Introduction: the Regulatory Instability Hypothesis

(preprint version)

from

Law, Bubbles, and Financial Regulation (Routledge 2013)

Erik F. Gerding

The University of Colorado Law School

http://routledge-ny.com/books/details/9780415779395/

erik.gerding@colorado.edu

Preprint Version

Introduction

The Regulatory Instability Hypothesis

We move through the economic and social wreckage of the global financial crisis. Sifting through the debris field, we encounter the once shiny and still strange detritus of financial market failure: option adjustable rate mortgages (ARMs), synthetic collateralized debt obligations, credit default swaps, trust preferred securities. All this devastation, examined at great length in other books, seems hypermodern, bewildering, and even alien.

Unless our eyes shift their focus. We have been here before. With a changed focus and on a different level of abstraction, contours begin to emerge of a landscape that would have been familiar to our grandparents and to their grandparents as well. After three centuries of financial market history – from stock jobbers in London in the 1690s to NASDAQ in the 1990s – we face once again the bitter aftermath of a collapsed asset price bubble, the most destructive one since the Great Depression.

The postmortem confronts us with thorny questions. How did this happen? Who is to blame? How could this disaster have been averted? Why did the vast apparatus of national and international financial regulation, first erected in the wake of the Great Depression, fail to prevent the Panic of 2007–2008? (Admittedly this moniker is a misnomer, as the financial crisis continues to reverberate in Europe if it does not threaten to spread to Asia and other continents.) These questions are not merely academic; lawmakers face enormous pressure to find ways to avert a recurrence of the crisis. After all, less than a decade lapsed from the implosion of the U.S. technology stock boom until the first tremors of what started as the "subprime crisis."

Strangely, even though the landscape should be familiar, financial reform has emphasized fixing immediate symptoms, i.e., the particular financial products and markets that broke apart in the Panic: central clearing for derivatives, new rules for securitizations, and "living wills" for complex financial institutions. Legislators have grafted new regulatory structures on top of the existing architecture of financial law. Financial regulation has seen no revolutionary change. This has led some to wonder if financial reform is preparing only to re-fight the last war. Are policymakers constructing high-tech Maginot lines against an enemy that will not wield the same weapons or invade by the same route again? We have been here before. The causes of this crisis resemble the causes of many

past crises, but only if we examine them with the right lens and proper degree of abstraction.

With the proper historical focus, a disturbing insight emerges, one that should gnaw at any faith placed in this round – or perhaps any incarnation – of financial reform. In past bubbles throughout three centuries of history, financial laws buckled over and again. They failed to prevent bubbles. Moreover, law did too little to mitigate the economic destruction after asset price bubbles popped. Most troubling, financial law appears, in many cases, to have contributed to the growth of bubbles and to the severity of their implosion.

After each crisis, lawmakers responded with a regulatory backlash, launching flotillas of new legal rules. Yet many of these laws ultimately faded or failed when the next bubble emerged. Financial regulation has been caught in a series of long historical cycles, which were propelled not by iron laws, but by political and economic undercurrents that are powerful nonetheless. These currents swirl as booming markets and failing financial laws feed one another.

This book explores the interactions of financial regulation and asset price bubbles. Scholars have written rich tomes on the economics and history of asset price bubbles. Yet the role that law and financial regulation has played in bubbles and the effects that bubbles have on financial laws has remained largely in the background. The chapters that follow examine the interactions among bubbles and laws. The book argues that these interactions generated formidable and recurrent feedback loops. This feedback damaged financial markets and deteriorated the effectiveness of financial regulations, whether in banking, securities, or corporate law. This book explains how bubbles trigger the deterioration and decay of financial laws by introducing a set of theories called the Regulatory Instability Hypothesis.[1] This Regulatory Instability Hypothesis posits that strong forces act to decay financial regulations at the precise moment when they are most needed – when markets boom, investors and financial institutions exercise less care and take on more risk and leverage, and financial crisis looms. The Regulatory Instability Hypothesis argues that the following five dynamics cause the effective deterioration of financial regulation during bubbles:

1 *The regulatory stimulus cycle*: bubbles create strong pressure on governments to make regulatory changes to stimulate booming financial markets. Regulatory stimuli often take the form of deregulation (i.e., the repeal or roll back of legal rules). Yet deregulation is but one example; other forms of regulatory stimulus include lower enforcement and looser interpretations of existing rules by public officials. Furthermore, lawmakers and regulators create regulatory subsidies when they grant legal preferences to, or direct the government to make investments in, particular financial markets.
2 *Compliance rot*: bubbles skew the incentives of financial market participants against obeying financial laws. Deteriorating legal compliance by some players undermines compliance by others in the marketplace and financial fraud and other law-breaking can reach epidemic proportions.

