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TOWARD A METATHEORY OF ECONOMIC BUBBLES

Socio-Political and Cultural Perspectives

Nikhilesh Dholakia and
Romeo V. Turcan

Toward a Metatheory of Economic Bubbles

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Preface

In this book we put forward a multidisciplinary metatheory of bubbles. Since the notorious "tulipmania" in the Netherlands of the seventeenth century, bubbles have been part of our modern economic history, and, with advancing capitalism, they have become pervasive, more intensive and more frequent. In an earlier phase of our intellectual career, we became interested in bubbles not so much from financial or economic perspectives as from technological and strategic angles—the rise and bursting of the so-called dotcom technology bubble in March 2000 fascinated us. As the new century unfolded, we realized that bubbles were becoming increasingly global in scope—the world is far different from the eager merchants bidding up tulip prices in the relatively confined geography of the pubs of Haarlem and Amsterdam; and indeed even different from the dotcom tech-bubble that affected mostly the U.S. and U.K. markets. We were jolted into intellectual action by the interlinked stock market, housing, banking, and other bubbles of 2007–2009 that spread into the furthest corners of the global economy quite rapidly.

Bubbles, in the past, have been understood primarily in financial-economic terms, receiving rational explanations of individual as well as collective behaviors, with a few exceptional economists venturing out to point to the irrationality of investors caught up in bubble frenzies.[1] Bubbles, however, are also socio-political-cultural phenomena. While we, the authors of this book, have had some background in economics and finance during our postgraduate studies, we also are in the fortunate position not to be constrained by

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the doctrines and dogmas of these fields. Our interests and approaches are multidisciplinary, weaving together economic as well as non-economic ideas into this metatheory of bubbles that transcends the economically straitjacketed disciplinary frames of the past. Our metatheory of bubbles draws from many economic and social disciplines and reflects pervasive irrationality of individual as well as collective behaviors.

We embarked on this journey in the latter part of 2011. Coming from different research backgrounds, we had discovered in one of our meetings that we have had a common interest in researching bubbles. Romeo V. Turcan investigated in his doctoral studies how and why small high-technology firms internationalized, de-internationalized, and eventually struggled for survival during the "dotcom" bubble. The analysis of his data led to the emergence of number of bubble related behaviors and concepts such us hype, vaporware, hyperbole, and delusional optimism. In 2010 Romeo presented his model of bubble emergence at a conference on "After the Gold Rush: Economic Crisis and Consequences" that took place, probably with no surprise, in Iceland. The 2008 crisis and collapse of Iceland came out to be "handy" as they corroborated to a large extent to Romeo's model of bubble emergence. Further theorizing was needed to move that model to a higher level of generalizability.

In 2011–2012, Nikhilesh Dholakia—as part of his sabbatical leave from the University of Rhode Island—made multiple visits to Aalborg University, where Romeo V. Turcan is based. He talked during these visits of his earlier papers on the "dotcom" bubble (work done in collaboration with Anil M. Pandya) as well as his more recent work on financialization and "finanzkapital," aimed as understanding the ups and downs of the 2007–2009 Great Recession. These mutual discussions revealed a common ground and a common interest in studying and interpreting bubbles from a multidisciplinary frame.

In this book, we arrive inductively at our metatheory of bubbles weaving throughout the book cases and examples of bubble processes from a number of sectors such as entertainment (movies), commodities (minerals or agricultural commodities), financial stocks (especially shares of technology companies), and housing (real estate values in metro areas). These examples serve as signposts to exemplify the emerging metatheory of bubbles, a theory that can offer explanations for contemporary as well as historical bubble phenomena. We identify—in a comprehensive yet parsimonious way—the constructs of the theory, setting its temporal and contextual boundaries, as well as its underlying assumptions about

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economic, psychological, social, and political dynamics. Throughout the book we discuss and exemplify how the identified constructs, temporal and contextual boundaries, as well as theory assumptions are related.

While the contribution of the book is a step toward the development of a multidisciplinary metatheory of bubbles, our larger quest—perhaps quixotic in some people's view—is to nudge us all toward a saner future by laying bare the social, economic, and political factors that create and drive bubbles. At the same time, we lay a foundation to facilitate and encourage future dynamic scholarly conversations and research as well as policy debates on the sources and outcomes of bubbles as multidisciplinary—economic, social, political, and cultural—phenomena. The book also provides a partial window into the precarious nature of contemporary finance-driven capitalism, and suggests some possible ways of overcoming the wrenching ups and downs of the prevalent system. Our proposed metatheory of bubbles has far-reaching implications for the study and practice of entrepreneurship and marketing, public and corporate finance, and public policies toward innovation, economy, and finance.

The approach we took to build our theory is multidisciplinary, and therefore appeals not just to faculty and students in finance and economics, but also to faculty and students in applied and pure social sciences and to some in the humanities fields, especially history and cultural studies related fields. The language is in the form of narratives and concepts that can be understood by general intellectual audiences—no specialized knowledge of finance or economics is assumed. A variety of cases and contexts are employed to make the concepts of bubbles relatable to the everyday lives of people.

What follows, we hope, is an exciting multidimensional journey into bubble processes; where some bubbles are playful and essentially do no social harm while other bubbles are massively global and create pervasive dislocations, losses, and misery. If the book succeeds in promoting good debate, spurs further multidisciplinary work, and provides some guidance for sound policies, then we would consider our goals to be achieved and our project to have arrived at a new plateau on which stronger intellectual structures can be built.

Note

1 Shiller (2006).

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In the United States, we are grateful to Ian Reyes of the Communication Studies program at the University of Rhode Island for helpful suggested directions to explore in studying bubble phenomena.

We would also like to thank Leila Campoli and Sarah Lawrence of Palgrave Macmillan for prompt and helpful responses to our queries during the manuscript preparation phase and the publication process.

We are also very appreciative of the family support we have received throughout this project. The first author would especially like to thank his wife Ruby Roy Dholakia not just for the numerous airport trips to enable travel related to this book project but also for continuously keeping a sharp eye on unfolding bubble-like phenomena and gently urging us to check into useful current sources. The

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second author is very grateful to his family—his wife Natalia, daughter Andreea and son Andy—for their extraordinary support, patience, and understanding. And this was visible especially toward the end when magic words were aired "the book is over," and Andy approached and asked: "Daddy, is it difficult to write a book? Tell me more about it." And that was a wonderful feeling.

Note

1 Website for TBRP at Aalborg University: http://www.tbrp.aau.dk/

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1
Bubble Troubles

Abstract: *In this chapter we introduce the reader to the book—to its aim, scope, method and contributions, as well as its structure. The chapter starts with a short introduction to the history of bubbles and bubbles' impact on our daily lives. The method—the theory building strategy—is presented next, highlighting the four essential elements of a complete theory. These are the "what" aspects, the "how" aspects, the contextual "who-where-when" aspects, and the explanation-seeking "why" aspects. We conclude this chapter by providing short descriptions of each subsequent chapter, linking it to the building blocks of a theory.*

Keywords: asset bubbles and everyday life; history of bubbles; theory building; tulipmania

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> Who sees with equal eye, as God of all,
> A hero perish, or a sparrow fall,
> Atoms or systems into ruin hurl'd,
> And now a bubble burst, and now a world.[1]

The first decade of the twenty-first century had an eventful start, at least in economic terms. After March 2000, the so-called dotcom technology bubble burst. In a year-end review, *The New York Times* summarized the carnage that occurred in the tech stock indexes and in specific technology stocks during 2000:

> What a difference a year makes. The Nasdaq [technology-dominated stock market index] sank. Stock tips have been replaced with talk of recession. Many pioneering dot-coms are out of business or barely surviving. The Dow Jones Internet Index, made up of dot-com blue chips, is down more than 72 percent since March. Online retailers Priceline and eToys, former Wall Street darlings, have seen their stock prices fall more than 99 percent from their highs.[2]

Even before the dust had settled on the dotcom bubble burst, by 2007, the portents were clear that there was another bubble forming in the United States, this time in the residential real estate market, fueled by mortgage credit available on easy terms with minimal collateral requirements. While the dotcom crash wiped out $7–$8 trillion in capital, the housing bubble burst in the United States was of a similar magnitude, wiping out about $5–$7 trillion of inflated housing values.[3]

Bubbles—periodic episodes where hype about an asset outpaces reasonable expectations about valuing that asset—have been a part of modern economic history. Long before the stocks, bonds, technology, and housing bubbles of recent decades, there was the notorious tulipmania in the Netherlands of the seventeenth century:

> Semper Augustus…was a tulip of extraordinary beauty, its midnight-blue petals topped by a band of pure white and accented with crimson flares…Around 1624, the Amsterdam man who owned the only dozen specimens [of Semper Augustus] was offered 3,000 guilders for one bulb…the sum was roughly equal to the annual income of a wealthy merchant…A few years later, Rembrandt received about half that amount for painting *The Night Watch*…Yet the bulb's owner, whose name is now lost to history, nixed the offer.[4]

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The tulipmania style bubbles were infrequent and limited in their geographic scope. In the twenty-first century, however, the pace at which bubbles form, inflate, and deflate appears to have accelerated. In the United States, already two bubbles—the dotcom and the housing—punctuate the first decade of the century, and some believe that a third bubble (in stock prices or bond prices or both) is imminent. Contemporary bubbles also reverberate globally, if not in terms of specific asset price inflation/collapse then at least in terms of a global spillover of economic losses and misery. From a purely macroeconomic perspective, a report on the 2007–2009 Great Recession from the International Monetary Fund (IMF) found that the fast-rising developing economies, the so-called emerging markets or EMs…

> …with smaller initial vulnerabilities went into [the Great] recession later and exited earlier, and suffered considerably smaller declines in output during the first stage of the crisis. EMs with stronger external linkages—higher dependence on demand from AEs [Advanced Economies] or larger exposure to foreign bank claims—experienced sharper falls in output during the crisis. The analysis also indicates that countries that experienced pre-crisis credit booms experienced sharper output falls during the crisis…Such credit booms were typically foreign-financed and more pronounced for countries with fixed exchange rate regimes.[5]

Parsing the econo-speak above, it is clear that in developing nations with strong global financial linkages—in terms of trade and debt—the Great Recession of 2007–2009, linked inextricably to a real estate lending bubble in the United States, made the financial situation of governments and populations swoon downward strongly. Understanding these bubble processes is, therefore, crucial for managing economic affairs, for crafting government policies, and even for negotiating everyday life of our interlinked planet. This book offers a framework to arrive at a multidisciplinary understanding of bubbles.

While the underlying assets that rise or fall in value during bubble processes are economic, the processes that make assets rise giddily or fall precipitately are more than just economic; these processes are also political, social, and cultural. The processes that play out during bubbles entail intense and accelerating interactions of engineered hype and feverish expectations. It is, therefore, important to view bubbles in a multidisciplinary frame. Indeed, the language of bubbles is permeating

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fields beyond finance and economics: books on "consumer bubbles" and "technology bubbles" have been published.[6]

Aims and approach of this book

Our aim in this book is to lay down a pathway to construct a multidisciplinary metatheory of bubbles as well as to offer a first version of a theory of bubbles that draws from many economic and social disciplines. We follow a process of theory building whereby an empirically relevant theory in the behavioral and social sciences is built on the notion of relationships rather than on the notion of causality. This does not mean that causality (or prediction) is of secondary or lower importance. It means we have employed a theory building strategy aimed first at improving *understanding* of bubble phenomena before seeking to improve prediction. If there is a wider understanding of the bubble processes, then perhaps such processes could be attenuated and their excesses avoided.[7]

Building good theories

As we progress in this book, we present our emergent theory of bubbles as a mid-range theory. This book is the first stepping stone; there is need for much more work—theoretical and empirical—on bubbles. We see this book as a catalyst for sustained and dynamic scholarly conversation and future research, leading eventually to the development of a robust behavioral grand theory of bubbles.

We ground inductively the emergent metatheory of bubbles and related types of phenomena, along with their dimensions in the extant empirical realm as well as in the emergent theoretical frames derived from some work on bubbles.[8] Mid-range theories are solutions to problems that contain a limited number of assumptions and considerable accuracy and detail in the problem specification.[9] Such theories are workhorses: they do the drudge work of tilling the theoretical fields and sowing the empirical seeds, and often help shape the eventual elegant landscapes of grand theories.

In this initial theory building effort on bubbles, mid-range theorizing helps us manage the complexity of the emergent typology of bubbles and related types. Mid-range theorizing transcends pure description

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and single empirical observations. Such theories draw upon divergent units of analysis, perspectives, and even disparate disciplines to formulate new theory. Such theorizing recognizes that basic knowledge must be obtained before complex theoretical questions can be answered. As a first stepping stone, mid-range theories offer flexibility in that they allow researchers to seek generalizability without totally endorsing (or abandoning) the belief that a single, unified social science (of bubbles, in this case) is achievable.[10]

The unfolding structure of this book

A complete theory must contain four essential elements: the "what" aspects, the "how" aspects, the contextual "who-where-when" aspects, and the explanation-seeking "why" aspects.[11] The first element is *what*: what factors (variables, constructs, concepts) logically should be considered as part of the explanation of the social or individual phenomena of interest? There are two criteria for judging the extent to which the "right" factors have been included: *comprehensiveness,* which means answering the question whether all relevant concepts have been included in the emerging theory and *parsimony*, which means to inquire whether some concepts should be deleted because they add little additional value to our understanding of phenomenon we are interested in.[12] The principle of parsimony (or law of parsimony)—that came to be known as Ockham's Razor—suggests that it is pointless to do with more what can be done with less; or put differently, of two competing conjectures, the simpler explanation of an occurrence is to be preferred.

The second element is *how*: how the identified factors are related? By answering this question we aim to add order to the process of theorizing by explicitly delineating patterns, and typically introducing causality. The elements of *what* and *how* together constitute the *domain* or subject of the theory. Chapter 2 outlines, elaborates, and exemplifies the constructs that are part of our emerging metatheory of bubbles. These constructs relate to the core asset-linked dimensions of the emerging metatheory. We have aimed for comprehensiveness and parsimony in selecting the core dimensions as well as subsequent conditions and assumptions that interplay with these core dimensions.

The next building block relates to *who, where, and when*: these are temporal and contextual factors, which set the boundaries of generalizability,

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and as such constitute the *range* of the theory. Chapter 3 sets the temporal and contextual boundaries of the emergent theory of bubbles, thus marking the perimeter of generalizability. To determine the boundary of our emerging theory, we identify the key constructs in the form of meta-dimensions that cut across all bubble and asset types, and discuss their limiting values on theory generalizability. These constructs (meta-dimensions), discussed in detail in Chapter 3, are uncertainty, velocity over time, and negotiated space.[13]

The last, but not the least, element of a theory relates to *why*: what are the underlying psychological, economic, and social dynamics that justify the selection of factors and the proposed causal relationships? In other words, what are the underlying assumptions (or theoretical glue[14]) of our emerging theory of bubbles? During the theory-development process, logic replaces data as the basis for evaluation, and in order to avoid vacuous discussions, propositions should be well grounded in the "whys," as well as the "hows" and the "whats."[15] Chapter 4 underlines the assumptions the emerging theory of bubbles rests on—the psychological, economic, and social dynamics—that rationalize the selection of constructs and proposed relationships. The key emphasis in Chapter 4 is on sentiment-guiding theories,[16] hype processes, and four types of hype-related states.[17]

Chapters 5 and 6 focus on how the core identified asset-linked constructs of Chapter 2, the temporal and contextual boundaries described in Chapter 3, as well as the fine-tuning assumptions about a theory of bubbles—of Chapter 4—are related. Chapter 5 presents and discusses the typology of bubbles. Having pulled together the three core asset-linked dimensions (Chapter 2)—perceived asset availability, perceived asset value, and perceived asset communication; and the four boundary meta-dimensions (Chapters 3 and 4), in Chapter 5 we propose a simple yet robust typology of bubbles. Six bubble types are identified and profiled in terms of asset-linked dimensions, and the context-spanning meta-dimensions.[18] Chapter 6 presents and discusses the process model of bubble emergence, building on previous chapters, and introduces the "bubble thermometer" to exemplify the model, employing real life examples.[19]

We bring together our conjectures from Chapters 2–6 in Chapter 7 and put forward a grand theory of bubbles. Conclusion and reflections, including some key suggestions to curb bubble phenomena, are included in Chapter 8. The key conclusions focus on three items: (1) Are bubble

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phenomena unavoidable or are they, under appropriate conditions, controllable? (2) What social-political conditions are required to tame and control bubble formation and inflation processes? (3) What specific policy actions have the best chance of helping us avoid the extreme pain and privations caused by bubbles?

Toward a saner future

While the book is a contribution to the development of a multidisciplinary metatheory of bubbles, our larger quest—perhaps quixotic in some people's view—is to nudge us all toward a saner future by laying bare the social, economic, and political factors that create and drive bubbles. Throughout the book, as signposts to exemplify the emerging metatheory of bubbles, we weave in cases and examples of bubble processes—contemporary as well as historical. In this book, we lay a foundation to facilitate and encourage future dynamic scholarly conversations and research as well as policy debates on the sources and outcomes of bubbles as multidisciplinary—economic, social, political, and cultural—phenomena. The book also provides a partial window into the precarious nature of contemporary finance-driven capitalism,[20] and suggests some possible ways of overcoming the wrenching ups and downs of the prevalent system.

Notes

1 Pope (1892).
2 *The New York Times* (2000).
3 Orszag (2012), commenting on a speech by Fed Chairman Ben Bernanke, reported an estimated loss of $8 trillion from dotcom bubble burst. Handley (2011) estimated the losses from the housing market crash in the United States, from 2007 to the time she wrote the news story in December 2011, to be $6.4 trillion.
4 Dash (2000, p. 288).
5 Llaudes et al. (2010, p. 24).
6 Ekström and Glans (2011); Thackara (2005).
7 As suggested by Dubin (1978, p. 96).
8 Turcan (2010; 2011).
9 Weick (1989, p. 521).

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10 Merton (1968).
11 Dubin (1969).
12 Whetten (1989).
13 Dholakia and Turcan (2013).
14 Whetten (1989).
15 Ibid.
16 Dholakia and Turcan (2013).
17 Turcan (2011).
18 Dholakia and Turcan (2013).
19 Turcan (2010).
20 Dholakia (2010); Panitch and Gindin (2012).

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2
Core Building Blocks

Abstract: *This chapter outlines, discusses, and exemplifies the core constructs—building blocks—of our emerging metatheory of bubbles. Since bubbles are about the perceived values of assets, our starting building blocks related to assets. Regardless of the type of asset, three core asset-linked dimensions are important for bubbles to form, to inflate (often rapidly and dramatically), and eventually to burst; these are perceived asset availability, perceived asset value, and perceived asset communication. We conclude this chapter by comparing four asset types: entertainment (such as movies), commodities (such as minerals or agricultural commodities), financial stocks (such as shares of technology companies), and housing (such as real estate values in a metro area) and analyze the transcending properties of these three dimensions: those affecting availability of an asset; those affecting valuation of an asset; and those affecting communications about an asset.*

Keywords: asset availability; asset bubbles; asset communication; asset type; asset value; metatheory of bubbles

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Bubbles, of course, attract the attention of economic scholars. Bubbles also are of interest to those—often journalists, investigative reporters, and others who can be regarded as public intellectuals—who write about economic issues for the general public. Especially in the aftermath of major economic losses that follow the bursting of bubbles, there is a significant jump in the writing about bubbles by such "public intellectuals." For instance, the deflating of the dotcom bubble in 2000 spawned some popular books (see Table 2.1), and the collapse of the housing bubble in 2008, because it led to the Great Recession, led to a couple of dozen books—mostly by observers of the economic scene rather than by economists (see Table 2.2).

TABLE 2.1 *Selected books after the dotcom bubble burst*

Book title, publisher, year	Author(s)	Comments about the book and its author(s)
Dot.Bomb: My Days and Nights at an Internet Goliath. Hachette Digital, Inc., 2001.	John David Kuo	Written by an American author and journalist. The story of the Internet gold rush is told from an insider perspective, describing main features of the time, for example, sky's-the-limit optimism and belief in new rules.
The Internet Bubble: The Inside Story on Why *It Burst—and What You Can Do to Profit Now*. Harper Business, 2001.	Anthony B. Perkins and Michael C. Perkins	As chief editors of Red Herring Communications, the authors offer behind-the-scenes look at technology and stock market, discussing the process of bubble formation and the causes of its burst.
Dot.con: How America Lost Its Mind and Money in the Internet Era. HarperCollins Publishers, 2003.	John Cassidy	John Cassidy is a British-American journalist, writing for *The New Yorker*. The book is an entertaining narrative about the bubble formation and burst featuring all the iconic figures of the Internet era.
Origins of the Crash: The Great Bubble and Its Undoing. Penguin, 2004.	Roger Lowenstein	Roger Lowenstein is an American financial journalist and writer. The book ties together all of the characters of the dotcom bubble and offers a detailed portrait of the culture of the era, framing the understanding of the 1990s.

