman had jumped ship to work the gold mines. The captain allowed Henry to retire from service, and Henry quickly dispatched to Victoria in enterprise with his cousin. Unfortunately, their venture lasted little longer than the thousand-mile sail itself, though, as Henry quarreled with his new partner in ways he would later confess regret.[3]

Ellen and James' family followed the cousins to Victoria, only for Henry to soon make his way back to San Francisco. For a couple of years Henry found himself without his family, alone in San Francisco, and without any consistent work. But he was able to secure enough work and experience as a printer to eke out a living and, upon turning 21 in 1860, he was granted the journeyman printing status that he had sought for years, and was able to join the guild. For the first time in his adult life, Henry may have finally discovered some sense of permanence. He had given up drinking and smoking, had renewed his relationship with the church, was making a good wage, and felt California his home.

The early 1860s were an unsettling time for the nation. Abraham Lincoln had been elected, and his efforts to abolish slavery were dividing

a nation. While the West was almost immune to the worst of these gyrations, commerce had become increasingly uncertain. Henry George lost his steady printing job with the local *California Home Journal*, but he was able to turn this setback into an opportunity. He joined a handful of other youthful colleagues to form their own newspaper, the *San Francisco Daily Evening Journal*.

With his youthful adventures behind him, and finding himself now with a modicum of financial security, Henry George turned to romantic and intellectual pursuits. On October 12, 1860, Henry was persuaded to attend a birthday party. There he met the soon-to-be love of his life, Annie Corsina Fox (October 12, 1843–July 21, 1904). The 17-year-old birthday girl, Annie, had come to San Francisco with her Australian mother, Elizabeth McCloskey Fox, who had separated from Annie's British father and had come to town to join Annie's grandparents, Mr and Mrs Henry McCloskey. Henry McCloskey was a land and railroad magnate who had moved from Australia to the wide-open West Coast. While the grandfather died before the last spike for the US Transcontinental Railroad was driven in 1869, and a year before Henry George met his granddaughter, the courtship of Henry George and young Annie Corsina Fox was blessed by Annie's grandmother shortly before the grandmother's death in December of 1860.[4]

Annie was raised as a Catholic, something which was at odds with the preferences of Henry's Protestant family. Despite the protests of his family, and the concerns of Annie's uncle that Henry George had insufficiently stable income to support his niece, the two married on the third day of December 1861. By this time, Henry George had sold his share of the failing evening journal, and had found occasional work as a printer.

Anxious to support his new bride, Henry made yet another career move – although it was far from being its last. He relocated his young family to Sacramento, the state capital, one hundred miles to the northeast of San Francisco. There, he secured work at the Sacramento Union, the capital's largest newspaper. His bride soon followed, on the promise of steady and good wages, and they had their first child, Henry George Junior, on November 3, 1862.

The young couple's bliss was short-lived, though. Henry George again quareled with his employer, lost his job, and moved his family back to San Francisco. There, he found occasional work printing and writing, but their family lived in poverty, unable to regularly pay the rent. Henry George wrote of his poverty, of his strong feelings for the abolition of slavery, and for his concern that the progress and wealth creation of the settlement of the West often attracted the poorest immigrants

and resulted in a labor surplus and lower wages for the working class. Henry George's proletariat sympathies, harbored since his teenage years, were again occupying his mind and featuring strongly in his occasional writings. He began to enjoy some minor successes in the publication of short pieces on the human condition. Then, with the assassination of the abolitionist president, Abraham Lincoln, on April 15, 1865, George was commissioned by the *Alta California*, the city's oldest newspaper, to document the repercussions of the assassination of the nation's president.

With some modest success at journalism behind him, Henry George travelled between Sacramento and San Francisco, in efforts to find consistent work. In the summer of 1866, he was offered a job at a new newspaper, the *San Francisco Daily Times*, edited first by James McClatchy but, within a year and, following some newspaper intrigue, by the 28-year-old Henry George, in June of 1867.[5]

There is little that can do more foment one's intellectual creativity than the necessity to create an editorial or newspaper column one or more times per week. There are a limited number of events or thoughts that will interest the reader, and each column must explore a bit further than the previous treatment of the same topic. As editor of the *San Francisco Daily Times*, Henry George probed the depths of his thinking, on the economic progress and fairness of mid-nineteenth-century California, of the antics of the speculators and land barons, and of the plight of myriad immigrants attracted to a better life, but often finding a worse one. For two years, Henry George captivated the intellectual imagination of his community. In the *Times*, Henry George, with little formal education, developed his economic intuition through his observation of bankers and their monopolization of credit, and of speculators who sought to monopolize land and resources.

At his apex with the *Times*, on August 12, 1868, Henry George quit the newspaper on which he placed his indelible stamp, and, within two weeks, he joined the *San Francisco Daily Morning Chronicle*, where he stayed for the remainder of 1868. While there, he forged the intellectual temperament of the paper, in opposition especially to land monopolies and speculation, and advocated for the introduction of hefty land taxes to redress what he saw as the inevitable evolution of the wealth to the rich but generated by progress and the toil of the working class.

Just as suddenly, though, he had left both the *Chronicle* and San Francisco to join his wife and family, whom had relocated to join Henry George's extended family in Philadelphia. From Philadelphia, he travelled to New York City and to Washington, DC, and regularly sent news

to a paper in San Francisco so his newspaper could scoop the fledging *American Press Association Press* network. His bureau office for the *San Francisco Herald* was soon squashed, though, as behind-the-scenes collusion between the *American Press* and *Western Union*, the telegraph monopoly, prevented Henry George from transmitting his scoops in an affordable and timely manner. Their collusion and anti-competitive behavior cemented Henry George's opinions about monopolies and the importance of freedom of the press with the end of his correspondence job on the East Coast.

Henry George was once again forced to move back to California to find work as an editor. While there, on the first day of the new decade of the 1870s, he was riding between San Francisco and Oakland when he stopped to rest his horse and enjoy the view. In the distance, he saw cows in a pasture and asked a passer-by what land there might be worth. The observer suggested a price of $1,000 per acre. Almost immediately, to Henry George, a variety of themes were unified in his mind. While the fortunes of those who work the land seem never to improve, and may even decline with population growth and its depressing effect on the laborer's wage, the value of land increases steadily to capitalize on a region's progress. Yet the owners of the land themselves do nothing to advance progress. They merely find themselves in the right place at the right time. To this luck comes great fortune, while human toils go unrewarded. This moment of clarity was to define the legacy of Henry George as we know it today.

6
The Times

The times within which Henry George thought and wrote were perhaps some of the most dynamic in American history. The period from Abraham Lincoln's presidency, and his assassination, through the American Civil War, the abolition of slavery, the completion of the Transcontinental Railroad, and the initiation of the Gilded Age all occurred within the decade of the 1860s.

At the same time, the political thought of John Stuart Mill was making its way to America. First, his *On Liberty*,[1] published in 1859, and then his 1863 *Utilitarianism*,[2] became influential writings on the respective roles of individuals and the state. While in Philadelphia, Henry George was exposed to Mill's treatises.[3] Other writers, most notably David Ricardo's *On the Principles of Political Economy and Taxation*,[4] published April 19, 1817, also described the interaction between progress, profits, and land rents. This became the prevailing theme for much of George's most productive years. Yet, George may have at first been unaware of the significance of Ricardo's work, and was primarily influenced by Mill's writings for their completeness and application.

These writings by economic philosophers were dense, and ill-suited to the readers of Henry George's columns and editorials. They were also abstract, and did not weave into the literature current events and the rapid, but economically unbalanced progress Henry George was witnessing. Nor could one have imagined the vast transformation in land value and productivity that would develop with the railroads and their ability to create value in land that were previously too distant to be accessible.

From his observations and a modicum of economic writings by English economic philosophers, George's intuition would supplement and scoop the academic literature by decades. For instance, he observed that, while progress and free trade seemed to increase the gross income

of wage earners, when higher land prices, the cost of consumption goods, and taxes were deducted, the working class found itself ever closer to poverty, despite the progress they saw all around them. This irony of progress could not be proved statistically for more than half a century. Yet, the counterintuitive combination of progress and poverty still occurs today.

Henry George was not concerned about statistical truths, though. While the academic community would absorb his observations only slowly, his job as an editor, journalist, and social commentator was more immediate, and less constrained by the rigors of the academic community. He sought to draw conclusions from anecdote and relate these conclusions to the lives, times, and realities of a population vastly broader than the readers of academic treatises. These real-world concerns about land rents, free trade, population growth, and economic growth were shared by scholars such as David Ricardo and Thomas Robert Malthus, but they had not been digested and presented sufficiently for a broader audience.

Henry George had read Mill, in particular his *Principles*, 1864 edition, which, in chapter XVI, had advocated that land rent should accrue to the public rather than as private wealth. George also read Mill's thoughts on the subject of population growth. But while Mill's experience was confined to the more bucolic rural England, land speculation and Chinese immigration were incredibly intense issues, and public passions ran high, in 1860s and 1870s California.

Also, in the 1860s and 1870s, railroads in the United States were amassing unbelievable amounts of wealth and influence. Henry George became a thorn in their side at the western terminus of their transcontinental network. By 1870, as the editor of a Sacramento newspaper *The Reporter*, George had become critical of the railroad monopolies. His anti-monopoly rants had also struck a nerve, both in the public, and among the railroad barons. Then, in the summer of 1870, a respectable gentleman came into the Sacramento newspaper office with a generous financial deal to buy the newspaper. Within days, the deal was consummated, and Henry George was promptly fired. Later, it was revealed that the apparent newspaper benefactor had actually been bankrolled by the Central Pacific Railroad.

The issue of monopolies, of income distribution, of progress, population growth, and of taxation had once again come into clear focus in Henry George's mind. At that time, the tenth governor of California, Henry Huntly Haight (May 20, 1825–September 2, 1878), a Democrat, occupied the governorship. Early in his term, which ran from

December 5, 1867 to December 8, 1871, Haight was a supporter of George's ideas, and quietly smoothed the way for George. When Haight lost the gubernatorial election of 1871, his successor, Newton Booth (December 30, 1825–July 14, 1892), a Republican, also ran on an anti-monopoly platform, much to Henry George's surprise. In fact, in 1871, Washington was also concerned about developments in this area, and attempted to force railroads to forfeit the overly generous grants given railroads to build out the Transcontinental.

Up until this time, the regulation of monopolies was still left to the individual states. The excesses and monopolization of Standard Oil, the railroads, and the steel industry would not garner the attention of Congress for another two decades. Meanwhile, pockets of activism, fueled by none more fervent and prominent than Henry George, were prompting state capitals for action.

With the loss of yet another job, but with some money in the bank as severance, Henry George had time to write. He created two documents in the next year, both of which would telegraph his major life work, *Progress and Poverty*, at the end of the decade.

The first pamphlet, *The Subsidy Question and the Democratic Party*, which was followed later in 1871 with *Our Land and Land Policy*, crystallized Henry George's thought on economic issues that were increasingly weighing into public discourse.

The first of these two pamphlets used free market arguments to challenge the subsidization of railroads and of big business, at the expense of labor and small business. The greater freedom of the long form afforded Henry George a luxury his columns could not afford. He included charts, graphs, and data that conferred upon his arguments a greater air of authority and scholarship. This uneducated journalist was transforming himself into an economic scholar.

Henry George's second thesis continued on his scholarly theme. In *Our Land and Land Policy*, he applied the notion of Thomas Malthus that population grows geometrically while our resources expand only arithmetically. Henry George argued that population, including immigration, was growing at a rate of 24% per decade, which would represent a doubling, a doubling again, and a doubling yet again – or an eightfold increase in population – in less than a century. Yet the availability surplus agricultural land was increasing at a much slower rate. Malthus's similar conclusion, which contrasted population growth and the food supply, prophesized periods of feast and famine and caused economics to be given the label *the dismal science* – something it has retained ever since. Henry George's conclusions were no less dire.

Yet George added a texture Malthus neglected. Malthus' clarion call was with regard to our ability to feed ourselves. George observed that increasingly dear land is nonetheless often not owned by those who farm it. Renters and tenant farmers of our nation pay the price of the Malthusian prophecy, while the owners reap the benefits of exponentially increasing land prices. While George teased from his exposition the notion that land ought to be granted only to those who work it, and that the land price pressure arising from immigration may need to be curtailed in order to arrest the concentration of wealth and depression of wages, even this broad treatise lacked the holistic connections his later work would establish.

For the next few years following the publication of his pamphlets, George, with a profound message in hand, sought a new opportunity to take his theories to new readers. With two other investors who shared his economic and journalistic philosophies, he found a silent and a managing partner to open a new California newspaper, the *San Francisco Daily Evening Post*, in late 1871. Their idea at first was to charge the lowest price in the market for reasonable content, and then subsequently raise their price, but always more than a proportional increase in content.

They recognized that they would need to cultivate a readership, and their politics at the same time. In doing so, they delved bravely into State politics itself. Indeed, there was nothing entirely provincial about George's theories. These were issues that had both national and global implications, being more like economic theory than local journalism. The professional and personal risks to Henry George and his family were large and acknowledged. However, George's theories would not be capable of being considered widely unless he took that risk. At least as a social commentator, entrepreneur, and owner, he was able to better control some of the variables that led to his remarkable pattern of job separations since his youth. Finally, his lifelong penchant to express his ideas could be realized without constantly jeopardizing his livelihood.

In the early days of the new venture, with his family once again united in San Francisco, and now enjoying a steady and comfortable income, George focused on thought leadership at the regional and national level. He used his new bully pulpit to rally against his twin nemeses, the *American Press Association* and *Western Union* and helped to break up their backroom deals that monopolized access to the news.

At the same time, he rallied against other monopolies, except one. He differentiated between the artificial monopolies of the railroads and the large landowners, monopolies preserved not because of some intrinsic

advantage, but rather because of an advantage cultivated by corruption and the destruction of all competition. These artificial monopolies were in stark contrast to the natural monopolies that occur from economies of scale in which a large investment can expand the production of a good or service at almost no additional cost. Economists label such additional costs for one additional unit of output as marginal costs. When marginal costs are negligible, so should be the price. But, obviously, no private concern would recoup its investment if it charged a price close to zero.

Henry George viewed the telegraph system as one such industry. Once the network is built, usage ought to be encouraged by charging a low price, rather than discouraged by charging the capricious price a monopolist may impose. While George was opposed to monopolies, and preferred the private sector over a burgeoning government, he saw a unique role for government in the provision of the infrastructure necessary to create a national telegraph system.

Indeed, England had established a public monopoly postal system in 1660, agreed to a uniform low cost of a penny for all mail in 1840, and expanded its reach by nationalizing the telegraph industry, effective February 4, 1870. As telecommunications innovated further, their Government Post Office began to absorb telephone networks in 1878, and completed the integration by 1912. From 1904 they also licensed radio, another similar public good.

George was no doubt aware of England's public sector innovations when he argued for the prevention of myriad competing wires stringing the nation by replacing such redundant capital with a single natural monopoly. He believed that only a government-run monopoly would avoid the corruption and favoritism he knew, from personal experience, could be fostered by private monopolists.

When well-heeled opposition mounted, Henry George reiterated his position:[5]

> The government should be restricted as nearly as possible to the preservation of order and the administration of justice, leaving everything else to private enterprise – in a word it should only do for the people what they cannot do for themselves . . . The progress of invention has created certain great and necessary businesses which are in their very nature monopolies, in which competition does not operate to secure good service at a fair price.

George was beginning to find his political-economic voice. By the middle of the 1870s, Henry George had produced three postulates that

have defined public finance and the provision of public goods ever since. He stated that the public sector should be confined to those areas for which our private enterprises cannot provide efficiently and without corruption. He also asserted that the economies which result from public investment and population growth and which flow inevitably to the value of land should be used to fund these innovations through a land tax that usurps these excess rents. These are sound concepts of positive economics today, based on the premise of economic efficiency enhancement. To these two premises, Henry George is willing to add a third in his commentaries that may be more normative than positive – an egalitarian premise that we all have an equal right to our share of these bounties. In making these statements, he, in essence, defined modern public finance, the public sector, and a distributive role for the tax system. The Great Mind, Richard Musgrave, was to return to these themes more than eighty years later.

By restating these various propositions in an almost unrelenting manner, Henry George fomented a national debate. At that time, the United States federal government and the State of California had to raise the revenue to fund government from myriad sources. Two of the most obvious sources are from expenditures in capital and in labor. Henry George recommended that neither of these sources should fund government. He rationalized that neither the investment in productive capacity, nor capital, nor the efforts of labor, should be discouraged, especially when there are sources of public finance that do not discourage production.

George used his forum to debate the inevitable rebuttals published by newspaper editors who represented opposing interests. When they complained that a land tax would hit farmers, George corrected them that the tax was on land alone, and not on the fruits or efforts of farmers. When capitalists complained about taxes on monopoly profits, George could retort that true investments in productive capacity should go unimpeded, even if the earnings on idle wealth deserves no such protection because a tax on their investment in land has no discouraging effect. Indeed, a tax on idle income may encourage the holders of wealth to direct their income to more productive capacities. In other words, improvements in our productive capacity should go unhindered, but the investments in public infrastructure should be funded by the rents it creates.

When competing journals would argue that George's policies would raise rents, he showed how the full cost of housing would decline under his proposal, while housing capital would improve. And when large farming concerns lobbied for import tariffs to protect their market,

George argued that free trade erodes monopolies, and hence improves the lot of workers and consumers alike.

By appealing to fact and well-rehearsed intuition, the *Post* grew to become the region's most popular newspaper. Farmers and workers alike subscribed to his newspaper and his ideas. But, as the circulation rose, so did his ambitions. In 1875, George expanded by producing another newspaper and, in the process, spread his corporate resources too thinly. When a financier was offered an interest to shore up their balance sheet, under the promise that he would never exercise editorial control, the corporate white knight soon violated his pledge. In turn, as he had done so often in the past, Henry George took a principled stand, and quit as managing editor of the region's most successful paper, of his own creation.

At this point, Henry George had a platform that would grow no higher should he simply look for another editorial position. He realized he had to translate the intellectual goodwill he had established in California and beyond into an expanded intellectual base. While he harbored some political ambitions, his true ambition was in the marketplace for ideas. Henry George embarked on a speaking tour.

Initially his speaking and consulting practice achieved some success. He had little doubt that he could stretch his savings and leverage speaking fees to support his family. It would also allow him to test his ideas on new and more academic audiences, and afford himself the time to assemble his ideas and write a major work.

His speaking tours from 1875 to 1879 were somewhat successful. A man without any formal academic training was presenting his intellectual capital to universities, political gatherings, and commissions. He was becoming known as an economist based solely on the strength of his arguments, rather than the length of his academic pedigree. His reputation was enhanced, and his ideas advanced.

Perhaps some hubris made a brief foray into California politics unavoidable, at least temporarily. Henry George took a very public stand against the means by which California would forge a constitution. He believed a constitutional convention would be co-opted by those with the greatest pecuniary interests. Soon he felt that he was a lone voice, and his concerns were going unheeded. With his political capital spent in a 'winner-take-all' effort, he took the advice of those concerned about his career, and left California for the East Coast, with *Progress and Poverty* ready to pave the next phase of his life.

7
The Theory of Progress and Poverty

By 1879, Henry George was ready to frame for a nation his condemnation of the effects of technological progress on land values and the distribution of income. His analysis begs its implication on the funding of government and the morality of unearned income:

> Take now . . . some hard-headed business man, who has no theories, but knows how to make money. Say to him: "Here is a little village; in ten years it will be a great city – in ten years the railroad will have taken the place of the stage coach, the electric light of the candle; it will abound with all the machinery and improvements that so enormously multiply the effective power of labor. Will in ten years, interest be any higher?" He will tell you, "No!" "Will the wages of the common labor be any higher . . . ?" He will tell you, "No the wages of common labor will not be any higher . . . " "What, then, will be higher?" "Rent, the value of land. Go, get yourself a piece of ground, and hold possession." And if, under such circumstances, you take his advice, you need do nothing more. You may sit down and smoke your pipe; you may lie around like the lazzaroni of Naples or the lepperos of Mexico; you may go up in a balloon or down a hole in the ground; and without doing one stroke of work, without adding one iota of wealth to the community, in ten years you will be rich! In the new city you may have a luxurious mansion, but among its public buildings will be an almshouse.

By the end of Henry George's most inspired decade, he was to be remembered not as a printer, journalist, or editor, but rather as a social commentator and economist.

At the time of Henry George's publication of *Progress and Poverty*, classical economics was experiencing an analytic revolution. These

theoretical contributions, in England and in Europe, would have been lost on Henry George because their pages would have appeared as physics more than the political economy of John Stuart Mill. The new breed of economics described the *marginal conditions* that govern the decisions of a rational agent. These new concepts were first developed in William Stanley Jevons' (September 1, 1835–August 13, 1882) *Theory of Political Economy*, published in 1871, Carl Menger's (February 23, 1840–February 26, 1921) *Principles of Economics* of the same year, and Léon Walras' (December 16, 1834–January 5, 1910) *Elements of Pure Economics* in 1874–7. Their collective contributions culminated first in *Mathematical Psychics* by Francis Ysidro Edgeworth (February 8, 1845–February 13, 1926) and were further united in the seminal textbook by Alfred Marshall, entitled *Principles of Economics* in 1890. The subtitle to Edgeworth's book is perhaps the most telling: *An Essay on the Application of Mathematics to the Moral Sciences*.

These major treatises make either no or only scant reference to the work of Henry George, nor he of their works. This is not at all surprising, but invalidates neither of these approaches to economic questions since. They address different facets of the same problem.

The issue is how factors are rewarded, a topic that David Ricardo had treated more than half a century earlier. The modern economists of Henry George's day correctly determined that, under competitive conditions, the wage paid similar laborers is equivalent to the price of the good produced times the *marginal* contribution of the last laborer, also known as the *marginal worker*. This condition gives us a familiar intuition. As the labor supply expands, wages will drop to induce producers to absorb more workers, even though the last worker's marginal contribution to output diminishes.

Notice the careful use of the term *marginal* in this equilibrium condition. It offers the intuition that the way in which labor, and other factors, are rewarded is based not on the contribution of the most productive, but rather on the contribution of the least. If one wage prevails for a class of workers, and no producer will pay any worker more than the value of the least productive worker's contribution, then producers extract a surplus from workers. If the market is competitive, these surpluses will be just enough to compensate producers for the various costs of fixed factors of production, most notably land.

There is no fundamental flaw in this marginalist approach. It still begs a question the marginalists avoid, though, which Henry George seized upon.

George observed what Ricardo had discovered seventy years earlier. In such a competitive solution, revenue exactly compensates

wage-earners, physical capital owners, and the surpluses, or rents, which accrue to the owners of the production process and fixed factors, like land, upon which revenue depends.

$$\text{Revenue} = \text{Costs} = \text{Wages} + \text{Interest} + \text{Rents}$$

Or:

$$\text{Revenue} - \text{Rents} = \text{Wages} + \text{Interest}$$

These aggregate rents tend to rise as the demand for land rises and the best land becomes increasingly dear. As more marginal land is used, output rises more slowly, but rents continue to rise. This leaves less available to pay the wages of laborers or the return for those who provide the machines.

At any moment, the first-order conditions of the marginalists were describing the static problem of a given equilibrium. But Henry George, by contrast, was treating a dynamic problem of shifting equilibria as the population expands. While George was lamenting the unfortunate distributional consequences of a competitive equilibrium over time, Marshall was exalting its efficiency properties.

There was little discussion between these two different characterizations of the economic solution. Henry George had likely not seen these marginalist treatments as his book came out in 1879, while Marshall's comments on George in 1890 represent one sentence in a footnote on page 760 of his text. There is no flaw in Henry George's intuition, however. If demand expands because of an increase in population, for instance, diminishing returns result in the employment of factors of production that are less productive, on average. Both the average and the marginal productivity of these factors then drop, as do their rewards in equilibrium. Meanwhile, the rents accruing to the most productive and best-situated fixed factors of production rises, and the owners of these factors command a larger share of the wealth created by production.

This intuition reinforced the observation George had made over his decades of social commentary. The rich owners of fixed factors of production, especially land, get richer, and the poor get poorer, at least in the absence of methods to redistribute wealth.

When Henry George began the process of seeking a publisher for his 512-page treatise, the publishers he approached were unwilling to risk attaching their name to such a strident and aggressive thesis. George sent his manuscript first to Appleton and Company in New York City, the publisher of Herbert Spencer's (April 27, 1820–December 8, 1903) radical but popular theory of social Darwinism. The publisher declined

George's manuscript. George then asked his brother Thomas to take the book to the New York publishing house of Harper's and Scribner's. They were also unwilling to publish the work, but offered the comment that the manuscript might be more favorably considered if Henry George provided the plates from which the book could be pressed.

Recall that Henry George began his career as a printer's apprentice – and a reasonably good one at that. His initial foray into his first few journalist jobs was based on his printing ability. He had earned his journeyman printer's privilege when he turned 21, and employed these skills many years later when he and some colleagues produced the typesetting and the plates for the book's first run of five hundred copies.

This trial run was not entirely unusual among great minds who produced ideas that went well beyond a tinkering around the edges of orthodoxy. For example, John Burr Williams (November 27, 1900–September 15, 1989) had to pay to have his ground-breaking 1938 book *The Theory of Investment Value* published, as had John von Neumann (December 28, 1903–February 8, 1957) and Oskar Morgenstern (January 24, 1902–July 26, 1977) for their 1944 book *Theory of Games and Economic Behavior*. These authors were willing to take risks that publishers would not. Henry George used the summer of 1879 to produce the printing plates and the first five hundred copies of his book – these were then distributed carefully to influential readers and reviewers. Finally, after additional intervention, William H. Appleton acquiesced, publishing *Progress and Poverty* in January of 1880.

By then, a number of commentators had already seen copies of the first five hundred prints Henry George had self-published. Learned comments were coming in, and these gave Appleton some encouragement that the book might prove successful. By early 1880, the five hundred Henry George printed and a thousand copies printed by Appleton and Company were exhausted and a second run was anticipated for March of 1880.

Versions of the book also made their way to Europe. C. Kegan Paul and Co. of London agreed to publish it within a year of its publication of a Henry George antithesis, Edgeworth's *Mathematical Psychics*. Within a few months of publication by Appleton and Co., a favorable review was offered by the *Economist*. During this time sales were accelerating and reviews were generally favorable. In one stroke the fortunes of Henry George had been transformed. He was increasingly viewed as both a serious economist – for his observations of the distribution of wealth when there exist scarce and fixed factors of production – and a political commentator – for his proposal that the rewards to the fixed factor of

land should be usurped through a 100% land tax, to be used to pay for the infrastructure that creates value to land's proximity.

George's policy prescriptions created a political quandary, however. Ever since David Ricardo, economists had argued that taxes ought to be non-distortionary, unless they are designed to discourage a certain activity. In other words, a tax should not affect the efficiency or decisions of producers or consumers. By imposing a tax on fixed factors of production, the important variable factors of capital and labor are undeterred.

However, to politicians, taxes should flow to those who are most able to bear them, or least able to avoid them. Henry George's policy proposal, to impose a 100% land tax, and hence usurp rents accruing to land, is a burden upon the nation's most powerful, and who likely own land in greater concentration. They were unlikely to accept his radical proposal, at least without a fight.

8
Legacy and Later Life

As stated above, with the publication of *Progress and Poverty*, Henry George's fortunes changed permanently. In the 1880s his book was second only to the Bible for the number of English-language copies sold. It was widely regarded as the most important economic work published in the latter half of the century, and the greatest economic treatise to come out of the United States to that date.

While most readers found George's observations profound and his prescriptions provocative, his analysis was not uncontroversial. Edgeworth was resolute in referring to him as Mr Henry George, in apparent recognition of his lack of academic rank. Others associated with George not because of his analysis but rather because of his prescription that would rid the landed class of a bulk of their property wealth, through his 100% land tax proposal. While there are a variety of ways in which this prescription could be implemented, his writing was embraced by a wide range of people, including: those who sympathized with the nationalization of land; those who wished to remove the influence of feudal lords; or those who preferred socialism to capitalism; and those who advocated for any sort of land reform, all embraced the writing of Henry George. Their warm reception was for this work, though, and at odds with their reaction to that for many of George's writings, as he was decidedly free-market oriented. He was more concerned about economic efficiency more than his distribution-oriented followers would have cared to acknowledge.

It is possible that his new-found and unfortunate friends may simply be following the axiom that the enemies of one's enemies are one's friends – a phenomenon that is quite common in intellectual debates. Charles Darwin's (February 12, 1809–April 19, 1882) 1859 book *On the Origin of Species* had spawned a social movement that drew analogies

to his explanation of evolution. Indeed, upon reading Charles Darwin's theory the economist Herbert Spencer had coined the term "survival of the fittest" and had spawned a populist movement that sanctioned ferocious capitalism just as America was entering into its Gilded Age. Later, Spencer's notion of survival of the fittest was embraced by supporters of the eugenics movement, ultra-laissez-faire economics, and racial prejudice that sought to promote the interests of the Caucasian race.

Subscribers to social Darwinism and the writings of Spencer had, likely without a careful reading of Henry George's works, concluded that his policy prescriptions promoted socialism. Spencer was himself perhaps George's fiercest critic. The two men had met briefly at a gathering in England in 1882. Until then, George had respected Spencer's work, and had believed him an ally because Spencer had written in his *Social Statics* that land should belong in the public trust. However, at that time George had also expressed some support for the militant Irish land reform movement,whereas Spencer strongly opposed the social protest of the Irish land reformists. The chance meeting between Spencer and George was uncomfortable, and set both authors up for a series of mutual retributions to follow. Later, George was to distance himself further from the youthful views of Herbert Spencer when he wrote:

> I am not even a land nationalizationist. . . . I have never advocated the taking of land by the state or the holding of land by the state, further than needed for public use; still less the working of land by the state. From my first word on the subject I have advocated what has come to be widely known as "the single tax;" i.e., the raising of public revenues by taxation on the value of land irrespective of the improvements on it – taxation which, as fast as possible and as far as practicable, should be made to absorb economic rent and take the place of all other taxes.

These differences would never be reconciled, and would paint both Herbert Spencer and Henry George into more extreme corners than perhaps either deserved. This rivalry could perhaps have been a friendship had circumstances been slightly different, and had they read each other's work more completely. They may have only differed in terms of the degree of their willingness to limit the scope of government. After all, George advocated for the public provision of certain natural monopolies.

There were other aspects of George's prescription that proved troubling to many. Should landlords have the value of their land usurped by

government, some concluded that rental rates should fall as the incentives to speculate would disappear. Yet landlords would still (presumably) be saddled with the existing debt, but would now find themselves with a reduced after-tax ability to pay the debt. Even many of George's supporters felt that to be unfair. And, if many read George as an advocate for those in poverty, it was not a narrowly held belief that some individuals bring poverty upon themselves. He had no compelling answers to all who would levy those concerns, and hence was, perhaps unfairly, cast more as a Marxian revolutionary than a social commentator.

Henry George's Achilles' heel was rooted in his journalistic background. The journalism as practiced in his era was polemical in nature. George took a cause and either amplified or marginalized it. Readers sought such strong stands from the editors they read. In the process, George sought a coalition of allies, rather than kindred spirits. Yet, while his allies often wanted the same result as he did, they typically sought the same ends, for very different reasons.

For instance, George found an ally in the labor movement. He agreed that labor would be more productive and more sustainable if it were afforded a greater share of the product. But his solution was a sustainable tax on land, rather than a union that could act as a countervailing influence to the power of management. And while he was gravely concerned about poverty, his solution was to limit immigration, rather than to empower immigrants. When George made forays into politics, each time it began with great fanfare and enthusiastic support from groups who liked his prescriptions. As the campaigns wore on, however, it became clear that the reasons for his beliefs differed from the motivations of his followers. Each time, he seemed to lose campaigns that were his to win, to his surprise. Meanwhile, his backers that became jaded by his campaign performance.

Had George explained his scholarly conclusions more fully, perhaps he would have been even more successful. But his conclusions were formed from experiences over a lifetime and deep thought into these conflicts and their causes and solutions. In the body politic, it is common for practitioners to seek simple solutions to complex problems. Certainly the problems Henry George contemplated were complex ones. From a political perspective, his solutions were never simple, nor easy to implement. Unfortunately, he lacked both the political skills and the temperament to put his policies into effect, and his allies lacked the sophistication and scholarship to understand the nuances necessary to accomplish them on his behalf.

9
John Bates Clark in Defense of the Status Quo

In the 1880s, no American political economist was more renowned than Henry George. A decade later, however, there was no American academic economist better known than John Bates Clark. Although they were different in many respects – the former was a journalist and self-taught economist, whereas his contemporary was steeped in academia and, ultimately, shouldered the responsibility of the maintenance of the status quo – they both came from similar devout Puritan beginnings.

The Clark family resided in the states of New England, fought on behalf of their new nation, and,in common with most good New Englanders in that era, were devoted to their Protestant faith.

John Bates Clark's father, John Hezekiah Clark, was born in Plymouth, Windsor County, Vermont on May 6, 1822. He grew up in a region known as Clark's Kingdom, not in the sense of royalty, but rather as a tribute to his grandfather, Deacon Daniel Clark, and the Congregationalist's devotion to the Kingdom of God. John Hezekiah Clark's middle name, a family name passed down through the generations, is the Hebrew term for "God is my strength."

The Clarks emerged from a long line of devout Christians that dated back to the formation of America's first colonies. Predecessors of the Clark family of Plymouth, Vermont had arrived as the first settlers of Middletown, Connecticut. The first Clarks came to a new colony in the first years of European immigration to the New World.

The patriarch of the Clark family in the New World was William Clark (February 6, 1611–July 22, 1681). He had travelled to the Connecticut Colonies in the 1630s and married Katherine Bunce (1610–August 3, 1683), who had arrived in the colonies from Kent, England with her parents.

The couple were devout Puritans and they created a long lineage of Congregationalists. Three generations of John Clarks followed, living

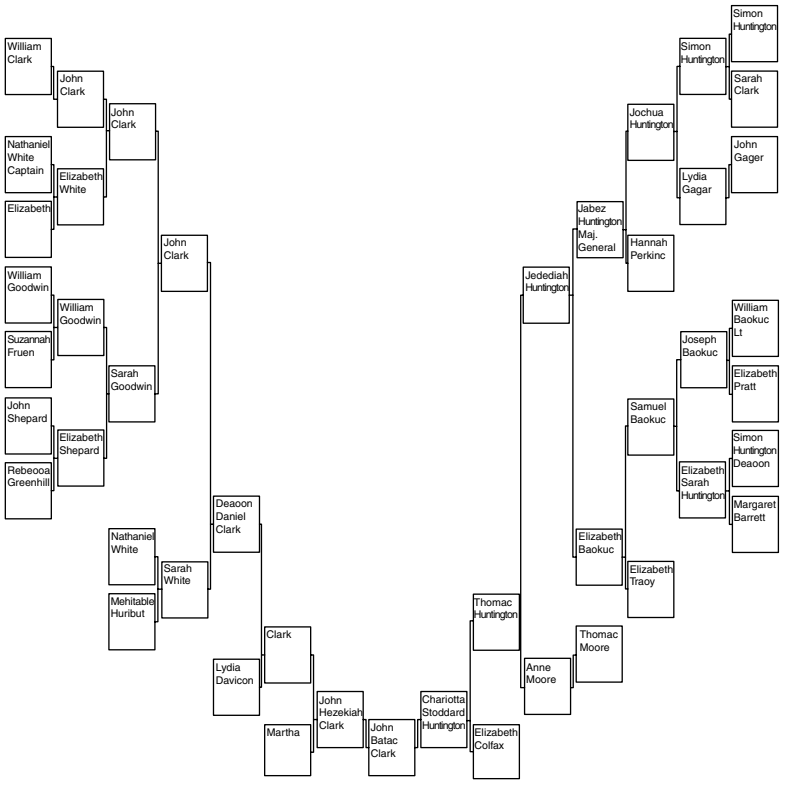

Figure 9.1 Ancestors of John Bates Clark

from 1651 to 1731, 1678 to 1771 and ending with Deacon John Clark (9 December 1715–8 August 1809). All had settled in the Middlesex County region of Eastern Connecticut.

Daniel Clark was the second son of Deacon John Clark and his wife, Sarah White (24 October 1724–26 June 1780). Born on October 13, 1752 in Middletown, Connecticut, as a young man Daniel Clark had enlisted as a private in the 2nd Company of Colonel Wyllys' Connecticut Regiment in 1775, and he later fought alongside Jedidiah Huntington at the Battle of Bunker Hill on June 17 of that year. In 1804, Daniel Clark came to Plymouth, Vermont where he established a sawmill and a gristmill and also founded a church, and became known in the town as Deacon Daniel Clark of the Congregationalist Church. He died in Plymouth on April 14, 1854, at the age of 101 years.

Daniel Clark, and his wife, Lydia Davison, had eight children, with most being born in Plymouth, Vermont following the family's move there after the ending of the Revolutionary War. The first child of Deacon Clark was Lydia Clark (1781–1838), who had married James Garvin in April of 1806. Together, they raised six children, including James Garvin Jr. (February 10, 1809–June 29, 1846), who would go on to become a professor at East Tennessee University.

James Jr. and his wife, Sarah Ann Gunn (August 26, 1812–June 27, 1890) had a son, Lucius Fayette Clark. A great grandson of Deacon Daniel Clark, and a second cousin to John Bates Clark, Lucius had attended Amherst, and graduated in 1862, just seven years before John Bates Clark began his studies there. Lucius went on to graduate with an MD from Harvard Medical School. Later in his life he was to serve as Rhode Island's 48th governor, from 1903 to 1905. He had entered politics first as a moderator of town meetings for Cumberland, Rhode Island in 1881. In his gubernatorial campaign at the height of the Georgist movement, Lucius Garvin developed a progressive political platform which championed George's "Single Tax", advocated for better working conditions and worked to create a shorter workday.

John Hezekiah Clark, born on May 6, 1822, and named for his paternal great grandfather and an uncle, was a grandson of Deacon Daniel Clark. On April 16, 1846, John Hezekiah married Charlotte Stoddard Huntington (May 19, 1825–November 22, 1905). They began to raise a family in Providence, Rhode Island.

Charlotte Stoddard Huntington was from a family which had equally deep New England roots. Simon Huntington (July 6, 1629–June 28, 1706) had left England with his father Simon and his mother Margaret Baret on the ship *Elizabeth Bonaventure*. The ship arrived in Boston on June 15, 1633, but without the father since Simon Huntington Sr had died of small pox en route and he was buried as sea.

The younger Simon Huntington went on to found Norwich, Connecticut and he established a family who were to become shippers, fight as patriots in the Revolutionary War, and some of whom were founders of the State of Connecticut. As can be seen from this brief background, the union of John Hezekiah Clark and Charlotte Stoddard Huntington was steeped in tradition.

John Hezekiah Clark began his working life as a dry goods merchant in Providence, Rhode Island, but his poor health forced him to abandon the long hours of this trade for work as a draftsman and salesman for an industry-leading manufacturer, the Corliss Steam Engine Company. The engines manufactured by the company were in demand all over

the developed world. John Clark became a trusted advisor to George Henry Corliss (June 2, 1817–February 21, 1888) at the engine works. Corliss was a remarkable mechanical engineer and the inventor of one of the world's most advanced and efficient steam engines. He was also a Congregationalist in Providence, and knew John Clark from the latter's devotion to the Church and also his family's centuries-long devotion to the movement.

Congregationalism had played a central role in the Clark family for generations. The origins of these Congregationalist churches had initially been their exception to the centralization of power of religion under King Henry VIII in 16th-century England when the King formed a Church of England in opposition to the power of the Catholic Church. Decades later, many independently-minded people of faith left the ensuing oppression by sailing to the Massachusetts Bay in the 1600s. New England assumed the responsibility to uphold the role of an independent church in civic life for the first couple of centuries of a new America.

Like many Protestant churches, the Congregationalist churches were led locally through the efforts of laypeople rather than a separate clergy. This close connection between faith and local control created a much more engaged parish and it was a religious philosophy to which the Clark family subscribed enthusiastically.

A Clark upbringing was a strict and pious one, but in these respects it was a common feature shared by many New England families of the era. They observed rather rigid Congregationalist traditions. The family within which John Bates Clark was raised practiced daily prayer and observed the Sabbath. They also embraced New England industriousness and prized intellectual growth.[1]

John Bates Clark was born to John and Elizabeth in Providence, Rhode Island, on January 26, 1847. Six years later, a sister, Elizabeth Huntington Clark, was born, on July 4, 1853, and she was followed, three years later, by a brother, Frederick Arthur Clark, on February 22, 1856.

His struggle with tuberculosis forced John Sr. to move his family to the fresher and cooler air of Minnesota, where he established a plow manufacturing company to support his family. Young John Bates dutifully supported the family and his father in the family business. When he attained college age, John Bates returned to New England, first to Providence's Brown University, but soon thereafter to the Congregationalist-founded Amherst College in western Massachusetts, where he enrolled in 1869. Clark was forced to interrupt his education for extended periods, however, in order to help his father run the family

business in Minnesota as tuberculosis took its toll and his father's health deteriorated.

John Hezekiah Clark died just after John Bates Clark's 25th birthday. In that year, the family disposed of their business, and John Bates Clark was finally able to return to Amherst to finish his schooling. By then, however, the graduate had accumulated a great deal more life experience and business experience than his peers. He was also accustomed to hardship, and he had little reason to return home to Minnesota, at least until he could pursue his education still further.

Clark was determined to study religion, and attend the prestigious Yale Divinity School upon his graduation, but his taking of an optional course offered by Professor Julius Hawley Seelye convinced him to switch his studies to economics. Seelye was Professor of Mental and Moral Philosophy until 1890, having earned a Doctorate of Divinity from Union College. Later, Seelye would go on to become the President of Amherst College, while his brother took on the Presidency of nearby Smith College.

Before the neoclassical school of economics took hold later in the 19th century, economics was taught in the vein of political economy, with the goal of improving the human condition. In fact, Seelye had been appointed to the Massachusetts Commission on Taxation from 1874 to 1875 because of his moral perspective on taxes. Seelye next served as a member of Congress for one term.

While present-day economics practices the ruthless pursuit of efficiency, issues of equity and justice were frequent topics of economic discussion when Clark was learning the subject. In the 19th century, it was not a long reach for those interested in improving the human condition to studyeconomics. Clark became hooked.