3 *Regulatory arbitrage frenzies*: asset price bubbles likewise increase the incentives of market participants to game financial laws short of breaking them altogether. Eager to participate in surging financial markets, investors and financial institutions become more aggressive in seeking or devising economic substitutes for heavily regulated or prohibited transactions. Again, rising levels of regulatory arbitrage can generate cascades and contagion effects in the marketplace.
4 *Procyclical regulations*: some financial regulations interact with economic cycles to exacerbate market booms and busts. This occurs in the normal operation of these regulations. It requires neither changes in regulator behavior nor deteriorating compliance by market participants with financial laws.
5 *Herd-promoting regulations*: financial regulation does too little to counteract the herd behavior that drives asset price bubbles. Moreover, many financial regulations, by creating preferences for certain asset classes, actively encourage this herding. These regulations thus perversely increase the correlations of risk among financial institutions with destructive market-wide consequences.

Together, these five dynamics weaken financial regulations just as the storm clouds of a financial crisis gather.

What are bubbles, when they matter, and why they matter

To understand this ominous warning, a little context is necessary. It is important to understand what asset price bubbles are, when and how they threaten financial markets, and which types of bubbles pose the greatest dangers. The answers to these questions illuminate the cases in which the dynamics of the Regulatory Instability Hypothesis pose the greatest danger. These answers can help identify those most crucial financial regulations that, when undermined, would cause the most economic damage.

Bubbles are unfortunately not an alien concept to the public today. The global economy still struggles with a massive financial crisis (which this book calls the Panic of 2007–2008)[2] with roots in real estate investment bubbles. The tale of how the crisis began has now been told many times over: subprime and exotic mortgages and complex financial instruments based on those mortgages fueled a dramatic and prolonged boom in U.S. housing prices.[3] However, the U.S. real estate bubble of the last decade is not the only story. The financial crisis gathered strength in Europe because of severe losses incurred by European financial institutions. These firms suffered not only because of their mortgage-related investments in the United States,[4] but also from the collapse of a string of European real estate bubbles that stretched along an arc from Iceland to Ireland to the Iberian peninsula to the Black Sea.[5] Now, after financial markets have crashed, media stories find financial bubbles in every corner of the global economy – Chinese stocks,[6] Chinese real estate,[7] gold,[8] U.S. Treasury Bonds,[9] and even higher education in the United States funded by student loans.[10] Perhaps bubble

thinking is experiencing a bubble of its own. Although this intellectual epidemic of anxiety over overvalued financial markets would have been far more useful while real estate markets were overheating in the years before the Panic of 2007–2008.

The Panic of 2007–2008 reawakened interest in a rich lode of scholarship on the economic history of financial bubbles.[11] One problem with the widespread use of the term bubble is that it seems to take on any number of meanings. To prevent this intellectual coin from being debased, it is important to turn to economists, who have been, as should be expected, more rigorous than the public in defining what they mean by an asset price bubble. The most widely used definition of a bubble, and the one adopted by this book, is when current market prices for a class of assets, such as stocks or real estate, diverge from the fundamental value of those assets.[12] An asset's fundamental value is, in turn, defined as the present value of all future cash streams from that asset.[13] This definition, as Chapter 1 of this book discusses in more depth, presents numerous analytic challenges. In particular, figuring out whether a bubble exists at the present time requires forecasting future cash flows, and determining whether a forecast is reasonable is inescapably subjective. Identifying historical bubbles by comparing past prices to whether the projected cash flows of assets actually materialized runs the intellectual risk of hindsight bias. So, indentifying bubbles for either descriptive or prescriptive purposes involves a significant degree of uncertainty. As this introduction underscores later, this uncertainty poses insurmountable obstacles for neither the descriptive nor the prescriptive aims of this book.