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TABLE 2.2 *Selected books after the housing bubble and 2007–2009 Great Recession*

Book title, publisher, year	Author(s)	Comments about the book and its author(s)
The Great Recession. Lulu Enterprises Incorporated, 2009.	Michael Roberts	Michael Roberts is an economist, who worked in the City of London for 30 years.The author explains why the Great Recession happened—relying on Marx's analysis of the laws of motion in a capitalist economy.
Too Big to Fail: The Inside Story of How Wall Street and Washington Fought to Save the Financial System—and Themselves. New York: Viking, 2009.	Andrew Ross Sorkin	Andrew Ross Sorkin is an award-winning financial journalist of *The New York Times*. The book is a popular narrative about days of Great Recession, recreating drama of that turbulent time, and revealing new details about the period.
The Great Recession: History, Ideology, Hubris and Nemesis. World Scientific, 2010.	Michael S. H. Heng	Michael S. H. Heng is a professor of information systems. The book discusses 2008 financial crisis from the point of view of real economy as a starting point and places the crisis within the societal context over the past several decades.
On the Brink: Inside the Race to Stop the Collapse of the Global Financial System. Hachette Digital, Inc., 2011.	Henry M. Paulson	Henry M. Paulson is ex-CEO of Goldman Sachs, and US Treasury Secretary during the Great Recession. The book contains autobiographic reflections from the participant's perspective, focusing on key decisions and critical moments.
The Big Short: Inside the Doomsday Machine. WW Norton & Company, 2011.	Michael Lewis	Michael Lewis worked for the Wall Street firm Salomon Brothers. The book describes several key players who created the credit default swap market, betting against the collateralized debt obligation bubble, and gaining from it.
The Great Recession: Market Failure or Policy Failure? Cambridge University Press, 2012.	Robert L. Hetzel	Robert L. Hetzel is a senior economist and research advisor in Richmond Fed. The author claims that monetary instability is created by central banks, not by boom-bust cycle in financial markets.
The Signal and the Noise: The Art and Science of Prediction. Penguin Books, 2012.	Nate Silver	Nate Silver is a statistician and political forecaster at *The New York Times*. In this book that is at the intersection of ICT and scientific progress, he examines why some predictions succeed and why some fail.

Since bubbles cause widespread social ripples, social scientists (other than economists) also sometimes address bubbles. Also, bubble phenomena often have deeply involving human stories associated with them, and hence scholars from the humanities—especially historians—also pen accounts of bubbles, especially of bubbles that leave indelible historical trails. The first bubble with characteristics similar to contemporary bubbles occurred in the pan-European, proto-capitalist economy centered in the Italian city of Florence during 1100–1347:

> In 1300, Florence had five or six times its former population, a wall embraced seven times the space of the earlier one [circa 1050], and the factious merchant oligarchy was constructing the new city hall (the Palazzo Vecchio) and a vast new cathedral dedicated to Santa Maria de Fiore. Beyond all other cities Florence epitomizes the history of the European environment and economy during those centuries of growth and the disastrous decades that followed . . . Florence became a powerhouse of finance and trade that catalyzed economic expansion. It was the leading banking center in Europe, an industrial giant, and one of the most populous cities. Florentine businessmen bustled everywhere in civilized Eurasia. Its gold coin, the florin, became the preferred currency throughout Europe . . . The great Florentine companies, the Bardi and Peruzzi and their rivals, forwarded and profited from the expansion. They were trading firms and banking houses, and their business included buying and selling merchandise and raw materials, supervising manufacture, financing trade, exchanging currencies, lending money, and doing the accounting necessary to these transactions. Sometimes they served as tax collectors for kings.[1]

Like the contemporary global financial bubbles, the Florentine bubble had a strong international dimension, and the prevailing sense that the processes leading to the inflation and bursting of the economic bubble were beyond the control of the powerful bankers of Florence. Of the bursting of the Florentine bubble, historian J. Donald Hughes offers the following account:

> Edward III had squandered the money he had borrowed from bankers to prepare for what became the Hundred Years' War against France. By 1339, his exchequer was empty and he abrogated his debts. This disaster caused the bankruptcies of the banking houses of Bardi, Peruzzi, and seven other families. The decade of 1340s was the lowest ebb of the Florentine economy. Hundreds of citizens went bankrupt, and hundreds starved in the famines of 1345–47. Property values plummeted and wages shrank as much as forty-five percent. Wars and the need for grain from overseas raised the public debt

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> even higher, and the Commune of Florence declared bankruptcy… Then the Black Death arrived. Between 1347 and 1351, plague killed one-quarter of Europe's population. Three-fifths of the Florentines, about sixty thousand, died.[2]

Not only is the notion of a strong ripple effect of financial trouble in one part of the world (England, in the Florentine bubble case) causing havoc in the financial center (Florence, in the fourteenth century) an early exemplar of the globally connected "financescapes"[3] of today, the regulatory moves after the Florentine collapse also echo the regulatory challenges of the contemporary era. In the case of fourteenth-century Florence, the regulatory authority was vested in the Church. The Church leaders of the time attempted to ban interest-bearing loans because they thought that obscure financial instruments, such as complexly structured loans, were against God's plans for humankind and would bring further social chaos. Just as now, the forces of financial capital prevailed over regulatory attempts—and the business of speculative finance resumed in full force.

Of all the observers and commentators of contemporary bubbles, mainstream economists—neoclassical economists and their successor and spin-off streams—exhibit the most resistance in recognizing, labeling, and analyzing bubbles. This is because bubble phenomena gnaw at—indeed make deep gashes in—the very foundational substructure of rationality, the substructure that supports neoclassical economics and its successor and distributary streams. If bubbles are acknowledged, especially in terms of their successive frequent occurrence in recent decades, then economic expectations guiding markets and the economy—forces that are usually salutary in nature except for the gentle ups and downs of economic cycles—fall by the wayside. A world of frequent, even accelerating, occurrence of bubbles represents a runaway train with failed brakes rather than a train that accelerates and decelerates, but whose throttle is basically under the benign control of a "fair, invisible hand" (see Figure 2.1).

Building blocks and their deconstruction

That is why conventional economics puts extremely demanding requirements for defining and acknowledging bubbles: bubbles threaten the very survival of conventional economics. Most phenomena that media and public in general readily recognize as bubbles are not acknowledged

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FIGURE 2.1 *The invisible hand*
Source: Charles Barsotti/The New Yorker Collection.

as such in conventional economics; rather, these are treated as just somewhat extreme forms of economic cycles.

Bubbles, by their very nature, represent a turning—gradually at first and rapidly later—of rational expectations into irrational behavior, aided and abetted by social processes of sharing and propagating hype, greed, and fear. These processes have economic elements, but they are not merely economic processes. This is why it is important to employ multidisciplinary approaches for understanding bubbles. A multidisciplinary theory of bubbles, comprehensive—and yet parsimonious—is not only feasible but also very useful in the aftermath of the dotcom, housing, and other recent bubbles.

This chapter outlines, discusses, and exemplifies the core constructs of our emerging metatheory of bubbles. Since bubbles are about the perceived values of assets, our starting building blocks related to assets. Regardless of the type of asset, three core asset-linked dimensions are important for bubbles to form, to inflate (often rapidly and dramatically), and eventually to burst. These are:

> *Perceived asset availability*: If an asset that is highly desired and demanded is perceived as being in limited or short supply, then conditions are often ripe for bubbles to form.
>
> *Perceived asset value*: If an asset's quoted market value is seen as very reasonable, perhaps even a bargain, compared to its expected future value, then a bubble could form.

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> *Perceived asset communication*: If the patterns of communications around an asset are such that great hype can be created but none or just a few skeptical voices can be heard, then conditions for bubble formation exist.

These building blocks constitute the domain of the emerging metatheory of bubbles: at the core, the theory is about perceived value of assets. If an asset is abundantly available and accessible at reasonable prices—in reality but, more importantly, in perceived terms—then there are no conditions that could support a bubble. All the terms—"available," "accessible," and "reasonable prices"—are operative here. Take the case of a commodity such as Crude Oil. Known asset stocks could be abundant but if political tensions in the Persian Gulf threaten the accessibility of the resource, or vitiate expectations about reasonable price being paid, then the asset could become a candidate for a bubble.

Before the asset-linked dimensions are discussed, we would like to deconstruct these core asset-linked dimensions and focus specifically on the conjecture that is common to all of them, namely, *perceived*. With this conjecture we are trying to capture the process whereby knowledge about an asset is created. We define knowledge as a justified true belief, "… a belief that stands in a particular relation both to the world (it is true) and to the body of evidence the agent possesses (it is justified)."[4] As to the process of knowledge creation, we view it as "… a dynamic human process of justifying personal belief toward the 'truth.'"[5]

From the point of view of the process of bubble formation, we define the knowledge creation as the emergence of a justified belief toward an asset. What characterizes an asset in a bubble is its newness, unknownness—hence uncertainty—to the agents interested in that asset. Human nature is not able or willing to tolerate uncertainty and is driven by a desire to find meanings and patterns everywhere[6] and, under uncertainty, tends to create corresponding perceptions about an asset availability, value, and communication.

An example of such perceived asset availability, perceived asset value, and perceived asset communication is the visionary predictions, in late 1990s, of the effect of e-business on human life, such as brands will die, prices will fall, and middlemen will die. The futuristic predictions that affected those involved were driven by prospects of the introduction of 3G mobile phones, adoption of smartcards, Internet banking and data-mining, to name a few—all new, unknown technologies at that time—hence uncertain: for instance, bank branches will disappear, and third generation mobile phones will replace home computers.[7]

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Types of assets where bubble processes could emerge are varied: new technologies and innovations (including financial innovations); high-tech products and services (and related financial securities or stocks); fashion items, entertainment products such as movies, and indeed many sophisticated derivative financial instruments that convert an otherwise slow-traded asset into a hyper-traded asset.[8] Building on the principle of comprehensiveness and parsimony introduced above, we argue that regardless of the type of asset, three core asset-linked dimensions are important for bubbles to form, to inflate (often rapidly and dramatically), and eventually to burst: (1) perceived asset availability, (2) perceived asset value, and (3) perceived asset communication. Each dimension has multiple factors that play some role in the formation and inflation (and eventual bursting) of bubbles.

To exemplify this first step in our theory building effort, we have chosen to compare four asset types: entertainment (such as movies), commodities (such as minerals or agricultural commodities), financial stocks (such as shares of technology companies), and housing (such as real estate values in a metro area) and analyze the transcending properties of these three dimensions: those affecting availability of an asset; those affecting valuation of an asset; and those affecting communications about an asset (see Table 2.3).

The building blocks in detail

Bubbles and perceived asset availability

The first dimension concerns the perceived asset availability: how graspable, how comprehensible, how much available (how readily, how easily, how scarce, how abundant), when, where? The set of factors that define this dimension is in trying to understand whether an underlying asset is creatable, consumable, storable, duplicable, divisible, renewable, perishable, depletable, or destroyable. We term these factors as availability-related factors.

All assets—with the exception of minerals (though Bitcoin[9] has emerged as a non-physical example of an asset with a finite creation threshold)—are creatable, but the pace and conditions that affect asset creation vary greatly. This gives rise to perceived supply-demand imbalances, which, of course, is a basic condition to initiate a bubble.

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TABLE 2.3 *Comparing core asset-linked dimensions and their factors by asset types*

Is the underlying asset…	Asset type (examples)				Notes and comments
	Entertainment (Avatar—the movie)	Commodity (silver, hog bellies)	Financial stock (Google)	Housing (Shanghai mansion)	
Dimension: perceived asset availability					
Creatable?	Yes	Yes or No	Yes	Yes	Agri-commodities are creatable
Consumable?	Yes	Yes	No	Yes	Houses are consumed as durable goods
Storable?	Yes	Yes	Yes	Yes	But see also the perishable dimension
Duplicable?	Yes	No	No	No	Low or no marginal cost per digital copy
Divisible?	No	Yes	Often Yes	Yes	Stock-splits are used to divide financial stocks
Renewable?	No	Yes or No	No	No	Minerals are non-renewable
Perishable?	No	Yes or No	No	No	Agro-commodities are perishable
Depletable?	No	Yes	No	No	Minerals are more depletable than agri-commodities
Destroyable?	No	Yes or No	Usually No	Usually No	Agri-commodities are often destroyable
Dimension: perceived asset value					
Depreciable?	Yes	Yes or No	No	Yes	In the accounting sense (losing value with age)
Appreciable?	Yes	Yes	No	Rarely Yes	In the collector sense (rarity, scarcity)
Tradable?	No	Yes	Yes	No	Refers to tradability on an exchange
Wagerable?	No	Yes	Yes	No	Refers to wagerability on an exchange
Dimension: perceived asset communication					
Discussable?	Yes	No	Yes	No	Internet has increased discussability
Reviewable?	Yes	No	Yes	Yes	Internet has increased reviewability
Hypeable?	Yes	Yes	Yes	Yes	Internet has increased hypeability

Even a movie—such as a new Harry Potter release—could experience a temporary supply-demand imbalance with lines at the box office on the release date. Supply and demand, especially for bubble-prone assets, are perceptual states—their perceived shortage, and the feeling that prices will rise (or the asset will disappear) and the deal must be done quickly, that contribute to the inflation of bubbles.

Bubbles and perceived asset value

The second core dimension pertains to the perceived asset value: how to value an asset that does not exist, or how to evaluate the promise of an emerging new asset? The following factors that we term "valuation-related factors" aim to understand whether an underlying asset is depreciable, appreciable, tradable, or wagerable. In economic terms, there is an implied inverse relationship between perceived availability and perceived valuation of an asset: the asset that appears to be scarcer is valued more highly.

Hence, beyond the perceived availability factors, the main factors affecting bubbles are the perceived asset value dimensions—particularly the ability to trade (in an exchange) or bet (again, in an organized exchange) on the asset. At the height of tulipmania, sometimes the ownership of a tulip bulb (still planted in the ground) changed hands as much as 8–10 times in a day, via auction houses.[10] Financial engineering or financial innovation[11]—the ability to craft derivatives for almost anything—has injected tradability and wagerability (the ability to place bets, in stock or commodity exchanges) in asset categories that were previously not tradable or wagerable. The housing bubble in the United States[12] that burst in 2007 was fueled largely by the creation of Credit Default Swaps, derivatives that allowed trading and wagering on home mortgage debt notes.[13] In this sense, the portrayal shown in Table 2.3 is a cross-sectional snapshot, reflective of the closing years of the twentieth century. Indeed, the Internet has accelerated tradability and wagerability—as well as discussability, reviewability, and hypeability—of all asset types. Hence, a future portrayal of Table 2.3 would likely look somewhat different than the one shown here.

Bubbles and perceived asset communication

The third and final core dimension relates to perceived asset communication: how can the target stakeholders distinguish between hype

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and reality; how much can the rules be bent; how many "legitimacy lies"—defined as "intentional misrepresentations of the facts"[14]—can be told without bursting an inflating bubble? This dimension consists of three factors, communication-related factors, that are trying to explain whether an underlying asset is discussable, reviewable, or hypeable. Intense and frequent communications are necessary (though, of course, not sufficient conditions) for the formation and enlargement of bubbles. Even in the case of tulipmania, when the mass media were hardly developed, the bubble phenomenon was essentially an urban one—in the Amsterdam and Haarlem metropolitan areas of the Netherlands. Rising wages and affluence of craft workers created conditions for these folks to meet in pubs and public places, to discuss the qualities of tulip varieties and to speculate on tulip bulbs.

The three items in the last set of factors in Table 2.3 are about communications pertaining to the underlying assets. Movies and financial stocks have been eminently discussable topics for a long time—in mass media, parlors, clubs, and pubs. The spread of Internet has boosted the ability to discuss, review, and hype all asset types—including the prosaic asset categories of commodities comprising of things such as titanium or pork bellies. Of course, for highly valenced and often emotive categories of entertainment products (movies, music, books), storied stocks (such as those of technology companies), and high-end real estate (Manhattan, London), the discussions—facilitated by Internet—have proliferated in terms of numbers and intensity.

In the bubble process, the role of such communications is similar to the processes found in the formation of what Malcolm Gladwell has called "tipping points."[15] For a tipping point to form or a bubble to inflate rapidly, the following factors usually come into play:

> *Propitious context*: A fertile and propitious context is helpful. The dotcom tech-stock bubble could not have been formed until there were some early, dazzling successes in e-commerce.
>
> *Irresistible stickiness*: Some aspect of the phenomenon must be irresistibly attractive to large numbers. In the U.S. housing bubble, the real estate price gains in some sunbelt states (such as Florida and California) appeared to offer sweet, no-brainer strategies for sure-fire capital gains: buy now, and you are guaranteed a higher sale price later.
>
> *Nodal roles*: Central and nodal roles that advise, mentor, connect, and persuade are crucial for the propagation of an idea—including, of course, the idea behind a bubble, that an asset's price will rise and rise and rise; or

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the dire counter warning that the asset is inflating in unsustainable ways and that the bubble will burst. Economist Nouriel Roubini, for example, was a lone wolf in warning about the inflating housing and stock bubble of 2007–2008, and earned him the nickname of "Dr. Doom." Roubini became a nodal and central celebrity once his warnings came true.[16]

Conclusion: interlocking of the building blocks

The asset-linked building blocks exist in many cases; yet, bubbles form only rarely. This is because the precise interlocking of the building blocks that would lay the foundation of a bubble spiral requires many more conditions.

In the next two chapters, we explore additional factors and conditions that may foment bubbles. In Chapter 3, we focus on the boundaries of the socioeconomic arenas in which bubbles could (and sometimes do) form. Uncertainty, of course, is a primal condition for the possible breeding of bubbles. Much like fertilizers and other nutrients enrich the soil for growing things, other conditions have to conjoin with uncertainty to "prepare the soil" for jack-and-the-beanstalk style bubble growth. In Chapter 3, we focus on two additional conditions that temper uncertainty about the value of an asset—the velocity of the phenomenon being discussed, often leading to a rapidly pervading sense that the asset in question is not a crazy gamble but a risky-yet-very-lucrative bet (and people should be "on board" since the train is about to leave); and the emergence of a negotiated space in which opinion shapers (with real or claimed inside knowledge about the value of the asset) have the opportunity to influence large masses of opinion seekers about the potential lure of the asset, and getting these masses to invest in the asset.

Chapter 4 goes into greater details of the interplay of hype and hope, the two critical states that influence the perceived future value of the asset, and often accelerate the asset valuation processes rather uncontrollably to create an asset bubble.

Notes

1 Hughes (2009, p. 89).
2 Hughes (1996, p. 64).
3 Appadurai (1990).
4 Elster (2007, p. 124).

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5 Nonaka and Takeuchi (1995, p. 58).
6 Elster (2007).
7 Coltman et al. (2001).
8 Galbraith (1993); Martin (2011); Perez (2002, 2009); Schmitt (2009); Turcan (2011).
9 Feuer (2013).
10 Dash (2000).
11 Perez (2009).
12 Baker (2007).
13 Cohan (2009); Lewis (2006).
14 Rutherford et al. (2009, p. 950).
15 Gladwell (2002).
16 Chen (2009); Das and Roubini (2012).

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3
Temporal and Contextual Boundaries

Abstract: *In this chapter we set the temporal and contextual boundaries of our metatheory, hence marking the perimeter of generalizability. We identify key constructs—uncertainty, velocity over time, and negotiated space—that cut across all bubble and asset types, and discuss their limiting values on theory generalizability. Uncertainty is the fallow soil in which the seeds of an asset bubble are sown. The velocity of discourse about an asset takes on a life of its own: there is rapid transformation of the stark uncertainty about the asset value into a seemingly graspable, even measurable, level of risk associated with the asset. We further view a negotiated space as a discursive space in which a "negotiated mix" of hyped promotion and hyped price are readily available but the material elements such as the product (technology) and its physical accessibility are still largely "imagined."*

Keywords: hype process; negotiated mix; negotiated space; risk; uncertainty; velocity over time

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In the period from the mid-1990s to 2000—several Internet eons ago[1]—a widespread belief was emerging that the world was in the grips of an e-business revolution.[2] The Internet and e-business were in the center of attention of many, including the popular press.[3] Even the normally sedate *Wall Street Journal*, for example, maintained that "[w]hen it comes to technology, even the most bearish analysts agree the microchip and Internet are changing almost everything in the economy."[4]

The acceleration in rate of technical advance in information and communication technology (ICT) became synonymous with the term "new economy."[5] Many features of the new economy were based on the importance of information as a commodity, very different from the standard goods and services of the materials-based old economy. Table 3.1 offers some key features of this new economy.[6]

The (seemingly) converging future prospects—partly realized, but sometimes vastly exaggerated[7]—of multiple new information and communication technology (ICT) innovations, markets, and products gave birth to several myths regarding the new economy, including the notion that the business cycle is dead or business decisions could ignore old rules about the marketplace.[8] Many believed that the Internet would have major impact on global business by 2001.[9] Visionary predictions about the nascent, emergent forms of e-business—brands will die, prices will fall, and middlemen will disappear—were driving the valuation of virtual firms to the level of an Internet bubble that burst in 2000.[10] For any new

TABLE 3.1 *Key features of the new economy*

Feature	Definition
Digital revolution	Prevalence of information and communication technologies, especially computers
Human capital	Rapid growth of education and training
Innovation	R&D, know-how, brands, and other forms of intangible capital more important than fixed capital
Mobility/ globalization	Capital (financial, fixed, and highly skilled) very mobile across national borders
Entrepreneurial capacity	Start-ups and new entrants as key drivers of growth
Clusters	Geographical concentration of high-tech firms
Inequality	Increasing wage dispersion and volatility of income, "winner takes all" in labor and product markets
Public/private	A blurring of the divisions between the public and private sectors

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asset with bubble potential, key enduring questions are when and in what context we may learn the difference between hype and reality, between myth and truth about the asset:

> Misunderstood, over-hyped, and a long way from delivering on its full potential? The hype could be to the detriment of nanotechnology . . . while the truth is both more complex and more prosaic.[11]
>
> The boom in ICT investment over the past decade was accompanied by hype . . . the effect of ICT may be no greater than other important inventions of the past, like electricity generation and the internal combustion engine.[12]

After identifying the core asset-linked dimensions of the bubble typology—availability, valuation, and communication—we are now ready to set the temporal and contextual boundaries of the emergent theory, thus marking the perimeter of generalizability. To determine the boundary of our emerging theory, we identify the key constructs in the form of meta-dimensions that cut across all bubble and asset types, and discuss their limiting values on theory generalizability. We identify three meta-dimensions that delineate the boundaries of the emergent typology: uncertainty, velocity over time, and negotiated space (see Figure 3.1).[13]

Uncertainty

A key factor contributing to bubble formation is the state of uncertainty linked to the degree of newness of an underlying asset, be it an innovation, a new product, a new technology, or a new business idea. We view

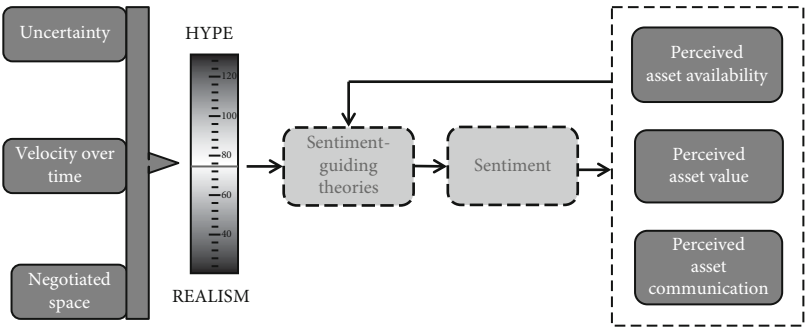

FIGURE 3.1 *Asset-related and meta-dimensions affecting bubbles*

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uncertainty and newness of an underlying asset as two sides of the same coin. For a new asset, uncertainty could arise from many sources: technical uncertainty (especially for high-tech products), market uncertainty (for mass market items), and goal ambiguity.[14] In the context of the 2008 economic crisis, the excitement-triggering newness was in the form of emergence of sophisticated derivative instruments tied to an underlying asset, developed over the years by bankers and other financial engineers, who—like Mary Shelly's Frankenstein—were themselves often not able to fully understand the creatures they had unleashed on the world.[15]

To illustrate the state of uncertainty, we distinguish between uncertain and risky decision-making situations. A risky situation is similar to rolling a dice that is balanced and fair: it is possible to assess the probability of the outcomes. An uncertain situation, on the other hand, resembles rolling a dice with infinite number of sides, without knowing whether the dice is balanced and fair. Under uncertainty thus, it is impossible to assess the probability of the outcomes. The stage gets set, in other words, for feverish speculation (during bubble inflation) or for panicked exit (during bubble bursting).