Economics as we know it had not become an established discipline in the United States when Clark embarked on further study in 1872. However, the discipline was already developing quickly in England, and in Germany it was an increasingly well-established discipline, where it was usually taught within the law faculties. Following his graduation from Amherst Clark decided to study in Heidelberg, Germany, and Zurich, Austria for three years. While there, he came under the influence of the German Historical School, which was at the time developing a narrative on marginalism and the significance of capital. Yet the approach it adopted was also a humanist perspective, and this provided John Bates Clark with the then-emerging socialist perspective.

John Bates Clark returned briefly to Minnesota in 1875, and soon after he married Almira (Myra) P. Smith (1853–1930), whose family had also transplanted from New England to Minnesota, on September 28 of the

year he returned. Myra also had Puritan roots and upbringing, and she had been educated at Vassar College. Together, they shared a humanist perspective and both were to remain members of the Congregationalist Church for the rest of their lives.

While Clark had returned to the United States without a doctorate degree, his experience gained while being abroad ensured he was very well qualified to teach courses in economics. He was promptly hired by Congregationalist-founded Carleton College in Northfield, Minnesota. While he was anxious to embark on his new job, however, a debilitating illness that was to last for two years prevented him from giving lectures. Instead, he convalesced at home and prepared essays for publication, in the *New Englander Magazine*, and in preparation for his first book, *The Philosophy of Wealth*, which he published in 1886, some six years after George published his *Progress and Poverty*. When he was able to lecture, he inspired Thorstein (born Torsten) Bunde Veblen (July 30, 1857–August 3, 1929), perhaps the nation's most well-known socio-economist, author of *The Theory of the Leisure Class*,[2] and coiner of many new terms, including *conspicuous consumption*. Veblen and Clark shared an acute critical sense of the failings of the prevailing economics at the time, but did not practice the same conscientious search for neoclassical solutions that became Clark's hallmark during this period of his life.

In 1881, Clark was attracted to Smith College in Western Massachusetts at the behest of his mentor's brother, Laurenus Clark Seelye (1837–1924), who served as the college's first president (from 1873 to 1910). Clark joined Smith College in its eighth year, and he remained there for around a dozen years. It was at this time that Clark published his 1886 work *The Philosophy of Wealth: Economic Principles Newly Formulated,* followed a year later with "Christianity and Modern Economics" in *The New Englander*, Vol. XLVII, No. 1, p. 56.[3]

During this period Clark was formulating his theory of marginal utility, which he labeled *social effectiveness theory* in his *Philosophy of Wealth*. Like George's work at that time, he had hoped his work would strike a populist tone. He collaborated with Franklin Henry Giddings, who was at that time publishing the *Springfield Republican* and the *Springfield Daily Union* in nearby Springfield, Massachusetts. Giddings was also interested in the human condition, but from a more sociological and political perspective. In that era, John Bates Clark went on to help inaugurate the American Economic Association (AEA), while Giddings became the vice-president of the American Academy of Political and Social Science. These two worked together to instil in their respective disciplines a sense of humanism and the advantages of cooperation and consciousness.

Clark also honed his new – and unique – concept of marginal productivity theory, and presented it in 1889 to the newly formed AEA. Three years later, in 1892, Giddings, took up a professorship at Columbia University in New York City. By then, Clark had moved from Smith back to his alma mater, Amherst, for a couple of years (1893–95), where he taught a number of students who would later go on to fame and fortune, including John "Calvin" Coolidge, Jr. (July 4, 1872–January 5, 1933), who served as the nation's 30th president, from 1923 to 1929. In 1895, John Bates Clark joined Giddings at Columbia, where he taught in the newly formed Faculty of Political Science. Three years after he joined Columbia, Clark spent a visiting year at Yale University where he stood in for the Great Mind Irving Fisher (February 27, 1867–April 29, 1947), who was convalescing from tuberculosis for three years in Saranac Lake, New York, at the Trudeau Sanitarium.

When Clark joined Columbia in 1895, the university's president was Seth Low, who had been Mayor of Brooklyn from 1881 to 1885 before assuming the presidency in 1890. Low's vision was to make Columbia part of the civic fabric of the city. This combination of engagement and intellectualism appealed to and inspired both Clark and Giddings. Low was also involved in the growing peace movement, and was named as one of the American delegates to the first International Peace Conference at the Hague in 1899. His philosophy on peace also appealed to Clark's sensibilities.

Once he had joined Columbia, Clark was also drawn into the emerging peace movement with his friend and colleague, Franklin Giddings. Clark shared with Giddings a great concern over the terrible tax war imposes on the pursuit of the improvement of the human condition. Later, in 1911, Clark was appointed to head the economics and history division of the recently established Carnegie Endowment for International Peace. Clark went on to advocate for the League of Nations, and the League to Enforce Peace, and taught part time at Columbia, until his retirement in 1923.

Soon after Clark arrived at Columbia, college President Low (January 18, 1850–September 17, 1916) decided to run for the post of mayor of a newly combined City of New York, in opposition to the corrupt Tammany Hall political machine. One of his opponents in a crowded 1895 race was Henry George.

Henry George ran for Mayor of Greater New York for many of the same reasons as Low. It was widely understood by this time that Tammany Hall's corruption was detrimental to public welfare. But while Low ran on a broad platform on behalf of the Greater City of New York, George

was invariably regarded as a social reformer in the light of his most famous publication, *Progress and Poverty*. He had learned gradually that politics is the art of building support and coalitions so that one has an opportunity to put policies into effect. Yet, as a former journalist, his campaigning style was combative in nature. In any gathering, he could always find some representative of the idle owners of property – and this would lead, almost inevitably, to public quarrels.

While George was motivated by his policy, and his speeches degenerated to his prescriptions, his followers were often motivated by a vague sense that, were George elected, his first act would be to repeal the policies that held back the working class. George was regarded as a revolutionary, while Low was seen as evolutionary.

Perhaps more than elsewhere, success in New York City the assembly of a successful coalition drawn from a myriad of diverse interests. George realized that much of the coalition-building could be done if he could signal to an existing coalition that he was one of them. For this purpose George chose the Grover Cleveland Democrats. In fact, George held more faith in the free market than he would willingly admit to, and certainly more than the various unions that had also assembled as Cleveland Democrats. Unfortunately, Low also subscribed to the Cleveland platforms.

The crowded field meant that there was a splitting of the vote – and that, therefore, neither Low nor George won the election. The Low camp, Clark included, blamed George, and his ill-conceived candidacy, for their loss. Low and George were both to run again, four years later. This time, however, Low succeeded, drawing on the support of both the Citizens' Union and the Republican parties.

In the first campaign, Clark threw his support behind his boss, Seth Low. While their kindred interests may have been an obvious motivation, Clark enjoyed one other aspect. George, a self-trained economist with no formal education after the age of 15, and with western and southern rural loyalties, had become regarded as the most renowned American economist of his time. He was invited to speak on his theory around the country and in Europe, and he had spawned his own movement. Meanwhile, Clark had developed a uniquely American theory of the distribution of wealth that seemed diametrically opposed to the views of George. And Clark had established the American Economic Association, and was its president. Many professional economists viewed Clark as the nation's most eminent economist, while the population viewed George as such. Each viewed the other as a challenger who had not paid the dues to their respective and non-intersecting sets of

supporters. And while George was often painted as one who would tear down the American institutions that concentrated wealth among the capitalists, Clark was the representative of the establishment. The former wrote a book *Progress and Poverty*, while the latter wrote *The Distribution of Wealth*. There could be no more clear indication of two more diverse views and temperaments, even if both of them held a surprisingly consistent and mutual faith in competitive markets. And, there had been no greater distinctively American intellectual debate over economic issues since Clark and George took each other on.

By the time that this great public debate reached its climax, Clark had already begun to articulate the theories for which he is most remembered today. In particular, he published his *The Distribution of Wealth: A Theory of Wages, Interest and Profits* in 1899. Most scholars differentiate between his former book on the philosophy of wealth and his later work on the distribution of wealth. Others prefer to describe the two works as simply two sides of the same coin. It is clear, however, that Clark's tone in his advocacy had changed by this time.

10
John Bates Clark and His Times

To understand the debate between Henry George and John Bates Clark, one must appreciate the times within which each of them lived.

While Henry George was brought up within a religious family in Philadelphia, he left his family for adventure and fortune before his 16th birthday. His formative years were first among sailors, miners, and schemers from around the world, and, then in his early adult years in San Francisco, with all these varied elements located in one place. Even today, the western states prize entrepreneurship and independence of spirit and thought. Government was not oppressively large because the population was not concentrated enough to induce the complications of urban life. Government, however, needed to set boundaries around human interactions so that these free spirits could devote their energies to new production rather than to the protection of what others before them have left to them. There was no status quo, yet. Nor was there much of an expectation that some entity was going to protect you should you falter. George prized free markets, when they work well, and felt government could best be employed to fix free markets, when they don't.

John Bates Clark, on the other hand, was raised within the Congregationalist Church in the land of American puritanism. The Puritans left England because the Catholic Church Henry VIII had disbanded was replaced by a Church of England that still retained its Episcopalian approach – a religious hierarchy administered regionally by bishops and locally by ministers assigned by the Church. The Protestant revolution at the time questioned the Church's monopoly on faith, and the artificial construction of a Holy Trinity, which related The Father, The Son, and the Holy Ghost, and claims Jesus is the son of God and embodies God. Such organized religion in the 17th century had the local minister act as the translator between the Holy Trinity and the church's flock.

The Protestant nonconformist movement rejected what they saw as artificial divisions and hierarchies. Instead, they asserted that a person of faith can have a direct relationship with God. Such Puritans in England at the time rejected attempts by organized religion to dictate to the faithful. These Puritans were increasingly persecuted in England, and sought out new land in America where they could practice their relationship with God more directly and freely. They formed colonies, created metaphorical islands of religious freedom, such as Rhode Island, and new kingdoms of God, such as the Plymouth Kingdom (of God) in Vermont, founded by John Bates Clark's great grandfather, Deacon Daniel Clark.

The Congregationalists were united not under a church hierarchy, but rather in a belief that local churches ought to be led by laypeople. Parishioners had a much greater responsibility to their local church than attendance on the Sabbath Day. They were required to run their church, set the moral tone for their church, and, in turn, set an example for the entire community. In these communities, the church acted as its local government in many ways.

John Bates Clark was born two centuries after the settlement of his Puritan Congregationalist ancestors, who lived first in Middletown and Haddam, Connecticut, and then in Vermont and Rhode Island. From William Clark's arrival from England in the 1630s, one can trace a constant chain of Congregational Deacon Clarks in every generation. These Congregationalists lived a pious and relatively modest existence, but not one that was uncomfortable. They believed in the local control of human and economic affairs, but not without a strong social conscience. And, they had a strong faith and conviction in what was right, and the need to preserve it.

A casual observer may discern little difference between the rigidity of a more hierarchical religion and that of such strongly established local churches. However, these local churches were able to adopt much more principled stands, against slavery, in favor of a woman's right to vote, and also other important issues of the day, than was possible for the Catholic Church, the Church of England, or the Episcopalian Church in the United States.

The liberal positions of the Congregationalists, combined with the perceived need to maintain a firm foundation and status quo, informed John Bates Clark's personal and economic philosophy. When Clark was just ten years old, Herbert Spencer published a book called *Progress: Its Law and Cause*.[1] Three years before the publication of Charles Darwin's magnum opus,[2] Spencer argued that societies evolved in an organic

sense, analogous to living organisms. In doing so, Spencer, an avowed agnostic, suggested there was some sort of natural order to the evolution of society, based on a stylized version of the *survival of the fittest*. Congregationalists, too, found reassuring the existence of a natural order of things, especially in light of such a state of flux within which America was thrust in the throes of the Gilded Age.

Notice the similarity of the titles published by some of the leading thinkers at the time: Spencer wrote of *Progress: Its Law and Cause*; George wrote of *Progress and Poverty*; and Clark first wrote *The Philosophy of Wealth* in 1886, followed by *The Distribution of Wealth* in 1899. Progress in the period following the American Civil War was creating such seemingly unbounded wealth that the status quo was threatened, and our understanding of the implication of progress was challenged.

In *The Philosophy of Wealth*, Clark agreed that wealth followed innovation, invention, and progress, but also that the distribution of wealth must serve a public function. He had stated that:

> (S)ystems of economic science must submit to be judged, not merely by their correctness or incorrectness, but by their seeming tendency to strengthen or weaken the social fabric . . . Original production and valid transfer afford the only sound basis of tenure of any form of wealth.[3]

Clark was at once creating both a philosophical and a moral basis for the just rewards to those who toil to produce. Note how he ended his declaration. He also preserved the right to own a title to property. In essence, he was arguing that there is a morality to receiving one's just reward, but also in keeping it, selling it, and preserving its right to ownership to any subsequent owner or heir. In essence, he was declaring the morality of the free market system, which Clark viewed as a divine prerogative. Economics could be used as a system that creates a moral principle for laborers to earn their contribution to production, and owners of wealth to preserve their wealth, but also argues for a moral obligation for the economic system to reinforce the moral fiber. He asserted:

> The system of individualistic competition was a tolerated and regulated reign of force; solidarity, even in its present crude state, represents the beginnings of a reign of law.[4]

Clark was arguing that the providers of labor and capital alike are united in their right to equitable compensation for their efforts, as a

natural law that has maintained stability in the economic system since civilization began. Should this solidarity deteriorate, disputes among the owners of factors of production can erode the socio-economic fabric. In essence, just reward is a natural principle that promotes efficiency, but also creates a responsibility to maintain equity. A responsible business would not struggle to lower wages or produce an inferior product, but would encourage competition to instead allow commerce to pursue broader good works and maintain Christian ethics.

Clark was actually responding to the same sort of emerging economic forces that troubled George. He saw monopolies and wealthy industrialists attempt to increase the price and reduce the quality of the goods they produce, in an attempt to enhance profits, while simultaneously attempting to reduce wages.

In response, the Knights of Labor, a predecessor to the American union movement, fought to monopolize labor so that they might raise wages, the 'price' of labor. Clark saw any effort at monopolization as unenlightened and in violation of the moral obligation of the free market economy. In one statement of a natural law of the economy along religious lines, he was at once siding with Karl Marx (May 5, 1818–March 14, 1883), the defender of labor at the time, and Henry George, the critic of monopolies and excessive profits. He was also taking them on, however, for their prescriptions of redistribution of wealth. Instead, Clark argued that the free market system need only be repaired to the natural order that had functioned well since the formation of the first market. Clark believed that the distribution of wealth would take care of itself.

While Marx argued that religion was the 'opiate of the masses', the devout Congregationalist Clark was arguing that the lack of Christian values was the cause of socio-economic inequities. In doing so, Clark created both a role for the Church to steer workers away from the radical labor movement, just as he argued that the Church could enlighten the propertied class that was typically associated with and protected by the Protestant Church.

Clark found himself wedged between the Communist movement and organized religion, and he set out to widen the gap in the middle of these two monoliths. He was not alone, however. Others, from John Stuart Mill onward, were also arguing for an improvement of the lot of the middle class who participate and benefit from the free market system, not only as a means to enhance economic efficiency and equity, but also as a way to avoid destabilizing social revolution. While Marx, the nascent labor movement, and perhaps even Henry George, were all arguing for wholesale changes in politics, in workers' rights, or in the

profits flowing to the owners of resources, Clark was arguing that the status quo works well and that is is consistent with the natural order of things. It required only greater enlightenment, rather than wholesale revolution.

Clark may have maintained this preservation of the market system based on moral enlightenment within his personal philosophy. Professionally, though, he found himself increasingly defending the enemies at the gate of the free market system. His argument for enlightened capitalism was not sufficiently philosophically compelling to rule the day.

Instead of defending his concept of enlightened self-interest, he went on the offensive. He developed his marginal theory of productivity. In doing so, he made a lasting contribution to the neoclassical economic model, but his defense of the free market determination of wages put his squarely in the sights of unions, of proponents of a minimum wage, and of much of the progressive movement at that time.

Clark's most remembered foray into the defense of the determination of wages and factor rewards in competitive models was described in his second major work, *The Distribution of Wealth*. There, he begins with the preamble:

> It is the purpose of this work to show that the distribution of the income of society is controlled by a natural law, and that this law, if it worked without friction, would give to every agent of production the amount of wealth which that agent creates. However wages may be adjusted by bargains freely made between individual men, the rates of pay that result from such transactions tend, it is here claimed, to equal that part of the product of industry which is traceable to the labor itself; and however interest may be adjusted by similarly free bargaining, it naturally tends to equal the fractional product that is separately traceable to capital. At the point in the economic system where titles to property originate, – where labor and capital come into possession of the amounts that the state afterwards treats as their own, – the social procedure is true to the principle on which the right of property rests. So far as it is not obstructed, it assigns to every one what he has specifically produced.[5]

In this opening volley, Clark embraced the notion of a frictionless free market as a natural law, stated that any wealth duly earned was well-deserved and should be protected, and argued that *all* factors of production deserve their just reward. The final detail is to work out the meaning of the product the factor produces and its just reward.

We begin with the fruits of the laborer, but the treatment will be easily modified the owners of each factor. The intuition is simple enough. The benefits accruing to those who employ additional labor L occur in two ways. First, they earn an increment to production, defined by the increase in output Q earned by an increase in labor. Let us define this increase as the marginal product of labor, or MPL. Second, they enhance their total revenue TR by an amount defined as the firm's their marginal revenue, or MR, arising from their ability to sell the increase in output the additional labor provides.

$$MR = \frac{\partial TR}{\partial Q}$$

$$MPL = \frac{\partial Q}{\partial L}$$

Thus, their net increase in revenue arising from the increase in labor, the Marginal Revenue Product of Labor MRPL, is the product of these two factors:

$$MRPL = \frac{\partial TR}{\partial L} = \frac{\partial TR}{\partial Q} * \frac{\partial Q}{\partial L}$$

Prudent employers would expand their use of labor, and employ increasingly unproductive labor as they experience diminishing returns to labor, until the amount by which revenue is enhanced, on the margin, is equal to the competitive free market wage w of additional labor, on the margin:

$$MRPL = w$$

If the employer is operating competitively, in the sense that it has no power to affect prices or wages, then the increase in revenue they receive for the additional output is equal to the market price:

$$P * MPL = w$$

From this relationship, Clark concluded that all workers would receive the contribution of the marginal worker to the market.

In each of these relationships, we can replace the amount of labor with the amount of additional capital K, in the form of additional machinery and other productivity-enhancing improvements, to show that the owners of physical capital are also compensated by their contribution to an employer's revenue. According to this definition, all variable factors of production receive their just reward.

Buried in the mathematics is one subtle, but important assumption, however. It is the marginal laborer, the last individual hired at the going wage w, who precisely earns that worker's contribution to labor. If all workers earn the same wage, they are all compensated by the same contribution, not by what they provided, but by what the last worker provided. Presumably, employers hire the most productive workers first. Yet these workers are compensated by the lowest increment to revenue, rather than by their actual contribution to revenue. If the supply of labor expands, and the prevailing wage is pushed down, employers hire more workers, and all wages decline, perhaps over time, even if the contribution of the most productive workers does not.

Certainly, an employer does not retain any worker that does not create value for the employer which is at least equal to the wage paid. But, in effect, the employer treats all labor identically by assuming that labor is all identical, or homogeneous. The employer compensates all workers as if they are the lowest-productivity worker, in a given job classification, and pockets the surpluses from the more productive worker in this "race to the bottom," just as Ricardo surmised three generations earlier.

These surpluses earned from each worker, or each unit of physical capital, up to the last worker, is a profit that goes to the enterprise. If the market is perfectly competitive, these profits above the non-variable, or fixed, costs of production are eroded away through the entry of competing firms and the reduction in the price the firm can charge for their production, until no profits remain.

However, monopolies that do not face such competition can artificially support a higher price and hence earn a positive profit which it can retain. And any fixed and necessary factor of production, like the land the enterprise employs, can also extract some of these profits.

Clark understood the ramifications of his theorem, but bolstered his argument, in opposition to the intuition of David Ricardo and Henry George, when he noted:

> . . . the modern struggle for existence means the survival of the fittest type of industrial establishment . . . (in which) pure profit is a vanishing sum, . . . competed away in the long run by the workings of the market (entry and exit) and arising only as a result of a "disturbing influence" identified as a new technology, etc.[6]

There remains, however, one loose end in Clark's analysis. He argued that pure profits are dissipated by competition, except in the short periods that are induced by some sort of disruption. Owners of capital only

earn their just reward, equivalent to the cost of renting the capital they own, and any management skill for which they deserve to be compensated. Workers receive their just compensation. But the owners of fixed factors of production, the aspect *land* most commonly described at that time, still earn a surplus that capitalized all the other surpluses which cannot be generated without employing such fixed factors. To justify his social and economic equilibrium, Clark would have to provide a moral defense of the ownership of property, the scarce and fixed factor that was the target of George's theoretical attacks, and the attacks by a growing populist movement since the publication of George's *Progress and Poverty* in 1879.

In 1890, Clark initiated his defense. He began on a conciliatory note:

> Of the wealth that resides in land the State is certainly the creator and the original lawful owner. As a sovereign it has a certain ultimate ownership of all property.[7]

But he then qualifies his generosity by stating:

> Modern legislators, judges and police officers do their work chiefly in order that claims to material wealth may be traced to their refinements and enforced . . . The mechanism of the modern state has been largely evolved in and through the operation of defining and enforcing the rights of property.[8]

Political philosophers from as far back as Adam Smith and beyond had articulated a concern that the concentration of wealth in land created wealth for a few but poverty for many. Smith had written in 1776 that:

> Wherever there is great property, there is great inequality. For one very rich man, there must be five hundred poor, and the influence of the few supposes the indigence of the many. The affluence of the rich excites the indignation of the poor, who are often driven by want, and prompted by envy, to invade his possessions. It is only under the shelter of the civil magistrate that the owner of valuable property, which is acquired by the labour of many years, or perhaps of many generations, can sleep a single night in security. He is all the time surrounded by unknown enemies, whom, though he never provoked, he can never appease, and from the whose injustice he can be protected only by the powerful arm of the civil magistrate continually held up to chastise it. The acquisition of valuable and

> extensive property, therefore, necessarily requires the establishment of civil government.[9]

Clark democratizes landownership, though, when he retorts:

> With his own land under his feet and his own roof over his head, the worker develops an energy and frugality not otherwise to be hoped for, in earning and saving the promised payments. It is this that has filled most of our cities with a population having a vital interest in the preserving of civil order and of economic activity and progress.[10]

Clark argued that the working class has as much to gain through the ownership of real property as the landed gentry. He also asserted that the institution of ownership of land is so ingrained in the free market system, for the rich, for the middle class, and for the poor that aspire to someday join either of those classes, that to redefine the right to ownership of land or resources would simply destabilize the entire economic system.

Clark, in essence, asserted a form of economic creationism. He did not accept the premise that factor prices were equated to the value of marginal productivity as a theory. Rather, he believed it was an almost divinely created natural law. He wrote:

> It is the purpose of this work to show that the distribution of the income of society is controlled by a natural law, and that this law, if it worked without friction, would give to every agent of production the amount of wealth which that agent creates . . . In particular, it is necessary to know that the primitive law which puts a man fact to face with nature and makes him dependent on what he personally can make her yield to him, (is) in essence, the law of the most complex economy.[11]

Clark's example does not prove his thesis, however. He argues that the store of value in one's home unleashes a wave of productive energy, in the improvement and maintenance of one's own land, presumably to enhance its value and our savings. Yet George had pointed out that there is nothing one can do to enhance the value of land. Rather, one's efforts enhance the value of the physical capital placed on the land. Indeed, under the most common form of urban taxes, the property tax is levied both on the land and on the physical capital placed upon it. Such a tax on the physical capital portion of the value of land acts

to discourage improvements, just as a tax on labor discourages work. An efficient tax would impose no such distortions that reduce production. George's single tax on land has this quality as it does nothing to discourage production.

Clark did not address George's policy prescription directly, however. George observed that a 100% tax on the surpluses that accrue to land and resources would change nothing but the distribution of wealth. The worker who prizes and invests in his home will still do so, as the farmers would continue to sow and harvest the fields. George pointed out that the farmers would be rewarded the same for their efforts, regardless of who owns the land. And those who extract resources from the land would still be compensated for their efforts. Land would remain "owned" by the private sector, even if it is taxed fully for its surpluses.

George was, basically, presenting Clark's marginal productivity of labor theory by noting farmers earn their marginal reward for their contribution. In contrast, Clark separated the activity of farmers into two separate aspects. One is the farmer/harvester, who is rewarded based on the marginal productivity theory he pioneered. The other is the farmer/land speculator. Clark argued that some of the settlers who were induced to leave their jobs in the East and venture to homesteads in the West were attracted only by the opportunity to become land speculators. The reward for their actual labor should be equated in either setting, at least in the long run.

This is the crux of the difference in their theories. Clark maintained that humans strive for the unique opportunity to own land, which, by its very nature, is differentiated from every other piece of land. Georgists thought that these differential values of land are not created by anything the landowner does. Land values arise either by the providence of nature itself, or by the investment of society and the economy as a whole. Yet humans clamor to own this heterogeneous factor of production, and capture its unique rents that arise from its heterogeneity.

Clark's entire thesis within his theory of the distribution of wealth is that the prevailing wage recognizes and rewards not one's unique contribution to production, but rather the contribution to production of the last person hired. All the surpluses up to that point accrue to the scarce factors of production, the heterogeneous land, for which Clark argues workers and capitalists alike vie.

Of course, if land were collectively owned and the surpluses of land were evenly distributed, these surpluses would be evenly enjoyed by the same workers for whom Clark argued that the democratization of land ownership enables. Yet such a solution returns us to the same conclusion

stated by George. A 100% land tax, collected by the state, and either distributed to all citizens, or used to purchase the public goods all citizens value, has precisely this effect, but without the destabilizing and risky consequences when those who benefit do so by the luck of the draw. George's solution of a 100% land tax then preserves Clark's concern about the maintenance of private property and his even more grave concern about the socialization of resources.

11
Later Life and Legacy of Henry George

There are few that enjoyed a life so colorful, at times controversial, and with so many professional transitions as Henry George. George's later life, following years of campaigning his idea of the single tax around the country and the world, were no less tranquil.

By 1890, George's level of activity had declined only marginally. He suffered a stroke that year following a globetrotting speaking tour, touting his ideas of the relationship between poverty and property. He began to spend more time at home in New York City, but his interest in politics never waned.

George's final campaign, for the mayorship of New York City in 1897, pitted him against Columbia President Seth Low, a wealthy heir to a family shipping fortune, in the Democratic primary. George ran a spirited campaign, but not with an outcome different from past forays into politics. In New York City, politics tends to be a full contact sport, and George took his hits as various groups tried to pull his positions in their direction, only to be disappointed when George's intellectual honesty prevented their unqualified support.

The strains of this campaign caused George to suffer from a second stroke. Henry George died on October 29, 1897. A day later, the Reverend Lyman Abbott, a well-known Congregationalist and son of the historian Jacob Abbot, delivered an address to an estimated 100,000 mourners who crowded Grand Central Palace, while many more lined the streets outside. Some commentators believe this was the largest funeral to be held in New York City to that date.

Memorial services were held in cities across the country. For instance, on December 5, 1897, the Single Tax club of Chicago held a service

in Chicago that included a Chopin organ recital, addresses by noted politicians and scholars, hymns, and a funeral march.

George was buried at beneath a large memorial at Green-Wood Cemetery in Brooklyn, New York. He left behind a national movement that rang loudly in its day and still reverberates today.

12
Later Life and Legacy of John Bates Clark

John Bates Clark is remembered as the premier American economist of the latter half of the 19th century and the turn of the 20th century. While his status was eclipsed by Irving Fisher once Clark's academic production declined in the 1910s, he is credited with bringing the rigors of the emerging European neoclassical school from Britain and Germany to the United States. In doing so, he more completely fleshed out the production side of the neoclassical equation and was instrumental in creating the foundations for what we now know as *the theory of the firm*.

Clark, and his wife, Mary, also left another legacy. Their youngest son John "Maurice" Clark (November 30, 1884–June 27, 1963) followed in his father's footsteps, graduated as an economist from Amherst College, and worked with John Bates Clark in improving his legacy and papers in his father's later years. The younger Clark also wrote an interpretation of his father's work.

Maurice Clark shared with his father the same pursuit of economic discussion and intellectualism during a most progressive period in American economic thought. He went on to an illustrious career of his own. Today, we give credit to the formulation and popularization of the *Keynesian multiplier* to Maurice Clark. Like his father, Maurice also presided over the activities of the American Economic Association.

Today John Bates Clark is permanently remembered through the premier award to a young American economist, awarded annually in his name. The John Bates Clark Medal has been awarded to many Great Minds, including its first recipient, Paul Samuelson, and others such as Milton Friedman, Kenneth Arrow, and Joseph Stiglitz. Almost half of the recipients also go on to receive the Nobel Prize.

John Bates Clark died at the age of 91on March 21, 1938 at his home in New York City.

His contemporary James T. Shotwell remembered:

> An outstanding figure in the history of American thought, Professor Clark guided the development and enriched the context of economic theory as few had done to his day. Throughout a whole generation his thinking dominated in this field of American academic life, and largely affected that of Europe. It is hardly too much to say that during this period and essential test of capacity in economics was the understanding of that subtly conceived hypothesis from which Professor Clark proceeded to formulate the fundamental laws of his science. For those who learned to appreciate this exploit in philosophy, Professor Clark's place among the great thinkers of our time has remained, and will undoubtedly always remain, unshaken.[1]

Section 2

From Burden of Taxation to Optimal Taxation

Ricardo and George both argued that taxation to fund the necessary provision of public goods ought to rest primarily on the owners of land and resources. However, for millennia it has been the resources of land that have concentrated wealth. John Bates Clark did his best to refute the notion that such a concentration of wealth is a threat to the social order. However, while he perfected the neoclassical model of the firm so that he could employ it to refute the claims of Ricardo and George before him, he may have only succeeded in opening up a broader discussion. A series of public financiers took up the challenge to characterize the optimal form of taxation that would not cause ripples of distortions that might otherwise permeate the free market economy.

13
The Early Years of Frank Plumpton Ramsey

Some Great Minds earn their distinction for just a couple of brilliant ideas over an entire year. The best create many brilliant ideas over an illustrious career. Only a couple produce an abundance of brilliance in the shortest of time, and then pass like a shooting star. Frank Plumpton Ramsey falls into this third category. He waxed philosophical in an era that redefined philosophy. Despite his chosen vocation, he came from a much more doctrinaire family.

Both of Frank Ramsey's grandfathers were church ministers. His middle name, Plumpton, was passed down from the de Plompton family, knights who dated back to the the time of the Norman Conquest of England in the 11th century. The clan held land in an area now called Plompton, in North Yorkshire, England. By 1168, Nigel de Plumpton owned land there, and his successors remained in the area into the 18th century.

By the 19th century, the ancestor Reverend Plumpton Wilson was the Rector of Mowsley in Leicester, a hundred miles to the south of his family's heritage.

Reverend Wilson's eldest of 14 children was Plumpton Stravinson Wilson, a smart and athletic lad who went on to study at Exeter College, Oxford. He followed in his father's footsteps and found his way to the clergy. However, he may have had a revolutionary streak. He jumped from position to position, and hence from town to town, often quarreling with his colleagues in the rectory, until he finally settled down in a small village named Horbling, in Lincolnshire, England. There, he served as vicar to the town and raised a family of his own.

Plumpton Wilson's modest income as a vicar was insufficient to support the demands of a large family. He was forced to supplement his income by keeping a cow and by offering teaching to some of

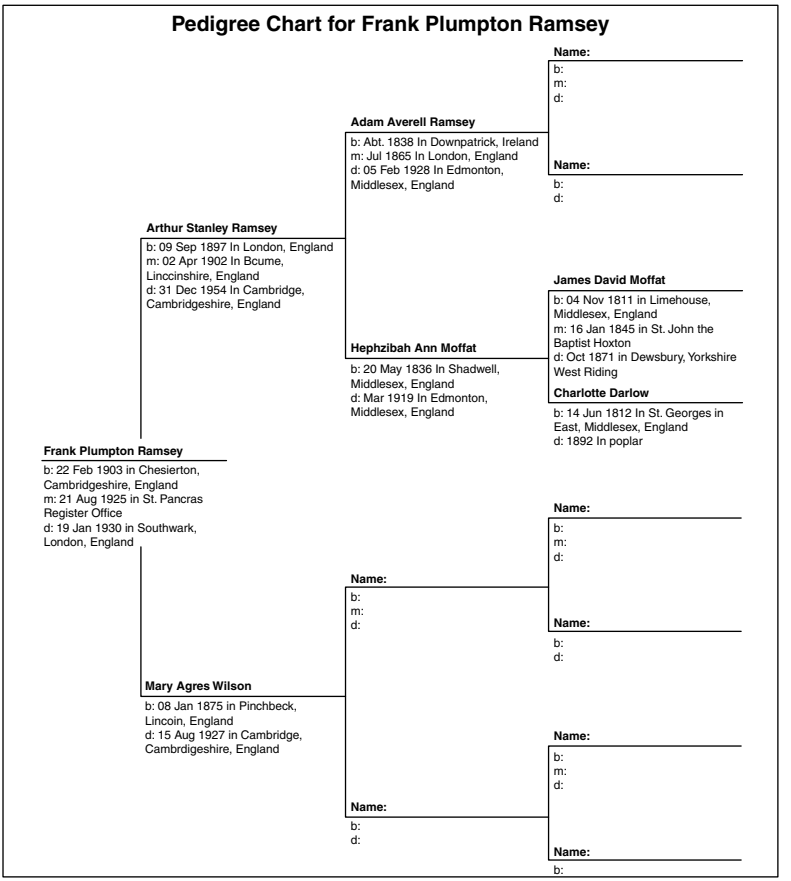

Figure 13.1 Ancestors of Frank Plumpton Ramsey

the children in the village whose parents could afford to pay. He also supplemented his own children's education with tutoring in the vicarage.

Plumpton's wife, Elizabeth Walker, was remembered as a gentle and kind soul, a natural teacher and nurturer, and the daughter of a successful merchant, Giles Walker, of North Lynn. Their extended family – of nine children – were bright and athletic. Two of her brothers became international soccer players and one played cricket internationally. One of the daughters, Agnes, played field hockey to a high level, and was noted at Oxford University for her athleticism. They were a particularly charismatic family.

Elizabeth's oldest brother, like many of her siblings, went into education as a vocation. He became the headmaster at Sandroyd Preparatory School, where he impressed upon his students the necessity to develop both the mind and the body. For bright children of less than extraordinary means, athleticism provided an opportunity to enter better colleges.

The Wilsons were boisterous, confident, and expressive, in addition to their athleticism and education. They were also a close extended family who would regularly spend part of the summer together at the seashore, where they camped in a school that they had rented out while it was standing vacant for the summer.

When Mary Agnes Wilson met and married Arthur Stanley Ramsey, the newcomer to the family was thrown straight into this maelstrom of boisterous Wilson family members. The family arguments would often erupt into shouting, especially as those who had espoused liberal views in their youth became more conservative with age, and as fissures emerged in their political leanings.

Arthur Stanley Ramsey (September 9, 1867–April 2, 1902) was not totally unfamiliar with loud oratory, however. He, too, was the son of a minister, and sat through his share of oratory from the pulpit. His father, Adam Averall Ramsey (1838–February 6, 1928), was named for a well-known Wesleyan preacher. He, too, had moved his family frequently, as his father and his mother, Hephzibah Ann Moffat, the daughter of a prosperous coal merchant and deacon, moved from parish to parish in Ireland. Adam Ramsey and his two brothers all joined the Irish Missionary Society, and they went on to become energetic evangelistic preachers at an early age. Indeed, some of their evangelic episodes could last through the night and into the next day.

When Adam and Hephzibah first met, Adam Averall Ramsey was a pastor at the Adelphi Congregational Church in Hackney, England. In 1867, they had a son together, Arthur Stanley Ramsey.

Five years later, Adam was invited to become the minister at Trinity Congregational Church in Dewsbury, Yorkshire. Arthur spent his childhood there, until his father was invited to start a new Congregational Church in Dulwich, near London.

The family was not wealthy, but they placed great store in education. Young Arthur was schooled, but he often had to struggle. He had won some prize money that he used to purchase five mathematics books so that he could teach himself sufficient mathematics at Batley Grammar School to pass the Sixth Form exams that would permit him to attend university. His resilience paid off and he secured a competitive scholarship to attend Magdalene College at Cambridge.

Arthur arrived at Magdalene in the Fall of 1887, just before his 20th birthday. He thrived in the college with his strong work ethic, his athletic skills, and his thirst for knowledge which allowed him to eventually graduate near the top of his class in mathematics. Yet his upbringing seemed to make him unsuitable for the few jobs available at Cambridge upon his graduation. Instead, he found work at Fettes College near Edinburgh, Scotland.

After six years of teaching in Scotland, and at the age of 30, Arthur's alma mater invited him to travel back to Cambridge to cast a vote to deny to female students who had successfully passed their final exams the right to attach Bachelor of Arts to their name. The vote passed, and Cambridge women were barred from using their academic title for another half-century. While back at his college, however, Arthur inquired about any available jobs. Fortunately, one was about to become vacant, and they offered the position to him. At the age of 30, Arthur had found the vocation he would hold for another 58 years, until his death at the age of 88, on the last day of the year, in 1954.

While at Magdalene College at Cambridge, Arthur Ramsey finally had the resources and the latitude to transform his fate. He revived the quality of the mathematics program there, and wrote a number of textbooks that were to remain in print for many years.

Within five years of his arrival there, Arthur had married Mary Agnes Wilson (January 8, 1875–August 18, 1927). She was a bright, kind, and well-educated child who was afforded the opportunity to attend Redland High School for Girls in Bristol. There, she came under the influence of her sister Ethel's husband, Arthur Rashleigh, a fiery socialist, and a teacher named Katharine Conway, who, despite the protestations of Cambridge, insisted upon attaching to her name the title Bachelor of Arts. Katharine was also married to a socialist, Bruce Glasier, and they were both to become heavily involved in the socialist movement for the rest of their lives. Mary Agnes was swept up in the movement.

Mary Agnes followed the girl's preparatory school with an opportunity to study at Oxford, which she went up to at the age of 18. Three years later, she graduated with a second-class degree in History from St Hugh's Hall. With a first-rate education in history in hand, Mary Agnes became a high school teacher. While at East Dudley High School, a position which she held for only a couple of years, she quickly garnered a reputation for an almost stereotypical academic shabbiness. This lack of attention to grooming was only one of the endearing qualities she would pass on to her son Frank.

It did not take long for Mary Agnes to realize she was ill-suited to the restrictions of education. She abandoned classroom teaching and moved

to join her brother at Fettes College in Edinburgh. There, Kenneth was a housemaster, and Mary Agnes became the housekeeper. She had to endure a vocation she did not enjoy and suffer the Tory conservative leanings of her brother. She occupied her spare time by editing scholarly works, meaning that she did not waste her time with the endless political arguments at which her family had become quite adept.

After a couple of years there, Arthur Ramsey returned to visit Kenneth in Fettes. While there, he fell in love at first sight with Mary Agnes. He extended his visit from a few days to a week, and proposed to her before he left. She told him to return in a few months when her family were coming up to visit. He did, was not dissuaded by her rowdy and opinionated family, and they announced their engagement. They married on April 2, 1902 in Bourne, Lincolnshire.

Arthur and Mary Agnes Ramsey, the parents of Frank Plumpton Ramsey, shared a strong sense of and background in religious faith, and a refined sense of both aesthetics and the arts. While their family's evangelic and Anglican backgrounds were quite different, they were united in agreement to attend Arthur's denomination. The family attended Emmanuel Congregational Church together until Mary Agnes died in 1927.

During the 1910s, Mary Agnes became more engaged in the emerging Labour movement, while he strived to train Congregational ministers as the governor of Cheshunt College. But, by 1920, Arthur converted to Anglicanism, at the behest of his eldest son, Michael, who was destined to become the Archbishop of Canterbury, the highest-ranking cleric in the Church of England.

With religion filling the family, one would assume that the other three children of Arthur and Mary Agnes – Frank and his two sisters – would have all been equally committed to God in their adult years as had their father and their brother Michael. However, religion ended at this point. Frank Plumpton Ramsey and his sisters all became determined atheists.

The marriage of Arthur and Mary Agnes paired two rather eccentric individuals. Their life together was at times loud and passionate. Both harbored deeply-held beliefs, as would their children. Frank Plumpton Ramsey was born a little more than ten months after his parents wed, and was followed in successive years by two further boys, Michael and Arthur. Frank Plumpton Ramsey was born early on the afternoon of Sunday, February 22, 1903, following two days of labor. Although he was a small baby, their doctors feared he would arrive handicapped after such a troubling labor. He was born jaundiced, and suffered from digestion problems for years. Yet he was a cute child. Christened over the Easter

holiday, he took the name of a brother of Arthur who had died in 1894, and Plumpton from his maternal grandfather's illustrious clan.

The Ramsey house was frequented by young men who were studying at the college. The family had servants, however, so Mary Agnes was able to devote herself to her progressive interests. She was a member of the Suffragists that had sought the women's right to vote through peaceful means, as opposed to Suffragettes who used violent means to draw attention to the same cause.

The Great War, which broke out in 1914, when Frank was 11 years old, caused Mary Agnes to curtail her advocacy on behalf of women's voting and devote her considerable energies to the war effort. When the war ended four years later, she then switched her time to the plight of the unemployed. While America remembers the Great Depression as beginning in 1931, Britain was plunged into a terrible depression not long after the end of World War I.

The Ramsey family had to scrimp and save during the Great War as their compensation was related to the number of students attracted by their College, and young men went to fight the war. But, with the end of the war and the beginning of the Depression, hardship remained for the Ramseys and for the country.

While Arthur did share his wife's liberal tendencies, he could not afford to give his time freely to others. Needless to say, Mary Agnes was universally loved both within and beyond her family. But while some of his brothers and sisters complained that their mother seemed to leave little time for them, Frank always adored his mother, and received more than his share of her attention.

Frank was a precocious child who learned to read not long after he learned to talk. At the age of five, he was sent each day to be taught by a woman in the neighborhood, Miss Cross; a little more than a year later, he was taken under the wing of a young teacher named Miss Sharpley. By the time he began school, he could already read well, and he progressed quickly in mathematics. When he was eight years old, he began to attend King's College Choir School, where he stayed for two years. He thrived in his studies, and in his sports, despite his clumsiness. There, he began his studies in trigonometry and mastered the quadratic equation. Soon, he was top in his class in both mathematics and classics, even though many boys were well older than he was. His family decided to send him to college preparatory school, at the age of ten.