This renewed public interest in bubbles should be welcomed as financial history demonstrates that asset price bubbles bear responsibility for some of the most profound financial crises in terms of the destruction of national wealth, damages to the real economy (unemployment, loss of productivity), extreme social dislocation, and even political upheaval and violence. The worst of these effects strike after the implosion of a particular kind of bubble, namely one fueled by borrowed money and leveraged financial institutions. Alone, an asset price bubble or a banking crisis can cause serious economic damage; when coupled together, they generate catastrophe.[14] Of course, even asset price bubbles *not* financed with borrowed money (sometimes called equity bubbles) can inflict economic devastation by destroying investor wealth, spawning epidemics of financial fraud and lawbreaking, and damaging investor confidence in financial markets. This book will explore these consequences as well. Yet the most gripping concern are those bubbles in which credit and leverage play a central role, for reasons which this chapter previews and the book later explains in more detail.

Renewed public and political concern with bubbles can benefit from over two decades of path-breaking economic research on how bubbles form in financial markets and the role that they play in financial crises. Chapter 1 will examine some of this research, but several threads are worth unspooling here. First, much of this research represents a synthesis of the behavioral finance movement that emerged in the last twenty years, on the one hand, and earlier, less quantitative economic scholarship that posited that financial markets suffer from cyclical

instability, on the other. Behavioral finance itself builds off evidence from psychological experiments that document how individuals suffer from various behavioral biases and cognitive limitations. These biases and limitations cause individuals to make decisions that deviate from the predictions of economic models that assume individuals are rational actors who maximize their self-interest.[15] If asset prices spike, behavioral biases can cause investors to chase price trends and engage in herd behavior.

Behavioral finance connects experimental evidence and theory on the cognitive limitations of individuals to market phenomena. It argues that these biases and cognitive limitations help explain empirical evidence that prices in financial markets have at times diverged significantly from what neoclassical economics, generally, and the Efficient Markets Hypothesis, in particular, would predict.[16] The work of behavioral finance scholars has strong affinities with the work of an older generation of economists, including Charles Kindleberger and Hyman Minsky, who presented historical evidence and theoretical models that explained how financial markets suffer from periodic bouts of bubbles and crashes.[17]

Although "irrational behavior" is central to many of the current models of how bubbles initially form, it is important to underscore that rational behavior also can play a crucial role. Indeed, a great deal of research on individual decisions made in the crowd of a financial market focuses on how individually rational responses can contribute to the folly of the collective destruction of wealth. Rationality can drive a decision by an investor to buy stocks in a boom even if she thinks prices are unsustainably high.[18] Rationality can also undergird a decision by a depositor who withdraws money from a bank during a run even if he thinks the bank is currently solvent.[19] Indeed, it would be often be *irrational* for many investors, even those who think market prices are unsustainable, to bet against the bubble.[20]

This odd cohabitation of irrational and rational decision-making will be explored throughout this book. It will inform the models this book uses to explain the behavior of lawmakers, regulators, and market participants (investors, company promoters, financial intermediaries) as they create, demolish, interpret, enforce, obey, bend, and break legal rules.

Another strand of economic scholarship looks at the importance of expanding credit and increasing leverage in fueling asset price bubbles. This scholarship, surveyed in Chapter 9, includes cutting-edge research on the workings of a leverage cycle in which the leverage in the economy dramatically expands as markets boom and radically contracts when markets crash.[21] Consistent with this model, other economists have presented empirical evidence that financial institutions increased their leverage during the boom years preceding the Panic of 2007–2008 and then shed leverage once the crisis took hold and financial markets plummeted.[22] This research sheds more light on why bubbles fueled by credit and leverage pose greater dangers. When financial institutions, businesses, and households increase leverage during asset booms, they magnify the losses to equity holders should markets fall.[23] However, collective increases in leverage have the pernicious effect of masking this risk, by driving asset prices higher.