For example, under uncertain decision-making situations the cash flow a new asset is expected to generate (the mean of the distribution) and the rate at which the cash flow should be discounted over time (the variance of the distribution) are unknown.[16] In other words, net present value of a new asset cannot be calculated under uncertain decision-making situations. The following quotes from a Venture Capitalist (VC)—offering his reflections on investments in "dotcom" companies in late 1990s and early 2000s—serve to illustrate the point:

> Businesses that we typically backed [by VCs] were businesses which needed to sell internationally. It turned out that the world market was a lot slower than entrepreneurs forecasted, and their ventures' revenue base did not support more than one location. So, we might have made an assumption that the revenue would grow such that we could open two or three offices and then in a year to break even, but because the market was smaller, we were growing slowly. In the end, that strategy did not work, and entrepreneurs had to close offices.[17]

The examples below will further illustrate the degree of uncertainty based on the asset types and their core dimensions and factors (Table 2.3). In the movie industry uncertainty is seen as being low. As a concept, the typical movie is a well-known product. As an outcome of a creative process, however, the value of a *new* movie to the

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moviegoers is unknown and this creates an uncertainty and certain expectations about that new movie. Social media industry is also characterized by low uncertainty. Its concept and technology behind it are not new to most of us. What is new—and what generates the state of uncertainty—are the sophistication with which people use social media, rapid changes in communication preferences, and constant innovation of social media as products and platforms. As an asset, gold has always been a highly appreciated commodity under the illusion that its value will be rising forever. Seen as a highly secure investment, its appreciability, tradability, and wagerability have contributed to its reputation as a time-tested asset.

The uncertainty in high-technology sectors is driven, for example, by the degree of newness of high-tech products and of forms of organizing (e.g., new business models)—be it an innovation, a new product, a new technology, or a new dotcom business model. In late 1990s the concept of Internet commerce and everything that had dotcom in a name were new constructs and frameworks for all involved: entrepreneurs, investors, academia, mass media, and policymakers. Without prior experience, knowledge, or history about such assets—and given their tradability and wagerability properties—such assets were easily overvalued and hyped. Thirteen years after the dotcom bubble, another technology bubble is being inflated by venture capitalists:[18]

> Nextdoor, a social network for neighbors…is now worth at least a few hundred million dollars, making it the latest example of fashionable and fast-growing start-ups commanding startling valuations despite the lack of a proven business model.[19]

By late 2013, with venture funding approaching $100 million and with the backing of major VCs as well as Internet firms such as Google, Amazon, and Facebook, Nextdoor was valued at $500 million and this number was on an upward zoom.

Velocity over time

Assets with bubble potential also have a temporal dimension, velocity over time. That is, with elapsed time, a history about the asset is being formed, making the involved and interested stakeholders more knowledgeable about the asset, and in the end allowing them to make more accurate predictions about asset potential. In other words, with elapsed

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time and with growing experience and knowledge, the asset transitions from an uncertain state (unknown probabilities) to a risky state (known probabilities of outcomes). With such transition, it becomes possible to differentiate between hype (a crafted and slanted projection—a mythical one, if you will—of probability of success) and reality (a projection where probabilities of outcomes are calculable). That is, as the history of an underlying asset is being formed, the behavior of various stakeholders changes accordingly. The quote below, from a VC during the dotcom era, explains the point:

> If you go back three years now, the market was extremely bullish, and investors were willing to take very large risks, and also had an inflated idea of what companies might be worth. The big thing that we've been working on quite hard to improve for the last five years I guess is to get real views on the size and trends of the markets[20]

In essence, velocity over time defines the rate at which an asset and/or its (perceived) value move from uncertain decision-making settings toward decision-making settings characterized by "risk." This transition process though is hindered by inertia that in turn is driven by the sticky sentiments that contribute to a bubble formation. For example, despite the fact that in the second half of 2000 the ICT market in the United States started to collapse—that is, a real view of the market was emerging—entrepreneurs of high-tech companies in the United Kingdom got trapped in (what in hindsight was to become) a failing course of action and kept committing resources to ventures with no prospects. The following quotes from two entrepreneurs who were running their businesses during that period exemplify this point:[21]

> When in 2000 things started to go wrong in the US, our sales stopped, but we were still making trips, because we invested a lot of money to go there, and time and effort.
>
> To raise money we had to make commitments of what we would need to achieve. Once we got the money we had to use them in the way we said we would. That leads to pressure to do things, rather than not to do things.

Compared to technology bubbles, movie bubbles have higher velocity as virtually after the first weekend premiere the true value of a hyped movie is being formed. The contemporary social media bubble has lower velocity; it started forming in 2005–2006 marking the emergent success of Facebook and was still inflating in 2013. Some felt that investments in new social network ventures are…

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> . . . bound to set off questions about whether venture capitalists are inflating another technology bubbles by throwing money at unprofitable start-ups.[22]

Negotiated space

In addition to the temporal dimension of "velocity," we also introduce the enviro-contextual dimension of a discursive "space" that forms around certain exciting assets. That is, regardless of the type of asset that is to be made available, valued, and communicated about, in the process of bubble formation, a physical exchange usually does not take place. The tulips, for example, were in the ground while they were being traded in the pubs of Amsterdam. We term this enviro-contextual dimension as *negotiated space*. In contrast to traditional (physical, palpable) marketplace exchange, in the negotiated space the parties arbitrate the value of an asset that is not readily available for physical inspection or exchange. Rather than speaking about a marketing mix, in the negotiated space there is a "negotiated mix"—product and place may have to be imagined, but elements of promotion (often hyped) and price (also hyped) are vividly present.

The exchange of a bubble-prone asset between sellers and buyers is solely based on the anchored or perceived value of that asset. In other words, the only reference point to form an opinion about an emerging new asset, that is, about its perceived value, is the anchored or hyped value of the asset. For example, the value of a not-yet-released movie is negotiated between movie producers and potential moviegoers primarily via marketing efforts undertaken by movie producers and is moderated, for example, by previous encounters of moviegoers with the specific movie director and/or movie stars associated with that movie. In this sense, the perceived value of a new movie (or any hypeable asset) is nothing else but the anchored view of the future prospects of the new movie.

In 2001, an OECD report on the dotcom frenzy showed that the boom in the ICT investment in the 1990s was accompanied by considerable hype.[23] In such an environment, one of the most pressing challenges facing various actors trying to predict future trends is to determine whether a hyped new asset truly has the potential to transform an industry and/or usher in a way of life.[24] This challenge is amplified by external and internal pressures that lead to hyping behavior in both business and investment

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communities. In the dotcom case—and in the case of any other new asset with bubble potential—we can find two such distinct pressures as part of the negotiated space: hyperbole and vaporware.[25] Hyperbole refers to a signal emanating from either competitive or remote environments about exaggerated future prospects of a technology, an innovation, a market, or a product—typically employing bombastic phrases such as "established brands will die," "prices will collapse," "middlemen will be disintermediated," "bank branches will disappear," and "3G phones will replace home computers." Vaporware is a signal emanated most frequently by large companies to the market and refers to a false announcement of a new product in an attempt to deter entry of potential competitors.[26] In the United States vaporware even became an antitrust concern.[27] The following quotes exemplify how hyperbole and vaporware shape the behavior of entrepreneurs in the negotiated space respectively:

> What was common to all our solutions was that people were using the Internet more and more in Finance as the way of communicating more cost-effectively with customers. At that point there was even an idea to get rid of all branches; it will be all internet banking. But we found out that branch network was still an important part. So we were looking at where the common features of the systems we had built for insurers and some banks so that we can build a product round that…it happened that our product was too immature at that point.[28]

> One of the things you learn about the technology markets is that [big enterprise] players spin awfully a lot about what is possible, and raise customer expectations. However, they consistently failed to deliver, and the markets became very skeptical. As a result, it became very difficult for someone who could actually deliver, to come along and penetrate the major market share. These companies put a lot of clouds, smoke, and actually prevent small businesses getting into the markets most of the time.

Conclusion: fueled and ready, but ignition?

What we have laid out in this chapter are three conditions that till and fertilize the soil in which a jack-and-the-beanstalk style monstrous bubble *could* germinate and grow uncontrollably. Uncertainty is the basic ground, the fallow soil, in which the seeds of an asset bubble could possibly be sown. The velocity of discourse about an asset sometimes takes on a life of its own: there is rapid transformation of the stark uncertainty

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about the asset value into a seemingly graspable, even measurable, level of risk associated with the asset. There is a rising—and spreading—feeling that the asset could have huge payoffs in the future; and those not investing "now" would be left behind, or would end up paying very high prices to acquire the asset. Even when very realistic risk-adjusted value estimates begin to emerge, there is often a fast-rolling bandwagon of optimistic sentiment, and those riding it often ignore the realistic valuation signals. We posit that there is—at this stage of the bubbles game—a negotiated space, a discursive space in which a "negotiated mix" of hyped promotion and hyped price are readily available but the material elements such as the product (technology) and its physical accessibility are still largely "imagined."

To shift to a different analogy, when the uncertainty has been reigned in to some extent and transformed into graspable risk, and when the hype is building up (via negotiations about lucrative values, led by "expert" opinion makers), the situation is analogous to a rocket at a launch pad: fueled and ready to take off. All that is missing is the ignition, for liftoff and for the rocket to shoot up with a roar into stratospheric valuations.

Such ignition, of course, does not always happen. We need to delve further into the interplay of hype and hope to understand what exactly triggers the rocket launch, and the formation of an asset bubble. We take up these topics in Chapter 4.

Notes

1 Pilat (2003).
2 Coltman et al. (2001); Gordon (2000).
3 Aldrich (1999); Downes and Mui (1999).
4 Ip (2000).
5 Gordon (2000); Pilat (2003); Rusek (2004); Van Reenen (2001).
6 Van Reenen (2001).
7 OECD (2001).
8 Bassanini and Scarpetta (2002); Pilat (2003).
9 Booz-Allen and Hamilton (1999).
10 Coltman et al. (2001).
11 Reported in ElectricNew.net (2002).
12 OECD (2001).
13 Dholakia and Turcan (2013).
14 Turcan (2008, 2011).

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15 This was one of the findings of the treasury committee of the UK Parliament at the hearing on the crisis of the financial and banking sectors (www.parliament.uk).
16 Alvarez and Barney (2005).
17 Turcan (2006).
18 Bilton (2013).
19 Gelles (2013).
20 Turcan (2006).
21 Ibid.
22 Gelles (2013).
23 OECD (2001).
24 Christensen and Anthony (2004).
25 Bayus et al. (2001); Coltman et al. (2001); Haan (2003).
26 Haan (2003).
27 For review see Levy (1997).
28 Turcan (2006).

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4
Hype, Hope, and Bubbles

Abstract: *In this chapter we weave theoretical threads together and present a working typology of bubbles. Specifically, we delve into the interplay of hype and hope to understand what exactly triggers the formation of an asset bubble. We view hype and hope as the two critical states that influence the perceived future value of the asset, and often accelerate the asset valuation processes rather uncontrollably to create an asset bubble. The key emphasis in this chapter is on hype processes, four types of hype-related states—delusional optimism, overoptimism, pessimism, and realism talk—and sentiment-guiding theories. The central thesis of this chapter is that a sentiment about an asset often remains temporally invariant and sticky because a majority in the stakeholder network is willing to change the sentiment-guiding theory rather than the sentiment itself—and this helps in coping with the perceived uncertainty.*

Keywords: asset valuation process; delusional optimism; hope; hype; hype and hope dynamics; hype process; overoptimism; pessimism; realism talk; sentiment-guiding theory; uncertainty

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Hype and hope: malevolent to benevolent

The goal of some powerful actors behind many major bubbles is often not to build "an enduring business" but an expedient one. The various Ponzi schemes and pyramid schemes that appear in the market from time to time are clearly businesses where hype is deliberately (and fraudulently) employed as a strategy—often as the *only* strategy—to grow the business. Such businesses, of course, are destined to crash, and are illustrative more of deceptive practices than of bubble processes. The largest Ponzi scheme in the world operated by Bernie Madoff that led to losses of over $65 billion (in terms of perceived and believed value of the assets, before the scheme unraveled) went undetected for a long time because the "hype" was kept at a very low-key (almost non-hype) level:

> Madoff may have avoided scrutiny…in part because he simultaneously operated a legitimate, regulated and high-profile business as one of the largest middlemen between the buyers and sellers of stock. In that role, he helped to create Nasdaq, the first electronic stock exchange, and advised the SEC on electronic trading issues. He was a large campaign contributor and a familiar of senior regulators…At the same time, Madoff's separate investment business operated on the outskirts of regulation, during a period when the government…intentionally allowed private, unregulated transactions. Private investment pools, such as hedge funds, are subject to limited oversight, and Madoff constructed his investment business to avoid most of it.[1]
>
> He earned his investors' trust because whenever they requested a withdrawal, Madoff's investment company got their money to them promptly. In addition, unlike other Ponzi schemers, he didn't tempt investors with unbelievable returns. He reported moderate (albeit, suspiciously consistent) returns to his investors.[2]

In the rest of this chapter, we look at hype processes where the intention is not usually fraudulent but reflects, at least initially, a genuine enthusiasm (a benevolent intent) for the prospects of an asset. In the technology-driven fields, especially, there is often close intermingling of genuine entrepreneurial enthusiasm—often infectious—and some contrived forms of enthusiasm (a questionable intent), emanating usually from venture capitalists who develop vested interests in hyping a venture because of their sunk investments in the ventures.

The case of the electronic game-maker Zynga and its stock prices is illustrative. Because of its close association with Facebook (with its

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billion-plus users) in 2009–2010, and early popularity of multiplayer games such as Farmville, Zynga become a darling of the Wall Street prior to its Initial Public Offering (IPO) in December 2011. The hyped up stock rose to a high price of a little above $13 within a few months of the IPO, but then the stock price collapsed to the $2–$3 level. CEO Mark Pincus…

> …took Zynga public late in 2011 on the strength of its relationship with Facebook…and general excitement about social gaming, selling $1 billion of Zynga stock for $10 each. Not long after, Pincus sidestepped lock-up provisions and sold $190 million of his own Zynga stock in a secondary offering. Since then Pincus has become the poster boy for investor disappointment in social media stocks as Zynga's share price collapsed…Pincus…tried to find salvation in the idea of online gambling by leveraging Zynga's popular online poker franchise, but online gambling is a competitive and highly regulated space…Meanwhile, the company has been caught in the shift to mobile as more gamers abandon web sites and opt for games played on wireless devices.[3]

Figure 4.1 charts Zynga's stock prices for about 18 months after the IPO. While the Zynga hype was orchestrated by the venture capitalists backing the company and the investment bankers chaperoning the IPO, the media became fully complicit in promoting the hype, with *The New York Times* speculating that Zynga may become the "Google of Games."

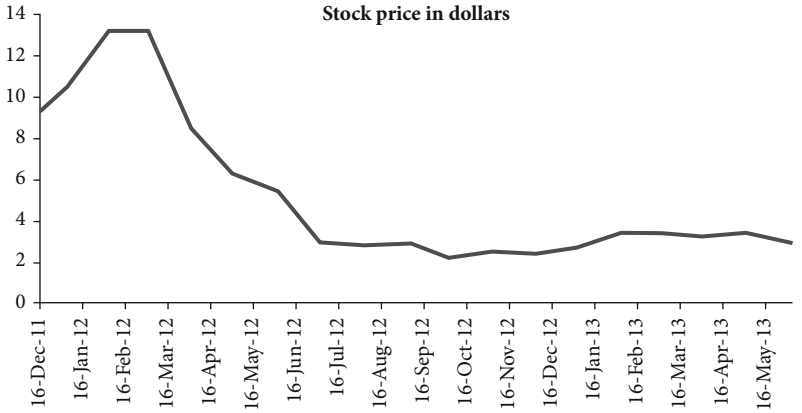

FIGURE 4.1 *Rise and fall of Zynga stock price after IPO*

Source: Authors' research.

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Assumptions underlying bubbles

Our emerging theory of bubbles rests on assumptions—psychological, economic, and social dynamic—that rationalize the selection of constructs and proposed relationships. The key emphasis in this chapter is on hype processes, four types of hype-related states,[4] and sentiment-guiding theories.[5]

As discussed in the previous chapter, for some cutting-edge products, such as a new genetic biotech therapy, both the availability of the asset to the market (will the genetics research and drug tests be successful?) as well as its value (how effective and unique will the drug be, and how big a market can be expected?) are unknown. Yet, communications—typically in rosy and optimistic terms—are provided to the market by the innovators and lead investors.[6] As a result, an overall sentiment of the environmental context about the future is created within which the asset is embedded—a state that can be termed as "hype."

To illustrate hype processes in the case of the late 1990s tech bubble—the so-called dotcom bubble—we draw selectively from the doctoral dissertation by one of us.[7] In this research study, Romeo V. Turcan explored how and why high-technology firms located in the Silicon Glen of Scotland internationalized and struggled for survival before, during, and after the dotcom bubble. To get a balanced picture of the situation, he talked, in addition to entrepreneurs, to these firms' investors, strategy advisors, and liquidators, as well as policymakers regulating that specific sector and business journalists who were covering the evolution of these firms during the dotcom bubble. A quote from a liquidator of a number of dotcom companies that went belly up in the early 2000s explains the nature of high-tech hype:

> When I look at forecasts in the business plans that were used to get the initial funding I can say straight away: this is absolutely ridiculous; there is no way the company could grow at that pace. The whole thrust of a young technology business is to hype, if you like, to create large expectations about sales, and profit levels.[8]

In the hype processes that lead to bubble formation, mid-level (or meso level) signals have a stronger effect on sentiments formation than macro level signals. For example, biotech investors pay less attention to the growth outlook of a nation issued by the European Union but pay close attention to the growth prospects of the biotech sector from a reputable

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consulting or investment advisory firm. Overall sentiment—the sentiment of the multitude—arises from interaction among individuals and the changes in behavior which they induce in one another.[9] In other words, positive feedback reinforces positive behavior, whereas negative feedback attenuates behavior—and these processes play out at an accelerated pace in the era of the Internet.