Sandroyd was a boarding prep school that was being run at the time by Mary Agnes' brother, Charles Wilson. It was an outstanding facility, with an indoor pool and the amenities that well-heeled parents expected

for their children. Frank thrived in his environment, where he enjoyed his studies, athletics, and the opportunity to join the fledging Scouting movement.

Frank was at the top of his class at Sandroyd. After only two years, his family decided to send him to Winchester College. He sat the scholarship exam, achieving the highest score, and, at the age of 12, began as the top scholar and the youngest boy of his class at one of the top schools in the country. While he did not enjoy the bullying inflicted upon a young skinny student at Winchester, he nonetheless thrived in his studies.

At the age of 15, Frank took the college entrance exams, just to see how well he would do. He received the highest score in mathematics, and was offered a scholarship to Trinity College at Cambridge, the top college in the nation, and one of the best in the world, at the age of 16. His experience at Winchester was not always pleasant, but he left with a great ability in mathematics and a strong interest both in philosophy and economics from John Stuart Mill's *Principles of Political Economy*.

Freed of the bullying and accepted for his aloofness by equally aloof and the most elite of elite young men in the country, Frank Ramsey found Trinity College a stimulating environment. He immersed himself in mathematics and harbored a fascination with philosophy. While he did not study economics formally, he was only one of two students invited to join John Maynard Keynes' Political Economy Club.

Twenty years Frank's senior, John Maynard Keynes (June 5, 1883–April 21, 1946) was a towering figure at Trinity, both physically and literally. Like Ramsey two decades later, Keynes had also entered Trinity as a student precocious in mathematics and philosophy. While Ramsey's father lectured in mathematics at Magdalene, Keynes' father, John Neville Keynes (August 31, 1852–November 15, 1949), lectured in moral science and philosophy at Cambridge until he became the University Provost, a position he held until his retirement. The younger Ramsey and Keynes were both philosophers and mathematicians at heart, as were their fathers, but both shared with Keynes' father a fascination with the rapidly maturing field of economics. At this time, in the early 1920s, perhaps neither of them would have defined themselves as economists. And both would be remembered for their profound contributions to philosophy. But, both are especially remembered for their contributions to economics, over a career that ended somewhat prematurely for John Maynard Keynes, and alltoosoon for Frank Plumpton Ramsey.

Ramsey's first substantive and extended conversation with John Maynard Keynes occurred in 1920, when Ramsey was just 17 years old.

By this time Keynes had already written his *Treatise in Probability*, which proposed a formal and logical approach to probability and revolutionized thought around the meaning of uncertainty. Their discussion was intended to be a brief introduction, but it lasted for four hours, first over lunch, then through a walk in the gardens. Keynes left impressed and Ramsey was almost mesmerized. A year later, after Ramsey scored spectacularly on exams necessary to allow him to continue his studies, Keynes had nominated him to be a fellow at King's College, an honor few receive, and none at the age of just 18.

Keynes also nominated Ramsey to 'The Apostles', a secret and exclusive club that admitted only the most profound thinkers from a campus littered with profound minds. Ramsey attended every meeting. Keynes attended many, as did such luminaries as E. M. Forster. In Ramsey's second year at Trinity, he presented to the Apostles his translation into English of Ludwig Josef Johann Wittgenstein's (April 26, 1889–April 29, 1951) renowned treatise in mathematics and philosophy, *Tractatus Logico-Philosophicus,* and he also wrote a critical review of Keynes' ground-breaking work in the logic of probability, something that lesser scholars may have resented, but which Keynes embraced as ground-breaking and influential. He also presented to the group some of his own nascent theories.

But, in contrast to the relative calm of his second year at Trinity, his third and final year of undergraduate study found him increasingly preoccupied. Still only 19 years old, he fell in love with a married woman, Margaret Pyke. Her family was fond of Frank, and they had befriended him. They even named him godfather to their child. But, Mrs. Pyke filled Frank's heart and mind. He once asked her if she would sleep with him, but she responded that it would be in pity rather than love, and Frank deserved more. Following his graduation, Frank tormented himself with his love for her that he seemed unable to make the best of the opportunities Keynes was creating for him at Cambridge. His mentor became increasingly frustrated with Ramsey's lack of intellectual focus, especially after he had arranged for him to receive a fellowship. Keynes beseeched Ramsey to teach and study with a passion rather than seeing it as a necessary condition to avoid starvation.

His lovelorn torment over the next year forced Ramsey to travel to Vienna to seek psychoanalysis from a number of contemporaries of Sigmund Freud. He received a most generous scholarship from Cambridge and argued successfully that he be permitted to fulfill it while he sought psychoanalysis in Vienna. He rationalized that "It seems to me perfectly proper to spend a scholarship being analyzed, as it is likely

to make me cleverer in the future, and discoveries of importance are made by remarkable people, not by remarkable diligence".[1]

The combination of life in Vienna and a course of psychoanalysis was not inexpensive. His scholarship nearly exhausted, Ramsey won a second larger award from Cambridge. In October of 1924, at the age of 21, he returned to Kings College at Cambridge to undertake his prestigious fellowship. The fellowship was a once-in-a-lifetime opportunity, and Ramsey was granted it in one of the intellectual capitals of the world at that period in 1924–5. Only about two Apostles are elected each year, and the majority of them resided at King's College. There, at peace at last in mind and spirit, he discussed his intellectual ideas, taught mathematics and philosophy, and began to publish his most serious scholarship.

Like his mother before him, Frank was overwhelmed by blackboard chalk. It was attracted to him like a magnet, and reinforced his reputation as an eccentric professor concerned more about ideas than about his personal appearance. His students found him friendly, but also so bright that he could not appreciate what they did not understand. With his mother close at hand, however, he began to find that he was using his affection for her as a substitute for his unrequited love for Mrs Pyke. He was familiar with Freud's concept of the Oedipus Complex, and hoped he could meet a woman who was available to return his love.

Upon his return to Cambridge, he found that emotional reciprocity when he met Lettice Cautley Baker. They met in October of 1924, almost immediately upon his return, and quickly became lovers.

Their relationship required some finessing, for both Frank and his mother. Her religious convictions were strong, and Frank's dependence upon her was reciprocal. But Lettice was a wise young woman, and she carefully soothed the trepidations of both Frank and his mother. While Frank immersed himself in his duties, and Lettice remained bored by her mundane job, she was astute enough to create exclusive time for them to be together on occasion. Then, when Frank was away from her, he missed those moments. He proposed marriage to her, by letter, and subsequently retracted his proposal at least once. But, they eventually came to an agreement for marriage, for Friday, August 21, 1925. Frank was 23 years old, and Lettice 27.

That year was a both a comfortable and an unsettling one for Ramsey. He taught for 16 hours a week, and also spent additional time with students. He published mathematical papers that flowed from this thesis. He and Lettice enjoyed a pleasant life in their Cambridge apartment. And a daughter, Jane, was born on October 12, 1926. In that academic

year, he wrote his important work, *Truth and Probability* and also his *A Contribution to the Theory of Taxation*. But during the period he also fell in love with another woman, Elizabeth Denby, whom he had met just days before he married Lettice. In that fateful year, too, his beloved mother died in an automobile accident on 15 August 1927.

Ramsey had lost a profound maternal influence in his life. He had always longed for feminine affection and, after the loss of his mother, he sought out affection even more. Frank appreciated his wife's willingness to permit him to pursue an open marriage. In fact, he described in letters to her in some detail his encounters and trips with Elizabeth – at least until his wife shared with him an encounter of her own. To her surprise, he reacted furiously and felt emotionally violated. She complained "I do think you rather a pot to be calling me a black kettle."[2]

14
The Paper That Spawned the Study of Optimal Taxation

While Frank Ramsey was often riddled with emotional torment, his intellectual pursuits, especially over such a brief period of productivity, are almost unparalleled. His efforts in the areas of mathematics and logic were both defining and ground-breaking. His four papers in economics, published over the course of only a year or so, were so varied and substantial that they could only be compared as the economics equivalent to the four varied papers by Albert Einstein in 1905, Einstein's miracle year.

Other books in this series of Great Minds have described his contributions to the theory of savings in equilibrium in economics, the significance of subjective probability, and a theory of growth. Each was substantial.

Most relevant to public finance is a paper on optimal taxation that spawned a literature in the 1970s, which remains topical to this day. Ramsey's 1927 paper, "A Contribution to the Theory of Taxation,"[1] also helped to establish a literature on monopoly pricing. A survey of Ramsey's titles in economics suggests less that he was trying to advance the discipline, than that he was trying to advance humanity. He took on not the esoteric problems of some, but the big problems of the day – optimal savings, optimal growth, the incorporation of uncertainty into economics and finance, and optimal taxation. These papers are united in their attempt to tease out public policy solutions to real-world problems that can somehow advance the human condition through economics and mathematics. In this respect, perhaps his 1927 article on optimal taxation is the most successful of all.

By the time he wrote this work there was a great deal of interest in taxation. Henry George and John Bates Clark had conducted a great quarrel on whether to tax land, capital, or labor. Helpfully, Ramsey sought a tax that would reduce total economic welfare the least. His attention was drawn to carefully tailored taxes on the goods and services we consume.

Frank Ramsey was probably not fully immersed in the volumes written on optimal taxation that had been published before him. He relied, therefore, on others, most notably his Cambridge colleagues John Maynard Keynes and Arthur Cecil Pigou (November 18, 1877–March 7, 1959), for their intuition and perspective. Pigou had contributed the theory of externalities to the finance and economics literature. In such a case when the production or consumption of one good by one agent enhances the production or consumption of another in ways that are not embraced by the price system, the true value of the good is distorted. When such an *externality* exists, prices must be adjusted to *internalize the externality*. For instance, if the production of a good produces pollution that reduces the enjoyment of others, the production ought to be taxed to incorporate the unpriced costs to others. We call such a tax a *Pigouvian tax*. But, in cases where externalities do not exist, and where no agent exerts significant market power, it was asserted at that time that the competitive model optimizes economic welfare. This general result was proven by Great Minds Kenneth Joseph Arrow (born August 23, 1921) and Gérard Debreu (July 4, 1921–December 31, 2004), who jointly received the Nobel Memorial Prize in Economics in 1983 for their proof.

By 1927, the economics literature was beginning to grapple with the distinction between equity and efficiency. While an economy without externalities and with no agents that exhibit significant market power, and where there exist no *non-convexities* in production and consumption is efficient, it may not be very equitable.

Ramsey considered an economy for which externalities had been corrected through appropriate *Pigovian taxes or subsidies*. Such taxes, named for Frank Plumpton Ramsey's contemporary, Pigou are formulated to properly discourage the negative externalities, or harms, that an agent's decision may impose on others. Ramsey turned his attention to the proper design of other taxes that could correct economic distortions that arise from firms who have disproportionate market power.

Ramsey left for political philosophers the determination of economic equity. In other words, he did not take into account that we all differ in the enjoyment we may derive from an increment to our income, which economists label as our differing *marginal utility of income*.

It is this notion of differing marginal utilities that later economists were to tackle more fully. If person A has a lower marginal utility of income than person B, then economic welfare would be enhanced by redistributing some income from person A to person B. Such *lump-sum* transfers can enhance overall utility, or *social welfare*, without damaging economic efficiency. This notion is also the argument for a progressive

income tax because, as income rises, our enjoyment derived from an increment to income should fall, as a corollary to the notion of *diminishing marginal returns*. We shall return to this notion, raised by Henry George and others, later in this volume.

For the purposes of his paper, Ramsey assumed externalities had been remedied and a primary goal of the tax system is to maximize overall welfare. He recognized that there may remain non-convexities in production, though, which occur when a producer consistently realizes increasing returns to scale. Such is the case for a natural monopoly characterized by large fixed costs and low or declining variable costs. In such instances, the cost of providing one more unit of the good (the producer's *marginal cost*) remains less than the average cost of producing the good, once various fixed costs are included. If consumers value the good at a price greater than the firm's marginal cost, a producer ought to increase production to enhance overall welfare. The producer does so to realize *increasing returns to scale*. However, in practice, such a firm would prefer to reduce output and raise prices, knowing that increasing returns to scale makes competition difficult.

Such a *natural monopoly* is not uncommon. Indeed, they are precisely the monopolies that so concerned Henry George. Railroads and telegraphs are often offered a monopoly franchise, as are our suppliers of electricity, natural gas, or an array of public infrastructures, from road and bridges, to reservoirs and sewers. Each of these industries exhibits the non-convexities that negate the positive prescriptions of the competitive model. George had argued that such monopolies in private hands create inefficiencies that beg for nationalization of their industries.

Like George, Ramsey believed that the market fails to properly price goods in the presence of significant monopolies. Rather than nationalization, Ramsey argued that the goods from such producers could be taxed in a way that could enhance overall economic welfare and reduce the distortions that indiscriminate commodity taxes may not.

Ramsey began by setting up the problem as one which has the goal of maximizing social welfare, subject to the constraint that the monopolist is offered a predetermined – and perhaps zero – profit for its provision. He avoids the issue of differential marginal utility of income by defining total social welfare as the area underneath demand for all monopolists' products, less the cost of producing them.

The model

Let there be a multi-product monopolist who produces an array of n goods, each with demand quantities $(x_1, x_2, \ldots x_n)$ as a function of their

market prices ($p_1, p_2, \ldots p_n$) and subject to costs $C(x) = C(x_1, x_2, \ldots x_n)$. Let us assume that demand for each good x_i is independent of the demand for other goods. Then the demand for each good, as a function of its price, multiplied by its price, can be summed to create the total revenue for the producer:

$$R(\bar{p}, \bar{x}) = \Sigma_1^n p_i x_i(p_i),$$

where $x_i(p_i)$ is the inverse demand function. Profits are then given by:

$$\prod = R(\bar{p}, \bar{x}) - C(\bar{x}) = \sum_1^n p_i x_i(p_i) - C(\bar{x})$$

The sum of social welfare is the total area under the demand curves, less costs, for each good n:

$$W(\bar{p}, \bar{x}) = \sum_1^n \int_0^{x(p_i)} p_i(x_i) dx_i - C(\bar{x}).$$

Optimal prices would then maximize social welfare W subject to the imposed constraint that profits are given by some predetermined level π^*. This level of profit could be held to zero if the monopoly is considered to be included in the public trust.

Ramsey used the Lagrange's Method to solve for optimal prices. He set up the following problem:

$$\max_{\bar{x}} \sum_1^n p_i x_i(p_i) - C(\bar{x}) + \lambda \left(\left(R(\bar{p}, \bar{x}) - C(\bar{x}) \right) - \pi^* \right).$$

The Lagrangian problem yields the following first-order condition for each of n goods:

$$\begin{aligned} p_i - C_i(\bar{x}) &= -\lambda \left(\frac{\partial R}{\partial x_i} - C_i(\bar{x}) \right) \\ &= -\lambda (p_i (1 + \frac{x_i}{p_i} \frac{\partial p_i}{\partial x_i}) - C_i(\bar{x})) \\ &= -\lambda (p_i (1 - \epsilon_i) - C_i(\bar{x})) \end{aligned}$$

where λ is the Lagrange multiplier, $C_i(\bar{x})$ is the marginal cost of producing the good x_i, evaluated at equilibrium, and ϵ_i is the elasticity of

demand for the good as a function of its price, i.e., $-\frac{x_i}{p_i}\frac{\partial p_i}{\partial x_i}$. If we divide both sides of the first-order condition by individual prices p_i, we get:

$$\frac{p_i - C_i(\bar{x})}{p_i} = \frac{(\frac{\lambda}{1+\lambda})}{\epsilon_i}$$

Notice that the numerator on the right-hand side of the equation is less than one, i.e., $0 < \frac{\lambda}{1+\lambda} < 1$. This equilibrium shows that the proportional markup of prices over marginal costs on the left-hand side is less than what would occur if the monopolist could price freely. In such a case, the monopolist would set prices such that:

$$\frac{p_i - C_i(\bar{x})}{p_i} = \frac{1}{\epsilon_i}$$

To see that prices are reduced under Ramsey's solution, consider the unconstrained monopolist's problem:

$$\max_{\bar{x}} \sum_{1}^{n} p_i x_i\ (p_i) - C(\bar{x})$$

The Lagrangian problem yields the following first-order condition for each of n goods:

$$p_i + x_i \frac{\partial p_i}{\partial x_i} - C_i(\bar{x}) = 0$$

Rearranging and dividing by p_i yields the familiar monopoly pricing condition:

$$\frac{p_i - C_i(\bar{x})}{p_i} = \frac{1}{\epsilon_i}$$

The difference between these two markups gives the optimal consumption tax that could be imposed on natural monopolies to optimize social welfare. The greater the inelasticity, or the nearer the elasticity of demand is to zero, the greater is the discrepancy and hence the greater is the tax.

This tax may be somewhat difficult to administer, however, because it requires an assessment of the conditions in each individual market. Nonetheless, Ramsey demonstrated that George's concern over monopolists' control over prices could be ameliorated, at least in part, through well-designed commodity taxes.

Over his short life, Ramsey remained particularly concerned about the plight of the poor and the working class. The poor remain particularly vulnerable, in particular, when it comes to some of the types of good a natural monopoly franchise may administer, such as water or electricity. He also recognized that political considerations are unavoidable, as Henry George discovered to his own political misfortune. If the monopolist is regulated by a public utilities commission, the commission may wish to further limit prices to ensure their product remains affordable.

Note also that regulators would, in effect, endorse price discrimination. Our economic culture believes that all buyers should be treated equally. But a tax that is imposed to a greater degree on goods that are more inelastic, that is, with few good substitutes and with price-insensitive demand, may be interpreted to prey unfairly on those items for which the fewest alternatives exist. This sense turns regulators into predatory pricers, and seems to violate the public's sense of fairness, even if Ramsey demonstrated that it promotes greater efficiency.

In addition, even within one commodity, the formula may mandate certain segments of the market in effect bear a larger tax than customers in other market segments. This too would likely be perceived as unfair.

At this point, George had demonstrated that a 100% tax on land would not distort equilibrium, and could be used to reduce taxes on wage earners. Meanwhile, Frank Ramsey demonstrated that the pricing excesses of monopolists could also be remedied through carefully chosen commodity taxes. Ramsey had focused on commodities while George had devoted his attention to land prices. Later, we move to the determination of an optimal income tax.

15
A Short Lifetime of Contributions

Except perhaps for Albert Einstein, there has perhaps been no scholar that has made such a profound contribution to scholarship in the natural and social sciences in such a brief time and at such a young age as had Frank Ramsey. Einstein's *Annus Mirabilis* (Miracle Year) of 1905, resulted in a paper on the photoelectric effect, one on Brownian motion, another on special relativity, and still another that teased out his famous $E = mc^2$ mass–energy equivalency. Einstein was 26 years old at the time, and he was to win the Nobel Prize in Physics in 1921 for his paper on the photoelectric effect.

Two other scholars of their generation produced spectacular multiple contributions at such a young age. The Great Mind John von Neumann (December 28, 1903–February 8, 1957) was born in the same year as Frank Plumpton Ramsey, and he, too, was incredibly accomplished. Had he lived longer, he may have well secured a Fields Prize in mathematics, Nobel Prizes in physics and in chemistry, and perhaps a number of times in economics, if the Nobel Memorial Committee would confer multiple awards to the same person in the same category for multiple contributions. A number of subsequent economists won Nobel Memorial Prizes in Economics based on work von Neumann had established. Even John von Neumann elaborated upon work that Frank Ramsey had developed in his paper on growth. However, Nobel Prizes are typically awarded only once to a recipient in any field, and not posthumously. John von Neumann died too early, shortly after his 53rd birthday, and before the Nobel committee could recognize his lifetime contributions, or before the Nobel Memorial Prize in Economics began in 1967.

By the age of 22, von Neumann had earned his PhD in mathematics, experimental physics, and chemistry, and a diploma in chemical engineering, to please his father. By the age of 19, he had already

produced two academic papers. Just five years earlier, he had published a dozen major papers in mathematics, and by the year Frank Ramsey died, von Neumann was publishing high-quality papers at an almost unimaginable rate of one per month.

It is fascinating that, while both were interested in theoretical issues of mathematics and logic, and both scholars developed papers at about the same time on the optimal growth of an economy and on the concept of probability and expected utility, and with Ramsey's fluency in German, that these two scholars never met, nor seemed to be aware of one another's work.

Perhaps the best explanation is that von Neumann and Ramsey both pursued economics as somewhat of a diversion. Neither principally considered themselves as economists, even though both might embrace they were mathematicians.

Upon his return to Cambridge, Ramsey had completed his dissertation in mathematics and, by the age of 23, he had been elected to King's College, became a lecturer in mathematics there, and soon became the Director of Studies in Mathematics there. He perhaps felt a bit alone as such a young director, and turned to established scholars at King's College, many of whom were economists who also had excellent mathematical skills and intuition. His mentors could not have been better – John Maynard Keynes, Arthur Pigou, and Piero Sraffa (August 5, 1898–September 3, 1983). With their intuition, and his extraordinary ability, he produced four seminal works while at Cambridge before he died.

Perhaps his most important work, and the one in which he seemed to take the greatest satisfaction, was his "A Mathematical Theory of Savings," published in 1928 in the *Economic Journal*, a publication which was edited by Keynes. In that paper, he used the calculus of variations to determine the optimal savings rate for an economy with the objective of maximizing the level of future utility. His is likely the first application of the calculus of variations in economics, but it was so sophisticated in 1928 that few scholars understood his work. By the 1960s and 1970s, his work was rediscovered, and spawned more sophisticated models in optimal growth theory, at least one of which resulted in a Nobel Prize in 1987 for Robert Merton Solow (born August 23, 1924).

In Ramsey's era, the Great Mind Irving Fisher (February 27, 1867–April 29, 1947) was one of the only scholars to have formally incorporated the dimension of time into our economic models. But while Fisher successfully brought economic decision making from the static world into two periods, Ramsey was able to determine the optimal level

of national savings over an infinite time horizon. In doing so, he was able to show results that Fisher could only conjecture.

Of course, as a mathematical prodigy, Ramsey was well adapted to both the calculus of variations and continuous time horizons. By applying these techniques, he was able to establish that growth and savings are interrelated and self-fulfilling. He also argued that the societal rate of time preference ought to be zero, a result that Robert Solow demonstrated much later, within a growth model for which Solow won a Nobel Memorial Prize. Ramsey also derived Fisher's rate of time preference in a much more general framework.

In Ramsey's era, some scholars focused on the consumer side of economics, and others the theory of the firm. These two sides were brought together somewhat ineffectively to conjecture the existence of a general equilibrium in which consumption affects production decisions and vice versa. Ramsey brought together both sides of the market and established the first well-founded general equilibrium model of the economy about thirty years before the Great Mind Kenneth Arrow produced a similar result and earned a Nobel Memorial Prize for his contribution.

In the first general equilibrium, continuous time model of the economy, Ramsey also pointed out the difference between the financial interest rate and the rate of time preference. In doing so, he demonstrated his intuition with regard to the separation of financial and productive markets. He concluded that, if the rate of financial returns is less than the rate of time preference, the marginal utility of income would rise, and hence income and consumption would fall over time. In such a case, the economy would consume its physical capital in a way analogous to a farmer who consumes his own seed.

In extending his results still further, he showed that an economy in steady state would balance these two discount rates, at which point the discount rate, the interest rate, and the marginal productivity of capital all coincide. He also established the earliest version of a life cycle hypothesis, which ultimately earned Franco Modigliani (June 18, 1918–September 25, 2003) the Nobel Prize in 1985. Ramsey wrote in 1926 that, if the financial interest rate r exceeds the rate of time preference ρ:

> . . . he will save when he is young, not only to provide for loss of earning power in old age, but also because he can get more pounds to spend at a later date for those he foregoes spending now . . . He will for a time accumulate capital, and then spend it before he dies. Besides this man, we must suppose there to be in our community other men, exactly like him except for being born at different times.

> The total capital possessed by n men of this sort whose birthdays are spread evenly through the period of a lifetime will be n times the average capital possessed by each in the course of his life. The class of men of this sort will, therefore, possess a constant capital depending on the rate of interest, and this will be the amount of capital supplied by them at that price. (If $\rho > r$, it may be negative, as they may borrow when young and pay back when old). We can then obtain the total supply curve of capital by adding together the supplies provided at a given price by each class of individual.
>
> If, then we neglect men's interest in their heirs, we see that capital has a definite supply price to be equated to its demand price. This supply price depends on people's rates of discount for utility, and it can be equated to the rate of discount of the "marginal saver" in the sense that someone whose rate of discount is equal to the rate of interest will neither save nor borrow (except to provide for old age).
>
> But the situation is different from the ordinary supply problem, in that those beyond this "margin" do not simply provide nothing, but provide a negative supply by borrowing when young against their future earnings, and so being on the average in debt.[1]

A posthumous comment by Keynes on his contribution stated that Ramsey's paper was:

> . . . one of the most remarkable contributions to mathematical economics ever made, both in respect of the intrinsic importance and difficulty of its subject, the power and elegance of the technical methods employed, and the clear purity of illumination with which the writer's mind is felt by the reader to play about its subject. The article is terribly difficult reading for an economist, but it is not difficult to appreciate how scientific and aesthetic qualities are combined in it together.[2]

In addition to his theory of optimal savings and growth under uncertainty, Ramsey was also at least two decades ahead of his time in a variety of other areas. He developed subjective probabilities that Kenneth Arrow employed to establish the existence of equilibrium in financial markets, for which Arrow won his Nobel Memorial Prize in Economic Sciences. Ramsey also established the notion of expected utility used by John von Neumann in the development of game theory, optimal growth that secured a Nobel Prize for Robert Solow, and the first multi-period Life

Cycle Model that Franco Modigliani reinvented in the 1950s, for which he too won a Nobel Prize. Ramsey spawned the field of optimal taxation that was taken up by Peter Diamond, James Mirrlees, and William Vickrey in the 1970s and 1980s, all of whom won Nobel Prizes for their subsequent work. Yet, the brevity of his contributions means that few finance or economics scholars are aware of his ground-breaking work.

16
The Premature Loss of a Great Mind

Over the course of just a few short years Frank Plumpton Ramsey made a remarkable contribution to the literature in the areas of finance and economics. He did so with distractions that most others would find debilitating. His neurosis over relationships, including that with his mother, consumed much of his emotional energy. Yet, this 6′ 3″ tall, ruffled, awkward, but handsome and friendly scholar seemed to be almost universally loved. He was a kind and sensitive soul, and yet his emotional blinders sometimes caused pain to those he loved. And he loved so deeply and with such infatuation that it is a miracle he could publish anything at all, much less redefine the areas of economics, logic, and probability, all by the age of 26. His loss was perhaps the loss of an entire generation of insights in fields as far flung as economics and finance, logic, probability, and mathematics.

By the late summer of 1929, Frank and Lettice had settled down into monogamy, after Frank's proposal that he, Lettice, and Elizabeth could just live together fell on deaf ears. Frank was 26 years of age, and was finally finding a degree of emotional peace. In November of 1929, just days after the Great Stock Market Crash in the United States, Frank invited a friend out to a feast scheduled for November 14. That week, he fell ill with flu symptoms and cancelled his invitation. Early in the New Year, he remained bed-ridden with jaundice. He came into the world with this condition, and he would leave the same way.

As his condition worsened, the family decided to send him to Guy's Hospital in London where Lettice's uncle, Davies-Colley, was the senior surgeon. Once there, Frank was diagnosed with a blockage in his liver. They operated on January 17, and he died just three days later.

The death certificate recorded that he had died of hepatitis. His form of the disease was transmitted by water rats, a creature that was

particularly common in the River Cam where he would often go for a swim.

Frank left behind a distraught Lettice, along with two young children. There was an outpouring of grief among his many friends and colleagues. Year for year, it is unlikely that any scholar has made such a varied academic contribution at such an early age, except perhaps, as stated earlier, the 26-year-old Einstein in 1905. None has done so in the study of economics or finance, and none over such a wide diversity of topics.

Frank Plumpton Ramsey remains recognized today by the Decision Analysis Society who give an award in his name for distinguished contributions in the field of decision analysis. Yet while some economists and financial theorists are familiar with his contributions, many now attribute Ramsey's results to other more recognized scholars.

17
A Modern Extension – Vickrey and Mirrlees

David Ricardo and Henry George had proposed a tax that was designed to prevent the distortion of factor or commodity prices. However, both Great Minds had acknowledged that monopolies can equally distort the economy. Frank Ramsey had demonstrated how a commodity tax on the product of monopolies can also enhance public finances while simultaneously correcting some monopoly distortions. However, Henry George's 100% land tax proved impossible to implement politically, while Ramsey's tax, by contrast, was difficult to implement economically.

By the 1920s in the United States, and earlier in Great Britain, the public sector was beginning to rely increasingly heavily on the revenues from income tax. However, this tax, while relatively simple to implement, had the unfortunate effect in that it acted as a disincentive to increase one's income. Since most taxpayers earn income through their labor effort, such an earned income tax can result in decreased effort. If income per unit of effort is also proportional to one's skill, then a progressive income tax would then presumably discourage the efforts of the most productive. William Vickrey and James Mirrlees set about to create an income tax that would not have this unfortunate disincentive. In doing so, they also created an entirely new field of study, beyond their native public finance, for which many Nobel Memorial Prizes would later be awarded – to them, to Joseph Stiglitz, and to others.

18
The Early Life of William Spencer Vickrey

In 1857, Victoria, British Columbia, Canada was the gateway to opportunistic miners from the world over who sought to provision themselves and make their way up to the steep canyons of the Fraser Valley, north and east of the lumber town Vancouver, just across the Juan de Fuca Strait. William Spencer Vickrey was the child of one of the most colorful and successful families in the history of Victoria.

The capital of British Columbia, Victoria had been founded as a British settlement in 1843. Named for British Queen Victoria, it was in ways the sister city to San Francisco, enjoying a similar climate, a sizeable Chinatown (the two oldest in North America), a sea port, and a city forged by immigrants, from China, from the rest of Canada and the United States, from Australia, and indeed from all over the world. This had been the town for which Henry George set sail in 1858 in the hopes of earning his fortune by provisioning miners on their way to the Fraser River and the Caribou gold rushes of British Columbia.

Farther south, in 1824, the Hudson's Bay Company had established a fort at the mouth of the Columbia River in what is now the intersection of Washington State and Oregon. Fort Vancouver, named after the early explorer Captain George Vancouver, was occupied by both the British and the Americans, under the Anglo-American Convention of 1818. At that time, the Columbia River defined the boundary between the American territory and British North America, much farther south than the current boundary between the United States and Canada.

From their base at the fort, fur traders could make their way mostly by boat all the way to Hudson's Bay. But, during the Great Migration of 1843, almost a thousand Americans travelled the Oregon Trail and settled in the rich farmland at this northern outpost to the Oregon Country.

Sensing that failure to occupy the Columbia District to the North would result in their loss of the territory, the Hudson's Bay Company and the British attempted to occupy areas to the north of the Oregon Country, in what is now Washington State, British Columbia, Alberta, Saskatchewan, and Manitoba. But, by 1846, the United States and Britain agreed on a new boundary, the 49th Parallel, to delineate their respective nations.

Part of the effort by the British to occupy the Columbia District was to build a fort farther north of Fort Vancouver, should hostilities erupt as a prelude to the treaty. James Douglas, the chief accountant at Fort Vancouver, had been promoted Chief Trader for the Fort in 1834. In 1841, he was charged with the duty of establishing a trading post at the southern tip of Vancouver Island. Upon the establishment of Fort Albert, later renamed Fort Victoria, James Douglas (August 15, 1803–August 2, 1877) was named its governor, in 1851. When Henry George arrived in 1858 to profit from provisioning gold miners on their way to the gold rush in the Fraser Valley east of Vancouver, British Columbia, Victoria was a rapidly growing city, and James Douglas was still its governor.

A little more than a year after Henry George abandoned his failed dry goods enterprise in Victoria, gold was found farther up the Fraser Canyon, near Barkerville, British Columbia. By then James Douglas was the governor of the entire Colony of British Columbia, and had commissioned a highway to be built from Fort Yale, a site of the Fraser Gold Rush, to Barkerville. The first stage, the Cariboo Wagon Road, followed a trail named the Harrison Trail as established by the Hudson's Bay Company.

It is this gold rush that attracted adventurous men. David Evans Spencer was born in St Athan, Glamorgan, Wales on August 9, 1837 to farmers Christopher Spencer and Ann Evans. In December of 1863, David Spencer had left Wales and arrived in British Columbia at the age of 26. He came first to mine the gold himself, but, upon seeing so many miners leave the goldfields empty-handed, he put his apprenticeship skills he had learned in Wales to better use. Spencer first purchased a stationery business in Victoria. But, like Henry George a few years before him, Spencer realized that there was a much more certain income to be made from servicing and provisioning the miners than could be gained from the mining itself.

By 1873, he had expanded into the dry goods business, first in partnership with William Denny, and then, from 1878, on his own. Spencer also devoted his time to the Methodist Church. In his capacity as church secretary and Sunday School teacher at Victoria's Methodist

Church, he met his bride, Emma Lazenby (May 10, 1842–September 11, 1934). Together, they went on to have eight girls and five boys together.

By 1889, the Spencer family had established itself as one of the most successful in Victoria. From a modest dry goods shop that had grown to having six employees by the 1870s, Spencer began to build a retail empire.

Another gold miner, named Alexander Green, had made his fortune in gold rushes in Australia and California by the age of 27. He had arrived in Victoria and used his proceeds to build a grand mansion for himself and his bride in 1889. Four years after he died in 1895, his widow sold the mansion to David Spencer. Spencer moved himself, his Yorkshire wife Emma and their 13 children into the mansion.

The Spencer retail empire continued to expand across British Columbia, including the major department store in Vancouver – which occupied an entire city block. By the 1920s, his stores occupied almost half a million square feet of retail space and employed 1,400. In addition to his business activities, Spencer also helped establish the Methodist Church in British Columbia.

David and Emma's second-youngest child, Ada Eliza, was born on April 24, 1887. She was raised in a comfortable home, with servants, and had access to a good education. Following her schooling, she met Charles Vernon Vickrey (July 24, 1876–September 16, 1966). Charles, from Bartley, Nebraska, had graduated first from Nebraska Wesleyan University in history in 1896, and went on to earn his PhD from Yale in 1900 and a BD from Drew Theological Seminary in 1902.

Charles Vernon Vickrey and Ada Eliza Spencer married, on July 26, 1912, at the Metropolitan Methodist Church in Victoria – at the time he was 35 years of age and she was ten years younger. When they married, he had been living in Scarsdale, New York. Educated as a Congregational minister, he was already heavily engaged in missionary work as the Secretary of the Interdenominational Young People's Movement, which he led since its inception in 1902.

Ada Spencer had divided her time between New York and Victoria during her pregnancy with their first child. Their son, William Spencer Vickrey, was born in Victoria, British Columbia, on the first day of summer, June 21, 1914.

While Vickrey was born in Victoria, he grew up in New York City. While William was still a young child, his father had been appointed as the General Secretary of the American Committee for Armenian and Syrian Relief, an organization founded by Cleveland H. Dodge, with the help of President Woodrow Wilson, to enlist American resources

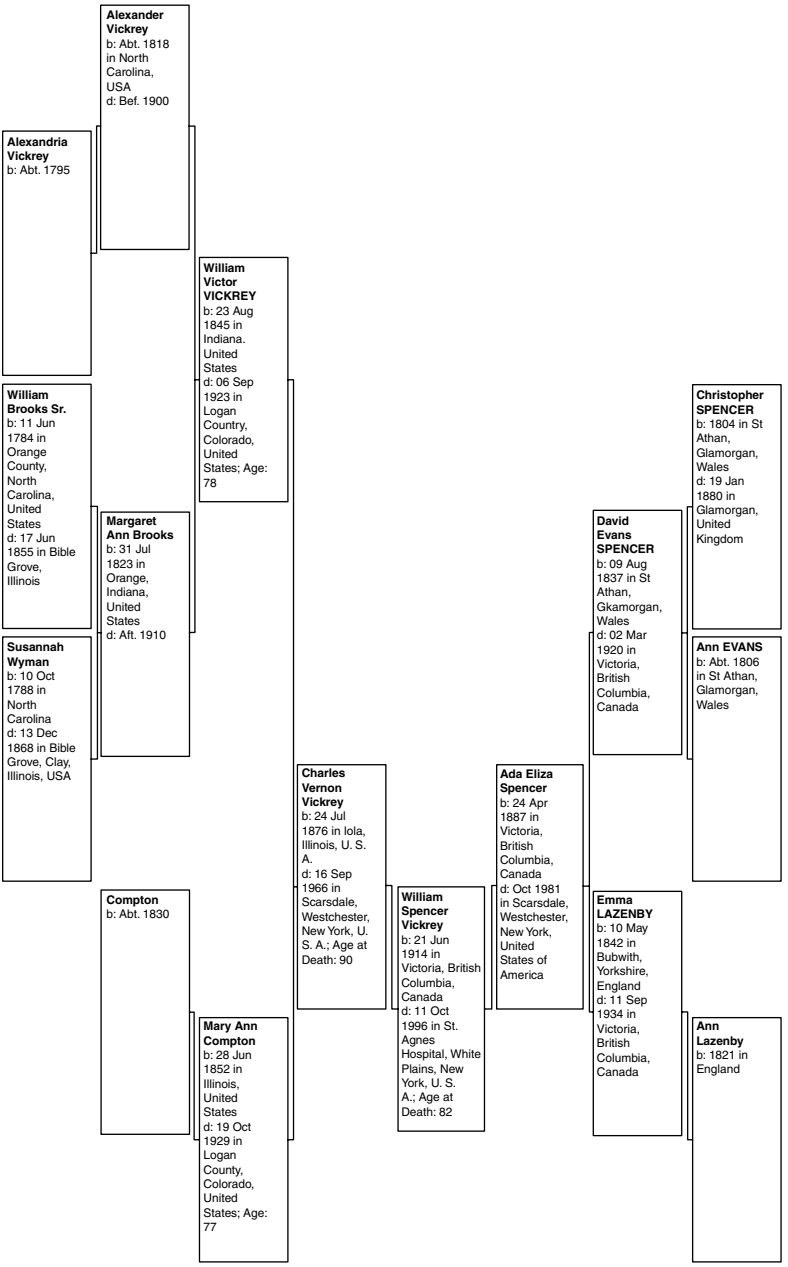

Figure 18.1 Ancestors of William Vickrey

to assist victims of the Armenian Genocide and the Assyrian Genocide and deportations of 1915. Over the course of the next 15 years, Charles Vickrey helped to save the lives of over a million refugees, supported 130,000 orphans, and raised $100 million for emergency relief. In 1930, the organization was renamed the Near East Foundation and it was to become the model for both the United States Agency for International Development and also the Peace Corps. In New York, as a youngster, William met victims of the Armenian massacres, an association that reinforced the strong social conscience that was to be the hallmark of his family.

When he moved from the Interdenominational Young People's Movement to the American Committee for Armenian and Syrian Relief, Charles Vickrey's office was located at1 Madison Avenue, in Manhattan. He, his wife, and their two children rubbed elbows with presidents and ambassadors, and travelled extensively. From his perch, Charles wrote a number of books that spurred missionary and humanitarian movements around the world.

William Spencer Vickrey, the first son of Charles and Ada, was educated in the finest schools of Europe and the United States. He graduated in 1931 from Phillips Andover Academy, one of the country's most prestigious boarding preparatory schools. He demonstrated an aptitude for mathematics, and went on to receive a BS in math from Yale in 1935 and an MA in economics from Columbia in 1937. He continued on at Columbia for his PhD, but had to interrupt his studies when the United States entered the war on December 7, 1941.

Raised in the Congregational Church, William Vickrey declared himself a conscientious objector at the onset of conscription and World War II. In lieu of military service, he worked for the National Resources Planning Board in Washington, DC and also for the Division of Tax Research within the Treasury Department. In his period of alternative service, Vickrey designed an inheritance tax for the US territory of Puerto Rico. His work inspired his thesis for Columbia University, which took the title "Agenda for Progressive Taxation." Based on this work, Columbia University awarded him a PhD in economics in 1948. By the time he graduated, he had already been lecturing for two years.

In 1958 he was appointed a Full Professor at Columbia, an institution at which he would spend his entire academic career. While there, he made many contributions to the theory of public finance and public sector economics. We will document here his greatest contribution to public finance and economics.

19
The Early Life of James Mirrlees

Galloway is a region in the southwest Scottish Lowlands where the rolling hills make for a particularly picturesque landscape. Located only a short distance from the Irish Sea, on the River Cree, Newton Stewart lies at the edge of the Galloway Forest Park. Closer to Belfast, Northern Ireland than it is to either London or the Scottish capital of Edinburgh, this village of shopkeepers serves a relatively remote region of farmers. It was in this bucolic setting that James Alexander Mirrlees was raised.

Less than a hundred miles to the north of Newton Stewart, also at the southern edge of a national forest, Loch Lomond and the Trossachs National Park, James Alexander Mirrlees' grandfather and namesake, James Mirrlees (1855–1943) had begun his work life at an early age. He took his first job at the age of seven in Alexandria, Scotland, a region that was famous for its dyeworks during the textile heydays of Great Britain. There, James Mirrlees moved eventually to the capacity of a chemical analyst at the dyeworks, a job he held until his retirement at the age of seventy, after more than six decades in the labor force. He was most proud of this strong Scottish work ethic and he passed on to his ten children a sense that a willingness to work was at least as important – and perhaps even more important – as formal education.

One of the youngest of his sons, George Mirrlees, was born in 1900. He had to leave school at the age of 13 to help support their large family at the onset of the Great War. The youngster, barely out of childhood, took a job at a torpedo factory to support the war effort. At the end of the conflict, with no high school education, George parlayed his aptitude with numbers into a job as a bank teller. He could not know at the time that his career in banking would set the stage for his children to pursue his careers in high finance.