Increases in financial institution leverage effectively increase the total amount of money (or "liquidity") that can be invested in financial markets.[24] When financial institutions collectively deleverage (for example, because of losses when asset prices fall), the supply of money contracts. A perfect economic storm then brews: falling prices generate losses for leveraged financial firms who deleverage, causing prices to sink further. This dynamic can cause financial institutions, already rendered more fragile by higher leverage, to fail and credit markets to seize.[25] The widespread failure of financial institutions, in turn, can devastate economies.[26] As financial institutions deleverage or even fail, credit contracts and chokes off economic growth. Systematic bank failure can cause disruption of financial intermediation in the economy, as banks lose the capacity (including the human capital of loan officers) to distinguish "good" borrowers from "bad."[27] It cannot be understated: bubbles fueled by debt and linked to financial institutions pose the most severe risk.

The leverage cycle points to a recurrent theme in economic research on bubbles – the role that feedback loops play in generating bubbles and crashes and in destabilizing financial markets. When leverage increases during an economic boom and decreases during a crash, it also exacerbates the boom and crash.[28] Furthermore, behavioral finance models claim that bubbles form because of positive feedback investment strategies; when investors chase price trends, rising prices spur more investors to buy assets, leading to higher prices.[29] These feedback loops foster the formation of boom/bust cycles in financial markets.[30]

Feedback mechanisms serve as a recurrent theme of this book. Economic research focuses on how feedback mechanisms can make markets behave in nonlinear ways – suffering spectacular booms, busts, and moments of profound disequilibrium. This book argues that feedback mechanisms also cause financial laws to experience severe bouts of instability and disequilibrium of their own.

Impoverished legal responses to bubbles

Despite the richness of economic research on bubbles, the legal response to economic crises has often been less than fully informed by economic insight. That is not to say that law does not react to bubbles. Legal scholars have demonstrated quite the opposite: the most profound historical changes in banking and securities regulations have tended to emerge from the frothy political wake of collapsed bubbles.[31] Often, however, these regulatory changes bear little connection to the causes and effects of financial bubbles. Curiously, for all the media talk about bubbles, statutes passed in response to a financial crisis seldom treat bubbles as a cause or contributing factor to financial crisis.[32]

Instead, legislation in the wake of crises typically addresses symptoms specific to that historical period. For example, in the United States, the Dodd-Frank Act of 2010[33] tackles a long list of suspected culprits of the Panic of 2007–2008. It addresses, among other things, subprime mortgages sold to unsophisticated households,[34] over-the-counter derivatives threatening the solvency of large financial institutions,[35] and executive compensation.[36]

The problem with this kind of ahistorical and particularized legislative response is that it ignores the larger context – historical, economic, and political. This context would reveal deep connections between the Panic of 2007–2008 and past financial crises that struck when financial booms imploded. This lack of context explains why legislatures and financial regulators are at risk of preparing to re-fight the last war, which is never a good military strategy.

Unfortunately, that missing historical context would also reveal that vast legal responses in the wake of crises are part of a larger regulatory cycle. Financial laws passed in the wake of many historical bubbles have been repealed, re-interpreted, under-enforced, and ignored when financial markets later boomed again. Ahistorical, highly particularized responses to crises fail to provide a sustainable long-term approach to mitigating the effects of asset price bubbles. One of the overarching aims of this book is to integrate economic research on the causes and effects of asset price bubbles with legal scholarship on the fragility of financial regulation. It adds a much needed legal perspective on the causes and consequences of bubbles and the policy responses to the crises that ensue.

Another aim of the book is to bring the insights from legal scholarship to bear on economic thought on bubbles. Although many cutting edge economists who have studied asset price bubbles look at specific legal rules (for example, legal constraints on arbitrage), the role of financial regulation in the development of bubbles is often not the centerpiece of the inquiry. This book will examine the role that both laws and legal change – including change through regulatory stimulus and regulatory arbitrage – plays in the formation of bubbles.

However, this book focuses much of its energy on the more novel question about the reverse effects: namely, what impacts do the dynamics of asset price bubbles have on financial regulation? How do bubbles change the content, interpretation, and enforcement of legal rules? How do they affect compliance with legal rules? A failure to look at how bubbles change the content, application, and effectiveness of financial laws can have dire consequences.