In uncertain decision-making settings, hype is important as it creates fashion; it is driven by fashion. Hype and fashion are the two sides of the same coin. Hype releases the pressure valve in investment decisions because it reduces the hassle of extensive search as well as the pain of possible failure; whereas human psychology of failure is ameliorated by fashion.[10] For example, people—driven by "do-not-want-to-lose-out-on-a-big-opportunity" fashion—often find it financially advantageous, and often unavoidable, to fall in with the ideas of the market, even though they themselves could have been better informed (if they acted wholly independently, rather than as "slaves to fashion").[11] There are high emotional and professional costs associated with being the odd one out: worldly wisdom teaches us that it is far better for reputation to fail conventionally than to succeed unconventionally.[12] A quote from a strategy management advisor who consulted with a number of dotcom companies in late 1990s and early 2000s illustrates this point:

> It is not nearly so bad being killed on the first day of the Somme with twenty thousand other people than it is being killed on your own in no man's land because you went out and stood up. The former is a glorious failure; the second is just an idiot thing to do. What happens in a hype driven market, people are making decisions because everybody else is doing it. The hype and fashion protect you from being one man odd out. If you feel in your heart and gut that this is all rubbish, but you still do it, because it is fashionable and hyped.[13]

Hype-related states

Four types of the hype-related states may occur: (1) delusional optimism, (2) overoptimism, (3) pessimism, and (4) realism talk (Figure 4.2).[14] Stakeholders are delusionally optimistic about an asset when sentiments about the future—in the environmental context within which the asset is embedded—are wildly positive. Reinforcing positive signals could come from meso as well as macro levels. Such delusional states typically do not

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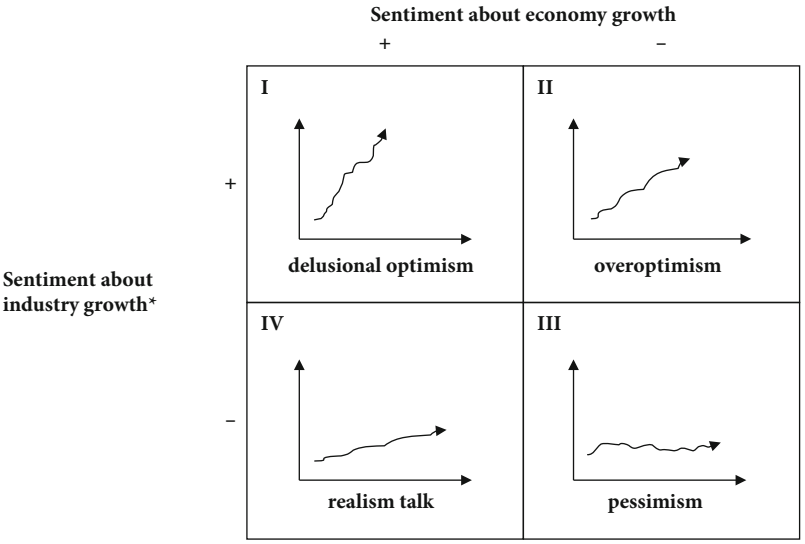

* At the moment of creating new industry or new demand within an existing industry

FIGURE 4.2 *Typology of hype*

last long. Stakeholders can be said to turn overoptimistic about an asset when they ignore negative signals emanating from the macro environment, and base their sentiments on the meso level signals which remain positive. The following quotes from a tech-business venture capitalist and a liquidator exemplifies the above respectively:

> The big issue when you invest is to make sure that the markets the company is going into are going to be big as you intend them to be. There were a lot of analysts in telecom, optical industries, etc. who thought that the markets would be huge, but they [ultimately] were not.
>
> It is the hype that generates VCs' money. When the things are not progressing quite as quickly as they wanted, in my experience, there tends not to be a lot of realism talk; there tends to be even more hype. Because usually what's happening is that suddenly they need more money than they thought. And the last thing they are going to do is to actually talk the situation down, and hype it a bit further.[15]

When both macro and meso level signals turn negative, then sentiments usually sink—often in an extreme and precipitate manner. The sentimental milieu that emerges in such situations is that of pervasive skepticism

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or pessimism. In the housing bubble in the United States, this happened around 2005–2006, with sentiments at meso-type levels (home buyers, speculative real estate investors) and macro levels (mortgage rates, market correction, home prices) all slid down a steep slope:

> By late 2005, the rapid growth of investment in residential structures had come to an end. Shortly thereafter, other indications of the oncoming bust became visible. First-time home buyers were increasingly priced out of the market, mortgage rates rose by roughly 1 percent, affordability of homes decreased substantially, and speculators pulled out of the market. The market correction . . . [was] much more abrupt than the onset of the bubble. Roughly a decade of growth of investment in residential structures was eliminated over just 3 years—from 2005 to 2008. Home prices, as measured by Robert Shiller's real price index, . . . [fell] considerably from their peak in 2006.[16]

Finally, realism talk propagates in a social network when the sentiments about the future from meso level are negative but signals from macro level are positive. The housing bubble (the bubble in residential real estate property prices) leading up to 2008 exhibited parts of such a cycle. Sentiments about real estate prices went from delusional optimism, to overoptimism, and entered a profound skepticism-pessimism phase—devoid of all hope—by early 2011. The next phase of "realism talk" in the U.S. real estate market began in late 2011, but by 2013 there were already indicators of perhaps the next stage of delusional optimism beginning to froth up, especially for speculative buyers, in selected cities:

> Miami has become known as a "global gateway," much like New York and San Francisco, that attracts deep-pocketed investors from all over the world . . . The influx of buyers, combined with the economic recovery in the U.S. . . . created a dramatic turnaround in Miami's housing market. Sales of single-family homes in Miami climbed 10.3% during the first three months of 2013 compared with 12 months earlier and prices jumped 23%, according to the Florida Association of Realtors.[17]

In some situations, where markets interact with spasmodic government interventions and corrupt practices, such as in China (see Box 4.1), the sentiments and sentiment-guiding phases are not as easy to tease out as in the tech and housing bubbles in the Western context. From a theory building standpoint, our theory of bubbles would eventually need to sprout some new branches to deal with special contexts such as China.

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BOX 4.1 *China's housing: a non-bubble bubble?*

In many ways, the frenzied pace of housing construction and flipping of apartments in China give the impression of a rapidly inflating bubble. For example, in 2009 Gloria Gu—executive in a food company—bought a 140-square meter apartment in the Pudong area of Shanghai for $483,000. In just a few months after that, another similar apartment in her building sold for $615,000. In 2009, average new apartment prices in the tony Pudong financial district of Shanghai gained 57 percent to a record $4,061 per square meter, while overall prices in Shanghai rose 26 percent to a record $2,434 per square meter. Chinese government stimulus programs, following the 2007–2008 global slowdown, aided these price rises by pumping in $1.3 trillion liquidity into banks, for easy lending for various purposes including buying real estate.

With breakneck pace of building, in some parts of China many "ghost towns" appeared: entire cities, malls, and office complexes built up, but with no occupants. Chinese as well as Western media began to take notice of these eerie ghost towns—massive blocks of high-rise buildings with no occupants. These turned into forbiddingly dark ghost urban zones as daylight receded and night fell. To lay observers as well as seasoned economic journalists, there could be no clearer sign of a bubble: an asset in oversupply, with no apparent buyers.

The reality of China's housing, however, is more complex than the typical bubble phenomenon. With rising affluence, millions of urban households have investible funds but—because of still inadequately developed financial markets—not many places to invest. The rich in China therefore are buying up property, often multiple apartments, with the simple aim of "flipping" (i.e., reselling) them for a handsome profit. Many such speculative bets have, of course, gone wrong. Builders and bankers, often with corrupt nexuses of money and influence, have abetted such behavior by massive overbuilding in some places.

The Chinese government has taken aggressive steps to curb the excesses in the real estate market, such as raising sales taxes on property transactions and limiting the loans available to those who already own multiple properties. Real estate research firm Knight Frank believes that speculative activity would be curbed somewhat by such measures, but housing prices are not expected to fall. Demand from first-time buyers, because of rapid urbanization

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of China, and from long-term investors looking for capital gains, would remain strong. The phenomenon of "ghost towns," while real is limited to only a few towns and not the country as a whole.

China's real estate, in fact, exhibits simultaneously the signs of inflating and deflating bubbles—frenzied buying of an asset and (in some cases) an oversupply of the asset with no takers. In a real bubble, these two conditions cannot coexist. What is happening in China's housing is a unique process where there is interplay of market processes, rampant corruption, and heavy state intervention. Bubble-like processes appear from time to time, but not in their full socioeconomic forms. Perhaps "unbalanced development" or "speculative side-bets" are better ways to express what is happening with real estate in China.

Several sources were consulted to develop this vignette.[18]

Sentiment-guiding theories

In the typical Western market contexts, sentiments about an asset's value—current and anticipated—are linked strongly to people's beliefs about the performance of the asset. People rely on sentiment-guiding theories. Uncertainty, for example, diminishes with elapsed time—and eventually transforms into measurable risk. Sentiments, on the other hand, are temporally as well as conceptually sticky. Once a sentiment is formed, it is very hard to challenge it and eventually to change it. What people tend to change instead are the theories they use to justify their sentiments. We call these sentiment-guiding theories.

A sentiment often remains temporally invariant and sticky because a majority in the stakeholder network is willing to change the sentiment-guiding theory rather than the sentiment itself—and this helps in coping with the perceived uncertainty. With sticky sentiments, "theories" become convenient and expendable and changeable: it is psychologically easy (less taxing) to change the guiding theory rather than to drop or reverse the sentiment. During the dotcom phenomena examined in the Silicon Glen region of Scotland, the following quote from a liquidator of failed tech firms illustrates the above:

> Human nature being what it is: keep on driving, keep on driving…management tends to deny the problem until it is at the very extreme stage; and I'm getting there usually after it has got badly wrong. The thought "let's try to get out of here" does not occur to the management.[19]

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Conclusion: hype, hope, sentiments, and setbacks

In the next chapter, we weave theoretical threads together and present a working typology of bubbles. Before doing that, let us revisit the very central issues of hype, hope, and sentiments one more time. Bubbles simply cannot form when there is no hyping, where hopes do not run wild, and where racing sentiments are not guided by conveniently crafted theories that make everything seem logical and natural—even as doom and disaster await in the wings.

Reverting to the rocket launch analogy, hype and hopes are the key fuel-packed stages of the massive asset valuation rocket, ready to ignite and takeoff. Hype is a primary-stage fuel that may burn out fast, but it helps propel the rocket past the massive pull of the gravity that we call "reality." Hope and optimistic sentiments represent less powerful and slower burning fuels, but they often help in keeping the asset-rocket going in a steady upward direction. Resistance—in the form of gravitational pull of "reality" (much weakened, since the uncertainty stage has been passed) and the atmospheric friction in the form of contrary and skeptical sentiments—can be overcome relatively easily when there are wide segments of investors who share optimism and hope. Also, in the "Mission Control Center" there are very smart people—inventors, engineers, analysts, and venture capitalists—who are willing to apply gentle course-corrections to the guidance system of the rocket, in terms of new sentiment-guiding theories, to keep the asset-rocket going upward, at least until the point that they (the smart, early investors) are ready to eject their investment payloads out.

Some asset-rockets reach stratospheric heights, creating dangerous asset bubbles, while others take just meteoric forms of sometimes spectacular but short-lived fireworks. In the next chapter, we outline the characteristics of these various bubble types.

Notes

1 Applebaum and Hilzenrath (2008).
2 Clark and McGrath (2009).
3 Biddle (2013); Vardi (2013).
4 Turcan (2011).
5 Dholakia and Turcan (2013).

DOI: 10.1057/9781137361790.0010

6 Rutherford et al. (2009).
7 Turcan (2006).
8 Ibid.
9 Ormerod (1998).
10 Strategy management advisor in Turcan (2006).
11 Kahneman (2011); Keynes (1936).
12 Ibid.
13 Turcan (2006).
14 Ibid.
15 Ibid.
16 Byun (2010).
17 Christie (2013).
18 Chadha (2013); Rapoza (2013); Riley and Pang (2013); Veneziani and Weisenthal (2010).
19 Turcan (2006).

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5
Typology of Bubbles

Abstract: *In this chapter we propose a simple yet robust typology of bubbles. Six bubble types are identified and profiled in terms of asset-linked dimensions, and the context-spanning meta-dimensions. These types are transient or playful bubble, inflating bubble, deflating bubble, contagious bubble, irrational bubble, and punctured bubble. While small, playful bubbles are not particularly harmful to overall society or economy where they occur, the large technology and financial bubbles have not only devastating economic impacts but also corrosive social impacts as people lose not only their savings or abodes but also faith in the institutions, private and public, that they have come to trust as protectors of their interests. To illustrate and discuss properties and indicators of these types of bubbles, we developed vignettes that present short overviews of movie, social media, gold, dotcom, and housing bubbles.*

Keywords: contagious bubble; deflating bubble; dotcom bubble; financial bubble; gold bubble; housing bubble; inflating bubble; irrational bubble; movie bubbles; punctured bubble; social media bubble; technology bubble; transient bubble; typology of asset bubbles

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Witch's brews and perfect storms

The three core asset-linked dimensions discussed in Chapter 2—perceived asset availability, perceived asset value, and perceived asset communication—set the basic conditions under which bubbles *could* form. When there is a *perceived* scarcity of the asset and a *perception* that the "boat would be missed" if the asset is not acquired quickly at the prevailing price, and when the *perceived* communication flows seem to converge on the notion that—even with rising prices—the asset is still reasonably valued (tomorrow's price would indeed be higher, raising the cost of acquisition), then the conditions for bubble formation ripen; but *bubbles still may not form* in all such cases. This is where we need to push our understanding of the bubble phenomena further by turning to the meta-dimensions that delineate the boundaries, discussed in Chapter 3—uncertainty, velocity over time, and negotiated space; and the underlying assumptions discussed in Chapter 4—the types of hype-related states and sentiment-guiding theories. Just as the witch's brew requires the perfect blending of the Newt's Eye, the Toad's Tongue, the Hemlock Root, the Snake's Slice, Baboon's Blood and more, the formation of a bubble requires a perfect amalgam (in a given space-time frame) of asset-linked dimensions, the boundary conditions or meta-dimensions, and the fine-tuning assumptions.

The bubble broth could create a storm in a teacup, with minor impacts, or a massive ocean-spanning "perfect storm" with widespread misery. In this chapter, we propose a simple yet robust typology of bubbles. Six bubble types are identified and profiled in terms of asset-linked dimensions, and the context-spanning meta-dimensions. Table 5.1 presents the basic typology of bubbles and labels the bubble types. Tables 5.2 and 5.3 profile the six bubble types in terms of the meta-dimensions (see Figure 3.1) and in terms of the asset-linked dimensions (see Table 2.3).

The typology

Playful bubbles

Compared to the other five bubble types, transient or playful bubbles are the least socially harmful. Particular individual investors or corporate

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TABLE 5.1 *The typology of bubbles*

Bubble types	Examples	Comments	Social impacts
Transient or playful bubble	Massive failure of Disney sci-fi film *John Carter*, 2012	For a particular (usually entertainment—film, TV program, videogame) asset, hype far outpaces realism	Individual persons or corporations may suffer, but such bubbles are socially harmless
Inflating bubble	Social media stock valuations, 2012	Asset valuations are rising, but not too fast	Major problems can be avoided if asset values are carefully monitored
Deflating bubble	Gold prices—1980 to 1983, and 2013	Asset valuations are falling, but at precipitate speeds	Major problems can be avoided if asset values are carefully monitored
Contagious bubble	Dotcom valuations, 1999	Asset valuations are rising at hyper speed—everyone wants to be "in on the action"	No visible locus of control—bubble has its own logic and momentum
Irrational bubble	U.S. Housing valuations, 2003–2007	Asset valuations are rising in inexplicable ways (Schiller 2006)	Dangerous and unsustainable rise in valuations—often supported by financial engineering
Punctured bubble	Dotcom valuations in mid-2000	Asset valuations drop at precipitate speed paralyzing asset holders who seek quick exit	Crisis state—huge loss of asset values and wealth, major bankruptcies

executives may be hurt by the bursting of transient bubbles, but the social effects are minimal. Examples of such transient or playful bubbles occur occasionally in the movie making industry, specifically in the period prior to the movie release and immediately after. Though characterized by low uncertainty, the buzz about certain as-yet-unreleased movies creates a virtual asset where the hype far outpaces the realistic box office prospects, leading sometimes to overoptimism or delusional optimism. The 2012 Disney sci-fi film *John Carter* is a case in point: it cost over $300 million to make and market and earned only a disappointing $31 million on the first weekend of release.[1] The value put on such virtual asset depends chiefly on the previous experience the stakeholders have

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TABLE 5.2 *Boundary meta-dimensions by bubble types*

Bubble types	Uncertainty	Velocity over time	Negotiated space	Sentiment-guiding theories
Transient or playful bubble	Low uncertainty	High velocity	Virtual asset	Overoptimism, sometimes delusional optimism
Inflating bubble	Low uncertainty	Low and decelerating velocity	Virtual asset	Overoptimism
Deflating bubble	Low uncertainty	Low but accelerating velocity	Virtual asset	Build up of skepticism
Contagious bubble	High uncertainty	High, first accelerating velocity; then decelerating velocity	Virtual asset	Delusional optimism (especially near the peak)
Irrational bubble	High uncertainty	Low and decelerating velocity	Palpable asset	Delusional optimism (especially near the peak)
Punctured bubble	High uncertainty	High and accelerating velocity	Virtual asset	Profound pessimism

TABLE 5.3 *Asset-linked dimensions by bubble types*

Bubble types	Perceived asset availability	Perceived asset value	Perceived asset communication
Transient or playful bubble	No (once the asset is available, it is valued very quickly and realistically)	Wagerable (actual or mock bets are placed)	Discussable, reviewable, hypeable
Inflating bubble	Yes	Tradable and wagerable (bets tend to be well-calculated)	Discussable, reviewable, hypeable
Deflating bubble	Yes	Tradable and wagerable (bets tend to be well-calculated)	Discussable, reviewable
Contagious bubble	Usually No (trading is based on asset's promise)	Tradable and wagerable (rising loss of logic)	Discussable and ultra-hypeable
Irrational bubble	Yes	Tradable and wagerable (rising loss of logic)	Reviewable, hypeable
Punctured bubble	Yes (for palpable assets) or No (for virtual, promised assets)	No	Reviewable (but only after the shock phase)

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had with similar assets and on the extent and degree of its discussability and reviewability. Transient or playful bubbles move away from the uncertain state relatively fast, either reinforcing or dissipating the hype around the asset.

BOX 5.1 *Going to movies: getting there first and then run*

Modern movie industry can produce outstanding degree of hype and anticipation. Movies from Twilight franchise had probably the highest buzz among the recent blockbusters. An example of fan loyalty can be provided as an illustration here: Kristy Noriega, 19, is a student at California State University, Northridge. She bought tickets for the first four nights of "Twilight" demonstration in theaters and slept on the sidewalk the night before to see her heroes at the première.

In this day and age, being influenced by the massive (and very expensive) marketing campaigns that accompany most of the blockbusters to its opening night, it's hard not to get excited all out of proportion. Often a point is reached where it's almost impossible for those expectations to be met. Today, public perceptions about the new movie hits are formed in a complex interaction between explicit advertising, word of mouth rumor, independent media evaluation, and paid ads mimicking independent media. These factors generate something that can be called movie bubbles. When a long-awaited blockbuster is released, fans have spent so long anticipating the première, reading features and articles, that no matter how good is the final product, it's rarely going to live up to the hype.

Movie bubbles can also be characterized by the term box office bomb or flop. It generally refers to a film that turned out to be highly unsuccessful or unprofitable during its theatrical run; it can happen despite the prior hype, high production cost, or marketing efforts. Sometimes, a film may do reasonably well at the box office, but still be considered a failure due to a large budget.

2002's *Treasure Planet* was an ambitious animation project released by Walt Disney Pictures. It was the first movie to be released simultaneously in both IMAX and regular formats. Despite the impressive visuals and good professional reviews, the public did not show

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any signs of appreciation. As a result, the $180 million movie earned only $38 million at the U.S. box office.

An example of an inexpressive movie failure is Sahara (2005), an adventure motion picture starring Matthew McConaughey and Penelope Cruz. It opened at number one, made $18 million in its first weekend and earned $119 million at the box office. This sort of statistics would make almost any film producer happy. But instead, *Sahara turned out to be a* box office disaster, since its budget of $241 million was more than twice what the movie managed to earn.

Speed Racer (2008) is another flop. After the *Matrix* trilogy and *V for Vendetta,* Larry and Andy Wachowski chose to adapt the Japanese cartoon *Speed Racer* to the big screen. The movie's massive marketing support from such partners as LEGO, Mattel, and McDonald's was worth $80 million. However, the movie received reviews that were indifferent at best. As a result, the actual net losses for this project were $106,054,234.

Among the recent examples of overhyped movies that failed to live up to expectations according to the professionals' and enthusiasts' reviews are *Oz the Great and Powerful* (2013), *The Hobbit: An Unexpected Journey* (2013), *Quantum of Solace* (2009), *The Amazing Spider-Man* (2012), *The Matrix Revolutions* (2003).

Several sources were consulted to develop this vignette.[2]

Inflating bubbles

Inflating bubbles are characterized by low uncertainty whereby the asset valuations are rising at a slow pace driven by an overoptimistic sentiment about the asset potential. The example of such bubbles is the 2011–2012 emergence of the social media bubble. Low uncertainty around an asset such as social media is driven by its availability in a vividly visible form, a form that facilitates understanding and actual experiencing of it. In the context of inflating bubbles, the velocity is low and decelerating. The asset value moves toward more uncertain settings, driven by the overoptimistic sentiments about the potential of the asset combined with the asset tradability and wagerability as well as asset discussability and reviewability. Given the low velocity of the hype that is built around the asset, major problems associated with such bubble could be avoided, provided the values put on the asset are monitored carefully.

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BOX 5.2 *Inflating and deflating social media bubble*

The social media bubble was forming due to the successes of a number of new tech companies such as Google, Facebook, Youtube, LinkedIn, Groupon, Foursquare, and Twitter to name the most prominent. The early investors of Google and Facebook have become venture capitalists and were constantly looking for other opportunities that can turn into a new Facebook.

Social media companies per se are a phenomenon that has all rights for existence, the reason why it becomes a bubble is the high level of hype surrounding it. The frenzy over social media companies as a group is claimed to be rooted in what economists call the network effect. The more users a site attracts, the more people will want to use it. This creates a sort of a natural monopoly and becomes a magnet for advertising agencies, therefore, generating profits. Facebook is a classic example here.

Within a few years, the popularity of the major social networking sites was growing consistently; it encouraged investments and made people overestimate the potential of these media. The peak of the new wave tech companies' growth came in the third-quarter of 2011. With dynamic user growth at Facebook, Twitter, and Zynga, investors were euphoric about the Internet sites that were connecting people.

The professional networking website LinkedIn was the first social media site that went public in May, 2011. Its shares were almost doubled to close at $94.25 after trading at $122.70 on the first day. Facebook followed at $38 a share. Within the same year, Internet companies such as Groupon, Zynga, and Yelp went public too. The new tech companies were getting extremely optimistic evaluations: Facebook was valued as nearly $105 billion, Groupon as $13 billion, Twitter—$8 billion to $10 billion, LinkedIn—$3 billion. "Social" became a new buzz word; the excitement over the new phenomenon can be compared to e-commerce in the times of a dotcom boom. However, since then the euphoria started fading.