In 1934, the 34-year-old bank teller George Mirrlees arrived in Minnigaff, Kirkcudbrightshire with a 24-year-old bride named Nan

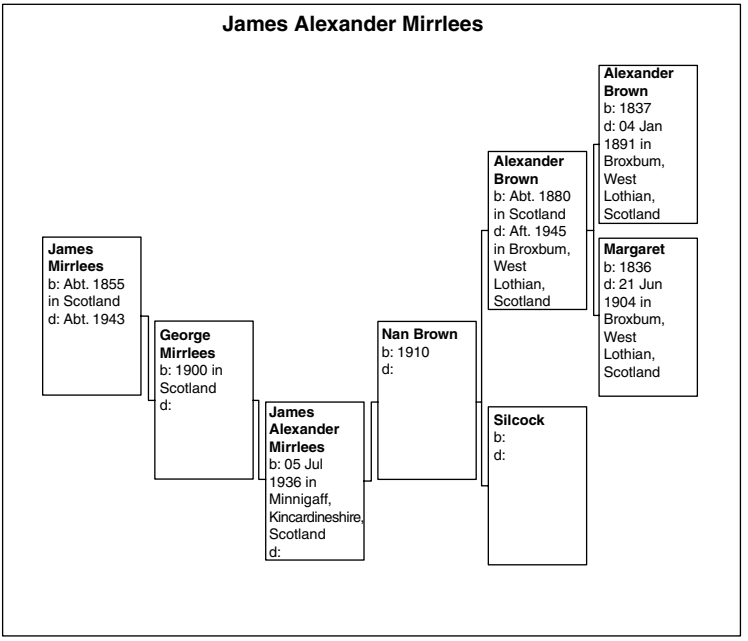

Figure 19.1 Ancestors of James Mirrlees

(née Brown (1910–?)). Nan Brown had come from a Scottish family of equally modest means. Her father, Alexander Brown (about 1880–about 1945), and his father before him, Alexander Brown (1837–January 4, 1891). had come from Broxburn, West Lothian, Scotland, also a hundred miles to the north of Newton Stewart, near the Scottish capital of Edinburgh.

Now a commuter suburb for Edinburgh, Broxburn was an agricultural community until oil-laden shale rock was discovered there in the latter half of the 19th century. Its future development was shaped by James Young (July 13, 1811–May 13, 1883), the son of a cabinetmaker and joiner. James had educated himself and had supplemented his education by subscribing to night school classes in chemistry. In 1844, he had been appointed manager at Tennants, Glow and Co. in Manchester, England. While at Tennants, he became interested in the phenomenon of natural petroleum seepage in Derbyshire. He left Tennant's to develop a business that would refine crude oil to create lubricating oil. Once this natural oil source was exhausted, Young noticed that oil was seeping from the sandstone roof of a coal mine. He invented a distillation process that

proved able to purify various oils and waxes from such stone. In 1852, Young made the moved from Manchester to West Lothian, Scotland to develop the world's first commercial oil-works and refinery, using as an oil stock the shale discovered in Broxburn.

The oil shale industry in West Lothian grew rapidly, and attracted workers from across the region. Alexander Brown, James Alexander Mirrlees' maternal grandfather for whom he was named, was a self-taught technician with an expertise in the mechanics of electric generation. The rapid economic growth of West Lothian afforded James Alexander a good career running the area's power plant. James Mirrlees later recalled that his grandfather was "in charge of electricity, (pun intended). Alexander Brown had books at his shop on electricity, which young James found fascinating in his childhood visits to his grandfather's family.

James Mirrlees' mother, Nan Alexander, Alexander Brown's daughter, was afforded the opportunity to finish high school and she continued on to secretarial college following her graduation. She married George Mirrlees not long thereafter.

The Brown clan was a warm, jovial, and jocular one. James remembers visits to West Lothian where numerous aunts, uncles, and cousins would gather around, gossiping and joking. The family seemed bewildered and bemused at young James' interests in politics and mathematics. The uncles were farmers or shepherds, gardeners, and sea captains. None had gone to college.

In 1950, the family moved to the small fishing village of Port William, Scotland, within sight of both Ireland and the Isle of Man on a clear day. George Mirrlees had earlier been promoted to bank manager and had moved his family 18 miles to the south.

In this picturesque village, young James enjoyed his summer visits from a slightly older cousin, Robert Silcock Downie (April 19, 1933–), who was the son of James' aunt Margaret Brown (about 1905–). James prized the summer visits Robert, who was three years James' senior, made to the new Mirrlees' home. Robert brought into the gregarious Mirrlees household discussion of the philosophies of the influential Scottish economist, philosopher, and historian David Hume (May 7, 1711–August 25, 1776). Robert discussed with his younger cousin Hume's theories of the economy, of the nature of data and decision-making, and of the emerging theory of logical positivism in the 1920s. James' cousin went on to an illustrious career as a philosopher, and inspired James to attend college himself.

James' young brother and only sibling, Alastair, followed in his father's footsteps, left school two years later than his father, at the age

of 15, and also went into banking. He took his various banking exams while on the job and also at night school. Eventually, Alastair made his way to Canada and the highest echelons of Canada's largest bank, the Royal Bank of Canada, before he moved to set up his own foreign exchange clearing house. It would seem that finance must have been in the Mirrlees family genes.

James' father may have hoped that James, too, would not stray far from the banking path he and James' brother Alastair took. At this time the family could ill afford to send a child to university. But no one could deny James' mathematical proclivity, nor his quick mind. James was determined to attend university and applied himself to do well enough in his various exams so that he could receive scholarships sufficient to pave his way.

James was a precocious grade school student. In later life he recalled correcting his teacher on the relative positions of the Arctic and Antarctica on the globe. James was able to do his grade school-level math in his head, to the bewilderment of students and teachers alike. His mathematical ability allowed him to pass the entrance exam, at the age of 11, which permitted him to attend a selective class in his high school in his home town of Newton Stewart – the Douglas Ewart High School. Despite coming from modest means, therefore, Mirrlees was afforded an excellent public education.

Mirrlees' high school had an illustrious history, with graduates that included John McFadzean, the founder of modern veterinary medicine, an Australian Member of Parliament, John Dedman, and also the writer and director Adrian McDowall. The school had opened in 1922 as an amalgamation of schools that dated back almost a hundred years. In his time at the school, Mirrlees had many opportunities to compete for prizes and scholarships, which he secured often.

In mathematics, Mirrlees was partially self-taught. On his trips to visit family, he would often read a book, named *Teach Yourself Calculus*, which he discovered at the age of 14. Mirrlees' enthusiasm spurred on his mathematics teacher on to provide him with individual attention during classes. Teachers in his other classes also encouraged him and shared with him their books on math. On the bus trip to school each day, for example, young James would read the university mathematics textbooks lent him by his mathematics teacher. And when the school headmaster, Rector Geddie, asked him what we wanted to do with his education, he replied he wanted to become a mathematics professor, which garnered a skeptical response from the headmaster.

High school prepared Mirrlees well for a good liberal arts university. He took the usual courses in English, mathematics, history, physics, and

other sciences, but he also studied French and Latin. He was curious and interested in everything, and was also a voracious reader. His eclectic interests allowed him to excel in the Scottish university entrance exams as they were equally eclectic in the range of the subjects they tested.

Mirrlees took the college entrance exam at the requisite age of 16, one year before his graduation year. He had already taken the most advanced senior-level mathematics courses available to him at his high school. His advanced mathematical standing caused an inspector of the Scottish Education Department to encourage him to apply to Cambridge.

Even the most academically precocious Scottish high school graduates rarely aspired to attend Cambridge. Scotland had an illustrious university tradition and many fine scholars. Furthermore Scottish scholarship grants could only be used in Scotland, even though England's students were able to attend Scottish universities. However, there was a special provision for the use of Scottish grants if they could also take the Cambridge exam, in addition to the requisite Scottish exams. Most students who succeeded in these special exams were specially trained in elite Glasgow or Edinburgh preparatory schools, institutions well beyond the reach of the modest Mirrlees family.

Of course, Mirrlees excelled in the Scotland exams and was fast preparing for the more rigorous Cambridge exam, when he was struck with appendicitis just days before he had to sit the exam. The illness forced his hand somewhat, and he attended Edinburgh University. While at Edinburgh, he studied mathematics and, based on the inspiration of his older cousin, Robert Downie, who was studying philosophy at the University of Glasgow by this time, Mirrlees also studied philosophy at Edinburgh.

Within his three years there, Mirrlees completed the requirements for a Master of Arts. As he neared completion there, he again prepared for and successfully sat the Cambridge exam. In a somewhat unusual twist, he was off to elite, exclusive and ornate Cambridge for a BA in mathematics after his MA from Edinburgh.

Mirrlees arrived at Cambridge in the fall of 1957. He almost immediately became involved in the Student Christian Movement as an avenue for the social consciousness that had always been a part of his upbringing. His father was an elder in their church, and Mirrlees shared the same fascination with the human condition as most all other subjects to which he was exposed.

At Cambridge, students do not necessarily immerse themselves in one field of study, as one would for a Major at most American universities. Instead, students are encouraged to go to lectures on various subjects.

While at the university Mirrlees studied game theory, and mathematics, and took an interest in sociology as had George, Clark, and Ramsey, he was concerned more generally about the human condition. He was also involved in the Sociology Society at Cambridge.

At Cambridge, a mentor in mathematics, Peter Swinnerton-Dyer, encouraged Mirrlees to explore economics as perhaps a more rigorous and mathematical tool to employ to address poverty. At the same time, Mirrlees became increasingly doubtful that he desired to continue on to a PhD in mathematics, despite his desire to eventually become a professor of mathematics. At Cambridge, Mirrlees was also surrounded by some of the most brilliant economic minds ever assembled. John Maynard Keynes had established a 'Cambridge Circus' there, and that tradition had continued after Keynes' death, through the likes of Piero Sraffa, the influential Italian neo-Ricardian economist, and Joan Violet Robinson (October 31, 1903–August 5, 1983), an influential post-Keynesian economist and perhaps the leading female economist of her era.

These pillars of the Cambridge School met with James and inspired him to study economics, just had so many mathematics majors, from Keynes to Ramsey, had either dabbled or immersed themselves in.

The opportunity to study economics was also fortuitous because Cambridge permitted one to earn a Diploma of Economics by immersion in its directed study as an undergraduate. This diploma, which he earned in 1959–60, could then count toward the first year of graduate work.

Mirrlees became hooked on the subject of economics. He was assigned to a tutor named David Champernowne, and was also introduced to a research mentor named Richard Stone, who immediately assigned to Mirrlees an exercise – to read and write about Keynes' *General Theory of Employment, Interest, and Money*,[1] the ground-breaking new treatise that almost single-handedly defined modern macroeconomics.

Mirrlees was out of the pan and into the fire. His tutor also secured him a three-year grant that would fund his combined final undergraduate and initial graduate year, and also two more years of study. The grant did not require Mirrlees to complete a PhD, but it did require him to produce a thesis.

Next, Reader Stone exposed Mirrlees to a couple of problems that had been developed by Cambridge alumnus Frank Ramsey. One was the concept of optimal taxation, and the other that of optimal savings and growth. Two decades after Ramsey published his papers, there was still little in the literature that shared his degree of mathematical

sophistication, Mirrlees was capable of absorbing and was inspired by Ramsey's work. At that time, while more American economists were beginning to ponder uncertainty, Mirrlees' PhD thesis was one of the earliest incorporations of uncertainty into Ramsey's optimal growth and savings result.

In the following academic year 1960–61, the influential economist Frank Horace Hahn (April 26, 1925–January 29, 2013) was attracted to Cambridge and became an unofficial mentor to Mirrlees. The year after, Nicholas Kaldor (May 12, 1908–September 30, 1986) invited Mirrlees to work with him on growth theory. It was the last year of funding for Mirrlees, and he had been actively pursuing a promising idea that had occurred to him in November of 1961. By his young age Ramsey had produced three brilliant papers in economics. One was on probability, uncertainty, and utility, and led to the development of game theory and the expected utility hypothesis. Another was on optimal taxation, as treated in this volume. The third was on economic growth. Mirrlees' idea was, in some sense, to incorporate the three concepts. He was interested in the way uncertainty affects the optimal savings rate, and hence growth.

To produce his counterintuitive result, that uncertainty enhances savings, Mirrlees employed the Wiener process that the Great Mind, and second winner of the Nobel Memorial Prize, Paul Anthony Samuelson (May 15, 1915–December 13, 2009), had also been employing in his own work on the random walk in the 1960s. In the process, Mirrlees discovered for himself what we now know of as Ito's Lemma, which is an important technique that is now commonly employed for optimization under uncertainty. Using the methodological innovations he had developed, Mirrlees demonstrated in his thesis that uncertainty induces individuals to save more.

This strand of research on optimal decision-making under uncertainty also stimulated Mirrlees to delve into issues of public policy. With his funding at an end, Mirrlees was offered an opportunity to work and study in India for the academic year 1962–3 which would offer him the opportunity to view the application of public policy within a challenging environment.

In 1958, the Cambridge PhD student and future Nobel Prize winner Amartya Sen had returned from a teaching position in India to take up the Prize Fellowship at Trinity College– a position that both John Maynard Keynes and Frank Plumpton Ramsey had enjoyed. The prize afforded recipients the freedom to focus on the research of their

choice, and, hopefully, to cross-pollinate their brilliance with others at the college.

Upon meeting Sen, Mirrlees' interest in developmental economics was reaffirmed. Mirrlees shared with Sen a desire to improve incomes and reduce poverty in the developing world. Sen also arranged for Mirrlees to visit and work in India for a year. He saw this as an excellent chance to see what did not work in the area of economic planning, and to contemplate what could work. This opportunity provided Mirrlees with an even brighter burning desire to increase incomes and economic welfare, and to discover tools of public policy that could enhance both economic efficiency and equity. Accompanied on his travels by his wife of two years, Gillian Marjorie Mirrlees, they embarked on the adventure together. Gill had just completed her teacher training at Cambridge and was ready for the next phase in their married life.

Mirrlees' year abroad began with a preparatory summer at the Massachusetts Institute of Technology (MIT) in 1962. There he presented a paper on optimal growth to Paul Samuelson and Robert Merton Solow (August 23, 1924–), who went on to win a Nobel Prize in 1987 for his own work in the area of growth theory.

In September of 1962, James and Gillian flew to India so he could begin his work with India's Planning Commission. On the long flight to India, Mirrlees took to heart some comments made by Solow and Samuelson to improve the theory he had been preparing on the subject of optimal growth under uncertainty. Their comments, in combination with his insights, culminated in the final production of Mirrlees' PhD thesis.

The development experience was a little unsatisfactory for Mirrlees, but it was an enlightening experience in terms of the juxtaposition of politics, policy, and the economy. By the end of his year in India in 1962–3, Sen was completing his Trinity scholarship. Mirrlees was offered a research fellowship at Nuffield College at Oxford but Trinity College at Cambridge trumped the Oxford offer. Mirrlees was on his way back to Cambridge, England, this time to teach and conduct his research.

Also, upon their return from India, Gillian and James welcomed the birth of their first of two daughters, Catriona, and, in September of 1963, James Mirrlees submitted his thesis, entitled "Optimal Accumulation Under Uncertainty." He had the good fortune to have as one of his thesis examiners the Great Mind Kenneth Joseph Arrow, who was visiting Cambridge for the 1963–4 academic year. Mirrlees followed his successful defense with an invitation to become a Fellow of

Trinity, then a lecturer, where he ultimately spent much of his academic career.

Kenneth Arrow made a significant intellectual impression on Mirrlees. Arrow had already completed his work that would later earn him the accolade as the youngest recipient of the Nobel Memorial Prize in Economics, which he shared the prize with John Richard Hicks (April 8, 1904–May 20, 1989) in 1972. Arrow's recognition was for his seminal work with regard to investment decisions under uncertainty. Mirrlees realized at this time that much good work was emerging in the field of growth under uncertainty, and decided to shift his research agenda somewhat. This shift proved providential indeed.

20
The Great Idea

While at Trinity in the mid-1960s, Mirrlees had a conversation with another research fellow, the physicist Jeffrey Goldstone. Goldstone had known Mirrlees was working on a theory of taxation and suggested to him that it seemed feasible for one to devise a model which shows how the income tax system could create incentives for laborers to produce. Mirrlees devised and analyzed the model over the next few years. It turned out to be a most difficult model to solve, but he succeeded in developing a model that would revolutionize public finance and other aspects of economic theory.

His great idea began with a trip to *the other Cambridge*. In 1968, by then with a five-year-old daughter, Catriona, and a two-year old daughter, Fiona, Mirrlees was offered a permanent professorship in economics at Cambridge and was granted a one-year sabbatical. The family had the opportunity to spend a year at MIT. for his sabbatical. There he had the opportunity to renew his relationship with Peter Diamond (April 29, 1940–), a brilliant MIT professor and future (2010) Nobel Memorial Prize laureate who he had met during his first visit to MIT before his trip to India. The two scholars shared a strong sense of improving the human condition, informed by their mutual nature, and by Mirrlees' experience in India. The two scholars had also shared mutual economic interests when Diamond had spent six months at Cambridge a few years earlier. When they reunited, they developed a research agenda to develop a theory that would redistribute income from the wealthy to the poor through well-designed commodity taxes, in a way that would not hinder production efficiency.

At the same time, Mirrlees became increasingly interested in general welfare economics. While at MIT he developed his great idea. He had followed the various strands of the great debates in general welfare economics. The most obvious notion of an equitable tax is that all residents

should pay an equal share of the costs of government and public goods. Such a lump-sum tax had been discarded once the notion of diminishing marginal utility of income became widely accepted in the late 19th and early 20th century. At the turn of the century, the Great Mind Irving Fisher was asked how to resolve the problem and he proposed funding public finances through a tax that represented an equal burden on all recipients. His approach commended a progressive tax because a $1,000 flat tax for a poor person is much more of a burden than the same tax, or even a proportional tax on the wealthy. Oxford University professor Francis Ysidro Edgeworth (February 8, 1845–February 13, 1926) similarly argued in a classic 1897 essay for a strongly progressive tax schedule such that "the marginal disutility incurred by each taxpayer should be the same."[1]

The neo-Ricardians, and then the Georgists, were aware of the problems associated with any income tax because those with earned income have a reduced incentive to produce and to earn if they are taxed on earnings. Instead, they argued that a tax on unearned income, especially on unimproved land, does not have the unfortunate distortions on the supply of labor as would an income tax.

Finally, Frank Ramsey had proposed a commodity tax that was variable and based on the elasticity of demand for the commodity. Those goods with the most inelastic demand could be taxed with reduced distortion because the consumers of these goods are price-insensitive. However, his commodity tax would be difficult to implement because the taxing authority must have knowledge of myriad elasticities of demand.

Mirrlees believed the prevailing income tax most often employed could be made more efficient. An optimal income tax was first revisited by William Vickery 30 years earlier. But while he first motivated the discussion, he admitted himself that some of the analytics were too difficult, in the 1940s, to sufficiently characterize an optimal income tax.

The intuition is obvious. An equal lump-sum flat tax that applies to all has the advantage that it does not discourage work. On the other hand, any tax on income discourages the additional generation of income. Because most taxpayers earn their income by providing labor, an income tax then has the unfortunate consequence of discouraging work, on the margin. Vickrey, and James Mirrlees after him, both identified this incentive incompatibility and proposed a solution.

It is more helpful to describe a simple version of Mirrlees' contribution to Vickrey's original insights. In 1971, Mirrlees wrote "An Exploration in the Theory of Optimum Income Taxation"[2] that described the

solution to the problem of an optimal income tax. His insights, initiated by William Vickrey, also spawned a new literature in asymmetric information and secured both a Nobel Memorial Prize in Economic Sciences.

Let us return to another important dimension of this problem. An ideal social planner's solution would require that individuals confronted with the incentives offered by the planner, without knowing in advance for which class they may belong, would nonetheless opt for the planner's solution. Such planners must maximize an appropriate measure of the aggregate of utility across taxpayers. Vickrey proposed a summation of utilities across classes that conforms to what we now know as the Rawlsian notion of utility, often attributed to the Harvard philosopher John Bordley Rawls (February 21, 1921–November 24, 2002). In his *A Theory of Justice*,[3] considered by many to be the most important work in philosophy published in the latter half of the 20th century, Rawls devised a clever notion for characterizing the social optimum among individuals who agree to a system under a Rawlsian *veil of ignorance*. In Vickrey's 1945 work, he telegraphed the eventual discovery of the concept of a *veil of ignorance* when he stated:

> If utility is defined as that quantity the mathematical expectation of which is maximized by an individual making choices involving risk, then to maximize the aggregate of such utility over the population is equivalent to choosing the distribution of income which such an individual would select were he asked which of various variants of the economy he would like to become a member of, assuming that once he selects a given economy with a given distribution of income he has an equal chance of landing in the shoes of each member of it.[4]

Vickrey goes on to state the planner's reality:

> It is generally considered that if individual incomes were made substantially independent of individual effort, production would suffer and there would be less to divide among the population. Accordingly, some degree of inequality (of income) is needed in order to provide the required incentives and stimuli to efficient cooperation of individuals in the production process.[5]

We assume that such individuals would accept such a social planner's solution. Mirrlees adopted the social welfare function formulated by Vickrey. Using the same planner's concept and social welfare that is the sum of individual welfare, Mirrlees verified that an optimal income

tax would produce average taxes that rise with income, including lump-sum transfers, but which permitted marginal taxes to fall with income. On the other hand, if one were to adopt an additional equilibrium concept of John Rawls, for which the social planner also maximizes the minimum utility of the class of taxpayers, subsequent authors have discovered that a more progressive tax structure may be necessary.[6]

I present here a simplified model to best demonstrate the intuition developed by these Great Minds. Let us consider just two types of wage-earners. One, labelled L, has a low productivity of labor, and hence earns a low wage w_L, while the other has high productivity H, with a higher wage w_H. Otherwise, these individuals have identical preferences defined by a utility function U(x) for their ability to consume an amount of consumption c_i, and an equal disutility $V(L_i)$ for each type i = L,H. The utility function has the usual properties $U' > 0$, $U'' < 0$, as does the disutility function $V' > 0$, $V'' > 0$.

This disutility actually increases as each type provides more labor L_i for each type, but because income is equal to $w_i L_i$ for each type, it is simpler to simply consider the disutility of income generation as $D(y_i)$. Note also that our characterization of the disutility function has the usual properties:

$$D'(y_i) = \frac{V'(\frac{y_i}{W_i})}{W_i} > 0$$

$$D''(y_i) = \frac{V''(\frac{y_i}{w_i})}{{w_i}^2} > 0$$

Then, each individual would like to maximize the following:

$$\max_{c,y} U_i = \max_{c,y} U(c_i) - D(y_i) \; for \; i = H, L$$

$$such \; that \; consumption \; c_i \; \leq \; income \; y_i.$$

Setting up and solving the corresponding Lagrangian yields:

$$\max_{c,y} \mathcal{L}_i = \max_{c,y} U(c_i) - D(y_i) + \lambda(y_i - c_i)$$

$$for \; i = H, L$$

$$\left[\frac{dc_i}{dy_i}\right]_{U_i^*} = \frac{D_i'(y_i^*)}{U_i'(c_i^*)} = \frac{V_i'(y_i^*)}{w_i U_i'(c_i^*)} = 1,$$

which is equivalent to our standard result that the marginal rate of substitution between consumption and labor is given by the wage rate w:

$$\left[\frac{dx_i}{dl_i}\right]_{U_i^*} = \frac{V_i'(y_i^*)}{U_i'(c_i^*)} = w_i$$

Let us first explore the implications of changes in the wage rate w_i on consumption c and income y. The marginal rate of substitution varies with the wage rate according to:

$$\frac{\partial \frac{D_i'(y_i^*)}{U_i'(c_i^*)}}{\partial w_i} = \frac{\partial \frac{V_i'(y_i^*/w_i)}{W_i U_i'(c_i^*)}}{\partial w_i} = \frac{\left(\frac{-y_i^*}{w_i^2}\right) w_i U' V'' - V' U'}{(w_i U')^2} < 0$$

This implies that a high-productivity consumer H will realize higher income and hence higher consumption than the low-productivity consumer L.

The planner's solution for the optimum tax then faces a dilemma. A higher income tax that lowers the effective wage also lowers the level of effort and labor for the high-income and the low-income taxpayer alike. Vickrey's intuition, and Mirrlees' proof, offered a fascinating insight. To see this, let us impose a tax that creates a gap between the income y_i over each class I and its consumption c_i sufficient to cover government expenditures G. The planner must ensure that the tax is not sufficiently onerous to induce the high-productivity taxpayer to instead put forward the production corresponding to that of the low-productivity individual. In other words, we must ensure that two conditions are met:

$$\sum_{i=H,L} \phi_i(y_i - c_i) - G \geq 0$$

$$U(c_H) - D_H(y_H) \geq U(c_L) - D_H(y_L)$$

where ϕ_i is the share of i = L, H types respectively. The social planner's problem then becomes:

$$\max_{c,y} \mathcal{L}_i = \max_{c,y} U(c_i) - D(y_i)$$

$$+\lambda \left(\sum_{i=H,L} \phi_i(y_i - c_i) - G \right)$$

$$+\mu(U(c_H) - D_H(y_H) \geq U(c_L) - D_H(y_L))$$

$$for\, i = H, L$$

This expression yields the same marginal rate of substitution for the high-productivity group when we differentiate the Lagrangian with respect to c_H and y_H for the (common) utility function and the effort function for the low-productivity individual. However, differentiating the Lagrangian with respect to c_L and y_L yields an interesting result.

To see this, first let us define a function that represents the difference between the marginal effort disutility for a low-productivity individual and that of a high-productivity individual who chooses to produce at a low level of output:

$$\delta = D'_L(y_L) - D'_H(y_L)$$

We can say something about this difference in the marginal utility of extra effort at any income level. It is intuitive that extra effort required for the same increment to income should generate less disutility for high productivity individuals. We can confirm as follows:

$$\delta = \frac{V'(\frac{y_L}{w_L})}{w_L} - \frac{V'(\frac{y_L}{w_H})}{w_H}$$

We know that since $w_L < w_H$, $y_L/w_L < y_L/w_H$. From the second-order condition $V'' > 0$, then $V'(y_L/w_L) > V'(y_L/w_H)$. These results combine to prove that $\delta > 0$.

It is helpful to express the relationship as:

$$D'_H(y_L) = D'_L(y_L) - \delta$$

Let us now describe the derivatives of the Lagrangian with respect to c_L and y_L:

$$c_L : (\phi_L - \mu)U'(c_L) - \lambda\phi_L = 0$$

$$y_L : -\phi_L D'_L(y_L) + \lambda\phi_L + \mu D'_H(y_L) = 0$$

By substituting in the expression for δ, we find:

$$y_L : -\phi_L D'_L(y_L) + \lambda\phi_L + \mu(D'_L(y_L) - \delta) = 0$$

Or:

$$y_L : (\phi_L - \mu)D'_L(y_L) - (\lambda\phi_L - \mu\delta) = 0$$

By moving parameters in the first-order conditions to the right-hand side of the first-order conditions for c_L and y_L and dividing the resulting expression for c_L into that for y_L simplifies to:

$$\left[\frac{dc_L}{dy_L}\right]_{\widehat{U_L}} = \frac{D'_L(\widehat{y}_L)}{U'(\widehat{c}_L)} = 1 - \frac{\hat{\mu}\delta}{\phi_L\hat{\lambda}} < 1.$$

By comparing this planner's solution for the lower-productivity individual solution, combined with the assumed strict convexity of the utility curve, we see that this marginal rate of substitution between consumption and income generation results in a lower level of both consumption and income generation by the lower-productivity individuals.

To see how this result can be generated, we impose a lump-sum (marginal income independent) tax on high-productivity individuals in an amount:

$$\hat{T}_H = \hat{y}_H - \hat{c}_H \text{ resulting in an allocation } (\hat{c}_H, \hat{y}_H).$$

To reach the social optimum, the low-productivity individual must be faced with a marginal tax to align the planner's optimal marginal rate of substitution, that is:

$$\left[\frac{dc_L}{dy_L}\right]_{\widehat{U_L}} = \frac{D'_L(\widehat{y}_L)}{U'(\widehat{c}_L)} = 1 - \frac{\hat{\mu}\delta}{\phi_L\hat{\lambda}} = 1 - t.$$

A marginal tax rate $\hat{t} = \frac{\hat{\mu}\delta}{\phi_L\hat{\lambda}}$ must be combined with a sufficient lump-sum transfer to ensure that low-productivity individuals are still able to attain their allocation $(\hat{c}_L, \hat{y}_L)$ after the tax and lump-sum transfer. This lump-sum transfer, from high-productivity to low-productivity individuals S is then equal to:

$$\hat{S} = (\hat{c}_L - \hat{y}_L) + \hat{t}\hat{y}_L.$$

This earned income tax credit is more than sufficient to compensate them for the optimal marginal income tax rate they face.

This combination of results is interesting. The flat rate tax paid by higher-productivity individuals, but with no marginal income tax rate,

is preferred by high-productivity individuals to the net subsidy offered to the rest. In effect, high-productivity individuals reveal themselves to be high productivity by opting for the lump-sum tax package and choosing to generate gross income at the rate $\hat{y}_H$. The subsidy is only given to those who choose to produce at the lower income rate $\hat{y}_L$. These individuals will necessarily be the low-productivity workers who self-select for the positive marginal wage tax, positive earned income tax package.

Mirrlees produced an extended version of this model by allowing for a continuum of productivity types. His more complex analysis retains the interesting result derived from his earlier and simpler analysis. Low-productivity workers pay a marginal tax but also receive an earned income tax credit. High productivity types forego the subsidy, and indeed pay a lump-sum tax sufficient to fund government and pay for the net subsidy to low income individuals.

The result is controversial, but from a political rather than an economic perspective. One who opts to be included in the high-productivity club must be a high-productivity type to generate the income they need at the effort and productivity level they can sustain. And they must pay the net subsidy offered to low-productivity and low-income wage-earners. They do not pay any taxes on the margin, however. Their marginal tax rate for extra income earned is zero.

From a policy perspective, this solution also presents other problems that would necessarily change the way income taxes are levied. A household that is made up of two taxpaying spouses in effect pay a combined tax. For the social planner's solution to work, spousal income would have to be broken up into its two halves and treated separately if the household is a union of a high- and a low-productivity individual.

21
Legacy and Applications

The works of Vickrey and Mirrlees opened a floodgate, not only in the literature on optimal taxation, but also in general welfare economics and in incentive compatibility.

One of the most immediate results was from Mirrlees' partnership with Peter Diamond. In 1971, they produced a paper that created the *Diamond–Mirrlees Efficiency Theorem*.

Their efficiency theorem determined that a well-designed commodities tax can, under certain circumstances, create a Pareto-efficient allocation. Their analysis assumes that government can raise revenue by taxes, but that lump-sum taxation on an individual basis is unavailable. This means that the first-best optimum is also unavailable to the policymaker.

Instead, a second-best optimum can be realized if there are no other distortions in the economy such as imperfect competition or externalities that cannot be remedied, if production is characterized by constant returns to scale, and if the government can determine a series of consumption taxes for each good that is independent of product prices. By disconnecting producer prices from the ultimate consumer prices, the consumption decision is thus independent of the production decision. Thus production efficiency can be attained, and the vector of individual taxes on consumer prices can allow the government the latitude to achieve both consumption efficiency and optimal distribution of income.

To determine this result, Diamond and Mirrlees began by drawing on the intuition and analysis of Frank Ramsey. As you recall, Ramsey's analysis stated that an optimal commodity tax must differentiate between goods on the basis of their price elasticity. Diamond and Mirrlees generalized this result and afforded the policymaker greater latitude in their

tax policy. In the first of two papers, entitled "Optimal Taxation and Public Production I: Production Efficiency",[1] Diamond and Mirrlees first consider the challenge of imperfect information between the planner and taxpayers, as Mirrlees had demonstrated in his own paper published in the same year. Because individuals differ in their ability to earn income, but the planner cannot observe this ability or effort directly, an effort for the planner to increase tax revenue from a high- and low-ability taxpayer alike would produce a stronger negative incentive on the higher-productivity taxpayer. Those who can contribute the most to additional production instead are hindered. The social planner must then develop a tax plan that provides the appropriate incentive for high-productivity taxpayers to reveal their true ability. This is much like Mirrlees' result.

In the second part of their two-paper series, "Optimal Taxation and Public Production II: Tax Rules,"[2] Diamond and Mirrlees showed that a marginal income tax schedule can be created that impinges on low-income individuals, but is phased out for high-ability and high-wage individuals.

In 1976, five years after Mirrlees and Diamond produced their optimal income taxation results, Joseph Eugene Stiglitz (February 9, 1943–) and Anthony Barnes Atkinson (4 September 1944–) produced a seminal paper entitled "The Design of Tax Structure: Direct versus Indirect Taxation,"[3] In which their results synthesized the contribution of Frank Ramsey, James Mirrlees, and Peter Diamond. The Atkinson–Stiglitz theorem demonstrates that, when households are homogeneous and one's utility can be separated into components of consumption and labor (or leisure), a planner's optimum can be obtained without the use of indirect taxes but through the use of non-linear income taxation. They also assert that, since capital gains taxes are, in effect, a tax on future consumption, and distorts savings, it is inferior to a well-designed non-linear income tax.

To understand their results, let us retain Mirrlees' notion and generalize his results. To allow for the possibility that there can exist non-linear taxes on the individual goods included in consumption, taxpayers indexed by their productivity and wage w, and distributed according to a cumulative distribution function F(w), are able to consume a bundle of goods such that:

$$\bar{x} = (x_1 \ldots x_n).$$

Since households and government are assumed to be price takers, we can adjust the units of the goods such that their prices are normalized

to unity, without loss of generality. Then, consumers pay a price, after tax for the *ith* good of:

$$q_i = 1 + t_i,$$

where t_i is the tax imposed on the good by the social planner. In addition, the social planner can impose a non-linear income tax (TwL), where w is the wage, and L is the amount of labor supplied, in equilibrium as a function of the taxpayer type w.

The taxpayer then faces the following budget constraint:

$$\sum\nolimits_{i-1}^{n}(1+t_i)x_i = wL - T(wL)$$

The taxpayer maximizes the following Lagrangian as a function of taxpayer utility and the budget constraint:

$$\max_{x_i,L} \mathcal{L}_i = U(x_1 \ldots x_n, L) + \lambda\left(wL - T(wL) - \sum\nolimits_{i=1}^{n}(1+t_i)x_i\right)$$

This yields familiar first-order conditions:

$$\frac{U_j}{U_k} = \frac{1+t_j}{1+t_k} = \frac{q_j}{q_k}$$

$$\frac{U_L}{wU_k} = -\frac{1-\frac{dT(wL)}{dwL}}{1+t_k} = -\frac{1-T'}{q_k}$$

The social planner maximizes a social welfare function:

$$\int_w W(U)f(w)dw$$

subject to two constraints. The first is its budget constraint that the total private sector production generated, less the amount consumed, provides its necessary budget B:

$$B = \int_w \left(wL - \sum\nolimits_{i=1}^{n} x_i\right) f(w)dw$$

The second constraint is based on the intuition developed by Mirrlees. The optimal package of non-linear income and commodity taxes, based on an individual's income and productivity, must be set so that the individual w does not choose to represent herself as belonging to another productivity class w^*. Since the social planner does not have

the same information as the taxpayer, the taxpayer must self-select the package of taxes. This can be done by ensuring:

$$U\left(\bar{x}(w), \frac{y(w)}{w}\right) \geq U\left(\bar{x}(w^*), \frac{y(w^*)}{w}\right),$$

where, as before, y(w)/w is equal to the labor supply L(w). From this expression, we can determine a result that flows from the incentive constraint. We do so by constructing the following inequality:

$$0 = U(w) - U\left(\bar{x}(w), \frac{y(w)}{w}\right) \leq U(w^*) - U\left(\bar{x}(w^*), \frac{y(w^*)}{w}\right).$$

Then, the planner can minimize the right-hand side of the inequalities with respect to w^* and set w^* to w to yield the following:

$$0 = \frac{dU(w)}{dw} + \frac{\frac{dU}{dL}y(w)}{w^2} = \frac{dU(w)}{dw} + \frac{\frac{dU}{dL}L(w)}{w}$$

This reduces to a simple expression dU/dw = –(L/w)dU/dL.

We are now ready to set up the social planner's solution that maximizes social welfare subject to both incentive compatibility and the social budget constraint. In contrast to the simple two-person simplification of the Mirrlees case, the Atkinson–Stiglitz solution will determine an optimal path of indirect and commodity taxes on consumers as a function of abilities as indexed by their productivity of labor w. But, while in the simplified Mirrlees example, the social planner optimized Rawlsian utility for two productivity groups, this example will optimize the path of wages, and hence the taxes and the commodity taxes for the distribution of taxpayers as a function of their productivity w.

The social planner must then optimize a Hamiltonian rather than a Lagrangian expression. While the Lagrangian expression is a function that it optimized through the choice of its variables, the Hamiltonian is a functional that is optimized along the entire pathway of a function. The maximization exercise requires maximization of the Hamiltonian with respect to the distribution of wages w, subject to both the resource constraint and the incentive compatibility constraint:

$$\max_{x_i, L} \mathrm{H}_i =$$

$$(W\left(U(x_1 \ldots x_n, L)\right) + \lambda\left(wL - \sum\nolimits_{i=1}^{n} x_i - R\right))f(w) - \frac{\gamma L U_L}{W}.$$

We have already discussed the optimization exercise and the intuition behind the level of non-linear income taxation. We can now derive such a non-linear income tax. The innovation of the Atkinson–Stiglitz result is in the exploration of a non-linear commodity tax imposed on each commodity as a function of the taxpayer, as indexed by her productivity w. The first-order condition with respect to the pattern of consumption of each commodity reveals the optimal price, and the commodity tax, that each consumer must bear.

These first-order conditions with respect to the consumption of each commodity i as a function of productivity w is then given by:

$$0 = \lambda \left(1 + \frac{\delta x_1}{\delta x_k}\bigg|_{\bar{u}} \right) f(w) - \frac{\gamma L}{w} \left(U_{Lk} + U_{L1} \frac{\delta x_1}{\delta x_k}\bigg|_{\bar{u}} \right)$$

The relative rate of change of consumption of one good versus another, holding utility constant, is given by their relative marginal utilities and relative prices:

$$\frac{\delta x_1}{\delta x_k}\bigg|_{\bar{u}} = -\frac{U_k}{U_1} = -(1 - t_k).$$

Using this result, we can solve for the optimal non-linear (individualized) commodity tax $t_k(w)$:

$$t_k(w) = \frac{\gamma L U_k}{\lambda w f(w)} \left(\frac{U_{Lk}}{U_k} - \frac{U_{L1}}{U_1} \right)$$

We can also solve for the optimal non-linear commodity tax relative to the commodity price:

$$\frac{t_k(w)}{q_k} = \frac{\gamma LMUI}{\lambda w f(w)} \left(\frac{d(\log (U_k / U_1}{dL} \right)$$

where MUI is the taxpayer's marginal utility of income. If the marginal utility of consumption does not depend on income and labor supply, the term in brackets above is equal to zero, and a commodity tax is not necessary to achieve the social optimum. However, Atkinson and Stiglitz find that the optimal commodity tax is positive if utility for the kth good is valued more highly with increased labor, and hence is consumed more with increased leisure, given declining marginal utility, relative to the normalized good 1. In other words, if we relax the assumption in the Mirrlees example that utility is separable in consumption and leisure, the optimum is achieved by taxing more heavily for each taxpayer w those items more closely associated with increased leisure.

These results are insightful. Assuming that income is derived from productivity, the Mirrlees result, and the elaborations flowing from his collaboration with his colleague, Peter Diamond, in 1971, commend for an average tax rate that rises with productivity and income, as tax brackets are ratcheted upward, while the incentive for the most productive to produce more is reduced through a falling marginal tax rate. Atkinson and Stiglitz show that this result optimizes social welfare only if consumption and leisure are independent in the generation of utility. They then show that, if the level of utility simultaneously includes the dimensions of consumption and leisure, social welfare is enhanced if a commodity tax is imposed on those goods most closely consumed with leisure. However, while it may be feasible to create non-linear income tax brackets that are assessed based on productivity, it is not feasible to also individualize commodity taxes in such a way.

Other authors have further refined these two contributions to our intuition. However, they do not negate the intuition. If the policy goal is to tease more production out of the most productive, a lower marginal tax rate on earned income makes good public policy sense, even if it challenges equity sensibilities And if the social planner wishes to further encourage production, it can do so by discouraging the consumption of those goods most associated with leisure, through a tax proportional to the good's complementarity with leisure.

The results also confirm our intuition that producer prices should remain undistorted, should the production market be free of externalities or imperfect competition. In the absence of such market failures, a social optimum can be achieved through income redistribution, combined with individualized commodity taxes. A value-added tax that shelters the producer from such direct fees can be an integral part of the social optimum – if not quantitatively, then qualitatively.

And, since the Mirrlees example demonstrates that the more highly productive class may have to fully subsidize the income of lower-productivity individuals, who are more highly taxed on the margin, but more than indemnified using an Earned Income Tax Credit, the tax authorities have even more tools to employ and policies to ponder.

Mirrlees, Diamond, Atkinson, and Stiglitz have combined to enhance our intuition with regard to the effects and problems associated with our various tax instruments. For these additions, these have been fully recognized, even if public policy makers lag in their incorporation of these scholars' results into modern tax policy.

22
The Nobel Prize

In 1986, William Vickrey and James Mirrlees were the joint recipients of the Nobel Memorial Prize in Economics for, as the citation phrased it, their fundamental contributions to the economic theory of incentives under asymmetric information".[1] The committee added:

> In the late 1940s, Vickrey also formulated a model indicating how income taxation can be designed to attain a balance between efficiency and equity. A quarter of a century later, interest in this model was renewed when James Mirrlees found a more thorough solution to the problems associated with optimal income taxes. Mirrlees soon realized that his method could also be applied to many other similar problems. It has become a principal constituent of the modern analysis of complex information and incentive problems. Mirrlees's approach has become particularly valuable in situations where it is impossible to observe another agent's actions, so-called moral hazard.

James Mirrlees found out about the prize mid-morning on October 8, 1996. He was told that the Royal Swedish Academy of Sciences had awarded him the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel. His first response was that the news seemed unlikely, and that he wanted proof. Mirrlees knew a colleague of his was on the other line, so he asked his friend to confirm the legitimacy of the award announcement.

Next, Mirrlees thought the award was surprising. Most of the Nobel awards had been for particular innovations, but within the context of a lifetime of work. And most concepts awarded had withstood the test of decades of time. The innovation they cited, for asymmetric information, especially from a public policy perspective, had not yet been fully

absorbed by the literature to the extent it is today. In this respect, the Nobel Memorial Committee was even more prescient than usual.

Mirrlees' next challenge was to complete his tasks of the week while he avoided the barrage of journalists. For instance, after Kenneth Arrow won his Nobel Prize in 1972, his wife shared with the wife of the 1985 winner Franco Modigliani (June 18, 1918–September 25, 2003) that, when one receives a call from the Nobel committee, one must immediately take a shower because journalists will be at the front doorstep in minutes.

Most recipients of the Nobel Prize are associated with leading universities and those universities that house many Nobel winners have long-established protocols for handling the media and performing the requisite press conferences on the day of the award. At that time, Cambridge University was not so sophisticated in this respect. It is constituted by many individual colleges, sometimes in apparent competition with one another, which often complicates the coordination of public relations events. Eventually, a modest press conference was assembled, but the press did not have a good opportunity to interview Mirrlees.