Even reform proposals based on sound economic research and data must eventually be translated into concrete legal rules. These rules are subject to repeal; as memories of the Panic of 2007–2008 fade, the current round of financial reform will be subject to deregulatory pressures. This may strike the contemporary reader as unsurprising. Indeed, there is a widespread, popular, yet inchoate notion that deregulation caused the current financial crisis.[37] As with "bubbles," popular thought may find the correct target in a very general sense, yet fail to achieve a nuanced understanding of what "deregulation" means and how it contributes to bubbles and financial crises. Legal thought can help policymakers and the public understand how regulation, deregulation, and legal change more generally can take different forms and be measured in different ways. Legal scholarship can thus help move the public debate beyond cartoonish, binary questions of "more" or "less" regulation. It is not just the quantity or even the substance of regulation that should concern us, but also how regulators, judges, and market participants interpret, apply, and comply with legal rules.

Because legal rules are not self-executing computer codes, they are subject to heavier or lighter enforcement, as well as to creative interpretation, gamesmanship, and violation by human agents.

The Regulatory Instability Hypothesis

The problem is that bubbles radically alter both the content and application of legal rules. Market booms can interact with political markets, psychological dynamics, ideologies and social norms, and legal institutions to trigger dramatic deterioration and decay in the effectiveness of financial regulation. To see how this occurs, the five elements of the Regulatory Instability Hypothesis deserve further elaboration. Each of these elements is summarized below.

The regulatory stimulus cycle: deregulation and beyond

An examination of financial history reveals a clear pattern of governments changing legal rules to stimulate markets before or during the inflation of numerous asset price bubbles. I call these changes "regulatory stimulus." Then, after markets crash, policymakers respond with a regulatory backlash of new rules to constrain investment and risk-taking in financial markets. This *regulatory stimulus cycle* leads to a perverse result. There is less regulation and less effective regulation just as markets begin to overheat and the risk of crisis and of financial fraud and law-breaking spikes. Then re-regulation takes hold only after the bubble has burst, the economic damage has been done, and investors and markets have been chastened by a crash.

Regulatory stimulus includes deregulation – i.e., the repeal or substantive alteration and dilution of financial rules – that promotes investment in particular financial markets. However, regulatory stimulus covers quite a bit more too. It would be a mistake to focus on the repeal of statutes and regulations to the exclusion of other modes by which governments change legal rules to promote investment in particular asset markets. Consider the following analysis. Financial regulation can operate as a "tax" on investment or lending, whether in general or in a particular market.[38] The economic opposite of a government tax is of course a government subsidy; a subsidy for a particular investment can have the same net economic effect as repealing a tax on that investment. Regulatory subsidies or stimuli can take a wide number of forms, including granting business ventures a legal monopoly to encourage them to develop new investment markets. Governments can also create various legal preferences for certain investments, such as by crafting exemptions to financial regulations. Similarly, policymakers can choose not to collect a regulatory tax by lowering enforcement efforts or by not applying an existing regulation to emerging, but economically equivalent activities.

The term "regulatory stimulus" as used in this book thus encompasses the following legal changes to the extent they promote or unleash greater investment or lending in particular asset markets:

- *the repeal or roll back of statutes, regulations, or legal rules*;
- *exemptions or waivers* from particular rules granted by lawmakers or regulators;
- *looser interpretations of financial laws and regulations* either by courts or regulatory agencies;
- *reduced enforcement of existing statutes and regulations* by regulatory authorities; and
- *active government stimulation of financial markets* through various legal devices, including via
    - *granting of charters or legal monopolies*,
    - *government guarantees of, or investments in, particular markets or ventures*, or
    - *the creation of other legal preferences for certain investments*, such as exemptions from rules applicable to a broad range of other financial instruments or markets.

If one takes an even broader definition, regulatory stimulus might also include a failure to exercise existing legal authority or to adapt existing authority to new, but economically equivalent investment contexts. In many historical episodes surveyed, regulatory stimulus took the form of creating, authorizing, or facilitating a particular financial innovation – such as a new financial instrument. Indeed, the legal history of bubbles provided in Chapter 1 includes a long list of examples of lawmakers endorsing, subsidizing, or even midwifing the birth of new financial technologies.