Facebook's shares could not exceed the $38 barrier. The shares' further decline accelerated after the company's first earnings report as a public company. In September, 2012, Facebook shares hit its lowest, and sank to $17.73. Other Internet companies were showing even worse dynamics. Groupon was offered a $6 billion takeover

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bid from Google in December 2010, which it rejected. After going public, the company got a market value of $13 billion. But after this point, the movement was downhill: in August, 2012 market capitalization of Groupon was a bit over $3 billion, a half of what Google had offered. Zynga's shares were down by 70 percent.

These declines gave analysts the grounds to talk about the start of a social media bubble deflation. However, in comparison to the Internet bubble of the late 1990s, in this case the air seems to be released quite gently. Of course, Zynga crashed and Groupon lost its attractiveness, but overall tech investment continues at a reliable pace. Facebook's shares picked up and overcame the initial $38 threshold (traded at $51.90 in October, 2013). The total amount of venture investment in Internet companies last quarter was $3.625 billion, close to what it was in the third-quarter of 2011.

Several sources were consulted to develop this vignette.[3]

Deflating bubbles

Deflating bubbles are rarer—sometimes found in commodity markets. Gold prices deflated relatively fast (but not in a precipitate manner) during 1980–1983, and continued to decline mildly or stagnate for the rest of the twentieth century. Asset values decrease—at least at the deflation stage—at an accelerating velocity. We characterize the deflating bubble with the following conditions: (1) low uncertainty decision-making setting; (2) driven by an overall skepticism about an asset potential; and (3) the asset is available, tradable, wagerable, discussable, and reviewable. The low velocity associated with a deflating bubble, and thus the gradual rise in skepticism, may allow actors and policymakers to avoid major problems or potential negative effects by carefully monitoring the values of the assets. The vignette in Box 5.3 presents a short overview of the gold bubble to exemplify the nature of deflating bubbles.

BOX 5.3 *Gold fever: distant past, near past, and future*

Gold is losing its allure after an impressive 650 percent rally from August 1999 to August 2011. Today, a mere two years after its price peak, gold is quickly sinking. Its price has fallen more than 20 percent since late 2011.

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Gold has gone through booms and busts before, including at least two from its peak in 1980, when it traded at $835, to its latest high in 2011. However, anyone who bought gold in 1999 and held on has done much better than the average stock market investor. Even after the recent decline, gold is still up 515 percent.

For a generation of investors, the golden decade created the illusion that the metal would keep rising forever. The financial industry managed to successfully market a growing range of gold investments, making the current downturn in gold more sensitive than previous ones. A poll by Gallup (April 2011) found that 34 percent of Americans thought that gold was the best long-term investment, more than any other investment category, including real estate and mutual funds. That was a triumph for those marketing gold.

The phenomenon that can be described as a gold bubble is somewhat everlasting. Throughout the history, gold has probably been the most highly appreciated commodity ever. In the modern times, gold was worshiped as a safe haven for investment, "a timeless classic," and a tangible guarantee of prosperity. However, today, the analysts are claiming that gold is a mere bubble and overly appreciated due to a number of misconceptions. Two main misconceptions can be mentioned here.

The first misconception is inflation is a looming threat, and gold offers you better protection than stocks or bonds. In reality, the price of gold is the only thing that seems to be rising. A study conducted by the investment management firm Research Affiliates found gold prices and inflation had very little correlation. Between January 1977 and April 1980, small-company stocks were actually the best-performing asset. One reason why gold may have been such a popular inflation hedge in the 1970s was that there were few alternatives for small investors back then.

The second misconception is unlike stocks, gold is real and tangible. So it will hold its value. In reality, gold prices fell for a quarter-century before the recent intensive growth. The same "real equals safer" argument was cited as the reason housing values would never sink precipitously—and we know how that ended.

So, two things that keep gold prices climbing are fear and greed. "When something goes up as quickly as gold has, the main thought is, Why am I not in it? And how can I get in it quickly?" says behavioral economist Dan Ariely, author of *Predictably Irrational*. "That's the

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same thing that happened with housing." At the same time, investors have turned to gold for centuries in times of trouble. Gold bubble is sometimes called a fear bubble, a defensive reaction to the burst of the latest housing bubble in the United States, which manifested itself in negative risk-free real interest rates and a soaring price of gold.

The experts make contradictory forecasts about the further behavior of the gold market. The 1970s can offer insights, though history never repeats. The gold price from 1974 to 1976 corrected 47 percent before it rose 8x to peak at US$887/oz in 1980.

Several sources were consulted to develop this vignette.[4]

Contagious and punctured bubbles

High uncertainty dominates the process of emergence of contagious bubbles that have their own logic and momentum with no visible locus of control. The dotcom bubble is an eloquent example of such contagious bubbles: there was rapid rise in 1999 of e-commerce valuations, which continued even into the first few weeks of 2000, and then there was spectacular and precipitate collapse by March 2000. During such bubbles the virtual assets that are tradable and wagerable usually are not available for palpable exchange: the dotcom stocks existed as electronic scrips and, in many cases, there were no operating physical businesses behind the scrips. The valuations of such assets rise at hyper speeds, being driven by delusional optimism over the promises these assets make. Such bubbles have high, at first accelerating (an epidemiological process—contagion spreading fast) and then a decelerating velocity (every vulnerable entity is infected). There is hyper-speed movement toward uncertain decision-making settings, making it hard for the stakeholders to learn and actually distinguish between hype and reality.

Punctured bubbles are characterized by high uncertainty and high, accelerating velocity. The system moves away from uncertain decision-making settings, and toward profound pessimism. An example of such bubbles is the dotcom (e-commerce) valuations in mid-2000. Although the underlying assets may or may not be available for palpable exchange, during such punctured bubbles asset valuations drop at precipitate speed, and asset holders are paralyzed at first (like in a traumatic fire) and then start looking for a quick exit. Effectively the system is in a crisis state whereby huge losses of asset values and wealth are encountered, and major bankruptcies are witnessed.

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BOX 5.4 *Sky's-the-limit optimism: an enduring philosophy*

From January 1994 to February 2000, the NASDAQ composite index rose from 776.80 to 4,696.69, a 605 percent increase, almost entirely influenced by prices of high-technology stocks. The impressive escalation of the share prices of Internet-related companies during the late 1990s were given a name of dotcom bubble (also referred to as the dotcom boom, the Internet bubble, and the information technology bubble). Furthermore, most of these companies experienced an abrupt fall in 2000 and reported losses in 1999 and 2000, so most of their capitalization was due to investor expectations. The growth of the bubble was stimulated by various causes. The main features of the time are described as the sky's-the-limit optimism, the huge amounts spent to get a market share, the investors' attempts to be inside, and the belief that there really were new rules.

By 1994, the general public got access to the Internet. Almost immediately, the businesses saw the global web as a unique profit opportunity. America Online provided households with the Internet connection on a large scale. In the same year, the Yahoo! search engine and Internet portal was started. Amazon.com became the first online book retailer in 1994. eBay started its activities as an online auction site in 1995. The Internet was commercialized quickly; many online businesses and their founders became very wealthy.

During the 1990s, the U.S. computer industry was primarily focusing on computer software development. Unlike computer hardware, the software products potentially had very high profit margins. Throughout the 1990s, software companies' stocks performed very well. Fueled by outstanding enthusiasm over the software business, numerous small software start-ups were created, many of which were launched by college students in basements or garages. Many of these start-ups attracted attention of venture capitalists that were looking for the opportunities for financing them, taking them public, and getting massive profits.

The novelty of the situation was confusing for investors. The stocks of dotcom companies were initially overvalued due to the difficulty to adequately estimate the non-traditional firms that appeared within a short period of time in big quantities. Besides, the investors were striving to participate in the quickly unfolding events and be

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in time for the "next big thing". There was an enormous demand for the stocks of the start-ups. Thus, the stock prices were rocketing as soon as the companies went public.

At that point of time, some start-ups paid their employees with company shares that would become very valuable when the company goes public. This is a good example of the irrational exuberance that took place at that period. At the peak of the dot-com bubble in 1999, a new millionaire was created almost every 60 seconds in Silicon Valley. Many of the dotcom companies were run by inexperienced entrepreneurs, lacked clear business plans and had no earnings. For example, Pets.com, which was presented as an online pet products retailer, was losing money before it went public and raised billions of dollars.

By early 2000, things started falling into places. Investors soon realized that the dotcom dream had developed into a classic speculative bubble. The Internet bubble officially burst on March 10, 2000 as the NASDAQ peaked at 5,048.62.

Several sources were consulted to develop this vignette.[5]

Irrational bubbles

Irrational bubbles resemble contagious bubbles in that they are also driven by high uncertainty, though at low and decelerating velocity. Probably the key difference is in the availability of what we call palpability of assets—the assets are available to touch, see, feel—but the values are rising in inexplicable ways.[6] U.S. housing valuations during 2003–2007 exemplify this type of bubble. Irrational bubbles are characterized by dangerous and unsustainable rise in valuations that are often engineered by few stakeholders, eventually leading to delusional optimism displaying the same contagion effects as in contagious bubbles.

BOX 5.5 *The U.S. housing bubble: does the story repeat itself?*

It is a widely accepted opinion that the housing bubble precipitated the financial crisis of 2008, also called the Great Recession. The Great Recession is now widely acknowledged to be the most devastating global economic crisis since the Great Depression. From 1997 to 2006, nominal U.S. housing prices rose by 188 percent. By mid-2009, however, housing prices had fallen by 33 percent from

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peak. Since the first-quarter of 2006, U.S. households have lost over $7 trillion in home equity. Such a massive housing collapse is not typical for a recession.

The American property market bubble started growing long before its actual burst. The starting point of its growth is dated as early as in mid-1990s. During the period from 1990 till the peak in 2007, the American mortgage market climbed from $500 billion to almost $4 trillion. In the first-quarter of 2007 there was the first fall in prices; this moment is considered to be the beginning of the bubble bursting.

The Great Recession influenced different states and groups of population unevenly. After the bubble burst, the housing prices went down throughout the country, however, the decline had disproportional impact in certain areas. For example, prices have fallen by 59 percent from their peak in Las Vegas compared to only 10 percent decline in Denver. Minority households (Hispanic and Black families) experienced the most severe equity losses.

The causes of the Great Recession are widely contested. But most often the crisis is associated with high-risk financial innovations and subprime mortgage lending (loans with low standards). This is why, the Great Recession is also called "subprime crisis."

Today, the U.S. housing market is showing signs of recovery with positive dynamics in home prices, sales, and construction. Foreclosures are also down as the Federal Reserve has pushed mortgage rates down. A one-story home in Menlo Park, California, listed for $2 million got six offers in April 2013, including four from builders planning to tear it down to construct a bigger house. An open house for a five-bedroom brownstone in Brooklyn, New York, priced at $949,000 drew 300 visitors and brought in 50 offers. In south Florida, ground zero for the last building boom and bust, 3,300 new condominium units are under way, the most since 2007. The opinions on the nature of this recovery differ. Some analysts are predicting the story to repeat itself, reading American papers today one can see titles such as "Reinflating the housing bubble," "A new housing boom." Really, the White House seems to be pushing for polices that fueled the housing bubble. In April 2013 administration began pressuring banks to lend to people with lower credit scores.

Barclays Capital report forecasts that home prices fallen after the bubble burst in 2007 can be back to peak levels as soon as 2015.

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> Constructing is predicted to grow by at least 20 percent a year for each of the next two years. Home builder stocks are up 162 percent in the past 12 months. Another opinion, however, is that housing rebound can produce a ripple effect that can help get the entire economy growing at a much stronger pace which will add to more demand for housing.
>
> Several sources were consulted to develop this vignette.[7]

Are there brewmasters?

While we do not wish to launch a witch-hunt of the agents behind bubbles, the following question is still relevant, especially in view of the [witch's] "brew" analogy we introduced at the beginning of the chapter: Are there brewmasters, those with specialized tools and skills to create special blends that foment rapid rises in asset prices? The answer is a clear "Yes, but … !"

The "yes" part of the answer is because of the very evident rise in the size as well as the sophistication of the "financial engineering" enterprise that operates behind the scenes in Wall Street, London, Frankfurt, and other global financial centers. While not central to the discourse of this book, we nonetheless provide a brief overview of the rise of financial engineering; followed by a quick overview of the "but" part of our answer—which refers to the stark uncertainties and abject control failures that even the biggest and most talented investment houses have faced.

Yes: rise of financial engineering

In medieval times, alchemists were engaged in a ceaseless quest to turn base metal into gold. After all, gold was a precious and finite asset, and whoever discovered the secret to "manufacture" gold from base metals would reap enormous riches. The alchemists did not succeed in their quest but, by late twentieth century, the major investment houses developed near-alchemical techniques and skills. Commodities, number of shares of a publicly listed firm, the stock of real estate available for sale—these are all *finite* commodities. If an alchemical method could be found to *multiply* these assets, then the possessor of such a method could become rich beyond dreams. While no one has found a way to replicate such assets, the investment bankers have discovered something close to

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alchemical magic: the creation and trading of derivatives. While an asset may be finite, a derivative financial instrument based on that asset can be multiplied manyfold. Indeed, at the beginning of the Great Recession crisis, the value of Credit Default Swaps (CDS) and similar derivative instruments in circulation—the derivatives being based on the underlying asset of mortgage debt—exceeded ten times the GDP of all nations on the planet combined.

But: spectacular failures of even high and mighty

While the wizardry of the "quant-jocks" and financial engineers has helped Wall Street and other financial center firms reap rich rewards from the 1980s onward, there also have been some spectacular failures. Sometimes the witches' brew, instead of becoming a magical potion, turns into disgusting dishwater. In the United States, one of the most visible and jarring failure was that of the hedge fund Long-Term Capital Management (LTCM).

LTCM was born with all the right genes and pedigree, and exhibited strong and steadily high performance for nearly three years. Launched in March 1994, LTCM had two Nobel laureate economists on its board—Robert H. Merton and Myron Scholes, the latter especially known for his famed options pricing model. In just over a year after its launch, LTCM tripled the portfolios of its wealthy investors. The fund almost had no bad month—the worst monthly drop in value was under 3 percent. Then came the severe downdraft of August 1997. The value of the LTCM investment portfolio fell by 44 percent that month, and declined by 52 percent by the end of 1997. A year later, LTCM was on the ropes, gasping to survive:[8]

> On September 23, 1998, the boardroom of the New York Fed was a tense place. Around the table sat the heads of every major Wall Street bank, the chairman of the New York Stock Exchange, and representatives from numerous European banks, each of whom had been summoned to discuss a highly unusual prospect: rescuing what had, until then, been the envy of them all, the extraordinarily successful bond-trading firm of Long-Term Capital Management.

The rescue effort was coordinated by the U.S. Federal Reserve, but entailed the deployment of private funds to bail out LTCM, which was on the verge of not being able to make payments on its margin loans. Reporters from the *Wall Street Journal* wrote on September 24, 1998:[9]

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> Terms of the pact reached late Wednesday call for 11 firms to put in $300 million apiece and four other firms to put in between $100 million and $125 million each—all in exchange for a 90% stake in the hedge fund. Five of the firms will also form a new committee to oversee Long-Term Capital's overall strategy, procedures, controls and even compensation. They would also have an option to buy 50% of the management company for a dollar… Long-Term's situation was so dire that if the bailout plan hadn't been sealed Wednesday night, the hedge fund wouldn't have been able to meet margin calls Thursday, people familiar with their situation say.

Through such extraordinary rescue efforts orchestrated by the U.S. Fed and funded by private bankers, LTCM did not default but it did not survive as an independent financial firm. It became a large footnote in the economic history of late twentieth century, a stunning example of how even the best economic in the world—while it can contribute handsomely to the inflation of a bubble—cannot prevent the bursting of the bubble.

Conclusion: the systemic inevitability of bubbles

While small, playful bubbles are not particularly harmful to overall society or economy where they occur, the large technology and financial bubbles not only have devastating economic impacts but also corrosive social impacts as people lose not only their savings or abodes but also faith in the institutions, private and public, that they have come to trust as protectors of their interests.

In the next chapter, we pull together various building blocks of Chapters 2–5 to present an overall model of bubble formation, with special focus on the "contagious," "irrational," and "punctured" bubbles of the type that have taken massive economic and social tolls in the twentieth century and that continue to threaten the economic and social well-being of people the world over in the twenty-first century.

Our model and "working theory" points to—in the absence of substantial systemic and/or policy shifts—the systemic inevitability of bubbles. What is of special concern is the possible speeding up of the bubble formations, a compression of the time between bubbles. In Chapter 7, we offer some thoughts on taking our "working theory" to the stage of a "grand theory," a conceptual schema that can help us in gaining a fundamental understanding of economic bubbles. In Chapter 8,

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the concluding chapter, we review some of the policy options to counter bubbles, or to recover from the damage caused by bubbles.

Notes

1 Kay (2012).
2 Barnard (2013); CNBC (2013); Dirks (2013); Hanson (2010); Kronke (2008); Wild about Movies (2013).
3 Brustein (2013); Colombo (2012b); Gustini (2012); NASDAQ (2013); Stewart (2012).
4 Gandel (2010); Glasner (2013); Gruber (2013); Salmon (2013).
5 Colombo (2012a); EconPort (2006); Galbraith and Hale (2003); Kuo (2001); Lynn (2011); Madslien (2010).
6 Schiller (2006).
7 Ghei (2013); Gopal and Howley (2013); Ellen and Dastrup (2012); Isidore (2012, 2013); Levitin and Wachter (2011); Russell Sage Foundation (2013).
8 Lowenstein (2001).
9 Raghavan and Pacelle (1998).

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6
Bubble Emergence: Toward a Model

Abstract: *In this chapter, we pull together various building blocks of Chapters 2–5 and present an overall model of bubble formation, with special focus on the contagious, irrational, and punctured bubbles of the type that have taken massive economic and social tolls in the twentieth century and that continue to threaten the economic and social well-being of people the world over in the twenty-first century. To illustrate our model of bubble formation, for example how theories behind sentiments were changed in order to justify sticky sentiments, we draw on examples from the dotcom bubble in the United Kingdom and from Nordic Europe—Iceland. To provide a stronger visualization of the model of bubble emergence, we invoke the concept of value-pricing thermometer and introduce our adapted version of the bubble thermometer. To exemplify the bubble thermometer, we explore social processes that attempt to build up movie hype, and their aftermath, and relate such exploration to our emerging interdisciplinary theory of bubbles.*

Keywords: bubble thermometer; contagious bubbles; dotcom bubble; hype; Iceland; irrational bubbles; movie hype; playful bubbles; punctured bubbles; typology of asset bubbles

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Model of bubble emergence

Our model of bubble emergence builds on the three core asset-linked dimensions: perceived asset availability, perceived asset value, and perceived asset communication. It draws on the temporal and contextual boundaries: aspects of uncertainty and negotiated space.[1] Finally, it incorporates our theory assumptions: sentiment-guiding theories and hype.

In an uncertain environment, the probability distribution of outcomes yet to be created by exploiting a (market) opportunity is unknown: it's like playing poker facing a deck of cards with some cards missing and other cards appearing multiple times. Under such conditions, different actors may make different predictions with respect to the same new asset, resulting in different outcomes:[2] there is a multitude of expected asset values.

These relationships and the process between uncertainty and the emergence of a new bubble-susceptible asset are depicted in Figure 6.1. The initial, objective state of a new asset presumably has an objective value, but (because the asset is new) this value is impossible to quantify (we have used a question mark in Figure 6.1 to indicate this indeterminacy). If the asset is deemed attractive (and there is buzz around it), then investible funds are attracted to it. Managers of such funds seek information—any and all information—that helps them develop expected values that these actors believe the new asset will generate and/or expected values the new asset is to generate as conceived by its creator.

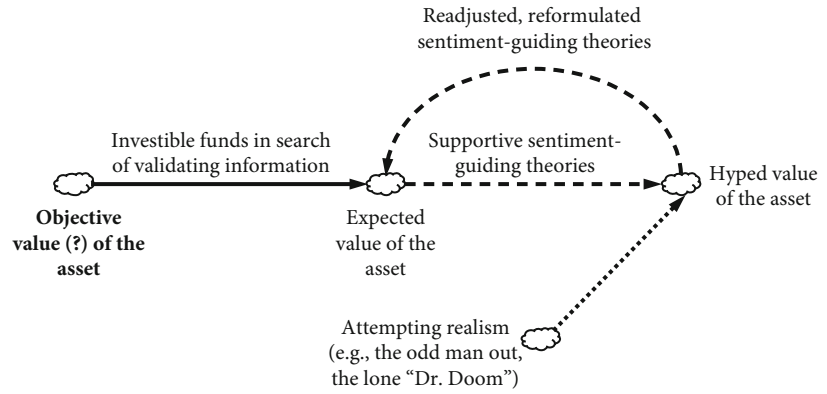

FIGURE 6.1 *Process model of bubble emergence*

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As we discussed earlier, the intolerance of uncertainty generates a desire to search for meanings and patterns, thus creating corresponding perceptions about the new asset availability, value, and communication. Such desire in turn makes people invest in the acquisition of information to state or to reinstate a belief about an expected, perceived value of a new asset. It is important here to note that—given the uncertain decision-making setting within which the information is acquired—the outcome of the search for information is, by definition, not known at the time decision to search is made.[3]

The array of expected outcomes of a new asset creates severe competition for resources among those actors who possess *intimate* knowledge about the potential of the new asset, albeit themselves being uncertain about its actual outcome. Knowing that the other actors are not able to properly evaluate the potential of the new asset, an asset creator will tend to skew its potential toward delusional optimism or overoptimism, hyping the new asset value and its skyscraping potential.[4] This phenomenon, known as anchoring, is considered one of the strongest and most prevalent of cognitive biases.[5] The result of the phenomenon is the hyped value of the asset, shown on the right extreme of Figure 6.1. In other words, the actors develop theories that guide the overall sentiment of the environmental context, within which an underlying asset is embedded, and on which they base the future valuations of the asset. As a result, there emerges an overall sentiment about the exaggerated future prospects of the new asset—a sentiment that we have called hype.