Had they done so, they would have found Mirrlees to be an honest and sincere, perhaps even a humble man. His area of interest, tax policy and asymmetric information, is not one that often propels him into the public sphere. However, since receiving the award, he has enjoyed a number of opportunities to speak around the world about his ideas and how his ideas can offer insight into practical problems of public finance.

23
The Later Years of James Alexander Mirrlees

The Mirrlees family thoroughly enjoyed their sabbatical year at MIT, and James his collaboration with Peter Diamond. Upon his return, Mirrlees had moved to Oxford University. He had been offered professorships at MIT and at the London School of Economics, but he had always preferred small towns, and Oxford and Cambridge were quite large enough. Oxford also afforded him the opportunity to work solely with graduate students, something which would not have been possible at the other institutions.

At Oxford, his former mentor, David Champerowne, had held a chair that had to be specifically filled by a scholar with expertise in mathematical economics or econometrics. The opening was difficult to fill, as Mirrlees modestly implied, so they offered it to him. In 1968, he was barely 32 years old, and occupying the Edgeworth Chair, one of the world's most prestigious professorships.

At Oxford, Mirrlees continued to work on a tangent to his non-linear income taxation. An essential element of his work on optimal income taxation was that one set of incentives would not apply to all, indexed perhaps by some sort of easy to discern variable, such as income. An example of a simple non-linear income tax system would be progressive income taxes. However, Mirrlees had realized that the optimal public policy prescription is one that has the various agents self-select because a less sophisticated set of incentives may force one subset of the population to choose to belong in one category while the social optimum prefers them in another. This is the notion of the concept of asymmetric information he and Vickrey had developed. We know our skills, but we may not wish to reveal them. The Great Mind Mirrlees' idea was to form a system of incentives that induce us to act is society's best interest.

At MIT Mirrlees began his work on non-linear incentives with Peter Diamond. From their joint work, which proved exceedingly difficult, he refined his application to optimal income taxation, as described earlier. His own work, and also their joint work, spawned a renewed literature on optimal taxation theory, and, more generally, the principal–agent problem. At about the same time, the Great Minds Michael Jensen (November 30, 1939–) and William Meckling (September 20, 1921–May 15, 1998), documented in a previous volume of this series, were developing a parallel principal–agent literature in management theory and corporate valuation.

While at Oxford, in addition to the supervision of many high-quality graduate students, Mirrlees was appreciated as a diverse supervisor, willing to supervise students from many other fields. This allowed Mirrlees to immerse himself in areas as varied as game theory, welfare economics, the principal–agent problem, implicit contract theory, and industrial economics.

Oxford University was particularly eclectic at that time. However, in November of 1993, his beloved wife Gillian died after a five-year struggle with cancer. By then, too, their children were young adults and had married. When Cambridge University and Trinity College came calling in 1994–95 with an available chair, James Mirrlees returned to the Trinity fold.

Mirrlees remained at Trinity College following the Nobel Prize. But he reserved more time to travel, lecture, and consult. He eventually retired as Emeritus Professor of Political Economy at the University of Cambridge and a Fellow of Trinity College, Cambridge. Mirrlees remains the Distinguished Professor-at-Large of the Chinese University, were he was recently appointed Founding Master of Morningside College. He also spends time at the University of Macau and at the University of Melbourne in Australia.

Over the course of his career, Mirrlees was visiting professor at Yale in 1989, MIT in 1968, 1970, and 1976, and the University of California Berkeley in 1986. From 1989 to 1992 he presided over the Royal Economic Society and is a fellow of the Econometric Society. He has also acted as a government advisor the governments of the United Kingdom, India, Pakistan, China, and other nations over the course of his illustrious career.

Mirrlees is also a member of the Council of Economic Advisers in Scotland, and directed the Mirrlees Review, which considered the United Kingdom tax system on behalf of the Institute for Fiscal Studies. During the debate in 2014 regarding Scotland's referendum to expand

its self-governance and economic independence, Mirrlees was a vocal participant in the public debate.

Sir James Alexander Mirrlees was knighted by Queen Elizabeth II in 1998.

Mirrlees also likes to observe that in his spare time he enjoys "playing the piano, reading detective stories and other forms of mathematics, travelling, listening."[1]

24
The Later Years of William Spencer Vickrey

William Vickrey shared the Nobel Memorial Prize with James Buchanan in 1996. Unfortunately, Vickrey was unable to accept his award as he died of heart failure soon after the announcement of his award. On October 10, 1996, two days after he received notice of the award, he suffered a fatal heart attack while driving to a regional economics conference.

Columbia University released a statement following his death that gave us all a sense of his endearing humility and humor. They noted:

> When asked the significance of becoming a Nobel laureate, Bill Vickrey characteristically answered that it would give his ideas a better hearing. It is our hope that the work of this dedicated and important scholar will continue to be given the worldwide attention it attracted this week.[1]

Since Vickrey could not accept the prize in person, it was accepted on his behalf by C. Lowell Harriss, his Columbia University colleague.

William Vickrey is well remembered by a few, but his ideas are known by many. He developed the concept of non-linear income taxation, but he did so within a model of general welfare analysis. He pioneered the notion of a social welfare function that was later adopted by John Rawls and spawned perhaps the most influential philosophical work in the latter half of the 20th century. He also pioneered the notion of congestion pricing in urban economics.

Some of his earliest work was actually done in this area of urban and regional finance and economics. He had been commissioned to determine the optimal pricing of public utilities, especially at first electric power. He noted that an optimal tariff should be both non-distorting

and appropriately representative of the need to have consumers act within a greater public interest in their energy consumption.

He took the idea of a public or social optimum to a study of transit fares on behalf of New York City's "Mayor's Committee on Management Survey" in 1951. The year earlier, he had been a member of a commission that developed a revised tax system for Japan. In fact, he lectured and consulted around the world and to the United Nations on the issues of public facility utilization and of national tax systems.

Vickrey was elected to the National Academy of Sciences. In 1992 he also presided over the American Economic Association (AEA), the association that John Bates Clark had once helped found. Vickrey was named a Distinguished Fellow of the AEA, a fellow of the Econometric Society and of the American Academy of Arts and Sciences, and he presided over the Metropolitan Economic Association and the Atlantic Economic Association. He also received the F.E. Seidman Distinguished Award in Political Economy, and an honorary doctorate from the University of Chicago.

William Vickrey was raised in a family of heightened and profound social consciousness. He shared and practiced these values over the course of his entire life. Vickrey helped found an organization called "Taxation, Resources, and Economic Development" and was involved with the Quaker organization "The Religious Society of Friends". Vickrey followed his father's legacy, and that of the Great Mind and Columbia professor John Bates Clark, and devoted much of his later career to the fostering of world peace.

In his lifetime Vickrey wrote eight books, 139 articles, 27 reviews and another 61 unpublished papers in his life, according to the 1994 volume of *Public Economics: Selected Papers by William Vickrey*.[2]

William Vickrey was survived by his wife of 45 years, Cecile Thompson, who had shared with him their family life in Hastings-on-Hudson, near New York City.

Section 3

Divergent Arguments for the Public Sector

Henry George's *Poverty and Progress* fomented the debate of whether to, and then how best to, raise the funds to finance the public sector. The debates, from a variety of perspectives, invariably contained – just below the surface – various assumptions about the legitimate role and extent of government. But, without a full discussion of the role of government, it is difficult to fully triangulate the strength of the respective arguments developed by the Great Minds of Ricardo, George, Clark, Vickrey, Mirrlees, Ramsey, and others.

We next delve into the approaches to public finance offered by Knut Wicksell, Richard Musgrave, and James Buchanan. Much of what we now know as the theory of the public sector began with the Swedish economist Knut Wicksell. His contributions were lost to the English-speaking world of public finance until his ideas were resurrected and translated by others. Then, in the 1950s, a new literature blossomed.

25
The Early Life of Knut Wicksell

Situated at the northernmost vantage point of Europe, Scandinavia has always offered a unique perspective, on both markets and the role of government, and on how these two institutions ought to interact. Other schools of thought, such as the Austrian or the Chicago School, might emphasize individualism. The Chicago School often concludes that the public sector can do nothing which could not be done by the private sector either equally well or better. The Communists of the late 19th and early 20th centuries swung the pendulum hard in the other direction. The Stockholm School charted a middle course between the two extremes of socialism and fully privatized economies. In doing so, the Stockholm School recognized what could cause either extreme to fail, and articulated the need for government to correct failings in the private economy.

John Maynard Keynes and Alfred Pigou are often remembered for their description of the role of private market and of coordination failure. Their regard reached an apex in the middle to late 1930s as economies across the world were dragged down by the Great Depression. However, many of their ideas were already widely understood in Sweden almost two generations earlier. Indeed, the disciples of Knut Wicksell, many of whom have gone on to redefine modern economics, refer to Wicksell as the father of the *Stockholm School*.

There is also no Great Mind is this series, and perhaps elsewhere, who has been imprisoned for the courage of his economic convictions. Wicksell is most unusual. His upbringing had elements that were quite common and also equally unusual.

Wicksell's name is likely anglicized from Wixell, the name that belonged to Jacob (1748–4 June 1815) and his wife, Caisa Haglund (June 21, 1746–July 23, 1816), a couple who lived modestly and piously

in the Uppsala region of Sweden. Located about seventy kilometers north of Stockholm, this region is the cradle of religion and higher education in Sweden. Their child, Johan Eric Wixell (June 6, 1784–1840) and his wife, Catharina Abrahamdr, gave birth to Jacob's grandson Johan Wicksell (February 26, 1806–November 20, 1866), who grew up to be an enterprising merchant and minor real estate trader in Stockholm in the middle of the 19th century.

Johan had married Christina Catharina Glassel (October 13, 1815–1857). They had a child, Johan Gustaf Knut Wicksell on December 20, 1851, in Stockholm.

Johan often reinvested the profits from his real estate into the purchase of more property. As a consequence, the family of Knut Wicksell found itself to be asset-rich and income-poor. When his second wife, Christina Catharina, died in 1857, after 16 years of marriage, Knut's father was left on his own to support his family of five children. Knut was only six years old when he lost his mother. He then lost his father just one month shy of his 15th birthday. Fortunately, by this time the father had built up sufficient real estate assets to afford his children an opportunity to complete high school and attend college.

Knut and his brother both attended the University of Uppsala, one hour north of their home in Stockholm. Uppsala was, and remains, one of the most prestigious universities in Europe. Founded in 1477, it had, even before the writing of Adam Smith, established the first professorship in *practical economics* to be found outside of Germany. The goal of the endowed chair in economics was to apply the techniques of the natural sciences to economic questions.

At Uppsala, Wicksell chose instead to study the natural sciences for which Uppsala was also well known. In half the time required for most students, he graduated with a Bachelor of Science degree with honors, in astronomy, physics, and mathematics.

For generations, the Wicksell family had been religiously devout. Knut's religious devotion deepened, especially after his father's death. However, the last quarter of the 19th century was a period of great philosophical evolution in liberal thought. It was also an era in which the dramatic changes and displacements arising from the industrial revolution were fomenting a revolution in our view of the human condition. This was an era in which the seeds of Scandinavian socialism and patriarchal benevolence were being planted. Knut wanted to continue his formal study and life in a way that had more meaning and make a lasting contribution, and he doubted he would have a transformational effect on humanity as a physicist.

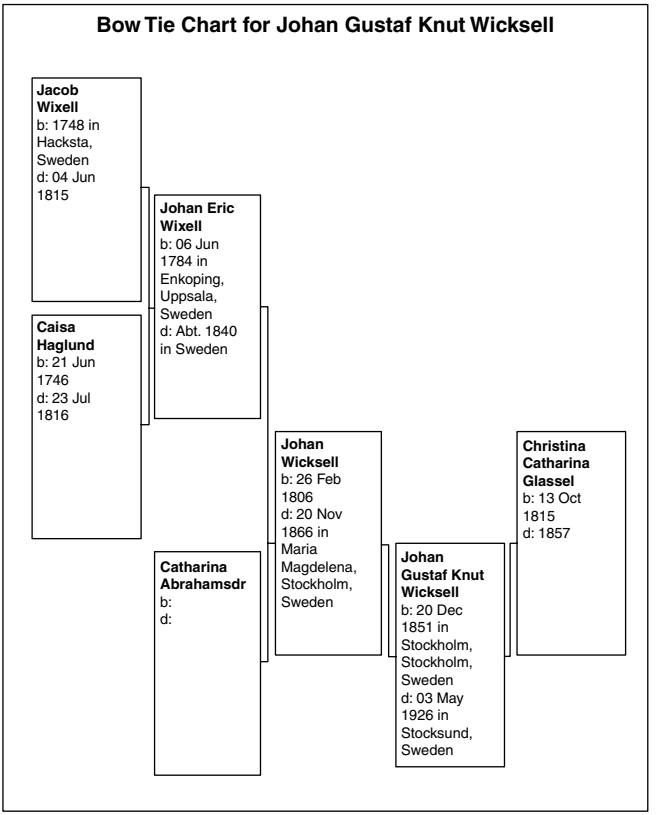

Figure 25.1 Ancestors of Knut Wicksell

The dramatic growth of population and human congestion that went hand in hand with increased national income and urbanization was also creating a number of other social problems. Wicksell was to become particularly concerned by two of these: alcoholism and prostitution (which he viewed as being completely degrading to women). He believed these two social maladies occurred because of the lack of hope among the poor that they would enjoy any share in the spoils of economic progress. Wicksell was outspoken in his concerns for humanity.

Of course, almost a century earlier Thomas Robert Malthus had shared the same dismal prophecies when he warned of the threats of overpopulation. Wicksell also agreed with David Ricardo, the first of the *marginalists*, who observed that excessive population growth dilutes

the amount of physical capital devoted to each laborer, and hence reduces the levels of both productivity and wages. Ricardo argued that an increase in the population would lead to the cultivation of less fertile land and thereby reduce average agricultural productivity and income. On the other hand, if we could restrain the levels of population growth, it would be possible to better manage economic growth and also ameliorate poverty.

Wicksell went farther in his moral explorations of population growth than perhaps many would have done at the time. He advocated for the use of contraceptives and, later in his life, advocated for the legalization of abortion – views that he publicized through the production of a number of brochures that were circulated and he received considerable criticism for espousing such controversial views. Members of the faculty at Uppsala were shocked by his activism, warned him about his conduct and publicly denounced him for his views.

While Wicksell hoped he would be able to continue with his academic and moral education, his controversial opinions barred him from many of the paths traditionally available to one with his intellect and originality. Instead, the university felt it safest for him to study mathematics, for which he received his PhD in 1885.

Using what remained of his share of the funds his father had left him, Wicksell travelled to London to learn of the new theory of utility developed by William Stanley Jevons (September 1, 1835–August 13, 1882). There, he combined his self-taught studies in economics with income earned as a correspondent journalist. He also travelled to the centers of intellectual economic thought in mainland Europe. He went to Vienna to absorb elements of the Austrian School from its founder, Carl Menger (February 23, 1840–February 26, 1921). While there, he was also introduced to the work of the Austrian School economist Eugen von Böhm-Bawerk (February 12, 1851–August 27, 1914), Menger's primary disciple and the developer of the notion of the contribution of capital, in response to Marx's criticisms of capitalism.

Wicksell returned to Sweden on occasion to continue to stir the intellectual pot with public lectures on socialism, contraception, marriage, prostitution, religion, and euthanasia. Then, during a period of self-imposed intellectual exile in Paris, Wicksell cemented a love affair by becoming the common-law life partner with a woman who was as intellectually driven as he was himself.

Anna Kristine Margrete de Bugge (November 17, 1862–February 19, 1928) was the granddaughter of a German politician – and also a member of the German aristocracy. She was also, in every respect, Wicksell's intellectual kindred spirit. Born in Huntsville, Norway to Jens Ulrik

Ferdinand Bugge (February 9, 1838–August 14, 1906) and his wife and cousin, Anne Hermine Bugge (November 10, 1840–1922), Anna was an uncommonly brilliant and outspoken woman in her era. She had graduated from high school in 1881 and then took private classes to earn her college degree in 1885. She started law school in 1887, but her extracurricular activism began to consume increasing amounts of time.

By the mid-1880s, Anna had become an organizer of the Norwegian feminist movement and, in 1888, she was elected to chair the Norwegian Association for Women's Rights. She used her position to advocate for women's economic independence and also for the introduction of programs to alleviate the poverty that affected many unmarried women.

The moral and intellectual agendas of Anna and Knut were almost perfectly aligned. When Anna Bugge was asked by her association to accept an invitation to attend a women's suffrage conference in Paris in 1889, she used the opportunity to meet Knut there and to further their love affair. The couple remained together for the rest of their life.

This relationship and the living arrangements between the 26-year-old Anna and her socially radical lover, who was 11 years her senior, without the blessings of a church marriage, caused her family considerable offence and she was never return to Norway. Instead, she returned with Wicksell to Sweden, and continued her work in feminism and peace advocacy, before completing law school at the University of Lund. She eventually secured Swedish citizenship, and was later named her adopted country's first female diplomat. In a culmination of her achievements, Anna was eventually appointed by Sweden to represent it at the League of Nations.

At that time, Continental European economics departments were often housed within schools of law. Upon his return to Uppsala, Wicksell enrolled in law school in the hope that it would be a pathway to an opportunity to teach the economics he was absorbing and discovering for his self. In 1897, at the age of 45, he began his study of law, and, again two years early, he graduated in 1899. With a law degree in hand, and a mixed reputation for his controversies at the University of Uppsala, he was offered a brief lectureship in economics.

Before long, however, Wicksell was again in trouble as a faculty member for his advocacy for his novel solutions to the problems of alcoholism and prostitution. With his penchant for antagonizing the reactive Uppsala academic community by his controversial lectures, he soon felt it prudent to apply for an academic position at the University of Lund. With a law degree in hand, a PhD in mathematics, and study both under and of some of the luminaries in European economics,

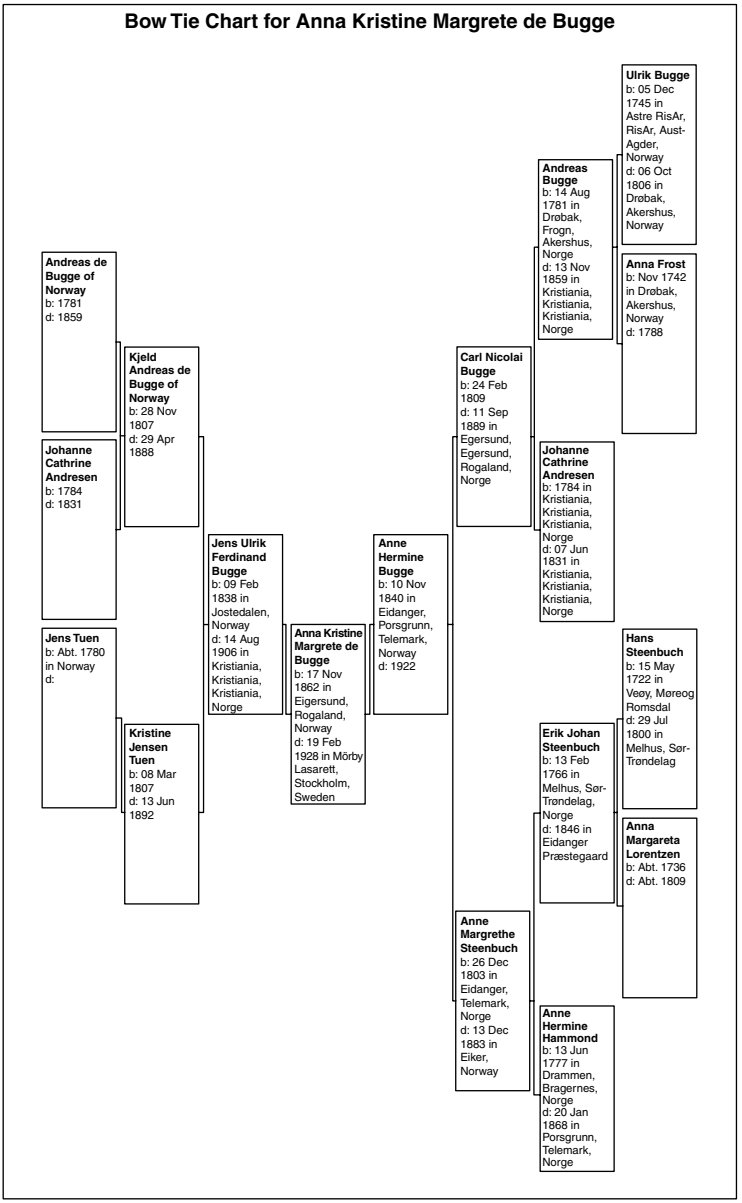

Figure 25.2 Ancestors of Anna Kristine Margrete de Bugge

Wicksell beat out three other competitors for the available position teaching economics at Lund. He jumped out of the fire and accepted a permanent position at the University of Lund.

On May 1 of 1904, exercising his by then infamous political activism, he used the occasion of the annual May Day demonstrations to declare that it was futile for Sweden to invest in defenses that offered it no possibility of protecting it from its better-armed neighbors. He proposed that Sweden discontinue its military and that it should instead petition Tsarist Russia to annex it. This would mean that Russia could provide Sweden with effective protection, and in return Sweden could educate the backward Russia on the issues of democracy and freedom. As might have been anticipated, his speech was not widely appreciated.

Four years later, Wicksell again tested the boundaries of civil disobedience and freedom of expression. In 1908 he delivered a lecture which satirized the immaculate conception of Jesus Christ. The authorities were not amused, however. Wicksell found himself charged with and convicted of blasphemy. After two years of trials and appeals, he was given a prison sentence. After two months, however, he was released to resume his teaching at Lund.

Wicksell was to remain at Lund until his retirement there in 1916. While he retired from academia, he continued with his penchant for public policy. Following his university experience, he accepted an offer in Stockholm to advise the government on finance and banking.

Wicksell was not the *Stockholm School*, but he was credited as their inspiration by many of those now considered part of the school. These include Eli Filip Heckscher (November 24, 1879–December 23, 1952), the 1977 Nobel Memorial Prize winner Bertil Gotthard Ohlin (April 23, 1899–August 3, 1979), and his students Erik Lindahl (November 21, 1891–January 6, 1960) and Dag Hjalmar Agne Carl Hammarskjöld (July 29, 1905–September 18, 1961), the second secretary general of the United Nations.

26
The Early Life of Richard Musgrave

Richard Abel Musgrave had a name that, unlike most Great Minds in this volume, had not resided long in this nation. In fact, the name was even relatively new for him. His ideas were also refreshingly new.

The middle name of Richard Abel Musgrave has a long history, however. In the Bible, Abel was the fifth human to have lived, as the second son of Adam and Eve, and the younger brother to Cain and Cain's twin sister. Abel was also the first to die, murdered by his brother because he refused to allow Cain to marry his own twin sister.

The Hebrew name Abel means "breathing spirit." This traditional Jewish name was passed down to Markis Abel, a Jewish banker who was born in Stargard, Pomerania, Prussia on December 9, 1745. The name Stargard, which literally meant "old town," was the commercial and political capital of the Province of Pomerania, first as part of the Kingdom of Prussia and then, in 1871, as part of the German Empire. Following the Potsdam Agreement following World War II, Stargard became part of Poland.

At the time of Markis Abel's birth, Stargard had a population of just over 5,000. There, Markis founded a regional bank that lasted until its bankruptcy in 1895.[1] Up to that point the Abel family was financially secure, with many of its sons trained to serve in the family bank. Markis Abel trained his son, Gerson Abel (November 1, 1791– ?) to follow in his banking footsteps. Gerson did so, both before, and again after his participation, as a 21-year-old, in the Royal Prussian Army in combat during the Napoleonic Wars.

Upon his return from war, Gerson Abel continued to clerk for his father for a few years. He then moved to Berlin in 1826, where, on November 25, 1827, his wife Frederike Basswitz (September 11, 1805– ?) gave birth to a boy, christened Carl Kalonymus Abel.

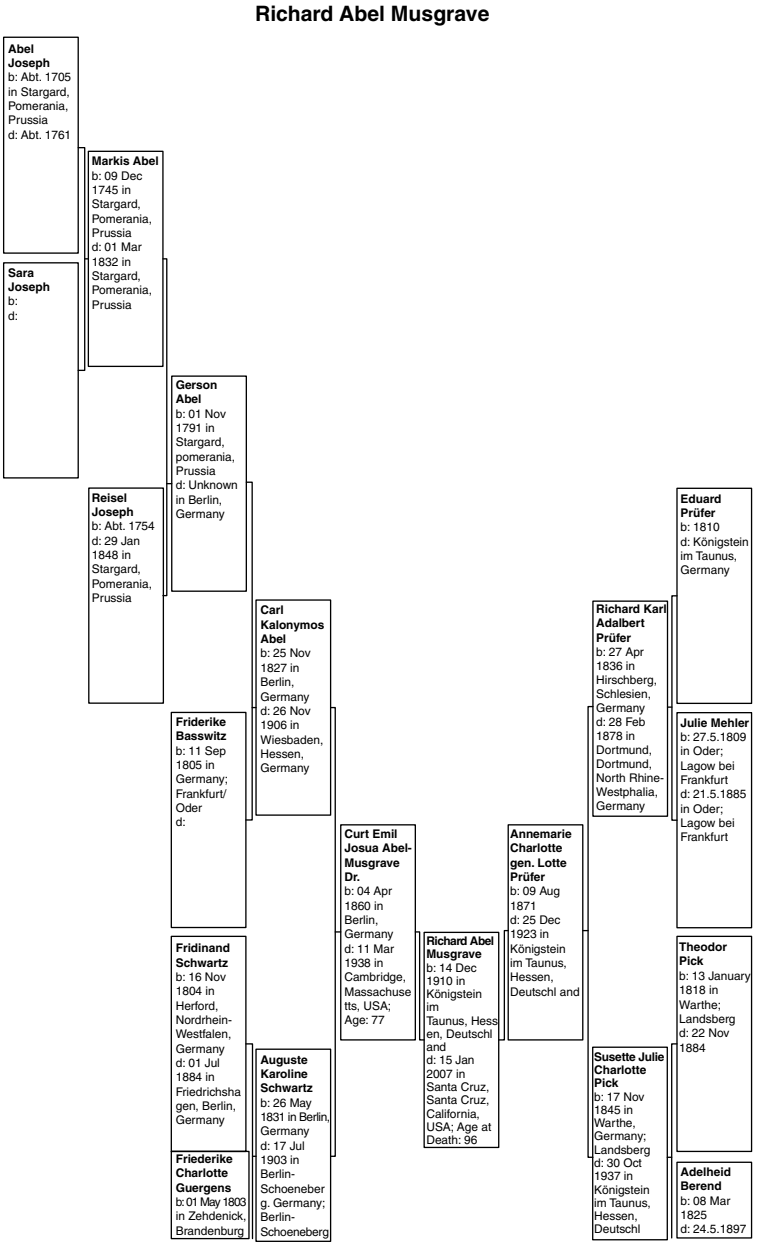

Figure 26.1 Ancestors of Richard Musgrave

Carl's move to Berlin was also a departure from his family's banking business. He was the first in the family to embark on a new branch, in the family tree, as an academic. He became a Professor of Linguistics at the Berlin Humboldt Institute, with a specialty in *philology* – that is, the study of language within written historical documents. Carl was a pioneer in the new academic field of philology. He wrote a dictionary of Egyptian-Semitic-Indo-European roots in 1884. His concepts and terms were also adopted by Sigmund Freud in Freud's search for archetypes.

Carl's studies brought him around Europe, and afforded him the opportunity to learn 52 languages.[2] Carl also wrote extensively in English, especially as the Berlin correspondent for the *London Times*. He taught briefly at Oxford, wrote 40 books, and parlayed his language skills into an active translation practice. He became a leading translator of great works into German, including the plays of Shakespeare.

Upon his return to Germany, Carl became a participant of the Royal Court of German Emperor Frederick III and his wife, Empress Frederick (November 21, 1840–August 5, 1901), the eldest daughter of Queen Victoria and Prince Albert. As a member of the intellectual elite in Berlin in the second half of the 19th century, Carl Abel married into German wealth and aristocracy, and, at the same time, he converted from Judaism to Protestant Lutheranism. The marriage of Carl Abel and Auguste Karoline Schwartz (May 26, 1831–July 17, 1903) produced one son, Curt Emil Josua Abel, who was born on April 4, 1860 in Berlin.

Young Curt was immersed in the rich intellectualism of the court of the Kingdom of Prussia, and from his vantage point within the intellectual elite he was able to witness its transition to the German Empire in 1871. Curt also followed in the classical education of his father.

Curt had a rebellious spirit of social justice. He harbored strong opinions and was critical of the increasing militarism of his home country. The views and writings he expressed leading up to the Great War, combined with his Jewish ancestry, meant that his days in Germany post-World War I were numbered. Even before the war, he had been forced to leave Germany for England because of campaigns he waged over the actions of German officers. While in England, he befriended Arthur Conan Doyle, who had been developing a character named Musgrave for his Sherlock Holmes series. Curt adopted this name to anglicize his persona and distance himself from his Jewish heritage in those troubling times. He eventually translated many of Doyle's books, especially the Sherlock Holmes series, into German, as he had also done for many Rudyard Kipling stories.[3]

Curt Abel was actually trained as a chemist, but it is for his translations that he is best known. However, he also wrote a number of novels and

poems. His writings often strayed into political commentary, however, which at one point yielded him a sentence in military confinement.[4]

On August 17, 1907, Curt Abel-Musgrave married Annemarie Charlotte Prüfer, in Frankfurt, Germany. Annemarie was the daughter of Richard Karl Adalbert Prüfer (April 27, 1836–February 28, 1878), a prominent German politician, and his wife, Susette Julie Pick (November 17, 1845–October 3, 1937). Like Curt's father, Annemarie's mother, Susette, was a convert from Judaism to Christianity. Curt and Annemarie raised their eldest child, daughter Ellen Angela Ilse Iris Abel-Musgrave (August 29, 1908–April 12, 1988) and son Richard Abel-Musgrave, in the Lutheran faith.

Richard Abel-Musgrave was born on August 14, 1910 in Königstein, Hessen Province, Germany and spent much of his early years growing up in the Hessen region, his mother's familial home. His mother's family was wealthy, which afforded her the time and her region the geography to pursue her passion of mountain climbing, an avocation that was highly unusual for a woman of her era. However, barely a week after his 13th birthday, Richard's mother died, on Christmas Day 1923.

With the death of his mother, and partly because of the rather intense academic and translation career of his father, Richard was sent to Stiftungsland Landschulheim am Solling, an exclusive private boarding school in the West Saxony region of Germany. There he received an education in the Classics, which culminated in an education and an *Arbitur* degree – equivalent to a Bachelor of Arts degree.

At the age of twenty, Richard moved to Munich to study economics at the University of Munich. There, he was immersed in the same Austrian and Marginalist Schools of instruction that John Bates Clark had enjoyed in his own studies at Heidelberg. Richard transferred to Heidelberg a year later.

In 1933, armed with a Diplom-Volkswirt degree, broadly equivalent to a Master's in the American university system, Richard made the transatlantic voyage by boat to the United States to attend Rochester University in New York. Soon after he transferred to Harvard University, where he earned his PhD in Economics in 1937. He applied for American citizenship that year. In the process, he dropped the hyphen in his last name, and became Richard Abel Musgrave.

Richard's arrival in the United States was fortuitous. He was one of dozens of German economists and hundreds of academicians who had come to the United States in the 1930s, many of whom had fled intellectual persecution. Most were Jews who had fled religious persecution and had likely also escaped death in the Holocaust.

While at Heidelberg, Richard Musgrave had been taught by one of the leading economists of a generation, Jacob Marschak (July 23, 1898–July 27, 1977). Marschak was a strong influence on Musgrave, as he was with a multitude of post-war economists, especially the Jewish refugee wave.

In many ways Marschak was the economic equivalent of a chemical catalyst. A catalyst dramatically increases the rate other chemical reactions occur, and it does so without in any way decreasing its ability to continue to accelerate additional reactions. Marschak made many contributions of his own, but he is most often recognized when others are asked who has inspired them. Great Minds such as Leonard Jimmie Savage, Milton Friedman, Kenneth Arrow, Harry Markowitz, and even Franco Modigliani, and other Nobel Prize winners, number Marschak among their own short list of inspirations and mentors. While at Heidelberg, Musgrave was heavily influenced by the technical, fiscal, and humanistic teachings of Marschak.

Marschak was born in Kiev, Ukraine on July 23, 1898 and raised in an upper-middle-class Jewish family of jewelers. He was still a teenager when the Russian Revolution swept through his region. He was drawn into an independence movement at that time, and even served for a few months as the Minister of Labor for the Social Democratic Party that had taken power temporarily. Soon, his youthful anti-Czarist ideas landed him in prison, until the Czarist regime was overthrown. By then, however, he recognized the need to leave Ukraine for his own safety. Like John Bates Clark before him, Marschak pursued his interest in economics at the University of Heidelberg, receiving his PhD in 1922 and continuing to teach there. But, once the Nazis had assumed power in 1933, Marschak recognized that his Jewish heritage would bar him from a permanent university position. In the same year, Musgrave felt it prudent to move from Heidelberg to the United States, as Marschak moved his family to Oxford University, courtesy of funding by the Laura Spelman Rockefeller Memorial Foundation.

Endowed by the US industrialist John D. Rockefeller, Jr., the foundation was run by Beardsley Ruml, an experimental psychology with a PhD from the University of Chicago. Ruml believed strongly that the social sciences needed to employ modern statistical and mathematical methods. The Foundation funded Marschak to bolster the level of mathematical sophistication at Oxford, and, soon thereafter, the United States. After four years at Oxford, Marschak brought his skills and Ruml's philosophy to the New School for Social Research in New York City just as the United States was entering World War II. Marschak had

joined the so-called *University in Exile*, a select group of almost 200 anti-Fascist scholars who were attracted to the New School by Alvin Johnson between 1933 and 1945. From his new academic home, Marschak fostered an economic philosophy and school of thought. While at the New School, Marschak channeled his youthful activism into advocacy on behalf of other Russian and Eastern European refugee scholars. He was particularly instrumental in attracting intellectual refugees seeking escape from Nazi Germany, and then during the Cold War from the Soviet Union. Marschak had also been instrumental in encouraging Musgrave to pursue his studies in the United States.

Richard Musgrave completed the requirements for and successfully defended his PhD. at Harvard University in 1937. His thesis, entitled "The Theory of Public Finance and the Concept of Burden of Taxation",[5] provided a synthesis of the accumulated knowledge regarding the burden of taxation that had been developed bymany theorists, including Ricardo, George, Pigou, Clark, Edgeworth, and Ramsey. But Musgrave had, in particular, absorbed the theories Knut Wicksell had described in the previous century. Musgrave's synthesis of Wicksell's writings contained elements also included some of his own original thoughts, and which he would revealed twenty years later.

Musgrave's thesis, and his subsequent 1939 paper published in the *Quarterly Journal of Economics*, named "The Voluntary Exchange Theory of Public Economics",[6] brought and extended Wicksell's concept of the role of government to the English-speaking academic world. Fifteen years later, Paul Samuelson produced his "The Pure Theory of Public Expenditure"[7] based on the same foundations Wicksell had produced in the previous century and Musgrave had more recently introduced. In fact, Samuelson even suggested that the Nobel Memorial Prize committee had been remiss in not awarding the prize to Musgrave for his extension of the insights of Wicksell, Pigou, and others.[8]

Upon his graduation in 1937, Musgrave was to remain at Harvard as an instructor for four more years. In 1941, he left Harvard to take up a post at the Federal Reserve in Washington, DC. Over the course of World War II, he was the personal assistant to the then Federal Reserve chairman, Marriner Stoddard Eccles (September 9, 1890–December 18, 1977), a zealous opponent of Keynesian fiscal expansion who fought to limit wartime inflation.

By this time, he was a European aristocrat who had adopted a new nation and had embarked on the development of new ideas in public finance and expenditures, but with a strong European flavor.

27
The Early Life of James Buchanan

James McGill Buchanan's ancestry was forged from equal parts of self-reliance and of defiance of a view of government worried less about self-determination and more about social coercion. From this heritage flowed a new theory of the role of government which we now call public choice. Central to this theory is the need to establish a balance between the aspirations of the individual, society, and the state. Buchanan proposed a balance that diverged from the prevailing thought espoused in the great urban cities of Northeastern United States, and instead represented the sensibilities and realities of an individualistic rural South still reeling from the loss of a civil war. His personal philosophy was more self-reliant in nature, reflecting his upbringing and heritage.

The Buchanans of the United States had their roots in the north of Scotland. In the 17th century, peasants in this region had more in common with northern Ireland than it did with England. The prevailing British culture was intolerant of Presbyterian Protestants, whom found more in common with the perhaps even more substantially oppressed Catholic Irish. Many Scots found their way across the 22-mile Straits of Moyle between Stranraer, Scotland, and Belfast in what is now Northern Ireland.

Some of these expatriated Scots discovered that their new country, Ireland, offered even bleaker prospects. The British imposed tariffs on Irish products in the 17th and 18th centuries, much as they had done in the case of the American colonies in the same era. However, at least the more distant colonies enjoyed a greater degree of autonomy provided by the buffer of the expansive Atlantic Ocean. Accordingly, during this time many Scots moved from Ireland to America, including the first Buchanans, who eventually settled in the state of Tennessee. These *Irish-Scotch* would frequently be drawn to settle first in either Pennsylvania or Virginia in search of religious and economic freedom.

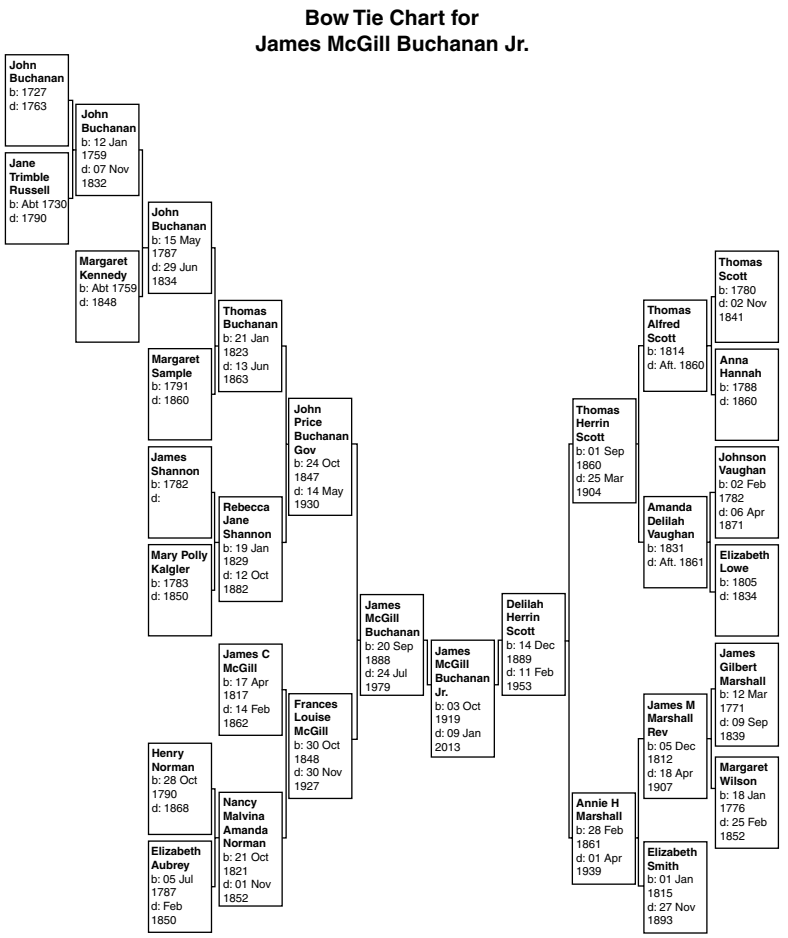

Figure 27.1 Ancestors of James Buchanan

Those who travelled to settle in Pennsylvania were following the vision of William Penn (October 14, 1644–July 30, 1718), who travelled to the colonies as a British real estate entrepreneur and Quaker. He had a philosophical penchant for religious and intellectual freedom, and was joined in Pennsylvania by many others from the old country who sought refuge from religious persecution and economic repression. The Buchanans sought greater opportunities than were available to them in rural Ireland, and they quickly found themselves seeking frontiers – first in Pennsylvania, and soon after further afield.

By one account, Thomas Buchanan had left Scotland in 1702 to settle in County Donegal. While the names John and James Buchanans peppered the records of early colonial residents, some researchers note that Thomas Buchanan, along with his wife Jane Trimble, sailed to America with a son, William Alexander Buchanan, becoming one of the Colony's earliest immigrants.[1] They settled first in Harrisburg, which was then the capital of the Pennsylvania colony, named after William Penn, the Pennsylvania namesake, who was offered a Royal Charter of land below New Amsterdam on March 4, 1681.

The Buchanans had another son, James Buchanan, in 1723. By another account, James Buchanan had left County Donegal with Jane Trimble, and had their first child not long after their arrival in Harrisburg. This first son of James and Jane, John Buchanan, was born on January 12, 1759 in Harrisburg, and followed by two brothers, Alexander and Samuel, and two daughters, Nancy and Jane.[2]

By the midpoint of the 18th century, good land in eastern Pennsylvania had become increasingly expensive. Those of modest means set for the Appalachians of West Virginia, Kentucky, and Tennessee farther west, where land was cheap and plenty, if not particularly productive.

James and his wife, with their children in tow, may have first moved south, but eventually they found themselves beyond the Appalachian Mountains in the heart of Kentucky and just beyond the reach of the French and Indian War that engaged the then superpowers from 1754 to 1763. In the mid-18th century, the areas of Kentucky and Tennessee to the west of the Virginias were considered the Wild West. Settlers were on their own to secure their homesteads and to battle with the Indians who also claimed the land in the years just following America's Declaration of Independence of 1776.

Soon afterwards the family moved south from Danville, Kentucky, and, on December 14, 1778 came across a settlement near present-day Nashville, Tennessee. At the mouth of the Sulphur Springs branch of the Cumberland River, the settlement of log cabins was led by General James Robertson. By early 1779, the Buchanan family patriarch moved to Fort Nashborough, a stockade that eventually became Nashville, Tennessee, in the Cumberland River Valley. Originally called French Lick, this two-acre perimeter allowed the settlers, led by the Buchanans, to erect 20 log cabins within the perimeter. This fort afforded the settlers protection from Indians and wild animals.