Moving from deregulation to a broader conception of regulatory stimulus runs some risk of looseness in evaluating historical evidence. Yet the risk of cherry-picking is outweighed by a broader and more nuanced understanding of what "law" means. "Law in action" rather than merely "law in the books" helps focus on the concrete effects of legal rules and the actual behavior of legal actors rather than simply counting whether there are more or fewer pages in the statute books. This book therefore builds on the foundation of the Legal Realism and Law and Society movements, which pushed legal scholars to look beyond statutes and cases.[39] Understanding the real world effects of laws requires studying how lawmakers interpret and enforce legal rules. It also requires considering a broad range of legal actors, including legislators, heads of government, regulators at various agencies, judges and courts, international organizations, and even private actors to whom regulatory functions have been delegated. Moreover, understanding the effects and effectiveness of legal rules requires looking at the behavior of individuals and firms subject to the law's command.

Chapter 3 of this book provides three models to explain the historical pattern of regulatory stimulus as markets boom and regulatory backlash after they crash. The first model looks at how bubbles radically alter the rational calculus of competing interest groups in demanding (or opposing) regulatory stimulus, as well as the rational calculus of lawmakers in supplying it. This analysis, heavily

influenced by public choice theory, is supplemented with a second model that examines how bubbles interact with the behavioral biases of regulators and interest groups to promote regulatory stimulus. Again, the interaction of rational and "irrational" decision-making serves as a recurrent motif in the book. For example, central bankers or bank regulators may be unwilling to suffer the career ramifications of taking actions that might cause financial markets to drop.[40] Meanwhile, they may also suffer from "disaster myopia," that is the tendency to underestimate the probability of an economic crisis when one has not occurred for a long period.[41] Yet, economic or psychological explanations may not provide a complete account of the decisions of the regulators and regulated. Accordingly, the third model examines how bubbles interact with ideological currents and changing social norms to encourage regulatory stimulus.

No matter the model used, the regulatory stimulus cycle and asset price bubbles generate powerful feedback loops; less and looser restrictions on investment or borrowing – particularly regulations that govern the provision of credit and the leverage of financial institutions – can stimulate financial markets. Booming markets, in turn, promote further pruning and slackening of those legal restrictions.

Compliance rot: deteriorating obedience to financial laws

Even those financial regulations that survive the regulatory stimulus cycle intact – i.e., those that are not repealed or more loosely interpreted or enforced – may, nonetheless, be rendered ineffective by the dynamics of a bubble. The prospect of sustained rising prices in financial markets can undermine obedience with financial laws by investors, financial institutions and intermediaries, and other market participants. Laws on the books have less meaning when compliance rot sets in.

Chapter 4 uses the same three-part template described above to create models – based on rational calculations, behavioral biases, and ideologies and norms – to explain how legal compliance deteriorates radically during boom times. Under the rational model, booms provide immediate benefits yet delay legal liability and other costs for breaking the law. Those who would engage in financial misconduct understand that the budgets and capacities of regulatory watchdogs may not keep pace with mushrooming volume of transactions during bubble times. If compliance deteriorates widely, there can be a jailbreak effect; firms and individuals may conclude that, "they can't catch us all." Second, bubbles exacerbate the behavioral biases of market participants, which can cause them to systematically underestimate the legal and other consequences to violating the law. Third, bubbles often coincide with broader social shifts in which norms of legal compliance and the perceived legitimacy of laws erodes.

Chapter 4 focuses much of the analysis on deteriorating compliance with antifraud rules during bubbles. Yet it also applies these same three models to prudential banking rules, including laws designed to protect the safety and soundness of financial institutions and mitigate systemic risk. Lower compliance

with financial laws causes the deterioration in the effectiveness of those rules. Here too feedback loops form. Deteriorating compliance with laws that combat fraud or restrain investment and lending can add further fuel to a bubble, which, in turn, can further vitiate obedience to financial law.