For example, such behavior—anchoring—was observed during the dotcom (or Internet e-commerce related) boom. Internet entrepreneurs, on the one hand, were trying to hype their business plans on the basis of various exaggerated market outlooks issued by leading research and consulting organizations in order to raise venture capital; and Venture Capitalists (VCs), on the other hand, were trying to get real views on the size of and trends about the markets and assets they invested in or were considering investing in (see also Chapter 3).

Anchoring leads to the creation of a positive feedback loop among the actors that in turn leads to trends being reinforced rather than reversed.[6] When caught up in this positive feedback loop, sentiments often become "sticky." The actors try to change the sentiment-guiding theories (if earlier theories crumble) rather than the sentiments themselves—and this helps in coping with the intolerance for uncertainty. In Figure 6.1 we have depicted the processes of initial and adjusted sentiment-guiding theories

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via the bold dashed arrows, with the adjusted and reformulated theories depicted as the backward arching dashed arrow. As we discussed earlier, sentiments are temporally sticky within the uncertain decision-making context, and once a sentiment is formed, it is very hard to challenge it and eventually to change it. In such a situation, theories behind sentiments become convenient and expendable and changeable: it is psychologically easier (less taxing) to change the guiding theory rather than to drop or reverse the sentiment. Of course, the initial and reformulated theories set up a dangerous spiral, an unsustainable upward spiral pushing up the expected asset value.

To illustrate these processes, let us look at an example from the dotcom bubble in the UK. In the mid-2000, a software company was set up in the UK with initial funding from four co-founders to develop off-the-shelf software platform for handheld devices for industrial and enterprise sectors. At the time that was an unknown opportunity, characterized by uncertainty over the pursuit of that *new* underlying asset. The company started growing very quickly by acquiring—within six months from its inception—companies in the UK, the Netherlands, and Dubai, and by opening overseas offices at the beginning of 2001 in Denmark, Saudi Arabia, India and Bangladesh, having plans to expand further to Germany and France. In 2001 the company estimated its turnover at £6 million by 2002, £15 million by 2003, and approximately £60 million over the next five years. Their projections were based on one of the leading market research organizations that estimated in 2000 the value of the market in Europe—a hyped value, in hindsight—at 40 million mobile workers, representing a market worth £8.2 billion. Despite the heady growth and rosy predictions, the owners struggled to convince potential investors to invest in the company, and turned for help to that market research organization—to adjust the sentiment-guiding theories. As one of the co-founders explained:

> We decided that the engagement of a leading market research organization to comment on our proposition and positioning in the emerging market to assist with our fund-raising would greatly improve our chances of success.

As a result, the founders hyped a plausible-sounding business plan that "the investors could buy into." To calm the fears of investors, the founders asked for lesser funds than were required to carry out their ambitious business plan as originally developed. By the end of 2001, it was clear that the company was behind its revenues, and there was a delay in

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developing the platform. The founders could not persuade VCs to change the business plan in light of the actual developments. For the investors, uncertainty was fading, and the certainty of failure was looming on the horizon. The early venture investors withdrew from the investment portfolio as a result of evidently poor performance. There was no time to look for any other funding options, and the co-founders had no alternative but to put the company into administration (insolvency); it ceased trading in March 2002.

Occasionally in such situations there might be a few actors trying to induce a sense of realism amid a milieu of such feverish, hyped expectations (see also Chapter 4). Such behavior is intermittent, however. Most actors involved find it financially advantageous, and often unavoidable, to fall in line with the ideas of the market, even if they harbor reservations and doubts. There are high emotional and professional costs associated with being the odd one out and the worldly wisdom teaches that it is far better for reputation to fail conventionally than to succeed unconventionally.[7] Hyped value of an asset is a homeostatic value—a value which tends to be stable in empirical reality, even though there are forces which tend to change it.[8]

Banking crisis of Iceland

An example from Nordic Europe further illustrates how theories behind sentiments were changed in order to justify sticky sentiments (Figure 6.1). As early as 2006, amid Iceland's euphoria, Iceland's government received a warning note from International Monetary Fund (IMF) in a report that identified its vulnerabilities, such as:

> …considerable near-term refinancing needs, credit quality, the long-term sustainability of the banks' presence in the domestic mortgage market, and the crossholdings of equity.[9]

This was the draft version and the published version of the report was toned down (adjusting of sentiment-guiding theories, back-arching arrow in Figure 6.1) at the request of Iceland's prime minister and the finance minister who argued that the initial report was overly critical.[10] At the same time, Denmark's Danske Bank—which was thoroughly familiar with the Iceland situation—published a report on the economic outlook in Iceland, in which Danske Bank described Iceland as *geyser economy*, arguing that Iceland was "the most overheated in the OECD area."[11] Rather than paying attention to IMF's original report and Danske

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Bank warnings, Iceland's government and mass media chose, to a large extent, to ignore them and instead continuously quoted IMF revised claims (i.e., the adjusted sentiment-guiding theories) that the institutions and policy frameworks were strong (sticky sentiment). The revised, adjusted IMF report read:

> Markets are open and flexible, and the skillful management of the country's natural endowments has diversified the economy and helped to ensure sustainability. Further, these factors are combined with a culture of entrepreneurial dynamism that has led to economic outcomes that belie the country's small size.[12]

To the above, in the same year, Iceland Chamber of Commerce added a report (further adjustment to sentiment-guiding theories) commissioned from Columbia Business School that affirmed the stability of Icelandic banks and Icelandic economy (sticky sentiment).[13] Next year, Iceland Chamber of Commerce commissioned another report from the London Business School (further adjusting sentiment-guiding theories) that virtually reached the same conclusion—"the institutional and regulatory framework appears highly advanced and stable" (sticky sentiment)—arguing that "the 'mini-crisis' of 2006 was an informational crisis, arising from external criticisms"[14] (further adjusting and tweaking of sentiment-guiding theories). As the history demonstrated, the failure of Iceland's entire banking system and economy was not a matter of *if*, but *when*. Indeed, by October 2008 the economic situation in Iceland turned dire:

> The Icelandic economy collapsed in early October 2008. Within a few days the three major banks had collapsed, transfer of funds in and out of the country was difficult or impossible, and firms were busy sending notes to the Directory of Labour regarding mass layoffs (sending such notes is required by law when the number of layoffs is over a given limit). The value of the currency collapsed, the inflation rate soared, and the finances of ordinary people were in shatters, even for those that kept their jobs.[15]

Bubble thermometer

To provide a stronger visualization of the model of bubble emergence, we invoke the concept of value-pricing thermometer[16] and introduce our adapted version of the bubble thermometer (see Figure 6.2). One pointer on the thermometer—an indeterminate one—is the Objective Value an

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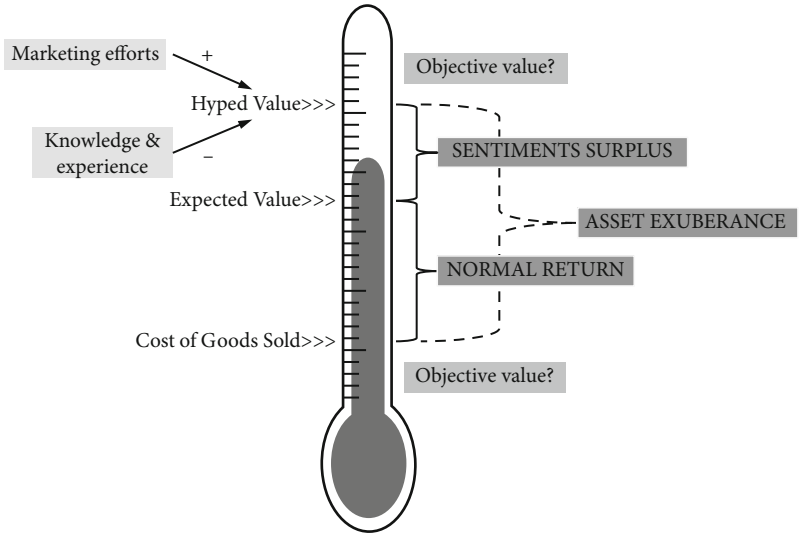

FIGURE 6.2 *The bubble thermometer*

asset may generate, a value that is impossible to quantify in uncertain decision-making settings (see question marks in Figure 6.2). Indeed, this indeterminacy is germinal for any bubble process—if the Objective Value of the asset is objectively and clearly known, there is no room for bubble processes to come into play. The indeterminate position of the Objective Value on the thermometer scale vis-à-vis other values (Expected Value and Hyped Value) opens the door for the possible emergence of a bubble. Another pointer on the scale is the Hyped Value of an asset—a value that reflects an overall sentiment about exaggerated future prospects of that asset. On the thermometer scale, below the Hyped Value pointer, there is the Expected Value pointer. This is a value that the asset is expected to generate.

The difference between Hyped Value and Expected Value is what we call the Sentiment Surplus. This excess over Expected Value—the Sentiment Surplus—emerges because actors (investors, media, analysts) get caught up in and are driven by a "do-not-want-to-lose-out-on-a-big-opportunity" philosophy. Sentiment-guiding theories emerge (or are promulgated) to act as actors' incentives to demand the new asset.

At the bottom of the thermometer scale is the pointer related to the Cost of Goods Sold (COGS)—a value that must be charged in order for an asset to stay "alive" in terms of covering enterprise operating costs. The

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position of the COGS pointer on the scale will vary depending on the type of an asset: be this a high-tech product, a movie, a rare tulip in the Netherlands, a house in Shanghai, or a tradable financial asset (see also Chapter 2). We label the difference between Expected Value and the Cost of Goods Sold as "Normal Return." The difference between Hyped Value and Cost of Goods Sold is the attractiveness (the promise, the dazzle, the lucre) of an underlying asset to the interested actors. We call this the "Asset Exuberance"—a sum of "Normal Return" and "Sentiment Surplus." Asset Exuberance is very high for assets around which the discourses of promise and profit—in terms of the processes described in this book—turn very intense (revisit the Semper Augustus tulip example, Chapter 1). For example, Asset Exuberance explains the attractiveness of new high-technology firms to investors. The ideal time for investors to exit is when the internal rate of return that measures the investment return is at its highest value; usually within three to five years after the investment was made.

While discussing the enviro-contextual aspects of an asset in uncertain decision-making settings (see Chapter 3), we introduced a corresponding dimension—negotiated space—to suggest that regardless of the type of asset that is to be made available, valued, and communicated about, in the process of bubble emergence, a physical exchange does not take place. In contrast to traditional (physical, palpable) marketplace exchange, in the "negotiated space" the parties arbitrate the value of an asset that is not readily available for physical inspection or exchange. Rather than a marketing mix, in the negotiated space there is a "negotiated mix"—product and place may have to be imagined, but elements of promotion (often hyped) and price (also hyped) are vividly present. In such situations, it is expected that marketing efforts will reinforce the Hyped Value of the asset (see the left side of the Figure 6.2 thermometer diagram, the plus-sign indicating the impact of marketing efforts). The only means left for actors to somehow mitigate the hype around such asset is prior experience, or knowledge. Insightful knowledge and relevant experience can have some attenuating, moderating effect on the Hype Value (see, again, the left side of the Figure 6.2 thermometer diagram, the minus-sign indicating the attenuating effect).

Going to the movies

To exemplify the above, we explore the social processes that attempt to build up movie hype,[17] and their aftermath, and relate such exploration

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to our emerging interdisciplinary theory of bubbles.[18] In this example, we relate the hype process observable in the selected movies to a more generic view of the social-institutional processes that build reasoned expectations as well as hype—irrational exuberance—and also the processes and performances that follow. Since movies are microcosmic phenomena (the context for relatively harmless "playful bubbles" to form) compared to financial and technology hypes and bubbles—phenomena that are global, macroscopic, few, and historically infrequent—studies of movie hype cycles provide an abundant, easy-to-access, and data-rich field for studying bubbles in general. Table 6.1 presents the list of movies that we chose for this purpose.[19]

We purposefully selected ten movies that represent movies where Critical Acclaim (Critics, C) exceeds the ratings by movie viewers (Viewers, V), on one hand and movies that have the opposite characteristic: Viewer Popularity (V) exceeds the ratings by critics (C, in Table 6.1). In developing the list, we also looked at the marketing efforts that went into building the hype for the movie, the production budgets, and revenue impacts. The revenue garnered by a movie relates to opening weekend revenue, first week revenue, and 13-week box office revenue. Of these, the first week revenue is of special interest, since it indicates either positive or negative sentiments that are built up following the opening weekend.

We use the ratio of the marketing effort to the production budget as a proxy for hype. We measure the instant effect of hype as the ratio of opening weekend revenue to the same denominator, that is, the production budget. We further use this denominator to measure the sentiments about a movie following its release as well as to measure the actual, realized effect during the 13-week period. The difference between realized effect and hype shows the influence of hype on the movie performance.

For example, *The Artist* has the highest hype index, suggesting movie producers invested a lot (compared to the production cost) in building up viewers' expectations about the movie. Compare this, for example, to *The Hangover* that also had a relatively high hype index, *The Artist* was overhyped as its follow-up and realized indexes indicate. This suggests that negative rather than positive sentiments were being built up following the opening weekend. Such negative (or not-so-positive) sentiments influenced other movie goers' behavior, creating an overall

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negative (unfavorable) sentiment about the movie that had a negative effect on movie performance (see also Chapter 4). In contrast, instant index for *The Hangover* indicates that larger-than-hyped positive sentiments were built up after the opening weekend—sentiments that positively influenced the behavior of next movie goers, who in turn reinforced these positive sentiments as its follow-up and realized indexes indicate.

The above example supports our earlier assertion that the positive or negative sentiments about the movie or about any other hypeable asset arise as a result of the interaction between individuals and the changes in behavior which they induce in one another.[20] Positive feedback that generally rules the real world of the economy and society[21] will lead to trends being reinforced rather than reversed; when negative feedback predominates, any differences between individuals' behaviors will tend to be smoothed away.

Conclusion: can hype be curbed?

One question that arises immediately from the model we put forward in this chapter is this: Can we manage (and even curb) the hype? In a milieu that seems ripe for hyping an asset's value, can we change/adjust sentiment-guiding theories away from a (usually ruinous) hype-building spiral and toward instilling a sense of realism in the emerging context of the new asset in order to alter the sentiments? Is it possible emotionally or professionally not to follow hype-created fashion and be the odd man out, thus going against worldly wisdom that teaches that it is far better for reputation to fail conventionally than to succeed unconventionally?[22] Managing hype would effectively mean to manage the sentiment surplus. Could this be the missing link in the Adam Smith's theory of market economy that does not function in the presence of greed?

There are no easy answers to these questions, but not seeking answers is a sure way to pave the path to frequent, intense, and increasingly harmful bubbles. In the next chapter we lay out the steps toward building a grand theory of bubbles, and in the final chapter—Chapter 8—we return to the pressing questions about taming of bubbles.

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TABLE 6.1 *Hype characteristics of selected movies*

	Ratings			Budgets (USD, mn)		Hype	US revenue (USD, mn)			Effect on market				
Movie	Critics [C]	Viewers [V]	Difference [V – C]	Production [P]	Markweting [M]	Hype index [H = M/P*100]	Opening weekend [OW]	First week [FW]	Thirteen Week [THW]	Instant index [I = OW/P*100]	Follow on index [FO = FW/P*1000]	Realized index [R = THW/P*100]	Reality vs. hype [R – H]	Comments
The Artist (2011)	98	88	89	90	91	92	93	94	95	96	97	98	99	Oscar winner (picture, director, actor, costume, design, original score) Golden Globe winner (motion picture, performance by an actor in a motion picture, original score)
No Country for Old Men (2007)	94	84	–10	25	45	180	1	2	56	4.0	8.0	224.0	44.0	Oscar winner (picture, director, actor, supporting actor, adapted screenplay) Golden Globe winner (performance by an actor in a motion picture, screenplay)
The Descendants (2012)	89	79	–10	20	30	150	1	4	72	5.0	17.5	360.0	210.0	Oscar winner (adapted screenplay) Golden Globe winner (performance by an actor in a motion picture, performance by an actress in a supporting role in a motion picture)

The Hangover (2009)	79	87	8	35	40	114.3	45	72	271	128.6	205.7	774.3	660.0	Golden Globe winner (motion picture)
Red Tails (2012)	39	58	19	58	35	60.3	19	24	50	32.8	41.4	86.2	25.9	
Dreamgirls (2012)	78	73	−5	75	44	58.7	0.4	0.6	103	0.5	0.8	137.3	78.7	Oscar winner (actress in a supporting role, sound mixing) Golden Globe winner (motion picture, performance by an actress in a supporting role in a motion picture, performance by an actor in a supporting role in a motion picture)
The Hunger Games (2012)	85	85	0	80	45	56.3	153	190	402	191.3	237.5	502.5	446.3	
King Kong (2005)	84	52	−32	207	98	47.3	50	71	217	24.2	34.4	104.8	57.5	Oscar winner (Sound editing, sound mixing, visual effects) Golden Globe winner (new star of the year)
The Golden Compass (2007)	42	55	13	205	59	28.8	26	32	70	12.6	15.6	34.1	5.4	Oscar winner (visual effects)
Avatar (2009)	83	92	9	425	35	8.2	77	137	733	18.1	32.3	172.5	164.2	Oscar winner (cinemato graphy, art direction, visual effects) Golden Globe winner (motion picture, director)

Notes

1 For the purpose of this model, the assumption of velocity over time is relaxed as this model is developed for the uncertain-decision making setting only.
2 Carlaw et al. (2006).
3 Elster (2007, p. 133).
4 Turcan (2011).
5 Lovallo and Kahneman (2003).
6 Keynes (1936).
7 Ibid.
8 Stinchcombe (1965).
9 IMF (2006, p. 24).
10 Wade and Sigurgeirsdottir (2010).
11 Valgreen et al. (2006, p. 2).
12 IMF (2006, p. 23).
13 Mishkin and Herbertsson (2006); according to Wade and Sigurgeirsdottir (2010), Mishkin was paid $135,000 for this report.
14 Portes and Baldursson (2007, p. 1).
15 Matthiasson (2008, p. 2).
16 Dolan and Gourville (2009).
17 Perren (2004).
18 We do not wish to contribute to the established stream of research that analyzes large samples of movies via statistical methods to determine relationships between budgets, revenues, star power, critics, director power, and so on (examples of such work are Basuroy et al. 2003; Eliashberg and Shugan 1997; Hennig-Thurau et al. 2007; Ravid 1999).
19 Data on selected movies were drawn from the film review aggregator Rotten Tomatoes (www.rottentomatoes.com), from online movie publication and box office reporting services such as Box Office Mojo (www.boxofficemojo.com) and The-numbers (www.the-numbers.com), as well as from the Academy of Motion Picture Arts and Sciences (www.oscars.org), and the Hollywood Foreign Press Association's annual Golden Globe Awards (www.goldenglobes.org).
20 Ormerod (1998).
21 Ibid.
22 Keynes (1936).

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7
Toward a Grand Theory of Bubbles

Abstract: *In this chapter, we put forward our grand theory of bubbles that reflects pervasive irrationality, of individuals and markets and builds on three transcending constructs that explain the formation of bubbles regardless of the asset types. These are sentiment-guiding theory, sentiment, and newness of assets. One of our central insights is that during the stage of rapid bubble inflation, there is a tendency to discard sentiment-guiding theories rather than sentiments themselves. To help theorize the emergence of bubbles further, we turn to the concept of turning points, and also introduce a number of constructs such as ignorant belief toward a new asset, subjective probabilities, and illusionary certainty of negotiated mix. We argue in this chapter inter alia that ignorance and illusion of skill are phenomena present not only at the level of individuals, but also at the level of industries, and various private and public institutions for the society as a whole.*

Keywords: ignorant beliefs; illusion of skill; newness of assets; psychology of bubbles; risk; sentiment-guiding theories; theories of asset bubbles; turning points; uncertainty

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Bubbles precede capitalism. They have, however, become pervasive, more intensive, and more frequent with advancing capitalism. Indeed, the first appearance of bubbles occurred at the cusp of a waning feudalism and emerging nascent forms of proto-capitalism. Ever since, the phenomena of bubbles have received rational and irrational explanations,[1] of individual as well as collective behaviors.[2] Our grand theory of bubbles reflects pervasive irrationality, of individuals and markets; yet we discern an overarching as well as an undergirding systemic rationality—the prevalent global politico-economy system may hate bubbles but seems incapable of avoiding them. This systemic nature of bubbles—that they are endemic, unavoidable, dangerous concomitants of finance-driven capitalism—is a topic most economic and financial theorists skirt around, and do not confront head-on, for doing so would cut off the very legs on which such academic and business enterprises stand.[3]

One of our central insights is that during the stage of rapid bubble inflation, there is a tendency to discard sentiment-guiding theories rather than sentiments themselves. In other words, for a bubble to emerge, rather than alter the sentiment itself when discordant notes appear, emotionally involved actors develop and continuously alter theories—sentiment-guiding theories—that direct their overall sentiment about exaggerated prospects of a new asset.

Revisiting the building blocks

Our grand theory builds on three transcending constructs that explain the formation of bubbles regardless of the asset types (the "what" aspect of a theory—see Chapter 1). These are *sentiment-guiding theory*, *sentiment*, and *newness* of assets. Before we discuss how these constructs are related (the "how" aspect of a theory), let us first define temporal and contextual boundaries of our theory (the "who-where-when" aspects of a theory).

As with any other theory, our theory has its own temporal boundary (the "when" aspect of a theory) that delineates its range. The temporal boundary of our grand theory of bubbles is defined by *uncertainty* about a *new* asset. We view uncertainty and newness of an asset as two sides of the same coin. The newness of an asset could be typified as an uncharted innovation: a new product, a new technology, a new business idea, or a new business model such as sophisticated derivative instruments developed in recent years by bankers and financial engineers who seek

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new sources of revenue via such sophisticated financial business models. Uncertainty is the accompanying fallout of the process of emergence of a new asset.