On April 2, 1781, warriors from the Chickamauga Cherokee tribe, led by Dragging Canoe, attacked Fort Nashborough. In the ensuing battle,

the men of the settlement were drawn out of the fort to fight. In the struggle that followed Alexander Buchanan, the second son, was killed in the battle, but his brother, John, and his father survived.

In 1783, the remaining members of the Buchanan family moved a few miles east to establish Buchanan's Station, where they built a mill at what became known as Mill Creek. There, young John Buchanan married Margaret Kennedy, and their only child, John Buchanan, was born there on May 15, 1887. However, Margaret died in childbirth and her widower, John, subsequently married Sarah (Sally) Ridley in 1791.

Buchanan's Station remained in the folklore of Tennessee in a manner similar to the historic Alamo of Texas. During the siege that became known as "The Battle of Buchanan's Station", twenty settlers huddled within the picket perimeter at Buchanan's Station and defended the settlement against hundreds of Native American warriors. This battle, with armaments supplied to the warriors by the Spanish, through Florida, was fought by an alliance of four hundred men drawn from the tribes of the Cherokees, Shawnees, and Creeks.

The evening of the Battle of Buchanan's Station brought Sarah a folkloric status. Nine months pregnant with their first child, Sarah's valor in the battle caused her to become known as the "Heroine of Buchanan's Station." Buchanan's Station itself went on to become a symbol of the resilience that forged the State of Tennessee and the folklore of the Buchanan clan.

In the summer of 1792, the patriarch of the Buchanan clan in Tennessee had been killed by Indians at his cabin near the fort at Buchanan's Station. Young John's brother, Samuel, was also to be ambushed and killed as he plowed his crop near the fort. A few months later, in a battle on September 30, 1792, the 33-year-old John Buchanan led the resistance against another Indian attack, while his second wife,along with the wives of other settlers, prepared bullets and reloaded muskets and rifles.

John Buchanan assumed the role of family patriarch and became known as Militia Major John Buchanan for his heroics. He had experienced almost unknown challenges and hardship at the knee of his father, and had learnt firsthand how to lead men and protect his family and peers. The Buchanan men forged a loose form of government where there were no laws or government presence. With the loss of this father, Major John Buchanan entered folklore as one of the fathers of Tennessee.

John, his father, and the heirs of his brother, Alexander, each received a grant of 640 acres, or one square mile. By the recording of the 1800 tax rolls, John owned 2,840 acres[3] and, by the time of his death in 1832, he owned land in four counties.

The youngest son of John and Sarah, Henry Ridley Buchanan, was elected to the Tennessee Senate, while John's first son, John Buchanan II, was the father of Thomas Buchanan (January 21, 1823–June 13, 1863), and the grandfather of Tennessee's 29th governor, John Price Buchanan.

John Buchanan Jr., the son of Major John Buchanan and his first wife, was forced to grow up quickly. Born on May 15, 1787, by the age of 14, John Jr. was already a farmer and landowner. He was married at the age of 18, on September 19, 1805, to the 14-year-old Margaret Sample (1791 – 1860). John was from a family with thirteen children, and sixteen slaves, in this antebellum age. Margaret had nine siblings of her own. Their families were farmers that prospered in the rich land of Tennessee. John and Margaret maintained the tradition.

Eventually, their son Thomas took over and tried to maintain the family farm. But rural prosperity enjoyed by the Buchanan families were challenged by the outbreak of the American Civil War. By 1860, Thomas Buchanan's family had land valued at $15,000 and they also owned 22 slaves.[4] But, following the outbreak of war in 1861, this region of Middle Tennessee was occupied by the Union Army. There were no doubts about the family loyalty, however. Thomas' eldest son, John Price Buchanan (October 24, 1847–May 14, 1930), enlisted with the Confederate Army as a private with the Fourth Alabama Cavalry in 1864.

The occupation of the region during the Civil War, and the general level of suffering, caused a sense of lawlessness and crime to erupt in a normally civil and peaceful region. This was lawlessness among citizens as a consequence of deprivation and a lack of effective government. Certainly, the anarchy of these years entered into the Buchanan family folklore.

The Civil War and the temporary downturn in the family fortunes meant John Price Buchanan had to choose the Confederate Army in 1864, at the age of 16, over college. But, following the capture of his unit in May of 1865, and the end of the Civil War, John returned home to resume his family farming enterprise, albeit without slaves. Crop failures of 1866 delayed prosperity somewhat. It also changed the pattern of activity.

With the emancipation of slaves and the Great Migration that followed, the rural South lost a critical piece of their to-then unpaid

labor force. As African-Americans moved from rural areas to the industrial cities in the North, there was a repatriation of white Americans from the cities to rural areas to alleviate the sudden shortages of labor. There was also a dramatic increase in the rate of tenant farming. Patterns of land ownership were in a state of flux, as were entire families.

John Price Buchanan, only twenty years old by 1867, set out from his family's farm in Williamson County, Tennessee to forge a life in the neighboring Rutherford County. There, on his twentieth birthday, October 24, 1867, John Price Buchanan married 18-year-old Frances (Fannie) Louise McGill (October 30, 1848–November 30, 1927), the daughter of a Scots'-heritage family that was even better endowed and established in Rutherford County than was the Buchanan clan in Williamson County.

Theirs was a marriage of two very well-known and respected family names. This sudden familial prominence for John Price Buchanan would serve him well, even though it may not have been greatly appreciated by a young 20-year-old and his 18-year-old wife. By 1881, and at the age of 33, John Price Buchanan was once again solvent and secure, if not perhaps fully successful. The family owned 430 acres, partly as a result of the settlement from his bride's father's estate following the Civil War, and the death of Fannie's only brother.

While the union of the Buchanan and McGill families combined to rebuild the family finances following the loss of a civil war and family tragedy, there remained much suffering in rural southern areas attempting to recover from both the loss of the Civil War and of an inexpensive and captive labor force. The movement of whites back into agriculture, the ability of African-Americans to start farms of their own, and a growing movement of Eastern seaboard population west meant that there was an increase in the amount of land in cultivation during this period. While Ricardo's conventional wisdom might suggest land would become more valuable in such circumstances, the resulting surpluses in agriculture and the concomitant fall in commodity prices, and the mismanagement of the national economy, meant that farms actually became less valuable. Some argued that farmers were actually poorer in the post-Civil War period than the slaves in the antebellum period.[5]

Meanwhile, the large corporations that grew out of the Gilded Age were increasingly monopolizing railroads, and hence the means of transportation of farmers' crops. Large processing and distribution companies were acting as monopsonies, as the only buyers of many crops. Like

the working class, for whom Henry George had showed such concern, farmers were left with just a trickle of such newly created Gilded Age wealth.

In 1882, first in Arkansas, and then in the adjoining states of Tennessee and beyond, a cooperative alliance of farmers formed to rebalance the growing monopoly power of distribution companies, grain elevators, and the railroads. By 1886, a conference inspired by the Georgist movement, called the *National Agricultural Wheel*, convened in Litchfield, Arkansas, with delegates from Arkansas, Tennessee, and Kentucky. By the time of the meeting a year later, three more states and the Indian Territory had joined.

Their alliance evolved into something greater than a simple farm union to rebalance the power of corporate unions. They had developed an entire political agenda, which included:[6]

- Paying off the national debt.
- Repealing laws that favored capital over labor.
- Preventing aliens from owning land.
- Abolishing national banks.
- Government operations on a cash basis.
- Ending of agricultural futures trading.
- Establishing a graduated income tax.
- Prohibiting importation of foreign labor.
- National ownership of transportation and communication.
- Direct election of national politicians.
- Free trade and removal of all import duties.
- Establishment of a luxury tax.
- Free public education.
- No renewal of patents.

The following year, the National Agricultural Wheel had met in Meridian, Mississippi to merge with the Farmers' Alliance. In these years from 1886 to 1888, John Price Buchanan had also engaged in politics, embracing many of the same platforms as advocated by the Alliance. In fact, however, it was less that these campaigns coordinated and more that their political philosophies dovetailed. Nonetheless, during this period John Price Buchanan emerged as a major figure in Tennessee politics advocating for the rights of farmers, in opposition to the profits of monopolies. John Price Buchanan advocated cooperation among farmers to such an extent that at the annual Alliance convention in 1889 he was elected to preside over what had become the Farmers' and Laborers' Union for Tennessee.

By 1890, a gubernatorial year, John Price Buchanan was completing his second term in the Tennessee legislature. Four candidates – one a former railroad president, two lawyers, and John Price Buchanan – vied for the Democratic ticket and endorsement by the Alliance.

At the endorsement convention, John Price Buchanan initially held a substantial lead. As the candidates dropped out one by one, however, their votes went primarily to the candidates that were standing against him. In the end, after 24 ballots, though, John Price Buchanan did win the Democratic nomination, and, on November 4, 1890, won the general election for the governor of Tennessee with a share almost twenty points higher than the next best challenger, a real estate speculator named Lewis Baxter. That year, half a dozen Alliance members were elected governor in the 42 states and 54 Alliance members were elected to the Tennessee legislature.[7]

But while John Price Buchanan ran on a populist Georgist platform of reform, in land, taxation, education, and labor, his belief in more activist public policy was "too much too soon" for the Democratic party. They did not endorse him for re-election, so he ran as an Independent Democrat. He lost, but the policies he advocated, for a system of universal education through high school, for an income tax, for free trade, and for worker and child workers' rights gained popularity. All of these were either passed into the law, or began matters of debate and would ultimately become the law of the nation by the time he died on May 14, 1930. He shared many of these policies with his contemporary, Henry George. But his populist platforms would not be shared with his grandson, James McGill Buchanan, Jr.

John Price Buchanan became the family patriarch who left the family farm and never fully returned. He and Frannie advocated for education. Their children embraced their priorities. They were all well-educated, and some also went on to become educators themselves.

The fourth son of John and Frannie made his way to the University of Oklahoma as a student-athlete. James McGill Buchanan (September 20, 1888–July 24, 1979) returned after college to oversee the family farm, but each subsequent generation drifted farther away from its agricultural roots.

The five brothers born to John Price Buchanan followed their father into politics, albeit primarily at the local level. The oldest boy of 13 children, John Price Buchanan Jr. (August 1872–May 6, 1958), was active in county politics and became a political appointee to a government job overseeing a prison farm while the youngest son, James McGill Buchanan (September 20, 1888–July 24, 1979), was elected to the county court, and remained in office from 1926 to 1954.

The boys of the Buchanan family all tried their hands at farming. But the Buchanan boys and girls also had a strong sense of community engagement, and of education. The youngest son, James, was an athletic and popular young man who followed his namesake uncle James to the University of Oklahoma. There he played both football and baseball, and he ran on the track team. By the age of thirty, he had returned home to take up 175 acres of land given to him by his father, the former governor. Following the death of his father in 1930, James managed the entire 400-acre Buchanan farm as the other siblings pursued their vocations off the farm.

Also upon his return in 1918, James married Delilah (Lila) Scott (December 14, 1889–February 11, 1953), a schoolteacher, and the daughter of Thomas Scott and Annie H. Marshall. "Lila" had been teaching in Barfield, just outside of Murfreesboro.

James McGill Buchanan was known as Uncle Jim Buck to the locals.[8] He was a fiscal conservative in political temperament. At the age of 38, he was elected to what became the County legislature. This gave him the opportunity to encourage strong local control in the education of local youth, values both he and Lila prized. Lila even supplemented the education of her own son, James McGill Buchanan, Jr, born October 3, 1919, so that he could graduate at the age of 16 from Buchanan School, the local school they sponsored with land donated from their property.

James McGill Buchanan Jr. was raised in a large family that struggled at times as they tried to maintain their sprawling farm in a particularly challenging period for farming following World War I. For a time, the farm did reasonably well as agricultural commodities were in high demand during and immediately following World War I. Unfortunately, James' father had purchased more land on mortgage to expand his Jersey cow herd, only to suffer the effects of a severe downturn in commodity prices in the Roaring Twenties. In fact, many of the bank failures quoted as arising from the Great Depression were already occurring over that decade as small family farms, such as that of the Buchanans, could not compete with the increased mechanization and corporatization of American farming.

These economic setbacks impinged even more when James' mother suffered a debilitating illness in 1922. At the time the Buchanan farm was considered one of the most advanced in the region, with modern tractors and automated milking machines. But, by the end of the decade, young James was once again plowing behind a horse and milking cows by hand.

Because the farm was owned by the estate of James Price Buchanan upon his death in 1930, there was little incentive for James Jr. to

maintain a large farmhouse that had once been the home to 13 children. James learned a life lesson in something Garrett Harden called *The Tragedy of the Commons*. If something belongs to many, it is often as abused as if it belongs to nobody. Buchanan learned early that well-defined property rights are essential for investment. Without the right to the improvements on land that belonged to a family trust, James' father had little incentive to invest in fixtures on the farm.

From these years, Buchanan learned the value of hard work and perseverance. Like many farmers, James' father had to run every aspect of the farm, and at different times he was forced to be a farmer, carpenter, welder, electrician, plumber and veterinarian. Not prone to intellectualism, he was a pragmatic, popular, and charismatic man. His wife was the educator of the family, and she gave James Jr a classical and eclectic education through a combination of classes at the Buchanan School and in the Buchanan home. But while his father may have once hoped the only young male Buchanan left on the farm would remain on and assume his family responsibilities, his mother had loftier ambitions. She hoped James Jr. would follow in his governor grandfather's footsteps by studying law at Vanderbilt University in Nashville.

His family had concerns, however. Unlike his grandfather, James did not have the flourish and charisma of a successful politician. He could learn to become a competent public speaker, and he did. But, in the midst of the Great Depression, the family could not afford to send James to study law at Vanderbilt University. Instead, he remained a hand on the dairy farm and attended nearby Middle Tennessee State Teachers College in Murfreesboro.

While at college, Buchanan continued with a classical education in Shakespeare, poetry, mathematics, and physics, and also took enough courses in economics to afford him majors in English literature, mathematics, and economics. While younger than most students in his classes, he nonetheless excelled, and by his second year he was the top student there.

Buchanan graduated from college in 1940 at twenty years of age. He had a few opportunities – to teach, to work at a bank in Nashville, or to take a $50 per month fellowship to study economics at the University of Tennessee.[9] After a year of study at Tennessee, Buchanan claimed he had learned little about economics, but a lot about whiskey and women. Nonetheless, while at the institution Buchanan was motivated by a mentor, the economist Charles P. White, who encouraged Buchanan down the academic track and into a fellowship in statistics at Columbia University upon his graduation from Tennessee in 1941.

At that time, however, the United States was drafting young men in preparation for entry into World War II. By August 1941, four months before the United States declared war following the bombing of Pearl Harbor, Buchanan was drafted and joined the United States Navy. As a college graduate, the Navy first sent Buchanan to officer training school and the Naval War College. He was then assigned to the staff of the legendary Admiral C. W. Nimitz and was to spend most of the war at Pearl Harbor in Hawaii and in Guam. He worked closely with men older and more experienced than he was, and in stressful conditions where the mettle of a man was regularly tested. That experience was to teach him much about human nature.

At the end of the war, Buchanan accepted a discharge, rather than an extension of his naval career. He also accepted the generous education subsidy from the post-war GI Bill and enrolled at the University of Chicago.

This period at Chicago must have been a particularly heady one for Buchanan. At the time he went there he would have had little idea that he was entering a hotbed of economic analysis, under the tutelage of such luminaries as Frank Hyneman Knight.

Buchanan shared a common background with Frank Knight (November 7 1885–April 15 1972) since both of them came from farming families. The Knight family farm instilled in Frank the sense of independence and libertarianism that would influence his renowned academic originality. The avocation of farming, beyond independence and self-reliance, also offers practical schooling in the workings of markets and institutions. Farmers also learn to function within a complex system of nature and government, and try to control as many of the variables they can simply to survive. Both Frank Knight's home state of Illinois and James McGill Buchanan's state of Tennessee border on Missouri, known as the "Show Me" state. These are practical, self-reliant and thoughtful young men with more faith in markets than many other human institutions. They question everything, not because they are skeptical, but because they are inquiring.

By 1945, Knight had established himself at the intellectual and ideological heart of the Chicago School, renowned for a strong free market and libertarian economic philosophy. There, too, in the years after the war, a number of the Great Minds – from Franco Modigliani to Kenneth Arrow, Milton Friedman and Gerard Debreu – were all to file through the economics department at different times. There could be no more doctrinaire or illustrious school for a young Midwest farmer son to study.

Buchanan did not come to Chicago alone, however. On October 5, 1945, he had married Anne Bakke, a nurse then stationed in Hawaii. The

young couple found themselves in Chicago, among strong and idealistic intellects, and in an era in which young people and a post-war nation fresh from winning World War II felt that anything was possible.

Chicago, and in particular Knight, honed Buchanan's powers of inquiry, intellectual openness, and his questioning of conventional wisdom. At the same time, Buchanan was searching for a branch of economics that he could call his own. While perusing the contents of the university library, and with his coursework completed in the German language, Buchanan came across a 1896 book written in German by Knut Wicksell on the theory of taxation. Contained in that dissertation was a statement on public choice that rung true to Buchanan.

Buchanan's appreciation of Wicksell's insights bloomed under the encouragement of Knight. The two of them were kindred spirits within an academy dominated by the elite and their offspring. Both had been raised on farms and neither were raised far from poverty. Subsistence on the farm spared them, but only through hard work. Both escaped the farm, by attending (different) colleges in Tennessee, and both spent time at graduate school at the University of Tennessee in Knoxville. They each felt that their backgrounds had given them considerable understanding something about individuals' struggle with the marketplace that perhaps their colleagues did not comprehend at the same level of intimacy. Knight took Buchanan under his wings, and Buchanan had great respect for his twin academic pillars Wicksell and Knight. Theirs were the only two portraits that subsequently hung on Buchanan's office walls.

In 1948, Buchanan successfully defended his Chicago PhD thesis, entitled "Fiscal Equity in a Federal State",an event that marked the beginning of a lifetime of scholarship. It was also the first volley in a series of books that represented with a revitalization of the analysis of the interface between politics and economics. Such political economy had been the mainstay of economic discourse in the 19th century, but had been thoroughly displaced by the neoclassical microeconomic explanation of markets.

The message Buchanan drew from Wicksell is that while private spending is directly correlated with private income, there is no such direct association between public finance and public expenditures. Taxes are raised or debt incurred and hence future taxes are obligated based on such premises as ability to pay, or on the goal of minimum distortion of the private sector. However, public expenditures are rarely allocated evenly, nor proportionally to each household's tax burden.

This disconnect between public finance and public expenditure is now so widely accepted that it is rarely subjected to challenge. Yet the

concept is not uncontroversial. For instance, Wicksell argued that the pattern of public finance and expenditure is justified only if it is unanimously approved by voters willing to accept a sense of Rawlsian justice and fairness: Were this the case, government expenditure would likely follow radically different patterns.

Buchanan translated Wicksell's work into English, and made a career of this study of the interaction between the democracy, politics, and the economy. In doing so, Buchanan almost single-handedly recast the nature of political economy. His insight was that economists, in their almost zealous focus on the market as the optimal mechanism for resource distribution and allocation, consistently overlooks an important dimension. Politics determines the rules that govern markets and distribution, and hence has a profound effect on market outcomes. Yet politicians set the rules of the game outside of the theoretical foundations and relentless drive for efficiency assumed almost universally within the study of economics.

Buchanan began his political-economic philosophy by making a distinction. He defined politics as the process which determines the rules of the economic game, while policy represents the strategies participants practice within the rules that govern interactions. The former, the definition of the rules that govern our interactions, had been the purview of social philosophers dating back to John Locke, Thomas Hobbes (April 5, 1588–December 4, 1679), Adam Smith, John Stuart Mill, and Immanuel Kant (April 22, 1724–February 12, 1804). Meanwhile, modern economics analyses the optimal or behavioral strategies economic players adopt. This interplay Buchanan labeled constitutional political economy, and the subdiscipline that has since emerged is labelled constitutional economics. He viewed a nation's constitution as an economic document that will govern the interactions of its citizens for many generations. Hence, it determines our individual relationship with the state, and must balance the needs of the state, of society, and of the individual.

Buchanan is most renowned for his collaborations with Gordon Tullock (February 13, 1922–November 3, 2014). As Knight and Buchanan were kindred spirits, so were Tullock and Buchanan. Buchanan was barely two years older than Tullock, and Buchanan died the year before Tullock. Both grew up in small towns in the Midwest, both fought in the Pacific sphere of World War II, and both attended the University of Chicago following the war.

But, while Buchanan remained in academia, Tullock began his career in the public sector. He joined the Foreign Service upon his graduation with a Juris Doctor from Chicago in 1947, and remained in public service, mostly in Asia, until 1956. While he had intended to continue a

new venue of public service upon his exit from the Foreign Service, his collaboration with Buchanan while he taught international studies at the University of South Carolina changed forever his academic fate.

Tullock later became Buchanan's colleague at the University of Virginia, but departed first for Virginia Polytechnic in 1968 (followed by Buchanan a year later), when the Virginia University administrators refused to protect his academic freedom during a period of campus controversy over some of the joint work produced by Buchanan and Tullock. Later, in 1983, Tullock established his Center for the Study of Public Choice at George Mason University, which was finally relocated to the University of Arizona. He remained there until 1997 and then returned to George Mason until his retirement in 2008.

Beyond his collaborations with Buchanan, Tullock developed his theory of *rent-seeking* in which he argued that firms use their financial resources to lobby and influence legislation constructed to favor their bottom line. Such rent-seeking creates the obvious inefficiencies that result when policy-makers decide law based not on the efficiency of the policy but on the influence of their legislative patrons.

In their major joint work *The Calculus of Consent*, Buchanan and Tullock assert that Wicksell's notion of unanimity is unworkable. Instead, they offer an alternative which they call "workable unanimity", which defined the study of modern democracy of market-oriented economies. In doing so, they spawned the subdiscipline of public choice. Later on they went further, in their collaboration with Anthony Downs, entitled *An Economic Theory of Democracy*. Buchanan and Tullock also established the leading journal in this field, entitled *Public Choice*, while Buchanan separately founded a journal entitled *Constitutional Economics*.

Buchanan is best remembered for his creation of a distinction between two alternative approaches to the study of public choice. The first is the effort to define the rules of the political economy through the establishment of a constitution. The remainder, which is most commonly practiced by the discipline of economics, is in working within these constituted rules, and perhaps mounting efforts to modify the rules slowly over time.

28
The Great Idea of Knut Wicksell

In the spring of 1889, just before he married in Paris, Knut Wicksell was strolling along a street in Berlin when his eyes caught a book on economics by the renowned Austrian economist Eugen von Böhm-Bawerk. *The Positive Theory of Capital*[1] influenced Wicksell profoundly. From this inspiration in 1889 came a wellspring of originality that eventually inspired both Richard Musgrave and James Buchanan. Wicksell commented in a letter to a friend:[2]

> I procured a copy and was soon lost in the book. I understood most of it rather imperfectly, as can be seen from my notes in the margin. . . . Nonetheless the book came to me as a revelation. I had already tried on my own, with little success, to penetrate the phenomenon of interest and the general problem of economic distribution, when complicated by the existence of capital (as well as labor and natural resources). . . . It was as though I now saw with my own eyes the roof being put on a scientific construction, which no economist since the days of Ricardo had managed to raise above its lower floors.

Wicksell had taken Ricardo's theory of the substitution of labor and capital, his first forays into Marginalism, and Böhm-Bawerk's original inclusion of time into the mix and synthesized them to construct the first coherent theory of factor exhaustion, wealth distribution, and the time dimension in economics. As he explored the implications of the work of Böhm-Bawerk and Ricardo, and as Clark was doing the same on the other side of the Atlantic Ocean, Wicksell began to ponder the same coin from a different side. Rather than driving farther down the neoclassical exploration of efficiency, Wicksell became interested instead in the distributive effects of progress. In doing so, he had

mastered the neoclassical calculus, but he also explored where none had gone far before. He applied theory to the process by which the government balances benefits and costs, on the margin, to provide for public goods. In his Nobel Memorial Prize lecture, James Buchanan observed:

> One of the most exciting intellectual moments of my career was my 1948 discovery of Knut Wicksell's unknown and untranslated dissertation, *Finanztheoretische Untersuchungen*, buried in the dusty stacks of Chicago's old Harper Library . . . Stripped to its essentials, Wicksell's message was clear, elementary, and self-evident. Economists should cease proffering policy advice as if they were employed by a benevolent despot, and they should look to the structure within which political decisions are made. Armed with Wicksell, I, too, could dare to challenge the still-dominant orthodoxy in public finance and welfare economics. In a preliminary paper, I called upon my fellow economists to postulate some model of the state, of politics, before proceeding to analyse the effects of alternative policy measures. I urged economists to look at the "constitution of economic polity," to examine the rules, the constraints within which political agents act. Like Wicksell, my purpose was ultimately normative rather than antiseptically scientific. I sought to make economic sense out of the relationship between the individual and the state before proceeding to advance policy nostrums.
>
> Wicksell deserves the designation as the most important precursor of modern public-choice theory because we find, in his 1896 dissertation, all three of the constitutive elements that provide the foundations of this theory: methodological individualism, homo economicus, and politics-as-exchange. I shall discuss these elements of analytical structure in the sections that follow. . . . I integrate these elements in a theory of economic policy. This theory is consistent with, builds upon, and systematically extends the traditionally accepted principles of Western liberal societies. The implied approach to institutional-constitutional reform continues, however, to be stubbornly resisted almost a century after Wicksell's seminal efforts. The individual's relation to the state is, of course, the central subject matter of political philosophy. Any effort by economists to shed light on this relationship must be placed within this more comprehensive realm of discourse.[3]

Buchanan was moved by a book Wicksell had published to satisfy the requirements for his PhD in economics in 1896. His "Studies in the

Theory of Public Finance" employed, for the first time, marginal utility analysis to better understand decisions in the public sector. Wicksell did so by applying the benefit criteria and the concept of ability to pay taxes to public finance for the first time. James Buchanan paraphrased his contribution as:[4]

> Among fiscal theorists, Knut Wicksell holds the unique position of having carried his theoretical ideas through to an examination of the political structure within which fiscal decisions must be made and implemented. . . . Wicksell proposed, first of all, that the bridge between tax and expenditure sides of the fiscal account be made explicit. When a specific expenditure project was presented, a whole array of possible distributions of the required tax bill were also to be presented, with each array estimated to produce revenues sufficient to cover the outlay. The expenditure project was then to be voted on in the legislature, along with each one of the tax allocations, and when one such combination secured the unanimous approval of the assembly, it was to be adopted. If no single combination received unanimous support, the expenditure project was not to be undertaken and no tax was to be levied.

Embodied in this description is both the political and the economic logic developed by Wicksell. He argued that fiscal decisions ought to be based on the calculations of benefits and fiscal burden. He recognized that this burden ought to best fall on the wealthiest who can best afford it, as a natural implication of Jevons' marginal utility principle. The natural monopolists and oligopolists who earn excess profits ought to be taxed to balance the distortions their actions impose, as later rediscovered by Frank Ramsey. He also legitimized the role of government who could provide goods produced by processes which exhibit decreasing marginal costs in a more efficient way than would be the case with the monopolists. In essence, he was arguing for a role of government in the provision of public goods. Finally, he argued that a legislature should make such decisions unanimously.

Buchanan's focus on the proper distribution of the burden of taxation had been first developed in a pamphlet Wicksell had written just a couple of years earlier, but under the assumed name Sven Trygg. His "Our Taxes – Who Pays and Who Ought to Pay Them?" was a condemnation of a Swedish tax system developed by wealthy legislators and endorsed by propertied voters. Unsurprisingly, the tax system propagated by the propertied and wealthy was regressive and placed too high a burden on

working-class residents who were not entitled to vote. Wicksell argued further that it should not be the tax amount itself that should be evenly distributed. Rather, it should be the loss of utility that will result with the drop of income induced by a tax. Based on Jevons' theory of declining marginal utility, a low-income household suffers more for a given loss in income. Hence, since wealthier individuals have a greater financial capacity to pay, the distribution of the actual burden of taxation measured in utility should be equalized, rather than an equal share of income.

Wicksell's outrage over his perceptions of income tax inequalities in his native Sweden was renewed in parts of his public finance treatise in 1886. In his *Finanztheoretische Untersuchungen*, he continued with his discussion in advocacy of a new socialist state. There, he outlined his principle of equitable taxation, based on the notion of diminishing marginal utility, and the decreasing cost aspect of public goods and the need for marginal cost pricing even if such would be unprofitable for a private firm. He noted that to do otherwise by charging based at average cost plus a profit markup would disadvantage most the lower-income households that would tend to rely on such goods as mass transportation.

Wicksell also argued for an extension of the vote to all households, not just propertied males. As such, he shared the values of his wife, who was a champion of women's suffrage. Finally, just as Henry George's 1879 idea of a 100% land tax was sweeping America and the English-speaking world, in 1886 Wicksell advocated for "confiscatory taxation" that would eliminate the rent component of unearned income from households' personal income. He specified that this tax would remove from personal income the increases in wealth that occur due to gains in land value, while leaving untaxed the investment and interest on the capital improvements upon the land.

Wicksell also argued for such taxes on unearned income arising from monopoly profits, capital gains, and inheritances beyond a certain threshold and inflation. Wicksell recommended that these revenues should not be used merely to offset routine government expenditures, but should instead create a permanent fund for future long-term public investments, much as Norway has since set up to provide lasting and permanent benefits from the temporary royalties arising from oil extraction.

His minor free speech offenses aside, Wicksell upon his retirement at Lund University in 1916 was invited to advise the Swedish government's Department of Finance over issues of tax and spending reform.

Wicksell's policy prescriptions were not embraced entirely and immediately, but they have since become a philosophical basis for Scandinavian socialism.

At the same time a combination of language barriers and the degree to which his great mind had advanced so far beyond the existing literature prevented his work from being absorbed and integrated more widely until it was rediscovered by Musgrave and Buchanan generations later.

29
The Times and a New Role for Government

Richard Musgrave had left Heidelberg with his mind reeling from the ideas of Knut Wicksell and from another mentor, Jacob Marschak. A mentor of many throughout his illustrious career, the Great Mind Jacob Marschak had a particularly prescient view of economics. In the throes of the Great Depression, a growing cadre of economists believed that economic theory could inform policy and help stabilize the economy. Of course, the unorganized private sector could not sufficiently coordinate such policies for the public good. This led to a coalescing of ideas around a new role for government – that of stabilization policy.

But while these ideas may have been novel in the English-speaking world, they had been percolating for years in Germany. While the Georgists in the United States had reignited populist discussion about the appropriate role of government, these fires had been quenched by the powers the Georgists had hoped to emasculate. The discussion had continued in Germany, though. Richard Musgrave brought to the American academic debate the ideas espoused by German scholars, and further elaborated upon them.

The era in Germany between the end of the Great War and the rise of the Third Reich was one of contrasts. A liberal movement demanded greater democracy, while a more zealous camp, led by Adolf Hitler among others, invoked a heightened sense of nationalism. Much of the academic and Jewish elite sided with the liberals. And these liberals were increasingly singled out by nationalists. Some, such as Musgrave's mentor, Alfred Weber, at the University of Heidelberg, fought back, but their resistance cost many of them their careers. They demonstrated that certain liberal, perhaps even libertarian, values were sufficiently worthy of taking risks. Musgrave witnessed an incredible clash of values between

the individual and a state running amok and this tension was to prove formative for Musgrave.

At the time academics in Germany were arguing for a constructive role for economics in rebuilding the post-war nation, not by investing in a more powerful military, but by investing in a future based around efficiency and the public provision of public goods. There developed a strong interest in the use of fiscal tools to enhance economic growth.

The reality for economists in the United States in the 1920s was quite different. The success of US private markets through the Roaring Twenties merely seemed to confirm their faith in free private markets. The experience of England during this period fell somewhere between the struggles of Germany and the successes of America. But most English-speaking nations, allied among the winners of World War I, were faring better than the citizens of Germany.

The study of public finance was the tool by which economists could demonstrate how well-run government could enhance a nation's economic wealth. It was not in the provision of the goods and services for which private markets were well adapted. Rather, these economists were postulating the importance of a new type of good, known as a public good. As early as 1880, a collection of German socialists, led by Adolph Wagner, were advocating for the development of a field of study that focused on the types of government expenditures that could enhance economic output and efficiency, and the taxes that could support such spending without creating inefficiencies in private markets.

At the time, Wagner even postulated a concern that we still share today. Later, Musgrave explained Wagner's qualification of the provision of public goods. Wagner had noted that the share of public spending relative to the gross domestic product tends to rise because the scope of government tends to expand over time, bureaucracies grow, and citizens increasingly expect a ratchetting expansion in the extent of services. But, while Wagner believed that an increase in national income creates a more than proportional increase in public expenditure, which implies public spending is a luxury good, John Maynard Keynes subsequently postulated that an increase in public expenditure enhances overall national income through a large multiplier effect.

While there remains a significant amount of debate over the direction of this causality, the intellectual exercise was enlightening. A discipline was created that treated the goods government should produce as being separate from those in the private sector. The requisite characteristics were that these goods exhibit joint consumption and non-excludability, and that there exists non-rivalry in terms of their consumption.

In 1893, Wagner defined joint consumption as the benefits that are enjoyed by goods such as defense or radio signals. Such public goods are unusual because the enjoyment by one does not diminish the consumption by another. Joint consumption typically also implies that one cannot be easily excluded from the enjoyment of the good produced.

The second criterion, non-rivalry, occurs if a service can be delivered to an additional consumer at low or zero marginal costs. The private sector is ill-equipped to efficiently price such goods. Hence, there is a natural role for government to provide such public goods.

The Great Mind Johan Gustaf "Knut" Wicksell augmented Musgrave's intuition for a natural role for government in Musgrave's mind. Over the course of the career Wicksell was the mainstay of the "Stockholm School". He had argued that government could be viewed somewhat as a cooperative or club that is formed through an implicit contract between the club and the individuals who join. Another member of the Stockholm School, Erik Lindahl (November 21, 1891–January 6, 1960), who also taught at Uppsala University, added that the collective should value the marginal benefit of the provision of public goods to its members as the vertical sum of each individual's marginal enjoyment. Such a vertical summation is in stark contrast to the horizontal summation of demand that a private firm would employ should one more consumer vie for its product.

Musgrave presented these concepts of the *Stockholm* and *Austrian Schools* to the English-speaking audience through a paper he published in 1939, entitled "The Voluntary Exchange Theory of Public Economy".[1] While we often attribute to Paul Samuelson the concepts originally developed by Wicksell, Lindahl, and Musgrave, Musgrave's paper was the first major foray into public finance in the English-speaking economics and finance literature.

Musgrave had been pondering a paradigm for consideration of the functions of government, along the lines of allocation of public goods and services, their distribution among citizens, and the stabilization of the overall economy through carefully timed and planned government services. Musgrave first described this trichotomy in a paper he wrote in 1957 following a trip to Germany. His paper, "A Multiple Theory of Budget Determination",[2] became the basis for Musgrave's major contribution and legacy, and for the dramatic growth of interest in public finance beginning in the next decade. Musgrave brought his various ideas together two years later, in his 1959 tour de force *The Theory of Public Finance*.[3]

Musgrave's book was the first exhaustive textbook devoted to public finance, but it also constituted an original research monograph. It

combined both what was understood about Keynesian macroeconomics and of price theory to the objectives of the achievement of full employment, of efficient production and allocation, and of distribution with a minimum of economic distortion. Its scholarship, combined with its accessibility, made it particularly popular among law professors in the 1960s who often had the responsibility of teaching tax policy. A few law schools, and in particular the University of Rochester, where Musgrave initially enrolled when he came to the United States, were beginning to embrace the economic perspective. Musgrave's textbook began to garner significant academic traction in the public finance, economics, and legal scholarship communities.

Musgrave's timing could not have been better. The 1960s were an era of increased frustration with the prevailing private sector institutions. The warning by a conservative American Republican President and former Five-Star Army General, Dwight D. Eisenhower reflected these collective concerns. In his farewell speech at the end of his two terms of service to the country, Eisenhower warned the nation, on January 17, 1961 that:

> A vital element in keeping the peace is our military establishment. Our arms must be mighty, ready for instant action, so that no potential aggressor may be tempted to risk his own destruction . . .
>
> This conjunction of an immense military establishment and a large arms industry is new in the American experience. The total influence – economic, political, even spiritual – is felt in every city, every statehouse, every office of the federal government. We recognize the imperative need for this development. Yet we must not fail to comprehend its grave implications. Our toil, resources and livelihood are all involved; so is the very structure of our society. In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military–industrial complex. The potential for the disastrous rise of misplaced power exists, and will persist. We must never let the weight of this combination endanger our liberties or democratic processes. We should take nothing for granted. Only an alert and knowledgeable citizenry can compel the proper meshing of the huge industrial and military machinery of defense with our peaceful methods and goals so that security and liberty may prosper together.[4]

The nation was also demanding a solution to some of the social and civil rights problems that had exploded in the 1960s. Finally, the public

observed that an inspired nation could send men to the Moon and back. Almost anything seemed possible, and government helped make it so. This was a heyday for a broadly embraced belief that government could play an effective and essential role in the creation of a *Great Society*.

Musgrave provided the reason for government and the means, through taxes, that those roles best provided by government for the public could be financed by the public.

Musgrave's caveat, however, is that, in the absence of the informational aspect of the price system that reveals the valuation of consumers, government may not have superior means to assess the optimal provision and financing of public services. Musgrave produced the conceptual framework to ask the questions, but was unable to formulate the complete answer.

Theoretical economic research is sometimes derided because of the unreasonable nature of some assumptions, the excessive sophistication of some analyses, or the complicated nature of some of the prescriptions. However, the true value of good theory is often in the way it organizes the mind to think about problems in a new and more productive way. Musgrave's trichotomy does just that. He did so by constructing a bridge between the Stockholm and Austrian Schools in Europe and the neoclassical economics school in the English-speaking world. He then worked to shore up its foundations on both ends. We leave it to one of his students, Charles Tiebout, to build a bridge between public finance and what we understood about free markets.

30
The Great Debate Between Musgrave and Buchanan

James Buchanan and Gordon Tullock were the first to discuss what had been the traditional domain of political scientists within the realm of economic theory. They did so by considering government decision-making not as a monolith, but rather as representing a spectrum of interests.

Some of these interests are purely individualistic, while others are universally held. The nature of the interests government is expected to mediate and satisfy determines the process for their resolution. In their discussion in mediating our collective consent, Buchanan and Tullock outline the "calculus" of such consent.

Buchanan and Tullock begin with assumptions that are widely accepted among economists. Self-interested individuals employ institutions to meet their needs. For private exchanges, the institution is the market, but for public goods, the institution is government. In their view, then, government should not be viewed as an entity with its own will, but should be seen merely as an extension and mediator of the citizens whom they moderate. In doing so, they were instrumental in the creation of a theory of public choice within the discipline of economics.

Their approach is consistent with the evolving thrust of public finance during the post-war period. Government emulates the marketplace in the sense that it attempts to ensure that decisions are made on a Pareto-optimal basis.

The concept of Pareto optimality is fundamental in economics and, ultimately, in the formulation of the goals of public policy. It specifies the goal for the allocation of resources to satisfy the criterion that it is impossible to improve the utility of one individual without harming the utility of another. The concept originated with Vilfredo Federico Damaso Pareto (July 15, 1848–August 19, 1923), an Italian civil

engineer who recognized in himself a strong libertarian bent. In his 40s, he began to lecture in economics, focusing particularly on the need to preserve the free market system and to protect it from government interference. By 1893, he had succeeded the eminent French mathematical economist Marie-Esprit-Léon "Leon" Walras (December 16, 1834–January 5, 1910) as the chair of Political Economy at the University of Lausanne.

Pareto had built his career and reputation on the basis of his training and his rigorous adherence to mathematical methodology. He took the indifference curve work of Edgeworth and showed how the utility and trade between two individuals can be portrayed simultaneously, in what we now call the Edgeworth Box. From the Edgeworth Box, we can easily see a region that reveals gains from trade for any initial distribution of goods. Such gains result in what is termed a "Pareto improvement." These two tools – the Edgeworth Box and Pareto optimality – were ideal mechanisms to demonstrate the gains from effective public policy.

Pareto's own politics began as strongly libertarian. In his later years, though, he concluded that democracy is unsustainable. He harbored the concern that, eventually, power elites emerge and dominate the lower class to enrich their own circles.

In some sense, Buchanan and Tullock took up where Pareto left off. They used sound economic concepts, drawn from Pareto optimality and from the emerging area of game theory, to construct a role for government. They develop a concept of *methodological individualism* in which collective decision-making is simply a product of individual actions and preferences. Government can then be viewed simply as an institution enabled by individuals and subject to modification as needs change. However, the overall limits of government's power are defined by a constitution that must be agreed upon unanimously and with multiple future generations in mind.

They also describe a tradeoff. A decision that requires unanimity suffers no costs, and can net improvements, to all current participants, but imposes a great deal of decision-making costs, and creates uncertainty with regard to whether a solution can be reached. On the other hand, a simple majority rule system reduces decision-making costs, but may result in costs being imposed on current stakeholders as decisions ultimately result in a reallocation of resources from one group to another. The decision, then, to employ various voter rules, from simple majority to supermajority to unanimity, depends on the relative balance of decision-making and stakeholder costs.

Their approach is at odds with the political science paradigm, which typically compares private interests to the public interest. Instead, Buchanan and Tullock see the negotiation as between private interests individually asserted and private interests collectively asserted in the aggregate by the state.

In creating public policy, the public interest is one that ought to appeal universally to all citizens, while most decisions of the state must instead balance the goals of coalitions of *special interests*. For many decisions of government, the sum of special interests does not span the entire electorate. Such decisions may not affect even most taxpayers, but instead contrasts the interests of one group with that of another.

Within such a decision-making process, it would then not be inappropriate for lawmakers representing one group to trade provisions and future votes with lawmakers representing another. This can be likened to the notion of the great mind Ronald Coase that the initial assignment of property rights for a non-market transaction are inconsequential. If the gains to those who benefit from a non-market transaction are larger than, and hence sufficient to compensate, the losses of those who stand to be worse off, payments or side exchanges can be used to create an outcome that is Pareto-improving for both winners and losers.

In the political science discipline, such dealing may be considered as *buying votes*. Within the *calculus of consent* is a method to construct political agreements. Such *log-rolling* is then an implication of the model, rather than being an unfortunate anomaly.

The Musgrave and Buchanan debate

The week began on Monday, March 23, 1998 in a seminar hall at the Ludwig-Maximilians University in Munich, Germany. Invited were James Buchanan and Richard Musgrave as presenters, perhaps even debaters. In attendance were professors and students interested in the theory of public finance as it evolved in the 1960s.