Regulatory arbitrage frenzies

The same dynamics that encourage market participants to break laws also lead them to bend laws using techniques of "regulatory arbitrage." Regulatory arbitrage is a new bottle for old wine. It describes how firms and individuals will seek to lower the "regulatory tax" on a transaction (that is, when financial regulations either prohibit or render a transaction extremely costly). They accomplish this by seeking or devising close economic substitutes that are less regulated or completely unregulated. Chapter 5 explains how regulatory arbitrage is more complex than simple evasion or finding loopholes. Investors and financial institutions seek to exploit the "incompleteness" and jurisdictional limitations inherent in all legal rules by engaging in one or both of two strategies. First, they can move capital to less regulated markets subject to other jurisdictions. Chapter 5 labels this "investment switching." Alternatively, they can hire lawyers, investment bankers, accountants, and other advisors to construct elaborate transactional structures to provide the same economics as a heavily regulated or prohibited investment but subject to a much lower regulatory tax. Chapter 5 labels this "investment structuring."

Just as they cause the deterioration of legal compliance, asset price bubbles increase the immediate benefits to regulatory arbitrage and delay the potential legal costs; booms increase the incentives to game legal rules that might otherwise shut institutions and individuals out of increased profit opportunities. Bubbles also can exacerbate behavioral biases that cause market actors to discount excessively the risks to regulatory arbitrage. Finally, bubbles affect the norms in financial and legal communities in ways that make aggressive use of regulatory arbitrage more acceptable.

Regulatory arbitrage can thus become contagious. Widespread use of investment switching and structuring encourages more market participants to partake. Those investors and institutions that do not will face the marketplace's punishment for failing to enjoy the returns of a booming market. Regulatory arbitrage frenzies begin.

To demonstrate the complexity of the techniques of regulatory arbitrage, Chapter 5 examines in detail an important species, regulatory capital arbitrage, which describes the gaming of bank capital rules. Regulatory capital arbitrage allows financial institutions to increase and cloak their leverage. As mentioned above, increased financial institution leverage has rippling and reverberating effects. It renders financial institutions more vulnerable to downturns. It increases the supply of credit to financial markets, which can fuel asset prices and the growth of bubbles. By inflating asset prices, increased leverage masks the risks it poses both to individual firms and markets as a whole. Once again,

particularly insidious feedback loops between bubbles and regulatory dynamics can form.

Regulatory arbitrage can also prevent policymakers from seeing new forms of risk that materialize in financial markets. Moreover (as Part IV of the book argues) regulatory arbitrage has also obscured the emergence of new channels in the economy for providing credit and increasing leverage. As noted above (and analyzed further in Chapters 2 and 9), credit and leverage can inflate bubbles. Thus, new, by fostering new channels for credit and leverage, regulatory arbitrage enlarges a dangerous regulatory blind spot.

Procyclical regulations

Bubbles and financial regulations can have perverse interactions even if regulations are not rolled back and remain fully enforced and obeyed. Economists have pointed to evidence that some financial regulations exacerbate boom and bust cycles in the economy in their normal modes, without any misconduct by financial firms or regulators. Through their mechanical operation, these *procyclical regulations* interact with market cycles to spur financial firms to make more investments and increased lending during booms and to throttle back after a crash.

To explain this, a simple example suffices for now.[42] Loan loss reserves require banks to set aside money to cover the probability of defaults on their mortgages or other loans. If the amount of the reserve required by legal rule is based on the previous year's losses on mortgages or other loans, then a real estate or other bubble that lasts several years can lead to troubling results.

Consider how rising market prices can lead to fewer loan defaults. When real estate prices surge for a protracted period, mortgage borrowers can exit loans they can no longer afford by selling their homes for a higher price (or by refinancing, if credit is cheap). Under the regulation, lower defaults allow banks to lower reserves. This frees a bank to lend more money. More credit can drive housing prices higher and a feedback loop develops.

However, the feedback loop jumps into reverse should real estate prices falter. Defaults rise. Lower prices narrow the exit options for borrowers to resell or "flip" assets. Higher default rates leads to higher reserve rates, which throttles back bank lending. Less bank credit further depresses asset prices, prevents more borrowers from reselling or refinancing, and increases the default rate.