We define the contextual boundary of our theory (the "who" and "where" aspects of a theory) as *uncertain decision-making setting*. Policymakers, entrepreneurs, CEOs, investors, analysts, and mass/social media are the key actors—as individuals and/or representatives of respective institutions—that "make" decisions (and more appropriately, signal the decisions they have made or are about to make) regarding the potential or fundamental value of a new asset. We put inverted commas around "make" because in uncertain decision-making settings these actors cannot know not only the chances of various outcomes, but they also cannot know all the outcomes that are possible.[4] In such an environment—a zero-validity environment[5]—different actors may make different choices with respect to the same new asset, resulting in different outcomes.[6] Despite the fact that under uncertainty the probability of outcomes and the nature of outcomes are impossible to assess, the actors involved do make seemingly confident predictions about a fundamental value of a new asset—a phenomenon called collective blindness to uncertainty.[7]

Such collective blindness to uncertainty is caused by *ignorance* masqueraded as knowledge so that decisions or choices may be made.[8] In other words, the actors involved appear to be ignorant of their ignorance,[9] with, of course, some troubling exceptions where some (unethical) actors *may know* the realities about asset values but choose to let the asset acquisition frenzy continue. With passage of time—moving from "uncertain" decision-making settings toward "risk" decision-making settings—a history of the new asset is being formed. More accurate information about the assets is coming from the market about its fundamental value, making it possible to perform statistical calculations, including much needed regression to the mean in order to make valid predictions.[10]

What glues together the above three constructs (the "how" aspect of a theory)—sentiment-guiding theory, sentiment, and new asset—is knowledge created about the new asset. We define knowledge creation in uncertain decision-making settings as the emergence of an *ignorant belief* toward a new asset. Inability or unwillingness to tolerate uncertainty (the "why" aspect of a theory; psychological) drive the actors involved to find meanings and patterns about the fundamental value

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of a new asset. In search for such meanings and patterns, the actors, being ignorant about their ignorance, acquire more knowledge—ignorant belief—and eventually develop an enhanced fantasy about their skill (*illusion of skill*) and become unrealistically overconfident.[11] Such belief creates corresponding perceptions about availability, value, and communication of a new asset. Ignorance contributes to the creation of perceived knowledge of asset availability, asset value, and asset communication or what we call *subjective probabilities*. These subjective probabilities typify an overall sentiment of the environmental context about the future, that is, hype.

As a homeostatic or equilibrium-seeking value, hype tends to be stable in empirical reality, which initially is an uncertain decision-making reality. As our theory suggests, a bubble emerges when actors involved alter sentiment-guiding theories rather than the sentiment—hype—itself. We posit that ignorance and illusion of skill are driving forces that generate and discard sentiment-guiding theories. In the context of uncertainty, we view sentiment-guiding theories as *subjective confidence* that is determined by the coherence of the story or theory one has constructed, and not by the quality and amount of information that supports it.[12]

Ignorance and illusion of skill are phenomena present not only at the level of individuals, but also at the level of industries, and various private and public institutions for the society as a whole (the "why" aspect of a theory; economic and social). With quick advancement of information and communication technologies as well as sophisticated, innovative financial/business models, the boundaries between real economy and financial economy, as well as meso and macro levels, are blurred. These trends have changed and continue changing the way bubbles are conceptualized: from individual phenomena in early days, to holistic (in terms of spanning industries, technologies, and/or sectors) phenomena in recent years and decades, to global socio-political phenomena at present and in the currently conceivable future.

From a social perspective, the overall behavior of individuals in a given uncertain decision-making setting still depends on the interaction between these individuals and the changes in behavior which they induce in one another. In other words, positive feedback—fanning the sentimental embers into leaping flames—will continue to rule the real world of the economy and society and will lead to trends being reinforced rather than reversed.[13] From a political perspective at the macro level, however, there will be institutional pressures which are beyond any

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individual decision-maker and which will constantly create conditions conducive to bubble emergence. We expect the signals emanating from the macro level to become at least as strong as the signals emanating from the meso (industry and sector) level, if not stronger.

Within this context, delusional optimism and overoptimism (see Figure 4.2) could be seen as engines of capitalism,[14] but only under the condition that bubbles are tamable so that there are no negative effects on the economy at the macro level. When bubbles are endemic and not tamable, these could turn into "runaway engines" that pull entire nations and populations "off the track," and could cause major accidents, even catastrophic crashes. At the meso (industry, technology category, and sector) level, there will continue to be a number of optimistic martyrs[15] or catalyst ventures[16] that—although they do suffer losses, economic as well socio-psychological (including the cultural "loss of face"), when meso-level bubbles burst—do drive the market-based processes of invention and innovation, contributing possibly to a positive net effect on the social level.

Bubbles as turning points

To help theorize the emergence of bubbles further, we turn to the concept of turning points. As a concept, a turning point has a number of properties that allow us to advance our understanding of bubbles. By theorizing bubbles as turning points we move away from extant trajectory-based approaches to bubbles. Turning points are "more consequential than trajectories because they give rise to changes in overall direction or regime, and do so in determining fashion."[17] A process has turning points because it has regular sub-processes between which we switch only rarely;[18] and in this context we view bubbles as these rare switches.

Theorized as turning points, bubbles are also seen as radical shifts redirecting the paths with reference to two points in time, not one.[19] The hindsight property of turning points suggests that a turning point can only be defined *a posteriori* rather than *a priori*.[20] This means that neither the beginning (inflating a bubble) nor the end (deflating a bubble) of a turning point can be defined until the whole turning point has passed, and that the analysis of a turning point makes sense only after the fact when a new trajectory or system state (e.g., pessimism or realism, see Figure 4.2) is clearly established.[21]

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Uncertainty—as another property of turning points—further contributes to our understanding of bubbles. Seen as a change in overall direction or regime, a bubble (as a turning point) moves out of one trajectory or state (inflating) onto a new trajectory or state (deflating). The nature of the trajectories or states, on either side of the turning point (bubble), is different: an asset moves out of uncertain decision-making settings onto risk decision-making settings.

To further our discussion on this issue, we borrow from the ideas of the Nobel laureate Daniel Kahneman—a psychologist whose work the Nobel economics award committee found to be of deep significance for economics (in a vein similar to earlier recognition of Herbert Simon by the Nobel economics award committee). Specifically, we turn to Kahneman's concept of *range of uncertainty*. A "range" of uncertainty has as its edges the bottom and the top of the region of uncertainty.[22] To facilitate an understanding of this idea, Kahneman uses the following example:

> …take a sheet of paper and draw a 2½-inch line going up, starting at the bottom of the page—without a ruler. Now take another sheet, and start at the top and draw a line going down until it is 2½ inches from the bottom. Compare the lines. There is a good chance that your first estimate of 2½ inches was shorter than the second.[23]

Kahneman, citing other related work in psychology, argues that in the first drawing of the line (from bottom up) we are operating at the lower end of the range of uncertainty, and therefore underestimate the actual length. In the second drawing of the line (from top down), we switch—we operate at the upper end of the range of uncertainty, thereby estimating the line to be longer than actual length.

A (turning) point, located somewhere at the edge of the region of uncertainty when you move up from the bottom of the page, defines the bottom of the region of uncertainty. To apply this concept—bottom of the region of uncertainty—to our theory of bubbles, we shall redefine the assumptions that this concept is based on, namely that the actors involved in "drawing" know what "2½ inches" mean and know what "a line" is. In *uncertain* decision-making settings—a context within which a new asset, an uncharted innovation emerges—the probability of outcomes (2½ inches) and the nature of outcomes (a line) are impossible to assess. One way to mitigate the formation and burst of a bubble might be to focus on educating the decision-makers about processes (such as drawing)

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rather than outcomes (2½ inch length; a relatively straight line) during the emergence of a new asset. The problem during bubble formation, of course, is that even the major decision-makers (let alone their followers) are not very interested in learning about drawing, geometry, or metrics: the blinds are drawn, and sunlight cannot get in (we urge strongly for letting "sunlight" in, in the next and final chapter of the book).

An inflating bubble might resemble "a move from the bottom of the page" in search for a turning point located at the bottom of the region of uncertainty. Driven by subjective probability and subjective confidence, however, the actors involved at all levels—individual, industry, private, and public—cultivate an illusory certainty[24] of not reaching the bottom of the region of uncertainty (or the turning point)—what we call *an illusionary certainty of negotiated mix*—and continue negotiating the fundamental value of an asset, pushing up the bottom of the region of uncertainty, and thereby postponing the (inevitable) beginning of turning point. In other words, the blinds are kept drawn, and—if some light begins to filter in through some crack—the action moves to a darker corner, away from the light; and the process that we have characterized as willingness to change sentiment-guiding theory rather than the sentiment comes into play.

Reconciling the differences

In 2013, the Nobel Memorial Prize in Economic Science was awarded to three professors who brought to the table different views on the linkages and interactions between financial markets and the overall economy. These are Eugene Fama and Lars Peter Hansen of University of Chicago and Robert J. Shiller of Yale University. The first two professors are proponents of the efficient-markets theory that posits that prices reflect all available information and rejects the existence of bubbles.[25] On the other side of the economics discourse, Professor Shiller stresses the massive role human error and irrational behavior play in asset bubble formation and bursts, arguing that the markets are not perfect and need regulation.[26]

According to Professor Hansen, what unites their work—of all three Nobel Memorial Prize winners—is "… puzzling implications that emerge from financial markets data," but what differentiates their work are the approaches they employ to understand and explain the puzzle.[27]

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This puzzle is fundamental value of an asset. Differences may arise then not only from wearing different lenses—approaches—to look at this puzzle, but also from looking at different puzzles; a fundamental value of asset in risk decision-making settings is one type of puzzle (Type II), and a fundamental value of an asset in uncertain decision-making settings is another (Type I).

The general proposition the efficient-market theory rests on is that a price—fundamental value of an asset—reflects all available information. According to our theory, all (objective) information about a value of an asset is available only in *risk* decision-making settings where it is possible to calculate the chances of various outcomes as well as the types of outcomes. Putting aside the issue of whether *all* available information is indeed included in the price, we rather focus on all *available information*. In other words, in risk decision-making settings, traditional marketing mix rules the world with known product (2½-inch line) and known place for the exchange. To hype and inflate such assets (Type II)—even if the asset is new—via traditional promotion channels is rather difficult (though possible—such cases representing the rare but not impossible "black swan"[28]) under risk decision-making settings. And indeed, in this context, there might be the case of no place for bubbles in efficient markets, as Professor Fama argues.

Bubbles do exist, however. But they exist in another dimension—in uncertain decision-making settings where the product (2½-inch line or, more appropriately, "how-many-inches-what?") is unknown; and the probability of outcomes (2½ inches) and the nature of outcomes (a line) are impossible to assess. In this context, the fundamental value of that new asset (Type I) is conveyed via a negotiated mix: the product (2½-inch line) and the place for exchange may have to be imagined (as we saw in the wondrous technology promises of the "dotcom" era), but elements of promotion (often hyped) and price (also hyped) are vividly present. Subjective probability and subjective confidence give rise to illusionary certainty of such a negotiated mix—perceived knowledge of asset availability, asset value, and asset communication—thereby pushing up (inflating) the fundamental value of a new asset.

Irrational behavior is built in both puzzles—Type I and Type II—and this goes back to the issue of whether *all* available information is reflected in a price or fundamental value of an asset. If all Type II assets reflect all available information, hence are correctly priced, then no one can expect either to gain or lose by trading, hence there shall be no room for trading

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or an exchange.[29] The only way to solve this logical contradiction is to assume that *not all* available information is reflected in prices, opening up complex pathways to imperfection and irrational behavior. In contrast, Type I assets may reflect all available information or knowledge that we call ignorant belief toward a new asset (where ignorance and illusion are the two lenses that actors involved are wearing, making them collectively blind to uncertainty), thus the key actors making confident predictions about the fundamental value of a new asset.

Indeed, the common theme is pricing that seemingly reflects a fundamental value of an asset. The concern with Type I puzzle it seems is not so much about (hyped) pricing as a monetary value, but about the role (hyped) pricing plays vis-à-vis the emergence of a new asset and its perceived value, availability, and communication. The question is whether (hyped) pricing—as part of the negotiated mix—is seen as a mechanism that fosters competition during the emergence of a new asset in uncertain decision-making settings, and at the same time tends to destabilize the firms in the market; or, is (hyped) pricing seen more as a mechanism to mitigate the competition among various actors to achieve stability in the market, as the goal of the market is to ensure the survival of a new asset?[30]

In this respect, it could be argued that a bubble bursts when (hyped) pricing turns into a "competition" mechanism rather than remain an insulating (from competition) and "stabilizing" mechanism. It could further be argued that using (hyped) prices as a mechanism to bring stability in the market by coordinating the efforts to avoid destructive forces of the competition during the bubble emergence would mean, among other things, that hype could be managed and as a result high prices could be perpetually increased (though marginally).

An example of such model can be found in BlackRock, the firm that is the biggest investor in the world with $4.1 trillion of directly controlled assets and another $11 trillion-worth assets that BlackRock oversees through its trading platform, Aladdin.[31] The risk-management model that BlackRock developed discovers the value of any asset by melding various actors' different conclusions and opinions on prices—that these actors arrive at based on their own idiosyncratic analyses—into a single price. The actors involved are looking at the financial world, at least in part, through this lens—model—crafted by BlackRock.[32] It appears that this model allows careful identification and selection of investable assets without destabilizing the respective markets. The model strives

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for a small, incremental, and—as BlackRock's steady rise to the top demonstrates—an enduring upside.

From a public policy perspective, the issue is how much regulation or government intervention is needed during the process of the emergence of a new asset in uncertain decision-making settings. As we have argued, this process of new asset emergence occurs (even if there are actual new technologies and/or products involved) in the financial sphere. The process is more about the formation of the market or negotiated space (battle for resources or competitive advantage) rather than actual exchange (in traditional marketing sense), and macro-level politics is not in the picture, except perhaps in the aftermath of a crisis (as the recent bubbles associated with the 2007–2008 Great Recession demonstrated).

Indeed, the path of negotiated space formation for the new uncertain asset begins in the invisible sections of financial markets and then moves onto visible sections. Values of most new and uncertain assets are first formed in the cloistered depths of venture capital and private equity markets, then transferred to those financial spaces where banks and investment firms transact with each other, and finally perhaps in publicly traded and observable financial spaces such as the stock and bond markets. These valuation paths for new assets start with the formation of invisible (to the public) private markets where initial exchanges occur, then move to increasingly visible and public markets, and finally—almost always after some type of crash or collapse—the macro-level political discourses open up, to examine why the crisis happened and what could be done to prevent it.

For example, after the Great Recession of 2007–2008, it took five years of macro-level political and policy discourse in the United States to create a significant regulation known as Volcker Rule aimed at curbing some of the speculative investing practices of government-insured banks, with the hope of preventing future trading blowups on Wall Street.[33] In this game, however, "Big Finance" is generally a step ahead of "Big Politics." Even before the Dodd-Frank financial overhaul legislation that proposed the Volcker Rule was voted by the legislators, and considerably ahead of the actual crafting of the details and language of this rule by regulatory agencies, big banks such as Goldman Sachs and Morgan Stanley had started inventing new business models that would allow the banks to get around the regulation:

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> Some banks like Goldman Sachs have already test-run certain strategies, such as putting together a separate investment vehicle to make loans to companies in the event the [Volcker Rule] regulation limits the ability of bank-owned hedge funds to continue that business… "Morgan Stanley and Goldman Sachs will go out and hire the best and brightest lawyers, and they will say, 'How do we do this?' " said Bill Singer, a securities lawyer who represents individuals and brokerage firms in disputes with regulators and advises clients on regulatory compliance. "The mind-set," he said, is "how do we get around it?"[34]

Conclusion: mopping up the bubble froth

The answer to the question of "how much and what type of regulation is needed for bubble-prone assets", of course, depends on the type of asset and the scope of a bubble. The box office collapse of a hyped-up movie hurts some people but does not constitute a case for regulatory intervention. Indeed, the severe financial and reputational beating that the producers of an unrealistically hyped movie take, when that unworthy movie fails at the box office, can be seen as poetic justice: they deservedly got what was coming to them.

The collapse of asset values in a technological category or sector represents a mixed picture. The hype and buildup of tech bubbles do accelerate the race for innovation. While asset buyers are scrambling to acquire assets, innovators and entrepreneurs are also scrambling, in parallel, to create asset varieties within the theme that is being hyped up. It could be argued that when the bubble bursts and the dust settles, while the field may be littered with failed ventures, the society still comes out ahead because of the strong surviving innovative technologies. Innovative firms such as Amazon, eBay and Yahoo! represent such survivors of the "dotcom" tech bubble, and—it could be argued—that additional innovative firms such as Google and Facebook may not have been possible if there was no "dotcom" frenzy and crash, with the application of lessons learned from "dotcom" failures to build more robust business models. Such meso-level logic, while acceptable, nonetheless ignores the numerous instances of micro-level losses in terms of money and employment. It ignores the thousands, even millions of narratives of loss and misery, not just of investors losing but also of well-trained entrepreneurs and employees losing work and

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self-confidence. Thus, the meso sector-level bubbles represent a mixed picture of social impacts.

Large, globe-spanning *financial* bubbles linked to physical goods such as housing or to virtual assets such as financial derivatives or stock prices do not seem to offer anything that is socially redemptive, notwithstanding the positions espoused by efficient-market proponents. The misery and pain caused by the 2007–2009 Great Recession—which entailed various bubbles in assets such as housing, derivatives such as Credit Default Swaps (CDS), and in European bank valuations—are well documented (see Chapter 2). The continuing longer-term impacts of the Great Recession include a sharp rise in income and wealth inequality, especially in the United States; various types of structural unemployment, even for trained and educated workers; and the widening of a destructive political ideological divide that pits a fraction-of-one-percent of the population (the ultra-rich) against the rest. Such bubbles bring privations and pains for almost everyone, and public policies options have to be created to prevent and/or tame such bubbles. But are such bubbles tamable? This is the issue we take up in the next and final chapter.

Notes

1 U.S. Federal Reserve chairman Alan Greenspan famously introduced the phrase "irrational exuberance" in popular lexicon. See Greenspan (1996).
2 Kestenbaum (2013).
3 There are, of course, occasional exceptions, and the works of economist Hyman Minsky (1977) are noteworthy in this regard—Whalen (2008) revisited Minsky's ideas after the 2007–2008 crisis. Also, those dealing with practical investment advice are well aware of this, and do sound out warnings (see Roubini 2006), but—once again—confronting the systemic issue head-on would undercut the very legitimacy of the intellectual and/or practical enterprises they are engaged in.
4 Loasby (1976).
5 Kahneman (2011, p. 240).
6 Carlaw et al. (2006).
7 Kahneman (2011, p. 262).
8 Loasby (1976).
9 Kahneman (2011).
10 Ibid.
11 Ibid.

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12 Ibid.
13 Ormerod (1998).
14 Kahneman (2011).
15 Ibid., p. 261.
16 Davidsson (2004, p. 13).
17 Abbott (2001, p. 249).
18 Ibid., p. 247.
19 Danto (1985).
20 Turcan (2013).
21 Abbott (2001, p. 250).
22 Kahneman (2011, p. 121).
23 Ibid., p. 120.
24 Ibid., p. 14.
25 Sommer (2013a, b); see also Kestenbaum (2013).
26 Sommer (2013b); Shiller (2013); see also Kestenbaum (2013).
27 Sommer (2013a).
28 Taleb (2010).
29 Kahneman (2011).
30 Fligstein (2001).
31 *The Economist* (2013).
32 Ibid.
33 Tangel et al. (2013).
34 Goldstein and Protess (2013).

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8
Bubbles: Trouble or Tamable?

Abstract: *In this concluding chapter, the issues are clear and straightforward: (1) Can bubble processes be detected early and stopped before they turn dangerous? (2) If bubbles form and burst, can steps be taken to control the damage and recover quickly? We argue that in bubble-prone situations, the inflation of a dangerous bubble could be avoided, or at least mitigated, by encouraging multiple, independent opinions on the realistic value of the asset; creating transparency about the motives of, and possible gains for, those who hype the asset; uncovering and shining a light on the linkages among asset inventors-creators, owners, funders, analysts, promoters, and speculators. Governments, nongovernment organizations, media, and universities can take up the responsibilities of doing these things. The pathways to regulate bubbles are clear-cut; however, the political economy of taking such actions is fraught with complexity.*

Keywords: asset bubbles; political economy; regulation; transparency

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Bubbles are not about to disappear. The concern the world over is whether bubble phenomena can be detected early and actions taken to tame these before they inflict enormous damage on institutions and individuals.

The damage done by the 1980s stock bubble to Japan stands as a stark lesson on how the economic engine and the corporate innovation culture of an entire nation—a nation feared at one time for its unbeatable technology and brands—could grind to a halt for decades because of macro-level mismanagement of speculative processes:[1]

> As the Nikkei stock average roared to new heights in the 1980s, investment bankers gained riches and new respect in Japanese society. They exerted increasing influence over corporate clients, relationships cemented at upscale bars and hostess clubs in Tokyo with thousand-dollar bottles of champagne and gold-dusted chocolate mousse deserts [*sic*]. Brokers found willing customers in dying industries such as basic chemicals and textiles, persuading them better returns could be had investing in stocks or bonds than in core operations . . . after the Plaza Accord in September 1985 . . . major industrial powers agreed to devalue the dollar. The yen appreciated sharply, gutting Japanese corporate profits . . . Suddenly the idea of using "zaitech," or financial engineering to pad earnings made sense . . . The Nikkei average peaked on the final trading day of 1989 and promptly went into a tailspin, losing nearly 40 percent the following year, crushing stock portfolios across the corporate sector.