Before the 1960s, the spectrum of mainstream economic theory on government was bounded by the writings of the Great Mind John Maynard Keynes at one end, and the Great Mind Milton Friedman at the other. The mathematics of microeconomics, defined by the Great Mind Paul Samuelson, was employed by either side as they saw fit. To then, though, all decisions were viewed as an extension of the neoclassical and mathematically oriented approach.

Both Musgrave and Buchanan made only sparing use of neoclassical economics and doctrinaire ideology. Instead, they constructed perhaps different paths by which we all observe the state. As we saw above,

Buchanan was raised in the South in an era that may have been more than half a century removed from the United States Civil War, but which still loomed large. He was raised among individuals who viewed the state as oppressive and running counter to their interests. Buchanan's views were no doubt cemented when he studied at the University of Chicago. There, though, he discovered an economic basis for his libertarian views, through the writings of Knut Wicksell and members of the Austrian School, and also the intuition of Frank Knight. These Continental European economists shared with Knight a skeptical view of any state which argued itself to be benevolent.

On the other hand, Musgrave had fled Germany, or, perhaps more correctly, studied abroad, but feared returning to Germany as Hitler amassed power and Musgrave's former colleagues lost their jobs. Musgrave subsequently attended Harvard University, which, then and now, shares with Yale the self-imposed responsibility of staffing the highest echelons of American federalism. Musgrave recognized that government could run amok, but he did accept a legitimate role for the public sector.

In their debate, Musgrave and Buchanan took turns advocating their ideas on various subjects in public finance. The debate was recorded as a number of chapters in their book published following the week-long workshop, entitled *Public Finance and Public Choice*.[1]

Musgrave begins the debate by debunking the notion asserted by Wagner that government bureaucrats have a penchant for expansion of the state's domain. Rather, Musgrave believes that government expands as an economy grows and its citizens' preferences evolve toward the services only government can provide. Buchanan asserts that this growth often occurs at the expense of a vibrant private sector by crowding the private sector out of production it once provided but government provides instead. Buchanan also complains that government makes too zealous an effort in the third role of government Musgrave asserted – the redistribution of income.

Buchanan argues that such redistribution can occur because of the wide variety of tools government and politicians create to assert their prerogatives. The complexity of legislative tools creates many avenues for the majority to exploit the minority, and perhaps even for the minority to exploit the majority at times. To reduce such problems, Buchanan advocates for methods to curtail the tyranny of the majority through the adoption of stricter voting rules.

The two also differ in their preferred methods to finance government. Buchanan prefers a flat tax because it makes more difficult for political manipulation to take place. He recognized that, beyond the flat

tax, there could be some additional transfers to redress, in a limited manner, any inequities that might be created by such a tax. However, Musgrave remained concerned about the ability of such a simple tax schedule to redistribute income to a sufficient text.

Perhaps the minds of neither Musgrave nor Buchanan were changed over the course of that week in Germany. Buchanan closed the discussion with a lament:

> How can the moral foundations of political order be restored? How can the civilization and culture of western Europe and America regain the confidence of its own participants?[2]

He added,

> Much of the moral rot that we observe, in both private and public behavior, is traceable to the exaggerated size of the public sector relative to the total economy.[3]

Musgrave remained more optimistic about government. He regaled the great successes of nations in fostering both social and economic progress in the 21st century and the attempt by European and American nations to each create a *Great Society.* Musgrave defended such programs as social security and universal medical care, and argued that progressive taxation is merely the price we pay for an evolving civilization.

Buchanan managed to view the same facts as evidence of a bloated public sector that has lost touch with economic realities and has created a sense of entitlement and dependency among its citizens. This attitude violated his strong sense of self-reliance and the Protestant work ethic, and engendered moral depravity. Buchanan would argue for constitutional restraint to prevent the abuse of politicians.

Perhaps their debate is one of whether over whether the glass is half-empty or half-full: Buchanan distrusted politicians while Musgrave maintained faith in them. Musgrave argued that the unbridled capitalism of the Roaring Twenties was improved through the sense of collective obligation arising from President Roosevelt's New Deal. This was not a new deal for workers, but rather a New Deal for the social contract. Musgrave also argued that the New Deal permitted capitalism to survive, while other countries increasingly experimented with communism. It also protected racial, religious, and economic minorities, and enhanced our sense of social tolerance, gains that would be absent were it not for a strong Federalist state.

But while Musgrave maintained a classical, if expanded sense of government and the state, the contribution of Buchanan is nonetheless helpful in framing our level of analysis. Government is not a monolith. It is constituted by legislators who, acting in their own self-interest, assert our self-interests in the aggregate. This paradigm is helpful, especially at the micro level of understanding how individual government agents for our collective will make their decisions.

31
The Nobel Memorial Prize for James Buchanan

In 1986, James Buchanan won the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel for (according to the citation) "his development of the contractual and constitutional bases for the theory of economic and political decision-making."[1]

In awarding the prize to him, the committee recognized, for the first time, a contribution to economic theory that modelled the public sector rather than the traditional focus on the private sector that is the subject of the neoclassical model. The committee noted the legacy of Knut Wicksell in laying the foundations from which Buchanan (and Musgrave) built upon. The committee also recognized how Buchanan had included into the economic mainstream the method of political decision-making. He did so by acknowledging that political actors are motivated to create reciprocal advantages, and cooperate within the political sphere to do so.

The committee described the game-theoretic underpinnings of Buchanan's theory. As with any game, the rules that govern subsequent moves must be well described. Buchanan argued effectively that constitutions serve that role. Because the setting of rules is a more potent decision than the mere application of the rules, such constitutional rule-setting must be done with a near consensus close to unanimity, even if the rules' application can be done with majority rule.

The committee also echoed Buchanan's claim that the advice of economists often fall on the deaf ears of politicians. He argued that the art of politics depends more on the coalitions politicians can form, rather than on scientific logic. To then advise politicians on their pursuit of economic stabilization policy was viewed by Buchanan to be simplistic. Politicians are motivated less by efficiency and more by the power

they can muster and the budgets they might command through the coalitions they can form.

Finally, the committee also described Buchanan's belief that the creation of public debt weakens still further politicians' relationship between public expenditures and public finance. While some may view his political prophecies as cynical, Buchanan, his followers, and the Nobel Memorial Prize committee might instead assert that Buchanan offered a greater sense of realism which ought to be included in the future modelling of public expenditures and finance.

32
The Legacy of Knut Wicksell

While we know Knut Wicksell for his contribution to public finance, a book he published two years after his public finance thesis received even broader attention. His *Interest and Prices: A Study of the Causes Regulating the Value of Money*[1] had directly challenged the quantity theory of money that was first asserted by David Ricardo in response to the fears of inflation during the Napoleonic Wars, and subsequently popularized by the Great Mind Milton Friedman of the Chicago School. Ricardo's logic was that prices could not rise if there was no increase in the money supply that would enable the additional purchasing power that fueled inflation. Ricardo had further reasoned that government could not be trusted with avoiding the temptation of monetary expansion. He proposed that this privilege be removed from civil servants and elected officials by pegging the money supply to a nation's supply of gold.

What was missing in the discussion, in recent similar discussions, and even in the perennial debate over increases in the minimum wage was a focus on the inputs that create and the outputs that constitute gross domestic product. Wicksell observed, in a thought experiment, that a barter economy would determine some rate of interest that would balance the supply and demand for capital used to invest in increased productive capacity. This he called a *natural rate* of interest. But, when money is introduced to mediate between supply and demand, then it acts as a cloak that clouds the exchange of financial capital and the physical capital it purchases. Observers were left to assess the degree to which a change in the interest rate reflects a real adjustment arising from a change in supply and demand or an increase in inflation. His concerns about the clouding effect of inflation were shared around that same time across the Atlantic by the Great Mind Irving Fisher in his seminal works on the rate of interest.

Because banks lend money rather than physical capital, an increase in the money supply will then lower the interest rate to appeal to a greater number of borrowers who fund projects that would not otherwise be profitable, were it not for the monetary expansion. This will be especially true for long-term projects since the benefits of a low nominal interest rate would accrue longer for these projects. His argument was the first to demonstrate the distorting effects that monetary policy might have on the real economy. It also opened the door for contemporaries, especially the Great Mind Irving Fisher (February 27, 1867–April 29, 1947), who pioneered the "two-period model" that successfully introduced time into economic models.

This interest rate shift bids projects away from the short term and toward the more profitable long-term projects which capitalize the net present value of their returns at a commensurately lower interest rate. The short-term production of consumption goods is sacrificed for longer-term investment. Hence, inflation is induced.

Wicksell's pathway for monetary mechanisms and the importance of the interest rate as a signal of economic coordination was unmatched at that time. His book was translated and published the same year as Keynes published his famous treatise *The General Theory of Employment, Interest and Money*,[2] which also developed the link between the three variables Wicksell had treated almost forty years earlier. Had Wicksell's work been translated earlier, the insights Keynes provided to end the Great Depression may have allowed us to avoid it.

Before Wicksell, and Clark, the prevailing belief was that the price of labor determines the price of all other goods since, it was argued, labor is ultimately employed in the production of each component of even the most complex good. This natural wage would then depend crucially on population, which determined the supply of labor. The Marginalists, including Clark and Wicksell, showed that the relationship between the employment of capital, labor, and land, and the equating of a factor's marginal productivity to its price is much richer. Wicksell described this richness in his first book, published in 1893, entitled *Value, Capital and Rent*. There, he combined the best analysis and intuition of Léon Walras with Böhm-Bawerk into a sophisticated and integrated theory of the neoclassical economy. In his approach, the interest rate is the price that transforms an economy from one period to the next. His sophisticated analysis was the most coherent and elegant of its day. Yet it was not known to most English speakers until Clark synthesized components of it into his own work.

Later in life, Wicksell wrote extensively on the subject of inflation and monetary coordination failures that occurred during and after World War I. He and his wife remained peace advocates and advocated strongly that Sweden should remain neutral in global conflicts.

Knut and Anna had two children. Sven Wicksell was born the summer after their Paris rendezvous, on October 22, 1890. He went on to become a statistics professor at Lund University. He had a son, Finn Wicksell (March 10, 1917–December 10, 1996), who was a successful medical doctor. Finn was named for Knut and Anna's second son, Finn, who was born in 1893 but died tragically early in 1913.

Knut Wicksell died at the age of 74 on May 2, 1926 of complications from pneumonia. His widow, Anna, died less than two years later, on February 19, 1928.

33
The Later Years of Richard Musgrave

The tripartite roles of government described by Richard Musgrave have been broadly embraced. The ensuing discussion he fomented was not one of the accuracy of his description of the role of government. Rather, it was one of degree. His exploration was of how to weigh each of his three criteria within a well-functioning government. None but the most ideological would place a zero weight on his three goals of government – to provide public goods, to promote economic stability, and to ensure appropriate income redistribution.

Musgrave is also remembered as an inspiring scholar. He encouraged his students to think about government, taxes, and even the methodology of economics in new and fresh ways. He also supervised more than his share of graduate theses and stimulated his students' understanding of methodological issues through the graduate research seminars he conducted.

Yet he often left to his disciples the task of directly conducting and influencing public policy. In contrast to some of his colleagues, his influence remained primarily through his scholarship rather than his advocacy.

One departure from that principle was his period of consulting on behalf of the government of Colombia in 1971. Like many American economists during those years, he was asked to help modernize South American economies. His contribution was in assisting in a report on tax and fiscal reform on behalf of Colombia and through the Harvard International Tax Program. He also went on to advise the South American countries of Bolivia, Burma, and Chile, the Asian nations of South Korea and Taiwan, and Puerto Rico over ways they could redesign their tax systems to make them more progressive.

In 1978, Musgrave was made a Distinguished Fellow of the American Economic Association, and in this capacity he helped organize the

International Seminar in Public Economics for an assemblage of American and European scholars interested in public finance. He was also the honorary president of the International Institute of Public Finance.

Richard Musgrave's wife, Peggy Brewer Musgrave, was also an economist. Together, they authored a leading undergraduate textbook in 1973, *Public Finance in Theory and Practice*. Peggy Brewer had produced significant works on aspects of international finance. But while Richard Musgrave had little interest in his own practice of governance, his wife was different. Together they moved from the Harvard academic community to the University of Californian Santa Cruz, where she became Provost, the chief academic official of the university.

Richard Musgrave is remembered for a diversity of contributions. Ever the European aristocrat, he acted as a bridge between European and American notions of public finance. He also introduced new ideas to our public finance lexicon, such as intergenerational equity, the balanced budget multiplier, pay-as-you-use, fiscal competition, and governmental deadweight loss. His books and articles have been widely distributed in the English speaking academic world, but have also been translated into German, the source of many of his inspirations.

His transatlantic scholarship, such as the Buchanan–Musgrave Workshop in Munich in 1998, earned him an honorary doctorate from his German alma maters, the University of Heidelberg in 1983, an institution that greatly influenced his scholarship, and the University of Munich in 2001.

Musgrave's academic career was also broad in scope. He began his career with the United States Federal Reserve from 1941 to 1946, taught at Swarthmore College until 1948, and then at the University of Michigan in 1948. He also taught at Princeton and Johns Hopkins before accepting an offer to join both the faculty of economics and of law at Harvard University in 1965.

Musgrave's one major foray into federal politics in the United States was in his participation in a letter to President Ronald Reagan in 1982. He was among 34 leading economists concerned that Reagan's economic policy was troublingly regressive and would create unintended tensions between the wealthy and the working class.

Richard Musgrave died of natural causes on January 15, 2007 at his home in Santa Cruz, California, just a month after his 96th birthday

34
The Legacy and Later Years of James Buchanan

James Buchanan's ideas are invariably associated with a new school of political economy at the University of Virginia, and a school of economic thought. But for the academic year 1968–9, which he spent at the University of California Los Angeles and visiting semesters at the Florida State University and at the University of Tennessee, Buchanan spent much of his career in the state of Virginia, first at the University of Virginia, followed by Virginia Polytechnic Institute and State University, and, finally, at George Mason University in Fairfax, Virginia, where he became the first Director for the Center for the Study of Public Choice.

Buchanan was the president of the Southern Economic Association in 1963, followed by the Western Economic Association in 1983 and 1984. In between, he served as the vice-president of the American Economic Association in 1971. He was also on the Board of Advisors of the Independent Institute, and distinguished Senior Fellow of the Cato Institute, an institution whose mission is "to originate, disseminate, and increase understanding of public policies based on the principles of individual liberty, limited government, free markets, and peace."[1]

He was also president of the *Mont Pelerin Society*. The society was formed in 1947, after the end of World War II, by a few dozen scholars concerned about the deterioration of a Western sense of democracy and values. The collection of historians, philosophers, and economists were invited to meet at Mont Pelerin in Switzerland by Professor Friedrich von Hayek to the evolution and maintenance of classic liberalism in the latter half of the 20th century.

Buchanan is most remembered as the founder of the *Virginia School of Political Economy* based on his contributions and founding of the

Thomas Jefferson Center for Studies in Political Economy at the University of Virginia. The Center he founded continues on at George Mason University.

James Buchanan died January 9, 2013 in Blacksburg, Virginia, at the age of 93. His legacy included a long list of published books, *including Liberty, Market and State, and The Reason of Rules* (with G. Brennan) in 1985; *The Power to Tax* (also with G. Brennan) in 1980, *What Should Economists Do?* from 1979, *Freedom in Constitutional Contract* in 1978; *Democracy in Deficit* (with R. Wagner) in 1977, *The Limits of Liberty* published in 1975, *Cost and Choice* in 1969, *Demand and Supply of Public Goods* in 1968, *Public Finance in Democratic Process* in 1967, his classic *The Calculus of Consent* (with G. Tullock) in 1962, *Fiscal Theory and Political Economy* in 1960, and *Public Principles of Public Debt* from 1958.

His works were also collected together in *The Collected Works of James M. Buchanan*. He made much of this twenty-volume work copyright protected agreed to provide free access online.

Section 4

Bringing it all Together – Voting with the Feet and the Henry George Theorem

Musgrave's arguments for the expansion of the role of government, as predicted by Adolf Wagner, and Buchanan's argument for what motivates the decisions of governmental officials each cast doubt on the use of the neoclassical economic model of rational decision-making in the public sector. As the share of government expenditures in gross domestic spending increases, it would be comforting to believe that at least some levels of government may act with the goal of maximizing social welfare. Charles Mills Tiebout provided us with a way in which we can think about local public production that helped revolutionize Public Choice Theory. Then, Joseph Stiglitz took his notion of a town calculated around and designed to appeal to a certain section of the population and showed that the public goods provided by such a town could be fully funded through the very property taxes Henry George advocated a century earlier.

35
The Early Life of Charles Tiebout

Charles Mills Tiebout revolutionized Public Choice through his development of a model which describes how local governments may attract footloose residents who seek a community that affords them the best opportunity to achieve happiness. That his ideas were novel and intellectually brave should not come as a surprise for the family name Tiebout comes from a Dutch word meaning 'brave' or 'bold'. Furthermore, the New World patriarch of the family did much to forge the meaning of his family's name.

Jan Tiebout was born in 1636 in Bruges, West Flanders, in the Flemish lowlands of Belgium. This region shared much with the industry, culture, Protestant religion, and language of the Netherlands, just to the north. At the time, his region was caught in a tug-of-war between feudal lords, England, and Spain. Much of their industry was also on the decline in the shadow of the growth in larger commercial centers in Ghent and Antwerp. Jan sought religious and commercial freedom elsewhere. He joined a fleet that set sail to the area of North America around Delaware, New Jersey, and New Amsterdam.

Tiebout settled first at Fort Casimer by 1656, a Dutch settlement near present-day Wilmington, Delaware. A series of conflicts there, first with the Swedes and then with the British, forced many Dutch settlers to New Amsterdam, where they received much stronger Dutch protection. Tiebout migrated northward to the settlement (the site of the present-day New York City) and records show that, in January of 1660, he and his wife, Sarah Vander Vlucht, both joined the church there.

Tiebout established his family on lower Long Island, in the Flatbush region of present-day Brooklyn. Their settlement of Flatbush was named for the Dutch words 'vlacke bos', which means flat woodland or flat plain. The Dutch colony Nieuw Nederland was settled in the

mid-17th century there, but surrendered to the English in 1664. The area eventually became the county seat for Kings County, being given the present name Brooklyn.

In Flatbush, Jan was served for many years as a government clerk. He was also the schoolmaster at the local school for which he had donated the land, and he was the preceptor to the church. Jan bought and leased land, and ran a farm to feed his family. He also acted as a messenger between New Amsterdam and nearby Bergen, New Jersey, where, on November 20, 1665, he took the oath of allegiance to the English.

Jan Tiebout had a dozen children, although several of them never reached adulthood. One of his sons, Theunis Tiebout (September 30. 1663–July 27, 1754), trained to be a carpenter, and he proved to be a good one. In 1712, he proposed to build a horse mill that had been "never before seen in these parts."[1] His hard work, intelligence, and frugality permitted him to secure his freedom from indentured servitude, and on April 11, 1696, he married Marytje Vandewater. Marytje's family also dated back to the earliest history of New Amsterdam. The patriarch, Jacobus, had arrived in 1658 and had then married Enngeltie Jureaans.

Theunis and Marytje themselves had eight children, including a son, Albertus Tiebout, born in 1708 in nearby Hackensack, New Jersey, just across the Hudson River.

Albertus was a mariner and seaman. He served as a captain in the French Wars, and, on October 12, 1728, married Cornelia Bogert (March 29, 1710–1754), who was herself from a respectable family in the Dutch community of Brooklyn. Her paternal grandparents, Jan Laurens Bogert (1630–1708) and Cornelia Everts Bogert (August 1629–1707), had arrived in the New World from Amsterdam on April 16, 1663 on *The Spotted Cow*, captained by Jan Bergen. They prospered in the colony and by 1675 Jan Laurens Bogert was established as the magistrate of Harlem.[2]

Albertus and Cornelia also had many children, including Nicholas, born in 1733, who went on to become a Lieutenant in the New York Regiment in the period leading up to the War of Independence. By then, the family was dividing their time between New York City, which had fallen under British control, Flatbush, across the East River, and Elizabethtown, Union County, New Jersey across the Hudson River. Returning from battles in the French and Indian Wars, Nicholas settled in Elizabethtown and married Ann Thomas (1742–September 25, 1795), the daughter of a family of the founders of Elizabethtown. The couple had at least three children, including John Tiebout (1778–1823) and Cornelius (1777–1823).

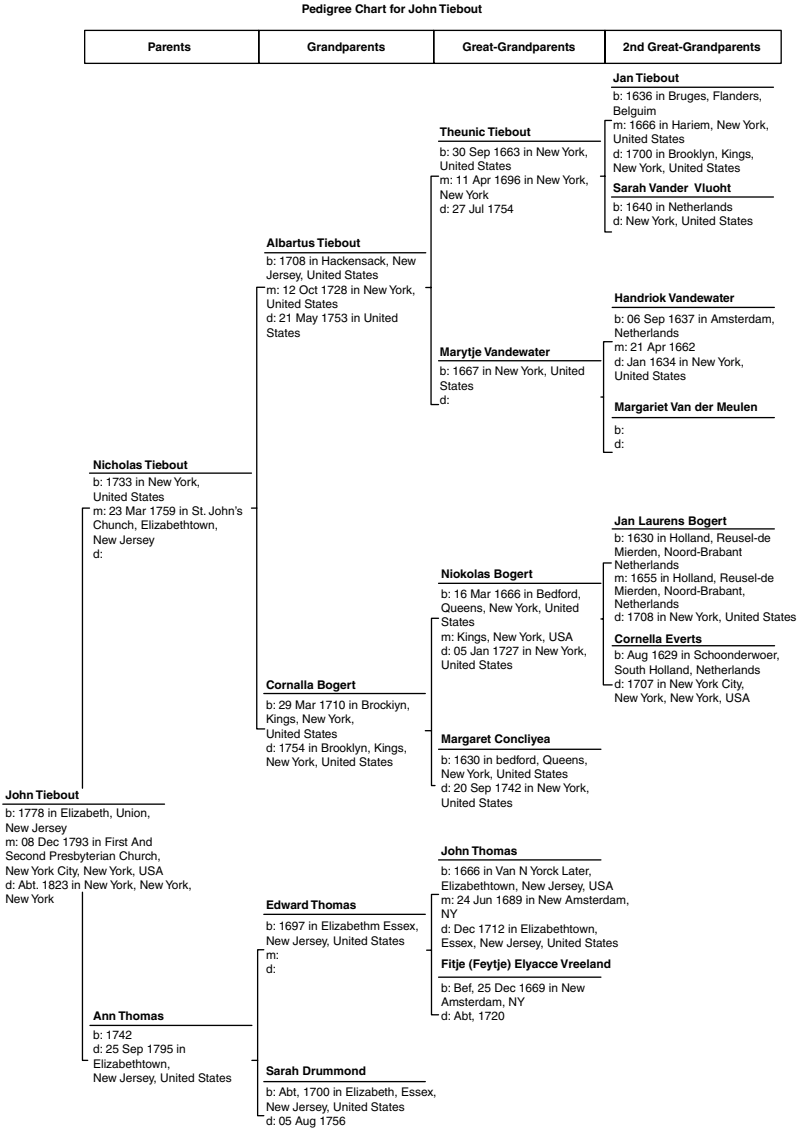

Figure 35.1 Early ancestors of Charles Tiebout

John Tiebout was born in Elizabethtown, New Jersey in 1778. As a young adult, he had moved to New York City to establish a newspaper, *The Tablet*, run a publishing house, and operate a bookstore on Water Street, close to the ferry crossing between Brooklyn and Manhattan that would eventually become the site of the Brooklyn Bridge. He was a publisher of some renown in his day, and continued his business there until at least 1809.

By the late 18th century, the descendants of Jan Tiebout were establishing themselves in a diverse range of occupations. John Tiebout had went into printing, while John's second cousins, Henry Tiebout and Cornelius Tiebout, became, respectively, a Revolutionary War hero and a famous war engraver. Each generation distinguished itself, but each also strayed farther, both geographically and from the Tiebout family roots in carpentry and shipbuilding.

John Tiebout married Margaret Todd (October 1869–1859), the daughter and granddaughter, respectively, of Scottish seafarers Captain Adam Todd (June 2, 1746–1798) and Adam Todd (1700–1765). Margaret and John had nine children together. Their son, William (March 2, 1801–April 26, 1873), began his adult working life as a salt merchant and then went into the hardware and ship outfitting trade with his brother John Tiebout, establishing premises at 197 Lewis Street in Brooklyn.

The business grew, being renamed W. & J. Teibout, and diversifying to manufacture much of the wooden hardware for the wooden merchant ships that plied the nearby ports, as well as providing a range of other materials. William and John married two sisters, Sarah Potter Crane (October 14, 1796–February 13, 1878) and Phoebe Crane, daughters of David Day Crane and Hannah Cleveland, and the granddaughters of the Revolutionary War soldier Eleazer Crane (1740–August 26, 1776), who had died in the hands of the British after his capture in the Revolutionary War.

William and Sarah's second son was John F. Tiebout (October 23, 1827–February 13, 1878), who took over the family ship outfitting business following the death of his father. John F. Tiebout. John and wife, Caroline Holmes, had a boy, John William Tiebout, on February 4, 1864, who also continued the family business that, by the early 20th century, had become highly successful by the time John F. Tiebout died in New York City on June 26, 1904.

John William had started with the company at the age of 16, and over the course of his life he witnessed many changes in the industry. When he had started, the company was located in the shipbuilding district of New York City. It then moved, first to 33 Chambers Street, and then,

in 1903, to 118 Chambers Street. John W. managed to further expand a business that had for long been known as a dominant firm in the industry.

John William Tiebout was a valued member of the New York City business community, a member of the Board of Trade and Transportation, and also the president of a bank. His family business came through many economic fluctuations, and, by the early part of the 20th century, it had become one of the leading manufacturers of marine hardware. Indeed, the family business was to succeed to such an extent that it almost monopolized some segments of that industry on the Eastern Seaboard.

John and his wife, Anna Louise Comings (April 16, 1863–April, 1938) together raised four children in Brooklyn. Anna Louise Comings Louisa Comings Tiebout was born on March 19, 1890, followed by John William Tiebout, Jr., born on December 30, 1891, Harry Morgan Tiebout on January 2, 1896, and Frances Comings Tiebout in 1906. The eldest daughter, Louisa, died just shy of her tenth birthday, on February 2, 1900.

John's wife died a few years before he did, but still managed to live until the age of 75. Not long after his wife died, John moved his family to Rowayton, Connecticut from the family home in New Rochelle, New York and a residence in Brooklyn. John Tiebout lived until he was 79 years old.

Only the eldest of the sons, John William Jr., remained in the family business. The second son, Harry Morgan Tiebout, went on pre-medicine studies at Wesleyan University in Middleton, Connecticut, from where he graduated in 1917. He then attended Johns Hopkins University School of Medicine, where he specialized in psychiatry. In his first year there, he participated in student army training, and at the end of the war in the following year, 1918, he received an honorary discharge as a private.

Harry Morgan Tiebout was taught at Johns Hopkins by Adolph Meyer, a renowned, Freudian psychiatrist at that time. Upon graduation, Harry Tiebout joined the staff of New York Hospital at their Westchester branch in 1922. At that time, he specialized in child psychology, and joined the Institute for Child Guidance shortly after it formed in 1927. Tiebout was also on the staff of Cornell Medical School and the Payne Whitney Psychiatric Clinic.

One of his next moves proved crucial to his later career. He moved in 1935 to Greenwich, Connecticut to become medical director at the Blythewood Sanitarium. This rather exclusive sanitarium was housed

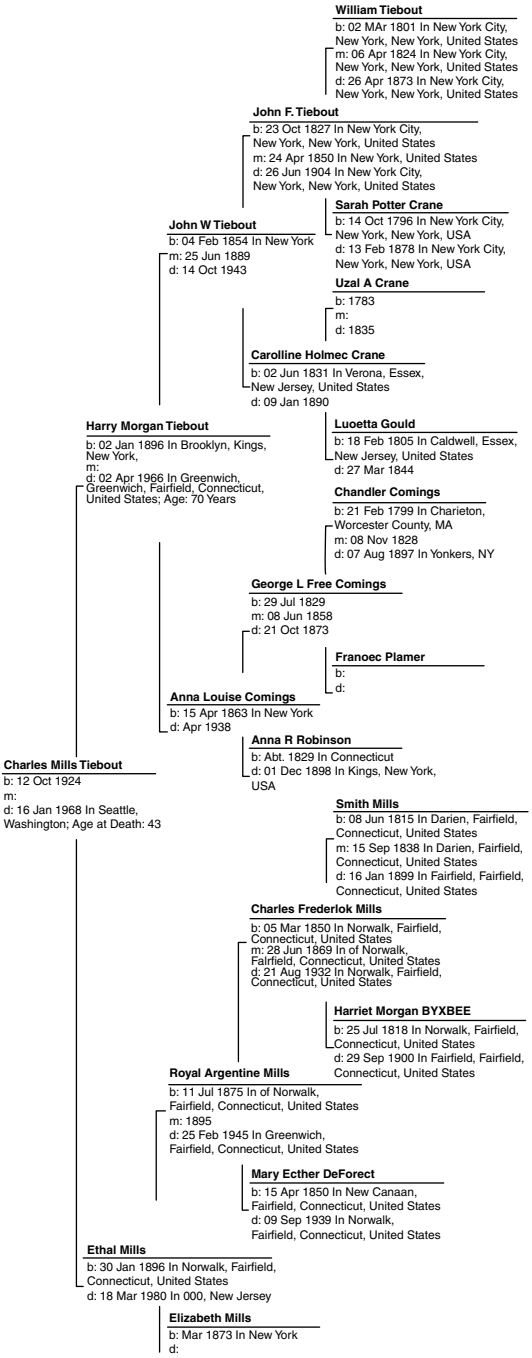

Figure 35.2 Immediate ancestors of Charles Tiebout

on a rustic fifty-acre estate that had once been owned by the infamous William Magear ("Boss") Tweed (April 3, 1823–April 12, 1878), the leader of the corrupt Tammany Hall that dominated and denigrated New York City politics in the late 19th century. Following the demise of Tammany Hall, the estate had been converted, becoming one of the best state-of-the-art sanitariums in the New York City region.

At the Blythewood Sanitarium, clients pursued an eclectic psychological and occupational therapy that departed significantly from the prevailing approach in which patients were treated more like prisoners than people. The sesanitarium primarily treated the mentally ill, but it also had developed a unique course of treatment for those suffering from alcoholism.

A few years after his arrival as medical director, Tiebout was asked to review a new book on a novel group-therapeutic approach to alcoholism, with the title *Alcoholics Anonymous*. Tiebout passed the book on to one of his patients who had proved particularly unresponsive to Blythewood's other therapies. This patient, Marty Mann, identified initially with the new approach as it finally attached the term, *alcoholism* to the disease that afflicted her. When she subsequently resented the religious tone of the technique, Tiebout implored her to persevere. She did, and eventually embraced the approach.

This transformation in Ms Mann, and the strong advocacy of Dr Tiebout, eventually allowed her to overcome her affliction. She quickly became a zealous advocate for the AA program. Indeed, her advocacy and education outreach on behalf of the program became her second career. Tiebout encouraged her and helped her to found the National Council on Alcoholism.

Tiebout also became a supporter of AA's founder, Bill Wilson, and he assisted Wilson in spreading his therapy ideas with the American Psychiatric Association and advocating for the *American Journal of Psychiatry*to publish his theory. Tiebout, too, began to publish his own research in this area of therapy, including papers that described the AA methodology. Tiebout argued that the erratic and destructive behaviors associated with alcoholism are but the symptoms of the underlying disease. It is these symptoms that can damage or kill their victim, though. Tiebout admonished other psychiatrists to treat the symptoms as well as the underlying disease.

Harry Tiebout married Ethel M Mills. Together they had three children – two sons, Harry Tiebout, Junior, and Charles Mills Tiebout, and one daughter, Sally Tiebout.

Harry wife's, Ethel, was also from a family that could trace his ancestors back to the founding of one of the first colonies in what became

the United States. Her heritage could be traced back to Richard Mills (September 21, 1608–December 25, 1660), who was born in Barnstaple, Devon, England, but died on Christmas Day in Stamford, Fairfield, Connecticut, just six miles north of where Harry and Ethel Mills raised their own family.

The first son of Harry and Ethel, Harry M. Tiebout, Junior, was born on November 3, 1921. In later years he went on to study at his father's alma mater, Wesleyan University in Middletown, Connecticut, during the war years 1941–45, before moving on to earn his PhD at Columbia University in 1951. He then moved to the University of Illinois, where he spent the whole of his teaching career. Harry Tiebout, Jr, was a popular philosophy professor, especially with his course on world religions. He was a leading light in the development of the philosophy of comparative religions, and wrote extensively on the subject. He also wrote on his father's subject, psychiatry, and on the work of particularly influential thinkers, particularly Jean-Paul Sartre and Alfred North Whitehead.

Harry Tiebout, Jr. was elected to his County Legislature, and served on the National Association of Colored People (NAACP), Champaign-Urbana branch, in the years just before the civil rights movement found its full stride in the United States in the 1960s.

Harry and Ethel Tiebout's second son, Charles Mills Tiebout, was born on October 12, 1924 and his formative years were in the wealthy town of Greenwich, Connecticut. Charles also attended Wesleyan University, beginning his studies one year after his brother began his studies there. After only one year of study, at the height of World War II, he dropped out to join the Navy. Throughout the course of the war, however, he was to remain stateside, in Chicago, where he met his wife, Elizabeth Charlton Gray (October 7, 1922–January 5, 1999). At the end of the war, the couple moved back so that Charles could continue his studies at Wesleyan, from where he graduated in 1950. By then, the couple had become a family, following the birth of Charles Mills Tiebout, Jr.

In 1950, Charles Tiebout moved his family to Ann Arbor, Michigan to allow him to pursue his PhD in economics at the university. His thesis, on regional multipliers, was completed in 1957. By the time he graduated, though, he had already been employed by Northwestern University for three years, and in 1956 he had had what was to prove his most seminal contribution to economics published in the *Journal of Political Economy*.

The *Journal of Political Economy* (*JPE*) was a particularly satisfying publication for Tiebout for a number of reasons. First, it meant that although

Tiebout had yet to defend his thesis, he was already published. Secondly, the *JPE* was, and remains, one of the most influential journals. Finally, he was using a journal published by one of the most economically conservative schools to espouse the concept that government could function with the same efficiency and agility as could a corporation. This seminal and often-quoted article represented an olive branch and bridge between the free market Chicago principles and the increasingly respected contributions of Musgrave and Buchanan. It also represented a resurgence of the ideas of Henry George.

36
The Early Life of Joseph Stiglitz

There are few scholars more academically talented, curious, or varied than Joseph Stiglitz. His interest in a broad set of important questions has allowed him to see the forest through the trees and to apply concepts from one area of public finance or economics to many others. His abilities have not gone unnoticed.

Joseph Stiglitz was born and grew up in Gary, Indiana, a medium-sized industrial town on the south shore of Lake Michigan, the second largest of the Great Lakes. Joseph's grandparents, on both his mother's and father's side, had settled in the Chicago area as Jewish immigrants. From Prussia, Joseph's maternal grandparents, Herman and Sarah Fishman, were born in the same year of 1888 and arrived as young teenagers with their parents in 1901 and 1902 respectively. They had married on January 27, 1907 in Chicago. By the time they gave birth to a son Isadore Fishman (January 18, 1908–November 3, 1977), they had settled in East Chicago, Illinois. On May 19, 1914, Charlotte Fishman was born. The two children were supported through income from the family's grocery store. Isadore himself grew up to be a successful attorney in the Illinois and Indiana area.

Joseph Stiglitz's paternal grandfather Max Marcus Stiglitz (December 26, 1868–January 9, 1925) had come to the United States from the Austro-Hungarian Empire in 1884. A decade after his arrival, he married Hannah Marks, of nearby Ohio. Their family ran a clothing shop in Gary, Indiana. Their son, Nathaniel D. Stiglitz, was born on May 5, 1903 in Gary.

Charlotte Fishman had met and married Nathaniel D. Stiglitz, born on May 5, 1903 in Gary, Indiana. Nathaniel (Nat) Stiglitz and Charlotte Fishman had two children – Mark Lawrence, born in 1937, and Joseph Eugene, born on February 9, 1943.

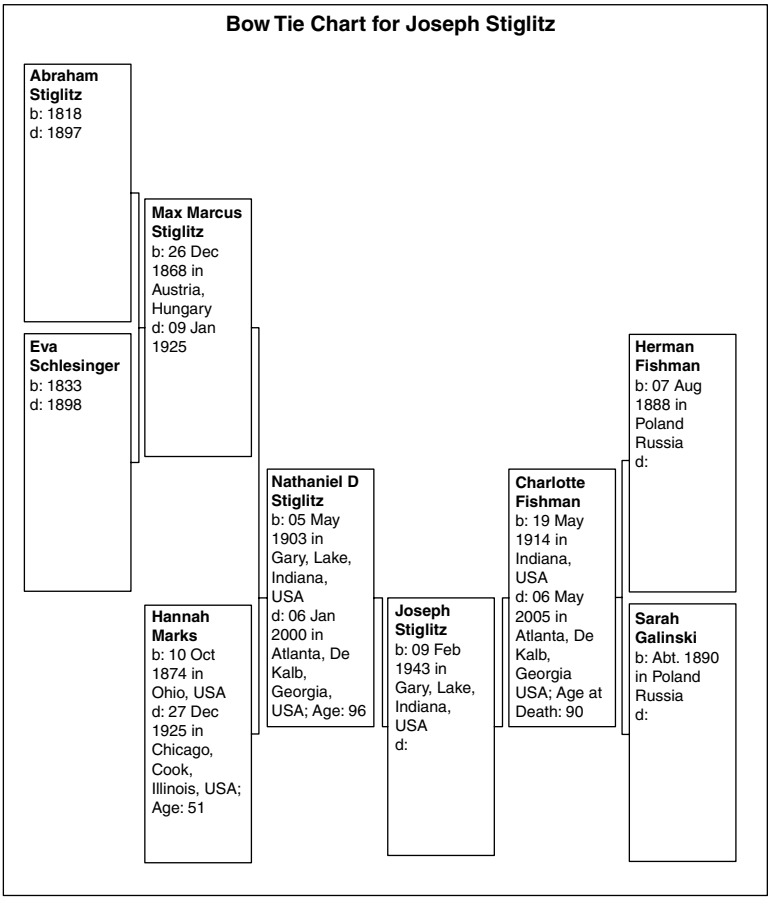

Figure 36.1 Ancestors of Joseph Stiglitz

Gary was the home of many immigrant communities drawn to the newly incorporated town to supply labor to the plants that were in full operation to make the steel that would be used to produce the armaments to supply the Allies in the midst of World War II. The city was founded by the United States Steel Corporation in 1906 and was named after Elbert Henry Gary, the founding chairman of the corporation. In the 1930s, almost half of the population were either immigrants themselves or had at least one parent who had immigrated to the United States. Theirs was a community whose economic fortunes rose

and fell with those of the town's main employer – the steel industry. Poverty, labor unrest, unemployment, and discrimination all colored the Gary community and had a profound effect on the young Joe Stiglitz. His mother's family, with whom they remained close, were New Deal Democrats and sympathetic to the labor movement. On the other hand, Joe's father, who had moved from his father-in-law's clothing business and into insurance, was more embracing of small business and notions of personal self-reliance.[1] The discussions at young Joe's dinner table focused around the need to balance growth and progress with competitiveness and the protection of civil rights.

In a growing manufacturing town in America's rustbelt over the 1950s and early 1960s, this era was characterized by the presence of a cultural melting pot on the one hand, but also of racial segregation. The public schools Joseph attended contained a large share of the children of immigrants. He considered himself fortunate to have good teachers in his youth, but the aim of his educators was to ensure that he should receive both an academic grounding but also some preparation for a future trade. Joseph chose the electrical and printing trades. Large classes, however, forced Joseph to also be somewhat self-reliant with regard to his own education.

He sought to expand his academic horizons by pursuing his growing interest in public policy. Joining the high school debating team, he quickly mastered the ability to argue either side of a position, as individuals in debating competitions are randomly assigned issues and positions and had to convince umpires of the logic and rhetoric of their side of the debate.

This skill in articulating all sides of an argument would prove very useful to Joseph. When his academic scores secured him a place at Amherst College, by then one of the most exclusive liberal arts colleges in the country, he established himself quickly on campus in the Fall of 1960.

Joe had followed his elder brother Mark to John Bates Clark's alma mater, Amherst College, although the brothers only overlapped there for about a year. Like Joe, Mark was a brilliant student. He had graduated in 1961 near the top of his class, then attended Harvard Medical School. Following his Harvard education, he worked as a psychiatrist at the Massachusetts Mental Health Center. By the 1970s, Mark had moved to the Washington, DC area to work in the psychiatric faculty of the Georgetown University Medical School. He had retired to the McLean, Virginia area with his wife, Karen, but continued to meet with the occasional client. On a Friday afternoon of July 22, 2011, a patient named Barbara Newman, a former scientist with the National Institutes

of Health Immunology lab, came to his home office and shot him before committing suicide in his office.

While Mark and Joe had only overlapped for a year at Amherst, then still a men's college located near Smith College, one of the nation's leading women's liberal arts colleges, both of them thrived in the Amherst educational atmosphere. Amherst emphasizes a complete liberal arts education, similar in some respects to the tradition adopted at Trinity College in Cambridge. Students receive classroom instruction, but are also brought under the tutelage of individual teacher/scholars. There, Stiglitz learned that a successful answer depends crucially on a well-formed question.

Stiglitz quickly parlayed his strong mathematical skills into the study of physics, in which he specialized through his third year of studies. But, near the end of his third year of study, he discovered that economics would allow him to combine his strong societal interests with the rigorous mathematics he had mastered in physics and which was increasingly being incorporated into the neoclassical economics of the 1960s, under the intellectual leadership of such Great Minds as Paul Samuelson, who had also grown up in Gary, Indiana, just a generation before him.

Joe had come late to the study of economics, but he soon aspired to go on to graduate school in that field. He had been on a full scholarship to Amherst, but one of his mentors, Ralph Beals, had not long before graduated from the Massachusetts Institute of Technology. His mentors arranged to have him attend graduate studies in economics at MIT rather than have him spend his fourth year at Amherst.