Two decades of stagnation followed the bursting of the Japanese bubble. The social and economic impacts have been far-reaching. The vaunted lifetime employment system of Japan shrunk from 85 percent to 65 percent of the workforce and keeps shrinking. Temporary and part-time jobs have become the norm for young people entering the workforce. Living standards are eroding due to rising tax burdens and shrinking pensions. The young in Japan are especially paying a heavy price because good, secure jobs are scarce; the social security burden is rising because of unfavorable age ratios; and a culture of ennui has taken hold in cities and small towns. The older generation of Japan—those retired or near retirement—came away less bruised because they kept their savings in postal bank accounts rather than in speculative stocks and mutual funds. Untamed inflation of bubbles and, even worse, ineffective policy responses after bubbles burst can have debilitating economic, social, and cultural impacts. The issues for this final chapter are clear and straightforward: (1) Can bubble processes be

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detected early and stopped before they turn dangerous? (2) If bubbles form and burst, can steps be taken to control the damage and recover quickly?

The Singapore strategy: effective but not replicable

One way to tame bubbles is to craft a local variant of capitalism where a strong state intervenes and exercises multiple controls on asset-valuation mechanisms and activities, even as it maintains solid linkages with relatively unbridled global capitalism. The soft-authoritarian Singapore model and the post-Deng Chinese model, which drew many of its ideas from the Singapore model, are such capitalism variants.[2] In both these nations—Singapore and China—multiple state interventions have been employed to tame bubbles in real-estate prices. China's interventions have had limited effects but Singapore's interventions, more numerous and far-reaching than China's, did eventually manage to slow down the rapidly inflating bubble of real-estate prices in that city-state (see Table 8.1).

What the "Singapore Solution" teaches us, however, more than anything, is the very limited applicability of such methods. To some extent, the 2012–2013 intervention measures did slow down and even curb the rise in real estate prices in Singapore. But a city-state of three million people—with its unique form of soft-authoritarian governance and the strongly ingrained culture of national discipline, a culture where even public chewing of gum is prohibited—is no model for any other entity but itself. Even China, with its strong-authoritarian system, a nation that has adopted many aspects of the Singapore model, has not been able to succeed much in curbing the real-estate bubble because of the vastness of China's economy, polity, geography, disparity, and diversity—compared to the compactness of everything in Singapore. And, of course, when we turn to smaller democratic states, such as Iceland, the authoritarian structures and processes—and the very centralized institutions that control the economy, as they do in Singapore—do not exist, and thus the Singapore model becomes irrelevant.

What, then, are the options for policymakers who are concerned about the destructive and sapping effects of asset bubbles, and who are seeking

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TABLE 8.1 *Singapore: real estate bubble and steps to control it*

Date	Event or action	Comments
Bubble formation and inflation		
1970–2012	Home ownership rate in Singapore rose from 27% to 58% in 1980 and then to 91% by 2012	Government policies encouraged citizens to leave poor quality government subsidized housing and to move into fancier private condominiums
Nov. 2009	Housing prices rose by almost 16% in late 2009. From under 1,000 units sold in Q4 of 2008, housing units sold jumped to over 11,500 in Q3 of 2009	Several "loosening measures" from 2005 helped inflate the bubble: (1) Loans up to 90% of home value; (2) Down payment as low as 5% permitted; (3) Foreigners permitted to buy homes in Singapore
2009–2012	Housing prices rose by 25% in 2009–2010, and by another 40% after 2010	Housing demand was driven up by purchases by both Singapore citizens and buyers from China and Southeast Asia
2009	Buyers queued up overnight to view premium "show flats" and "desirable projects" sold out the entire inventory in days, months before the buildings went up	The "hype building process" was in full gear
State interventions to control the bubble		
2009	Interest-only loans to developers were banned	Attempt to control supply of the asset
2009	Developers banned from "absorbing interest payments" for a few months, a tactic used to lure buyers	Control on sales incentive for the asset
2012–2013	Borrowing for real estate capped at 60% of the asset value	By August 2013, government had enacted eight rounds of "curbing and controlling measures" to influence demand for and cost of acquiring/owning residential real estate
2013	Raising of stamp duty on home purchases	
2013	Increase in real-estate taxes	
2013	Minimum down payment requirement for second home purchases raised	
2013	New taxes introduced for foreign and corporate buyers of residential real estate	Real estate values in Singapore increased by 33% vs. over 100% in Hong Kong during 2009–2012. Sales of homes in Singapore actually declined in mid-2013
2012–2013	New home sales expected to drop from 22,200 units in 2012 to 15,000 units in 2013	Some Asian observers felt the new real-estate rules in Singapore were "draconian," not implementable even in statist China

Source: Authors' research.

ways to tame if not stanch bubble phenomena? It should be evident from the discussions in the foregoing chapters that "silver bullet" solutions, short of complete systemic change, do not exist. In the aftermath of bubbles, however, there are attempts to rethink and reorient, and to search for policies that could prevent or contain bubbles. In the rest of this chapter, we review a few such policies that have been proposed, and offer our own concluding comments.

Policies to counter asset bubbles

Most public policies pertaining to bubbles come into effect after the bubbles burst—as damage control and repair and rebuild policies, rather than as policies to curb or control the inflating of values of bubble-prone assets. Therefore, almost all the evidence we have of bubble-directed public policies (extremely few of which have proved to be effective) is from the post-bubble rather than pre-bubble or mid-bubble phases. In what follows, we review four policy approaches, some of which have been tried and others that need to be tried.

Qualitative restrictions on collaterals for loans

Mason Gaffney argues that, at least in the United States, the Great Depression of 1929–1931 as well as the Great Recession of 2007–2009 were fueled by rising real-estate values, which reached unsustainable levels and then collapsed, causing catastrophic chain reactions throughout the economy via bank lending "freezing up":

> There is direct conflict between the high land values of the boom phase and the rate of return on productive, job-making real investments. High land values may mean low rates of return on new investments. The high land values are supported by siphoning off part of cash flow to income payments to those who own the land, or to those who lend entrepreneurs funds to buy it. The combination of high creditworthiness with low returns on newly created capital can only spell trouble: banks expand as real investment falls. At the same time, rising land values discourage saving and encourage consumption, for example, by using home equity loans. When land is so overpriced as to cut deeply into rates of return on job-making new investment, banks turn to taking land itself as collateral. When land gets so overpriced that the borrowers cannot pay the loans, banks panic, freeze up, and stop originating new loans. Then as old debts are paid, the money goes

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> into the bank and never comes out again. What banks have created they can destroy. Just as expanding banks issue new money, contracting banks swallow it up again… "Where has all the money gone?" people ask… Most of it has simply been retired by banks that collect old debts without originating new ones.[3]

Gaffney's argument is that the inflating of such (real-estate linked) bubbles is from excess liquidity flowing from banks to real estate developers and buyers (such speculative lending often siphoning off funds from productive activities), and the collapse of such bubbles is due to banks pulling in as much money as possible into their coffers—as things turn sour—and not creating enough liquidity, even for productive activities such as industrial expansion and working capital for businesses. The drying-up of liquidity leads to multiple contractions and crashes, not just in the housing markets, but throughout the economy, triggering the bubble-bursting downward spiral that causes a recession and (without the massive interventions that occurred in 2008) could lead to a depression.

The policy solution Gaffney offers is simple and drawn straight from his analytical argument: banks should be prohibited from accepting illiquid assets such as real estate as collateral. Since banks are in essence acceptors of deposits from savers and providers of liquidity for productive activity, bank lending should be confined to working capital needs of businesses. Residential mortgage lending, and business lending based on accepting a business firm's real estate as collateral, should be eliminated. Bank loans, under such a policy, would be short-term, self-liquidating loans, regenerating the liquidity every few weeks or at most every few months. The conditions under which bank liquidity gets trapped in speculative real estate assets simply would not exist—and at least a major cause of bubble inflation and deflation would be removed.

Of course, the political climate to create such a drastic change in bank lending policies does not exist, even in an authoritarian state such as Singapore. As we saw in Table 8.1, even in Singapore, bank lending for real estate was curbed in many ways but not banned. A major Western nation, however, could possibly break free from the monetarist non-interventionist mold (our current predicament, that Gaffney critiques) and impose qualitative controls on what banks can and cannot lend for. Should such a change happen, especially in one of the top five Western economies, and if the resultant economy could show a great deal of resilience and freedom from bubble phenomena, then other countries could be motivated to follow such a lead.

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The Swedish solution?

With a population size of less than ten million, the Swedish approach to banking reform is to some extent subject to the small-country critique that we offered for Singapore. But the Swedish case is different in many ways from that of Singapore. Sweden is a large country in geographic terms, it is run very democratically and consultatively, and its economy is a combination of an old and diversified industrial economy overlaid by a modern technology and service-intensive economy. All these conditions do make Sweden, in contrast to Singapore, much more comparable to many of the major economies of North America and Western Europe.

The 1992 banking crisis in Sweden was near-catastrophic. The real estate bubble in Sweden, fueled by frenzied bank lending of the 1980s, deflated rapidly in 1991 and 1992.[4] There was a run on the Swedish krona and the Central Bank had to raise the interest rate to 500 percent at one point in an attempt to control capital flight. The cumulative employment loss from this crisis exceeded the employment loss in Sweden during the Great Depression.

The steps Sweden took in the aftermath of the 1992 crisis offer clear, relevant, and emulation-worthy lessons for major Western economies. While the small country size and relative homogeneity of the population helped in the case of Sweden, nonetheless there is nothing in the Swedish approach that can be dismissed as being untenable or impossible for a United States, a United Kingdom, or a France. In brief, Sweden took the following steps:[5]

- The two major opposing political parties decided to act jointly to face up to the crisis.
- The two largest banks were taken over by the government and merged to create the new bank that is now called Nordea (which is still partly government owned).
- All bank depositors were provided an iron-clad guarantee for their deposits.
- Bank shareholders, however, were not offered any guarantees; and shareholder equity was used first before public funds were made available to banks.
- To receive government bailout funds, banks had to open their books completely to the government.

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Writing in *The New York Times* in September 2008 and drawing parallels between the brewing financial crisis in the United States in 2008 and the Swedish one of 1992, Carter Dougherty found that the salutary impacts of the Swedish crisis-response policies offered lessons for U.S. policymakers in the throes of the 2008 crisis:

> By the end of the crisis, the Swedish government had seized a vast portion of the banking sector, and the agency had mostly fulfilled its hard-nosed mandate to drain share capital [of the banks] before injecting cash [into them]. When markets stabilized, the Swedish state then reaped the benefits by taking the banks public again . . . Soon after the plan was announced, the Swedish government found that international confidence returned more quickly than expected, easing pressure on its currency and bringing money back into the country.[6]

The U.S. policymakers, of course, paid no heed to the lessons from Sweden, even though Bo Lundgren, Sweden's minister for fiscal and financial affairs during that country's 1992 crisis, visited the United States in September 2008, prior to the U.S. announcements of its crisis-response measures, and tried to convince U.S. officials to draw some lessons from the Swedish experience.

Curing technology addiction, curbing contagion?

We have argued that, especially during the phase of bubble formation and inflation, processes of contagious hype come into play. There are swirls of negotiated marketing of the bubble-prone assets (or of ideas that support the acquisition of such assets). The hype conditions impose certain patterns of consumption such as, for example, dictating what technology or style or strategy to use—and how to "consume" it, including how to signal to others that the user is hip, contemporary, and "with it"; in short, creating a form of social addiction. Until the bubble bursts, people may remain addicted to such consumption patterns:

> Technologies like Facebook are addictive by design. According to [Internet use tracking firm] comScore, Facebook users spend an average of 400 minutes per month on the site. A recent study from the University of Chicago suggests that Facebook and Twitter are more addictive than cigarettes and alcohol. Further, there is increasing evidence to suggest that, over time, Facebook use reduces subjective well-being.[7]

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If a major reason for bubble processes to emerge and zoom and mushroom is a form of social addiction to certain behaviors (which ultimately lead to excessive, indeed morbid, interest in and acquisition of bubble-prone assets), then perhaps the public policy imperative is to fight such contagious addictions. In the same way that public health authorities monitor and fight infections and addictions using various tools, the policy bodies responsible for financial and economic health need tools to fight the addictive aspects of bubble processes.

The problem, in times of infectious contagion and inflating bubbles—as we have pointed out—is the stickiness of the optimistic sentiments. Like addiction to certain substances, once individuals have enjoyed the "high" of participating in certain forms of bubble-linked consumption—not just individually but as part of a surging constituency of fellow enthusiasts—it is difficult to wean them away from such experiences. If policymakers interested in financial literacy and health offer advice and warnings to avoid risky behaviors, a majority may reject such advice—the process of changing the sentiment-guiding theories usually trumps the possibility of changing the sentiment.

Just as happens in some tough addiction treatments, a shock therapy approach may be needed to shake people out of their addiction to asset-loving sentiments. There is little evidence so far of governments or public interest groups trying approaches to "shock" investors out of addictive optimism about bubble-prone assets, but such moves are bound to happen relatively soon—more likely from socially minded groups who want to protect people from losing their life savings rather than by government agencies.

Bringing in large doses of sunlight

There is a very famous quote attributed to Justice Louis D. Brandeis, who served on the U.S. Supreme Court from 1916 to 1939: "Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman."[8] There are obvious merits in high and clear transparency: in public as well as commercial affairs. Wide-ranging disclosure, multiple and convergent analytical opinions, and wide dissemination of all the available information about the realistic value of a bubble-prone asset can help in curbing overoptimism about the asset, which, of course, is a key condition for an asset bubble to form and inflate rapidly.

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During the formative stages of a bubble, the "greater fool" process is often at work:

> The greater fool theory of bubbles holds that investors knowingly overpay for an asset (relative to fundamental value) because they believe a yet "greater fool" may arrive in the future to pay even more… research on the recent US housing bubble documents that speculators and house flippers played an important role in contributing to price booms in a number of markets… [We can] separate an asset's price into two components: a fundamental value and a resale option value. The fundamental value is the present value of future asset cash flows and represents the benefit from buying the asset and holding it forever. The resale option value is a… "bubble component" of asset prices, and relates to the possibility of reselling the asset later at a higher price… A key insight… is that when… investor disagreement is greater, so too is an asset's resale option value and hence its bubble component. Thus, to the extent that greater public dissemination of information about fundamentals reduces investor disagreement, it will mitigate bubbles.[9]

Andrade and his associates studied the emergent stock market bubble in China during 2006–2007, focusing especially on the number of analysts covering the stocks and the buy-sell-hold opinions of these analysts. These researchers found that for those stocks for which the number of analysts covering the stock was large, and when the analysts offered convergent rather than contradictory opinions, the bubbles were smaller.[10] In other words, the greater the dose of sunlight shining on a bubble-prone asset, the less likely (or less severe) is the formation of a bubble.

If these research findings hold in additional studies, then there are some obvious implications for public policymakers and social groups (such as consumer/investor education and protection groups). In bubble-prone situations, the inflation of a dangerous bubble could be avoided, or at least mitigated, by:

- Encouraging multiple, independent opinions on the realistic value of the asset.
- Creating transparency about the motives of, and possible gains for, those who hype the asset.
- Uncovering and shining a light on the linkages among asset inventors-creators, owners, funders, analysts, promoters, and speculators.

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Governments, nongovernment organizations (NGOs), media, and universities can take on the responsibilities of doing these things. Just as the task of forming and disseminating opinions about other potentially lethal things—toxic chemicals, potent drugs, certain foods, construction sites—are not left entirely to private analysts, there is no reason to leave the tasks of forming and disseminating opinions about the prices of widely owned stocks and residential real estate only to private actors, most of whom are likely beneficiaries of bubble inflation, or bubble burst, or both. There is no social reason why (although there are often obvious political and economic motives as to why) the "attempting realism" task and process (see Figure 6.1) are "lone wolf" activities, voices in the wilderness, at best, and nonexistent in the worst.

Future scenarios and concluding observations

While the causes and processes that lead to asset bubbles are systemic, within such systems—once the conditions for bubble formation begin to foment—there are usually individuals and/or institutions that spot opportunities to make gains, sometimes spectacular gains. Once such opportunities are spotted, some form of the "greater fool" process comes into play. The early opportunity spotters may not only acquire the bubble-prone asset, and increasingly perhaps just the derivative rights to trade the asset (thereby multiplying the potential gains by large factors), these early asset opportunity spotters also may have motives and incentives to hype the asset. In the case of the U.S. housing bubble that inflated until 2007–2008 before deflating rapidly, these early opportunity spotters were large Wall Street investment banks who crafted a variety of Mortgage-backed Securities (MBS) and Credit Default Swaps (CDS) as ways to invest—in indirect and multiplicative ways—into residential mortgages. Because of their vast global connection networks, these Wall Street bankers also found large pools of "greater fools," in the form of eager investors from Azerbaijan to Argentina. Since the remote investors—the greater fools—admired the investing skills and acumen of the Wall Street investment bankers, they had no problems in buying up exotic, untested assets that were being pitched by Wall Street. And, on the Wall Street side, the exacting culture of quarterly earnings along with the gold-plated culture of annual bonuses ensures that there always are

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ultra-smart people available to design and market financially engineered products that appeal to the greater fools all over the world.

Recent economic history suggests that the systemic factors that lead to asset bubbles are not only *not* disappearing; they are perhaps intensifying and accelerating. The dotcom-tech bubble and the U.S. housing-plus-stock bubble happened within less than a decade of each other, and there are indicators that other bubbles may be forming before another decade passes.

The long-term need is to move past a system where the requirements and dictates of financial capital are paramount; and toward social and political formations where people—as whole humans, not merely as investors or consumers or workers—are able to set and guide economic agendas. In the short term, it is important to bring in very large doses of sunlight into the murky spaces where asset valuations are mystically formed and hyped, and seductive asset-acquisition sentiments are crafted and propagated. It is imperative that such sunlight, and multiple searchlights, shine from sources that are committed to public interest: regulators, protection agencies, educators, fiduciary advisors, public advocates, and impartial researchers. We believe the world has far more smart people who believe in the greater good compared to people in search of greater fools.

Notes

1 Layne et al. (2011).
2 Ortmann (2012).
3 Gaffney (2009, p. 1004).
4 Dougherty (2008).
5 Based on Stahl (2012).
6 Dougherty (2008).
7 Robert R. Morris, Ph.D. candidate, MIT Media Lab: http://www.robertrmorris.org/pavlovpoke
8 Brandeis University (2013).
9 Andrade et al. (2012a, pp. 2–3); see also Andrade et al. (2010, 2012b).
10 Andrade et al. (2010, 2012c).

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Epilogue

At the time of completing this book, a set of big, global bubbles—in residential property prices in the United States and elsewhere, in derivatives based on mortgage lending, in European bank valuations, and more—reached their zeniths and collapsed during the 2007–2009 Great Recession. Just a few years prior, in the early months of 2000, the "dotcom" tech bubble had burst. The hyper-inflation and bursting of such bubbles affected not just the rich, not just the pension funds with large pots of investible funds, but millions of common people—especially in the United States and Europe—who found themselves jobless, and often without job prospects, as structural shifts in the economy accompanied the roller-coaster asset values. As this book was going to press in early 2014, however, signs of other bubbles forming were evident.

A Martian looking at Planet Earth would ponder: "Is there no long-term systemic learning of lessons by the people of Planet Earth? The Earthlings suffered so massively during these bubble collapses, and yet they seem to be enmeshed in the same processes all over again."

The reason our Martian visitor would be perplexed is because she/he cannot peer into the depths of human psychology, social influence processes, and the political-economy power dynamics of Planet Earth.

Robert Shiller, co-winner of the 2013 Nobel Economics Prize, has pointed out that the very idea of a bubble is hard to accept by his fellow professional economists and, therefore, has received relatively little scholarly attention in the economics discipline (of course, Shiller' own work

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being an outstanding exception[1]), and thus the subject has received a lot more popular attention than scholarly attention. Disciplines other than finance and economics, surmising (wrongly, of course) that bubbles are basically economic phenomena, have largely stayed away from scholarly efforts to explore and understand bubbles. Well, in this book, we have ventured into this relatively uncharted multidisciplinary territory.

Shiller, of course, knows that bubbles represent much more than economic phenomena. He has developed a relatively simple checklist to determine whether a bubble process is in progress or not.

During an inflating financial bubble, Shiller advises us to watch out for the following:[2]

- A time of rapidly increasing prices.
- People tell each other stories that purport to justify the reasons for the bubble.
- Some people tell each other stories about how much money they are making.
- Other people feel envy and regret that they did not participate.
- The news media are involved.

In this book, we have attempted to capture such processes. We decided that opening the concept of bubbles to more than just financial assets, and including minor bubble processes such as the meteoric hyping of some movies, would provide additional windows into bubble processes. We hope we have succeeded in garnering a few more insights (than currently available in the scholarly social science literature) about bubble processes—such as those in Shiller's checklist, above—by broadening the scope of the study of bubbles.

The columnist who offered the Shiller checklist also examined the opposing views of the two 2013 co-winners of the Nobel Economics Prize, Eugene Fama, who does not believe bubbles exist, and Robert Shiller, who has spent a career studying (and predicting) bubbles. The columnist Morgan Housel concludes thus:[3]

> If the history of bubbles teaches us anything, it's to be humble. Many gasped at Shiller and Fama sharing the Noble Prize, since the two hold what look like opposite beliefs. But the two economists have a common denominator: They both advocate humility. Fama doesn't think we can predict bubbles. Shiller thinks we can, but doesn't think we can ever know when they'll collapse. What we need, but I know we'll never get, is more of this type of thinking. I'm holding out for a humility bubble.

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We do not intend to either inflate or burst the humility bubble. We realize that what we offer here is but a small step in what would be a long multidisciplinary, multi-pronged journey of inquiry into bubble phenomena. But we are also not pessimistic like the columnist cited. We believe that, at this juncture, an increasing number of well-intentioned and well-skilled scholars from many disciplines are ready to take on the bubble phenomena that economists have either largely ignored, or outright rejected.

Notes

1 Shiller (2006).
2 Reported in Housel (2013).
3 Housel (2013).

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