Stiglitz would, of course, miss some of his undergraduate experiences at Amherst. In his final year at Amherst, he was the president of their student government at one of the most inspirational eras for American young people during the years of the John. F. Kennedy presidency. Their generation believed the president's assertion that anything was possible in an America reaching its ascendancy and a renewed sense of the nation's manifest destiny. Like many of his era, Stiglitz had a mistrust of entrenched power and the status quo. He was, and remains, a social activist inspired partly by his participation in the August 28, 1963 march in the Washington Mall when Martin Luther King made his "I Have a Dream" speech.

For Joe Stiglitz, barely twenty years old, the transition from the cradle of undergraduate liberalism at Amherst to the intense intellectualism of graduate studies at MIT was an abrupt one. At MIT, Stiglitz was

surrounded by some of the brightest economics and finance scholars in the world. One of his class colleagues was George Akerlof (June 17, 1940–), who had been accepted into the MIT PhD program just a year before Stiglitz arrived. Akerlof went on to win a Nobel Memorial Prize in the same year as Stiglitz in 2001. Peter Diamond, another Nobel prize winner, had graduated just as Stiglitz arrived. Also at MIT and teaching classes to the graduate students were the Great Minds Paul Samuelson, Robert Solow, Kenneth Arrow, and Franco Modigliani, each of whom earned a Nobel Memorial Prize. Clearly, in joining this institution he was being immersed in an incredibly rich intellectual environment.

The school had also developed a certain *school* of economic analysis. The models developed there in that era were only as mathematically sophisticated as was necessary to prove their point. This approach built upon Stiglitz's education at Amherst, which emphasized that a very well-crafted question often leads directly to the most appropriate answer. Because of this approach, which is evident from Stiglitz's lifework perhaps more than in any other profound thinker, the economic models were sparse and elegant. They lent themselves to extensions, and often then to further questions and intuitions. This is the hallmark of the work presented here. The models should enlighten our intuition. Our heightened intuition should then lead us to even greater conclusions and public policies.

Stiglitz absorbed this rich intellectual environment. He completed his coursework for his PhD very quickly, by the end of 1964, and began to work on his thesis and on projects assigned to him in his new role as a research assistant for Paul Samuelson. Interestingly, while the Nobel Memorial Prize had not yet been formed, Samuelson, also from Gary, Indiana, was its second recipient. Stiglitz would later win the same prize. Gary, Indiana has likely created the highest number of Nobel Memorial Prize recipients per capita.

For his third year, Stiglitz secured a fellowship to study at Cambridge University, where he was assigned to be under the tutelage of Joan Robinson at first, and then Frank Hahn. There he also became acquainted with the Great Mind James Mirrlees, and also another future Nobel laureate, James Meade (June 23, 1907–December 22, 1995). The strong faculty at Cambridge, with its interest in issues of public finance and the distribution of income, helped inspire his eventual thesis. Indeed, the first paper to flow from his thesis was "The Distribution of Income and Wealth Among Individuals."[2]

Over the course of his career Stiglitz's intellectual interests ranged over an almost unfathomable number of interesting questions. One topic

that always remained at the forefront of his thought, however, flowed from his *Distribution* paper. He was interested in how the public sector and the tax system could enhance both efficiency and equity. We have already presented Stiglitz's work with Atkinson on the role of taxes, as an extension of both the Ramsey and the Mirrlees models. In 1991, he also addressed the central thesis of Musgrave. In "The Economic Role of the State: Efficiency and Effectiveness," Stiglitz presented his belief in the essential role of government in maintaining and expanding economic efficiency through public finance and expenditure.[3] There he also addresses the balance between fair distribution and the need to preserve economic efficiency.

37
The Times of Charles Mills Tiebout

Charles Mills Tiebout was renowned among colleagues who knew him for two things – (i) the concept we now know as "voting with the feet" and (ii) his sense of humor. The first concept arrived with the second.

The Great Mind Richard Musgrave explained that Charles had studied under him at the University of Michigan. Charles had taken Musgrave's course on public finance and had offered to his professor a concept with would define him forever. As his professor pondered whether the public sector could provide for public services efficiently, Tiebout joked that, if local government did not, their residents could always leave. Musgrave saw much more in this intuition than the casualness of the joke might suggest, and urged Tiebout to elaborate on his idea. Tiebout's extension became both the subject of his first major paper and also his legacy.

Tiebout was actually using humor to deflect what was perhaps a damning criticism of one aspect of Musgrave's work. Musgrave had hypothesized that the *free rider problem* makes it difficult to achieve the optimal provision of a public good because residents do not have the incentive to reveal how they value a public good for fear that they will be taxed for it. This problem can lead to market failures.

Tiebout offered his solution in a disarming manner. By their willingness to move to jurisdictions that offer them the public goods they desire, their revealed preference is restored.

Musgrave, Tiebout, and James Buchanan were reviving a discussion that had been dormant for more than half a century. Discussions over public expenditure and tax policy were part of the public debate when more institutional issues were commonly discussed. But, once mainstream economics embraced the neoclassical model, and the models became increasingly mathematical and theoretical in nature, economists ventured into the public arena less and less frequently. Gone were the days of populist economists like Henry George or, a generation

later, Thorsten Veblen. As economic theory departed the public stage, novel ideas over the role of government became the purview of political scientists rather than economists.

Musgrave, Buchanan, and Tiebout assisted in a revival of public finance and economics, just as the Great Minds Coase, Williamson, and others were doing the same within the *New Institutional Economics* field as applied to corporate finance and the theory of the firm.

But while the theory of optimal taxation remained mathematically sophisticated, even if the intuition was simple enough, the concepts teased out by Musgrave, Buchanan, and Tiebout were both intuitive and elegant. Their theories did not require mathematical sophistication, even though one could employ mathematics at times. Rather, their contributions were at the conceptual level.

Perhaps the reason for retrograde analysis was its reflection of the direction of nations. In the 1880s and 1890s, when Henry George's ideas were at their zenith, local and state governments were still the most profound governmental influences on citizens' lives. The federal government in the United States was still relatively small, and reluctant to meddle in the economy, and was yet to adopt an income tax. Conceivably, the 100% tax on land that the Georgists recommended could fund most of what citizens then considered the legitimate role of government.

Over the course of the next half-century, government discovered new roles, the levels of taxation expanded dramatically, and the relative importance of public finance and expenditures ballooned. The natural exploration was whether government and the private sector were inherently different and, if so, why. And if there was much discussion of the theoretical or justifiable role for government, the discussion instead centered on national government, for which there was no alternative, and little ability to change.

At the same time, looming national issues such as two world wars, two large regional wars, the Cold War, the Great Depression, and other global economic and political problems captured the public's attention and cemented a role for a more activist federal government. It was not until the 1960s, when frustration with prolonged states of war and what was increasingly perceived as ineffective federal government became more problematic, was there a renewed recognition that all politics was local, at least all politics upon which an individual citizen could exert some influence. This was the era during which Charles Tiebout framed his hypothesis which seemed to offer an escape valve for a frustrated electorate.

38
The Great Idea of Charles Mills Tiebout

The very nature of a public good as described by Richard Musgrave challenges the neoclassical model. In private markets, one's pattern of expenditure reveals preferences. But when there exists non-rivalry and non-excludability, private markets fail. Their failure brings about the need to ensure that those who fill the void do so in an efficient manner. This question is the purview of public finance.

The ideal mechanism would be one which permits the public sector to emulate the private market. After all, ever since Adam Smith, Walras, and Arrow and Debreu, the economics literature has demonstrated the efficiency of a private market which approaches that of the competitive ideals.

Charles Mills Tiebout provided this bridge. He had grown up in Greenwich, Connecticut, which was an emerging suburb for the wealthy who worked in New York City. Just thirty miles north of the City, it was also proposed that his community house many of the people who would move to the United States should the United Nations locate there.

In Greenwich, there was a great deal of concern about the United Nations proposal. Just after World War II, Charles Tiebout, then a 22-year-old navy seaman who had recently returned home, wrote a letter to the editor opposing the increased suburbanization of his family's home town. He noted that the intrusion of United Nations workers in his home town was a most unwelcome development. It would command a change in the types of services the town provides, and would affect both the property values incurred and the level of taxes paid by its residents. Charles implored the United Nations to look elsewhere.

Clearly, in his arguments Tiebout was already viewing a town as a bundle of services, and property taxes as the price of admission to enjoy those services. Yet, by that time, he had not even completed his economics degree at Wesleyan in Middletown, Connecticut, having

dropped out to enlist in his first year, and having recently returned to resume his studies.

Once back at Wesleyan, Tiebout continued his developing interest in regional economics. He worked on workforce and regional marketing issues for the local Chamber of Commerce in Middletown before his senior year of college, and he worked in the state's capital of Hartford on regional tourism and labor force demand between his graduation and graduate school at the University of Michigan.

These extracurricular activities gave Tiebout an insight into the provision of public services. Tourism attractions often have a public flavor. Many attractions are non-excludible and non-rivalrous. In economic theory, they can be likened to a patent or some other form of product differentiation. Yet individual businesses have little incentive to provide such amenities that can broadly attract tourists. Meanwhile, all members of the community benefit from the employment created by an investment in amenities.

Upon his arrival at Michigan, Tiebout also had the good fortune to work with academics with an interest in regional issues. Wolfgang Friedrich Stolper (May 13, 1912–March 31, 2002) was a Viennese economist who had produced ground-breaking work with Paul Samuelson on the effect of the valuation of regional outputs on local wages and employment, summarized in the *Stolper–Samuelson Theorem*. He also had translated into English the ground-breaking work of the German regional and spatial economist August Lösch (October 15, 1906–May 30, 1945). Lösch had pioneered the optimal geographical layout of economic activity and helped establish the field of regional economics.

At that time, the University of Michigan had broad expertise in the study of regional economic issues. Tiebout had dabbled in regional economic studies in his work in Connecticut, and had the opportunity to expand his expertise at Michigan. While at Ann Arbor, Stolper and Tiebout collaborated in a regional input–output analysis of the local economy in 1952. There, Tiebout also came under the influence of Richard Musgrave. At that time, Musgrave was still in the twenty-year gestation before the publication of his path-breaking *The Theory of Public Finance*. He had been searching, to no avail, for a way to resolve the traditional method of pricing of goods and services within the neoclassical model. His intuition was through the avenue of voluntary exchange, but, while such exchange is moderated by a good's price in private markets, the public analogy was not self-evident. Samuelson, too, was frustrated in the creation of an analogy because of the frustrating

problem of "the impossibility of a decentralized spontaneous solution (because) any one person can hope to snatch some selfish benefit in a way not possible under the self-policing competitive pricing of private goods."[1] Such "free-riding", when combined with an inability to detect when consumers might reveal themselves to do so, frustrates the public analogy to a private equilibrium.

When Tiebout heard Musgrave's lament of Samuelson's frustration, Tiebout offered his solution. He suggested, somewhat jokingly, that consumers could instead just shop around for the bundle of public services that best fit their preferences. They, in essence, purchase public goods with their feet by moving to the jurisdiction that offers them the best package of public services they desire for the price they can afford. They "pay" for these services through the membership fee to the town, in the form of the property tax.

This perhaps flippant comment contained the kernel of a theory. Tiebout put this simple thesis aside while he completed his Michigan thesis on input–output analysis, but he returned to his idea while teaching on the side at Northwestern University in nearby Illinois. One of his students, Charles Leven, related a lament over lunch to Charles Tiebout from a Northwestern colleague. The colleague was frustrated that he should pay high Evanston, Illinois property taxes even though he had no children who would benefit from the superior taxpayer-funded schools in the town. Tiebout retorted that Leven should just move to a nearby community with lower taxes but also poorer schools.

Tiebout immediately saw how his solution connected with his previous comment to Musgrave and, within a few days, he completed the draft of a paper for which he would become famous.[2] The paper was published in 1956 and entitled "A Pure Theory of Local Expenditure,"[3] in a – some might call humorous, and others impudent – tip of the hat to, or a jab in the ribs of, Paul Samuelson.

For his theory, Tiebout adopted assumptions borrowed directly from the competitive model. He assumed the full mobility of residents, akin to full freedom of the consumer to purchase the good of their choice, full information, and no externalities. He further imposed that each community is of an optimal size, which, we shall see, implies constant returns to scale, and that communities which are not optimal in size can use the tools available to them to reach optimal size by attracting or removing residents.

Tiebout noted that these economies certainly include increasing returns to consumption-scale enterprises like public goods, but also decreasing returns to scale from such fixed factors as land. Again, we

shall justify this assumption when we revisit the Henry George Theorem in the next section.

These assumptions draw obvious parallels to the competitive market. It should then come as little surprise that Tiebout determines city managers set the level of public goods and services and local taxes to appeal to a subset of households might attract. Likewise, households choose the jurisdiction that offers their preferred combination of public goods and taxes. Voting with the feet, by moving to their preferred city, then completes the analogy with the competitive model in private exchange.

Tiebout's insights were ignored by many, misunderstood by some, embraced by some, but also rejected by an influential few. In particular, Joseph Stiglitz's mentor, Paul Samuelson took great pains to deny Tiebout's logic. Granted, Samuelson's earlier paper was more relevant to a federalist system, while Tiebout's analysis was decidedly local in nature. But at least one other, James Buchanan, absorbed Tiebout's logic and extended it in a meaningful way.

The Buchanan bent

Buchanan read Tiebout's approach as implying that residents can move between jurisdictions, and hence trade the bundle of public goods among themselves. They would do so until the marginal rate of substitution between jurisdictions is optimized. Buchanan also observed that the residents of each region can, through their public managers, create characteristics for their jurisdiction that effectively maintains and attracts residents of like taste and sufficient homogeneity. These characteristics include zoning, tax policy, and other membership criteria to preserve their "club." Buchanan realized that Tiebout's theory provided the bridge between private markets and public goods to which any good Chicago economist might aspire, and, similarly, how the Great Mind Ronald Coase (December 29, 1910–September 2, 2013) had argued in his "The Problem of Social Cost."[4] In doing so, Buchanan generalized Tiebout's results through his creation of the "Theory of Clubs."

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Applications and Extensions

The somewhat competing paradigms of James Buchanan and Richard Musgrave should not be viewed in a "winner takes all" manner. Both Great Minds contribute to the debate and help form our views. While their conclusions were often in sharp contrast, both add to our insights. And each makes a substantial contribution to the literature and our understanding.

To best grasp how each makes a contribution, it is helpful to ask what Charles Tiebout adds to the debate on the construction of effective government.

I am a county legislator. I have lamented why more citizens will attend a town meeting than a county meeting, even though the county is a collection of towns, often with a much larger budget, and with a greater latitude for legislation. For that matter, more citizens attend a meeting of a local taxpayer or ratepayer association, or a school board, than either town or county meetings. Proportional to the population, even fewer people attend meetings of the state legislature or the federal government.

Tiebout argued to the federalist in Musgrave that *small is beautiful*. The narrower the range of government, the more obvious is the package of public goods and services it can offer, and the more homogenous are the recipients.

In 1965, James Buchanan established a *theory of clubs* that helps explain Tiebout's vision. In his "An Economic Theory of Clubs" published in *Economica*,[1] Buchanan drew attention to the spectrum in between Samuelson's pure private goods and pure public goods, and argued that this gap can be better described by making an analogy between government and a club that offers a set of goods and services to a select group of members. The goal of the club is to then establish

a balance between the range of the club's offerings and the size of its membership.

Local government could then be viewed like a club which has the goal of discovering the "size of the most desirable cost and consumption sharing arrangement." One could use the example of the construction of a community-funded field, pool, or community hall. To a point, the facility can afford additional participants with little detriment to the enjoyment of others. Each additional member then helps defray the costs and lowers the contribution of all other members. This formula is optimized once the average contribution of each member becomes equal to the marginal cost of congestion of the facility that the last member induces upon the broader community.

Buchanan's thinly veiled rationalization of government was expanded and embodied in the Henry George Theorem, which is the topic of this volume's final exploration. Before we describe the Henry George Theorem of Joseph Stiglitz, let us tease out the contribution of Charles Tiebout to this discussion.

If we define a club to be a group of individuals who are homogenous in their payment in membership to a *club* and in their enjoyment of the services a club provides, then we unify the views of Buchanan and Musgrave by way of *voting with the feet*. In such a unification, government is small and local in nature. It provides a set of services that appeals to its ratepayers. Local government can use zoning to specify the services provided by the private sector, and to limit the number and type of local residents, and it can use local and property taxes, which represent the *price* for the provision of local public services, as the rationing mechanism that helps select its residents. Meanwhile, the members of its club self-select by moving to its jurisdiction, in essence choosing the club by *voting with their feet*.

Clearly, this Tieboutian resolution of the role of government between the competing roles of Musgrave and the skepticism of Buchanan works best with a small, geographically and demographically narrow, and relatively homogeneous governmental jurisdiction. Such a jurisdiction can meet Musgrave's tripartite specification for government, and address Buchanan's concern over competing interests.

The Achilles' heel of Tiebout's solution also explains Musgrave's relatively lukewarm embrace of his own student's solution. Tiebout requires sufficient mobility for ratepayers to exercise their preferences. This perhaps can occur if one takes a sufficiently long-term perspective. But when the metric is proportional to the length of time it takes families to make major geographical decisions, the timeline may be measured in

generations or more. As we tracked the ancestry of the Great Minds in this volume and others, we have witnessed that large moves in jurisdictions are relatively infrequent. The best predictor of where one lives is not which jurisdiction offers them the best package, but rather where one came from.

The other assumption implicit in both Tiebout's prescription and Buchanan's *theory of clubs* lens is that the managers of the club have sufficient self-awareness to view government in the manner that foments competition among jurisdictions. One may level the same complaint against the small atomistic firms in the competitive model that compete constantly in terms of both innovation and efficiency. While this assumption is equally suspect in the competitive model, the forces of economic evolution and *survival of the fittest* are strong in competitive markets, but relatively weak among government jurisdictions. While Tiebout established a link between government and the competitive model, a more apt link may rather be between government and models of monopoly at worst, or monopolistic competition at best. Government maintains a ready market because its *members* have limited and costly alternatives.

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The Early Death of Charles Tiebout

Charles Tiebout initiated a firestorm of discussion. In fact, his seminal article is perhaps the most frequently cited in public finance, and cited more than the treatises of Buchanan or Musgrave. The works by Buchanan notoriously attracted the attention of Paul Samuelson, the godfather of modern neoclassical economics. But by the time these debates with Samuelson and Buchanan had reached their apex, Charles Tiebout had moved on from Northwestern to the hotbed of Institutional Economics at the University of California in Los Angeles.

UCLA was renowned for taking the free market orientation espoused by the University of Chicago and applying it within the firm as an island. The UCLA approach was discussed in a previous volume of this series. At UCLA, the Great Minds Armen Alchian and Harold Demsetz were working to show how the internal workings of a firm can mimic the external functions of a marketplace, but with advantages when market information and contracting were costly. Tiebout was extending the same concept to local government and within local government. Armen Alchian had encouraged Tiebout to join UCLA as it developed a more institutional approach to issues in corporate and public finance.

Tiebout, and his UCLA colleague, Vincent Ostrom, took other concepts from the theory of the firm, such as the *structure, conduct, performance paradigm* to argue that jurisdictions were like firms. They use their information advantages and combinations of scale economies and diseconomies to produce a product that is in demand in the marketplace. Such an extension of competitive market ideals to institutions was the marriage between competitive economics and public economics, just as it had served the internal theory of the firm and corporate finance theory in the 1960s.

But just as the internal workings of a firm required greater institutional and governance detail than one needed for an understanding of the competitive ideal arising from the self-interest and maximizing behavior of individual agents, Tiebout and Ostrom's postulate that local government could function much like a firm demanded a richer analysis that is more political than economic.

Tiebout and Ostrom collaborated on their new approach to local and metropolitan government that invoked perhaps as much political science as it did economics. However, outlets spurned what they saw as being neither fully economics nor political science. This time, Tiebout had built a bridge, but found himself rebuffed by those on either side.

Tiebout retreated from UCLA to the University of Washington (UW). By the early 1960s, UW was building a cross-disciplinary *Center for Urban and Regional Studies* that employed economists, civil engineers, historians, law professors, sociologists, urban planners, and political scientists. Tiebout harbored hopes that such a multidisciplinary approach would yield insights into the urban problems that were beginning to accelerate in the 1960s.

Tiebout helped build a new and cross-disciplinary center to probe urban and institutional problems in a fresh manner. Unfortunately, he could not long enjoy the fruits of his collaborations, for he died suddenly of a heart attack while in his office on Tuesday, January 16, 1968, at the age of just 43. His death was untimely, but his legacy was already firmly established. Regional economics had been established based on a cross-disciplinary understanding that Tiebout had pioneered.

Colleagues remembered Tiebout especially for his sense of humor. While at an after-dinner event at an economics conference, the organizers scheduled a dance band to entertain a room that was almost entirely male and, as economists, mostly rhythmically challenged. Tiebout somehow convinced his male table companion to dance with him. Another anecdote was of the Christmas card he sent out to family and friends following his arrival in Los Angeles to take a job at the University of California Los Angeles. The card was a picture of his family all relaxing on the beach, with the three young children all reading economics texts as Charles and his wife, Elizabeth Charlton Gray, read comic books. Clearly, Tiebout could take the familiar and look at it in an entirely new light. Indeed, this was also the hallmark of his research.

41
The Henry George Theorem

Knut Wicksell had observed a peculiar aspect of public economics. Public finance raises revenue from residents, while public expenditures provide the public goods and services these residents enjoy. However, an income tax as the primary source of public finances acts to disconnect what is purchased and how much is paid for public goods. Charles Tiebout had championed the concept of the planned town that perhaps attracts residents that are homogenous in terms of income, preferences, and abilities, and provides them with a mix of public goods which they consume equally. Yet, Tiebout did not show that the public funds raised would be sufficient to pay for the optimal level of public goods. Joseph Stiglitz provided the model that connects the public finance and public expenditures side of the local jurisdiction. In doing so, he produced perhaps one of his most compact and elegant expositions in the theory of public finance – the theory known as the *Henry George Theorem*.

As you will recall from our discussion earlier in the book, Henry George was the most staunch and effective advocate for a 100% land tax, designed to replace all other taxes and to support the optimal provision of the public goods that make one location more attractive than another one.

Implicitly and arguably embodied in Henry George's concept was the "voting with the feet" of Charles Tiebout. If a public entity could combine a set of infrastructure and amenity attractions to attract a specific group of households, and could then devise appropriate tools, such as zoning, to ensure that only the correct number of households come, but with no free-riders on membership to the club, then would a 100% land tax on the increased demand for proximity to such a community provide sufficient revenue to finance the necessary public expenditures? Joseph Stiglitz showed that it can. Just as he and Atkinson

had synthesized the taxation efficiency work of Frank Ramsey, William Vickrey, and James Mirrlees, in this paper Stiglitz brings together the intuitions of David Ricardo, Henry George, Charles Tiebout, and James Buchanan. In doing so, he also reinforces the vision of Knut Wicksell and Richard Musgrave. His synthesis is one of the most elegant and intuitive in the whole of economics and finance. And while his mathematics is just sufficient to prove his powerful result, it is also very simple to grasp. As a consequence of its elegance, the intuition he develops for us is profound indeed.

Consider a production function $Y = f(N)$ which yields the total amount of production N individuals can enjoy through the production of a private good with an average productivity per person X and with a publicly financed pure public good G. Then,

$$Y = f(N) = XN + G.$$

We can reorganize this equation to identify the average private good product of the population X:

$$X = \frac{f(N) - G}{N}$$

If we assume constant returns to scale and competitive markets in private production, then the results of John Bates Clark affirms that the marginal productivity and average productivity of labor must be equal. Then,

$$\frac{\partial f(N)}{\partial N} = \frac{f(N) - G}{N}$$

We can rearrange this expression to yield:

$$G = f(N) - N\frac{\partial f(N)}{\partial N}$$

Notice, however, that from Clark's results, it must be the case that the total rent accruing to land must be the difference in production f(N) and the number of households times its marginal product, $N\frac{\partial f(N)}{\partial N}$,

$$R = f(N) - N\frac{\partial f(N)}{\partial N}$$

Then, it must be the case that this rent R equals government production G. A 100% land tax would then precisely fund public infrastructure

investment G. If the Tiebout assumption of zero migration costs is met, an influx of households N would drive up the level of land rents R until the optimal level of government public goods expenditure is just financed by the 100% land tax. In his proof, Stiglitz brought public finance full circle back to Ricardo's, George's, and Wicksell's proposition that a 100% land tax would fully fund the local provision of public goods. At the same time, his theory supported Tiebout's claim that a town could be viewed for the unique public infrastructure it creates, and for which it sells, for the price of property tax admission, to the correct number of people attracted by the town's investment. Finally, his solution suggests that the town must limit its size to prevent the congestion of the attraction it provides, perhaps through zoning. This intuition is consistent with James Buchanan's theory of club, as applied to urban communities.

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The Prize and Legacy of Joseph Stiglitz

Joseph Stiglitz is one of the most prolific scholars in the history of economics and finance, with more than three hundred published scholarly works. Since his first book was published in 1969, he has completed almost thirty books, at an average rate of about one book every 18 months. Many of his recent books have made their way to popular press, such as his book with Linda Bilmes from 2008 entitled *The Three Trillion Dollar War: The True Cost of the Iraq Conflict*,[1] and his book *Freefall: America, Free Markets, and the Sinking of the World Economy* from 2010.[2] Stiglitz has augmented many of his books in the popular press with numerous and frequent opinion editorials with such newspapers as *The New York Times*.

Joseph Stiglitz also joined the Clinton Administration's Council of Economic Advisors in 1993, acting as its chair form 1995 to 1997. In 1997, he became the chief economist and senior vice-president of the World Bank, a position he held until 2000. There, he became an unwavering advocate for anti-poverty programs and for fair trade. He was asked to leave the World Bank for his dissenting views on many of its policies that placed the position of the poor and impoverished behind the financial aspirations of large banks and the US Treasury. It was reported that Larry Summers (November 30, 1954–), the controversial former Harvard University president, nephew of Stiglitz's mentor Paul Samuelson, chief economist at the World Bank four years before Stiglitz assumed that role, and eventually Secretary of the Treasury in 1999 under Bill Clinton, fired Stiglitz in an unnecessarily humiliating manner for his dissenting views.[3]

Stiglitz has never backed down from the controversy that often results from adopting an unpopular, but principled stand. Indeed, he has been the subject of many political attacks, and has bucked the status quo ever since his days as student body president at Amherst College. His

difficulty with the status quo at the World Bank is the same challenge Henry George faced a century earlier. Those who own land earn rents from the scarcest of all resources. The value of proximity and fertility, which capitalizes the fruits of progress, is concentrated in the hands of the most politically elite. Clearly, the ownership and taxation of land upsets one of the most scared of all economic cows. While Stiglitz's observation that the oligarchs who may drain upwards of half of all new production in some less developed and less competitive nations, in the form of land values and monopoly profits, likely hold back development in many of the world's less developed nations, there is little will or political resolve to pursue the reforms Stiglitz recommended.

But while Stiglitz is renowned in the popular press for his thoughts on economic development, poverty, the limits of capitalism, and land reform, among academics he is remembered best for his Nobel Memorial Prize. In 2001 the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel went to George A. Akerlof, A. Michael Spence, and Joseph Eugene Stiglitz "for their analyses of markets with asymmetric information."[4] The Nobel Memorial Prize committee rewarded their extension of the theory of asymmetric information developed first by William Vickrey and James Mirrlees as a solution to the problem of optimal income taxation in public finance. The committee noted:[5]

> Many markets are characterized by asymmetric information: actors on one side of the market have much better information than those on the other. Borrowers know more than lenders about their repayment prospects, managers and boards know more than shareholders about the firm's profitability, and prospective clients know more than insurance companies about their accident risk. During the 1970s, this year's Laureates laid the foundation for a general theory of markets with asymmetric information. Applications have been abundant, ranging from traditional agricultural markets to modern financial markets. The Laureates' contributions form the core of modern information economics.
>
> George Akerlof demonstrated how a market where sellers have more information than buyers about product quality can contract into an adverse selection of low-quality products. He also pointed out that informational problems are commonplace and important. Akerlof's pioneering contribution thus showed how asymmetric information of borrowers and lenders may explain skyrocketing borrowing rates on local Third World markets; but it also dealt with the difficulties

for the elderly to find individual medical insurance and with labour-market discrimination of minorities.

Michael Spence identified an important form of adjustment by individual market participants, where the better informed take costly actions in an attempt to improve on their market outcome by credibly transmitting information to the poorly informed. Spence showed when such signaling will actually work. While his own research emphasized education as a productivity signal in job markets, subsequent research has suggested many other applications, e.g., how firms may use dividends to signal their profitability to agents in the stock market.

Joseph Stiglitz clarified the opposite type of market adjustment, where poorly informed agents extract information from the better informed, such as the screening performed by insurance companies dividing customers into risk classes by offering a menu of contracts where higher deductibles can be exchanged for significantly lower premiums. In a number of contributions about different markets, Stiglitz has shown that asymmetric information can provide the key to understanding many observed market phenomena, including unemployment and credit rationing.

These additional contributions to the study of asymmetric information firmly established the theory of Vickrey and Mirrlees in the context of distribution of income. All three recipients in 2001 improved our understanding of ways in which markets can cope with and accommodate information that is fundamentally less than the perfect information traditional neoclassical models had assumed to then.

To place their work in context, it may well be the most important extension of the neoclassical model. Perhaps only more profound will be a successful treatment of the underlying behaviors that underpin modern economic, capital and financial markets. However, while there is much attention increasingly devoted to behavioral finance and economics, success remains elusive. Meanwhile, the insights provided by Joseph Stiglitz remain both profound and practical.

Stiglitz has also received a number of other prizes and positions over the course of his career. Following his graduation from Amherst College in 1964 and MIT in 1966–7, he was an Assistant Professor at MIT in the 1966–7 academic year. He then joined the Cowles Foundation at Yale University from 1967 to 1974, and the Yale Department of Economics from 1970 to 1974. He then visited Oxford for a year before joining

Stanford University as a professor for two years, from 1974. From 1976 to 1993, he resided primarily at Stanford University, but also spent time at Princeton University, visited Oxford University, and was associated with the National Bureau of Economic Research over those years.

Following his governmental work, Stiglitz joined Columbia University, and has been there ever since. Stiglitz has received almost fifty honorary degrees. These include:

1. D.H.L., Amherst College, 1974
2. University of Leuven, 1996
3. Ben Gurion University, 1997
4. Academia de Studii Economice, Bucharest, December 1999
5. University of Namur, March 2000
6. Technical University, Lisbon, June 2000
7. Northwestern University, Doctor of Laws, June 2000
8. New School University, February 2001
9. Bard College, May 2001
10. University of Toronto, June 2001
11. Charles University, Prague, June 2001
12. Glasgow University, July 2001
13. University of Buenos Aires, November 2001
14. University of Andes, October 2001
15. Sofia State University, Bulgaria, 2002
16. Wirtschafts Universitat, Vienna, January 2002
17. University of Macau, March 2002
18. Pomona College, May 2002
19. Université catholique de Louvain la Neuve Belgium, February 2003
20. Doshisha University, April 2003
21. University of Barcelona, May 2003
22. Azerbaijan State Economic University, 2003
23. Waseda University, April 2004
24. Georgetown University, May, 2004
25. Indiana University, May 2004
26. Pace University, May, 2004
27. University of Oxford, June 2004
28. University of Bergamo, Italy, July 2004
29. Université d'Antananarivo, Madagascar, August 2004
30. Drexel University, June 2005
31. Universidad de La Plata, August 2005
32. Durham University, September 2005
33. Lingnan University, Hong Kong, December 2005

34. University of the Basque Country, May 2006
35. Università degli Studi di Genova, May 2006
36. Universidad Mayor de San Andrés, Bolivia, May 2006
37. Renmin University, China, March 2007
38. University of Venice, Italy, May 2008
39. University of Liège, Belgium, May 2008
40. University of Manchester, UK, October 2008
41. Luiss Guido Carli University, Rome, February 2010
42. University of Hyderabad, India, January 2013
43. University of Córdoba, Argentina, August, 2012
44. Cambridge University, June 2013
45. Université Paris Dauphine, France, June 2013
46. HEC Paris, January 2015

Stiglitz has also earned a number of awards over his career to date. In addition to his Nobel Memorial Prize in 2001, he received the John Bates Clark Award, offered by the American Economic Association to the best young economist in the United States, in 1979. Other prestigious awards include:

- National Science Foundation Fellowship, 1964–1965 Fulbright Fellowship, 1965–66
- Social Science Research Council Faculty Fellowship, 1969–1970
- Guggenheim Fellowship, 1969–70
- Fellow of the Econometric Society, 1972
- Fellow, American Academy of Arts and Sciences, 1983 Fellow, National Academy of Science, 1988
- UAP Scientific Prize, Paris, France, 1989
- Corresponding Fellow of the British Academy, 1993 Rechtenwald Prize, Germany, 1998
- Fellow, American Philosophical Society, 1998
- Nobel Prize in Economics, 2001
- Distinguished Leadership in Government award, Columbia Business School, 2002
- Member, Pontifical Academy of Social Sciences, May 2003
- John Kenneth Galbraith Award, American Agricultural Economics Association, August 2004
- National Center for Law and Economic Justice Benefit Award, May 2006
- Legion of Honor, rank of Officier, France, February 2012
- Economic Theory Fellow, Society for the Advancement of Economic Theory, July 2012

- Robert F. Kennedy Book Award, for The Price of Inequality, September 2013
- Member, the American Academy of Political and Social Science, 2014
- Jean-Jacques Laffont Prize, June 2014

Joseph Stiglitz remains one of the most broadly cited scholars in public finance and in economics in academic history. His name is perhaps the most well-known among the economists of the modern generation, primarily because of the breadth of his analyses. At the age of 72 upon publication of this volume, Stiglitz remains active. He has been married, since 2004, to Anya Schiffrin, a most accomplished journalist who specializes in financial, economic, gender, and poverty issues. He has four children, Michael, Edward, Siobhan, and Julia, from a previous marriage.

Section 5
What We Have Learned

This sixth volume in a series of discussions about the Great Minds in the history and theory of finance has addressed what the public sector produces and how the public sector funds the value it creates. While the extent of the issue is broad indeed, and continues to grow in size, it has received relatively scant attention in the fields of public finance and public expenditure until recently, primarily because of the complexity, and perhaps the politics, of the public sector compared to the private sector. The series of Great Minds discussed in this volume helped develop models and hone our intuition on the aspects that make public finance and expenditure unique and how they may best be conducted to optimize economic value and minimize distortions. We conclude with a summary of their contributions.

Conclusions

Public finance was not a recognized discipline among English-speaking finance scholars until the latter half of the 20th century. Since then, the Nobel Memorial committee has offered a multitude of awards to living scholars who have improved our understanding of whether government efficiently taxes and spends, and how that efficiency might be enhanced.

The public sector is rife with complications that are not found in its private counterpart,which should come as no surprise. The public sector is often expected to cope with precisely the types of goods and services which the private sector cannot efficiently provide. Such public goods – public education, non-excludable aspects like scenic vistas, local history, and the airways – can only be provided by the public sector without introducing serious inefficiencies. Still other goods are characterized by decreasing per unit costs, perhaps because they have a high fixed cost, but very low marginal costs of production. The private sector can only profitably sell such goods if it restricts supply and enjoyment to ensure there is a sufficient difference between the good's price and its marginal cost. Natural monopolies often are characterized by the degree to which its price well exceeds its variable costs. Finally, there are goods so rife with externalities that the public as a whole enjoys benefits which the private provider cannot capture. For instance, a private firm that creates significant jobs in a new town cannot enjoy the increased land prices that will result from its investment. Only the public sector has the power to tax to pay for many of the infrastructure investments that give rise to such increases in land value.

Because the complexity of the public sector dwarfs what we generally assume for the private sector, we cannot expect quite the same sort of elegance and parsimony we find in neoclassical economics of the private

sector. The models we have presented here have built upon the intuition of David Ricardo, on the taxation of commodities and of fixed resources such as land, William Vickrey on the challenges of an efficient income tax, and Richard Musgrave and James Buchanan on the role and function of government and its spending.

Each of these Great Minds helped hone our intuition and introduced new variables for our consideration that could not have been easily anticipated. However, it would require additional effort, from Henry George, Knut Wicksell, and John Bates Clark, to captivate our attention to issues of public finance, and from Frank Ramsey, James Mirrlees, and Joseph Stiglitz, to further tease mathematical results that further hones our intuition. Charles Tiebout offered us an elegant bridge that can connect the way private goods are produced and how a government may be viewed and marketed in its provision of public goods. Finally, Joseph Stiglitz brought the public finance and public expenditure of a locality together by demonstrating that an optimal town can fund the public infrastructure it provides through a 100% land tax, as David Ricardo, Henry George, and Knut Wicksell had advocated.

Together, these Great Minds are invariably invoked in any discussion on the optimal design of public finance and public expenditure. Combined, they created new disciplines of Public Finance and Public Choice, and added contributions that made for a much more nuanced discussion of taxation not solely as a way to increase not only revenue, but also the level of overall economic efficiency.

Glossary

Agency Theory	Study of the ways in which a representative (agent) of a principal balances the interests of the principal with his or her own interests.
Asymmetric Information	Study of decision-making when the various participants have differing levels of information.
Calculus of Variations	A technique that optimizes the path of a function, usually over time.
Commodity Tax	A tax on the price of a good.
Conspicuous Consumption	Consumption for the purpose of impressing those who witness the consumption as a method to expand social standing.
Constant Lump-sum Tax	A tax imposed equally on all taxpayers.
Constant Returns to Scale	A scale, or size, of production in which the declining effects of increased production on average fixed costs are balanced by the increasing effects of variable costs on increased production. In this region, average costs remain approximately constant for a small increase in production.
Conventional Wisdom	Theories and hypotheses that are generally accepted as true, whether valid or not. The term was coined by John Kenneth Galbraith to denote widely accepted theories that may nonetheless be inaccurate.
Corporate Finance	The study of the creation of value within a firm.
Decreasing Returns to Scale	A scale, or size, of production in which the declining effects of increased production on average fixed costs outweigh the increasing effects of variable costs on increased production. In this region, average costs fall for a small increase in production.
Diminishing Marginal Returns	The economic phenomenon that increased activity yields smaller benefits than previous activity yielded.
Discount Rate	The rate by which future earnings or costs are translated to the relevant present value. Often, this discount rate is determined by the weighted average cost of capital of the corporation.

Diseconomies of Scale	A region of production that provides increasing marginal costs for an increase in production than the average costs of production. This is the region of production for the firm that results in lower cost efficiency.
Distribution of Wealth	The pattern by which the wealth of an economy is distributed across its population.
Dynamic Model	A model that shows the evolution of the system over time.
Earned Income Tax Credit	A rebate in taxes, or a payment to a taxpayer whose income is at least partially earned.
Economies of Scale	A region of production that provides lower marginal costs for an increase in production than the average costs of production. This is the region of production for the firm that results in greater efficiency as output is expanded.
Edgeworth Box	A construct that allows the direct comparison of the utility of two individuals and the regions of resource reallocation that can increase the utility of one individual without decreasing the utility of the other.
Elasticity	The sensitivity of a commodity to a change in a factor such as price.
Enlightened Self-interest	The ability of a decision-maker to balance his or her self-interest with the long-term interests of others and hence his or her future interests.
Externality	A benefit or cost incurred by another, beyond the transactions of decision-makers and beyond the factors incorporated into the price system.
Flat Tax	A constant proportional tax on income.
Frictionless	The assumption that economic exchanges can proceed without artificial impediments such as transactions costs.
Gilded Age	The post-Civil War era in the United States that showed great economic growth but also heightened income inequality.
Hamiltonian	A functional that can be optimized by careful choice of the path of an underlying function.
Henry George Theorem	A result that demonstrates a 100% land tax can just fund the costs of public goods that enhance and are capitalized in property value.
Incentive Alignment	The creation of a compensation scheme that induces an agent to act in the best interests of the principal.
Incentive Incompatibility	A gap or difference in what is best for the principal and the incentive that directs the actions of an agent.
Income Tax	Public finance revenue raised from a tax on taxpayer income.
Increasing Returns to Scale	A region of production that results in marginal costs for an increase in production that are lower than the average costs of production. This is the region of production for the

	firm that results in increased efficiency with increased production.
Infinite Time Horizon	A planning horizon for economic decisions which lasts forever.
Interest Rate	The return that must be offered to attract financial capital.
Intertemporal	A modeling technique that includes the evolution of economic decisions over time.
Lagrangian	A function that can be optimized by the choice of variables subject to constraints.
Marginal Theory of Productivity	A theory of production that is determined based on the increase of production on the margin.
Marginalists	Those who argue that economic decisions are based on the last units of benefits generated or costs incurred.
Methodological Individualism	A theory that relates causal accounts of social phenomena to the motivations of individual agents.
Monopoly	A firm that is the sole producer of a good or service.
Monopsony	A firm that is the sole purchaser of a factor of production such as labor.
Neoclassical Model	A mathematical model of the economy and production that assumes all actors are fully rational and informed and concludes that market-determined transactions are efficient.
New Institutional Economics	The revival of an approach to decision-making based on more nuanced and less technically sophisticated descriptions of economic interactions.
Non-excludability	The quality of a public good that makes it difficult or inappropriate to exclude those who might wish to enjoy consumption of the good.
Non-rivalry	A good that may be enjoyed by one consumer without preventing simultaneous consumption by others.
Optimal Size	A scale that balances the marginal benefits with the marginal costs of increased size.
Pareto Optimality	A condition in which it is impossible to reallocate resources to make one person better off without making at least one other person worse off.
Pigouvian Tax	A tax that exactly apportions to the cost of consumption or production of a good, service, or factor the externalities it induces.
Public Finance	The analysis of financial structure used to fund government.
Public Goods	Goods that are non-rivalrous and/or non-excludable.
Public Infrastructure	Those elements of investment that can simultaneously be enjoyed by producers and/or consumers.

Rent-seeking	The concentration of effort to secure individual gain even if it results in an equivalent loss by others.
Ricardian Equivalence Theorem	A theory that increased government spending through debt financing will not increase the overall level of economic activity because the debt requires increased savings which detracts from consumption.
Social Darwinism	A social equivalent to the Darwinian notion of survival of the fittest among species.
Static Model	A model that is analyzed and optimized at one point in time.
Surplus	The difference between the economic benefits enjoyed and the costs incurred.
Theory of the Firm	The economic study of how firms create value and profit.
Time Value of Money	The value placed on a present stock of wealth, income, or costs, compared to a future amount.
Transactions Costs	The various fees, costs, or obstacles that arise in the facilitation of trade or a transaction.
Utility	An economic measure of human happiness arising from consumption.

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