This type of poorly designed (but unfortunately not uncommon) loan loss reserve requirements amplifies market cycles. Economists label these regulations "procyclical." Note that this procyclicality has both macroeconomic and microeconomic dimensions. Procyclical regulations have macroeconomic effects by inflating market booms and deepening market crashes. They also have microeconomic effects: lower loan loss reserves mean banks are more exposed to market downturns. Procyclical regulations thus run counter to regulations that aim to mitigate the risk of individual financial institutions failing. The systematic failure of financial institutions, in turn, can have macroeconomic consequences of their own.

Herd-promoting regulations

Financial regulations can also promote dangerous collective behavior by financial institutions. As noted briefly above (and as analyzed in more detail in Chapter 1), bubbles arise because of the herding of investors into particular asset classes. The economic logic behind this destructive behavior has a close analogue in the investor decision-making that drives bank runs.[43]

Financial regulation not only does too little to prevent these two forms of herding, it can actually promote them. Legal rules, such as bank capital regulations, encourage financial institutions to invest in asset classes that theoretically involve lower risk and seem more liquid. Investment grade asset-backed securities and Greek sovereign debt serve as two examples. Collective investment in these asset classes can reinforce their apparent safety and liquidity. Even if this collective investment does not create an asset price bubble, a bubble can further enhance these appearances.

Yet the herd can turn. The riskiness of these assets can spike and their liquidity can evaporate when collapsing bubbles (or even the mere fear of a bubble's collapse) trigger a stampede by financial institutions out of these market segments. Chapter 7 looks at the various facets of this herd behavior during crises, including the economics of bank runs and liquidity spirals.

Regulations can also encourage herding into liquidity – a kind of bank-run-in-reverse – by creating various legal preferences for certain asset classes. Chapter 7 analyzes how regulations, including exemptions to the U.S. Bankruptcy Code, fostered liquidity in the markets for novel financial instruments. By promoting herding into liquidity, these regulatory changes set the stage for post-modern bank runs. Chapter 7 also looks at how government bailouts – or even market-wide expectations of government bailouts – encourage herding by financial institutions. These firms understand that if they congregate into certain asset classes, the government may be unwilling to let them fail collectively because of the severe economic fallout that would result. The government may have few or no legally, politically, or economically principled ways to bail out only part of the herd and leave the rest to their fate.

This "too-correlated-to-fail" problem highlights the severe consequences of herd-promoting regulations. These regulations can exacerbate asset price bubbles and set the stage for bank runs and liquidity crises. Moreover, by prompting financial institutions to take correlated risks, they increase the susceptibility of these firms to common economic shocks and thus elevate systemic risk.[44]

In outlining and examining these five elements of the Regulatory Instability Hypothesis, the book relies heavily on models, economic and otherwise. This runs some risk of presenting the messiness of politics, markets, and laws as operating in too mechanical a manner. This risk is worth running to the extent that creating those models and stripping out some of the details leads to either testable hypotheses or at least a clearer understanding of the tectonic forces that stress financial regulation during crucial market periods.

Creating models and theories should not, however, minimize the importance of context, nuance, and deep institutional knowledge. Indeed, regulatory changes during various historical bubble periods are alike, but only when viewed at a sufficient degree of abstraction. The forms of regulatory stimulus and backlash, the problems of deteriorating legal compliance ("compliance rot"), and the strategies of regulatory arbitrage were not the same in early nineteenth century Britain and late twentieth century Japan. Rather the legal dynamics of a bubble in a given country at a given historical moment are shaped by the nature of laws, the structure of legal institutions, the roles of lawyers, and the sociopolitical and cultural environment. These contextual factors provide form to the abstract forces at work behind regulatory subsidies, regulatory backlash, non-compliance with legal rules, regulatory arbitrage…

The consequences of regulatory instability

Together and apart, the five elements of the Regulatory Instability Hypothesis paint a bleak and unnerving picture for regulating financial markets. They suggest that the risk of financial regulation failure increases at precisely the moment those regulations are most needed. These four dynamics may not be present to an equal extent in every booming market, and this book does not argue that there are iron laws to financial history. Nevertheless, the dynamics of asset booms and bubbles create powerful undercurrents with which financial regulation must contend.

The dynamics may affect legal rules in different domains of financial law: banking regulation, securities regulation, and even corporate law. However, when the Regulatory Instability Hypothesis applies to certain categories of financial regulation, concerns should be elevated. When these dynamics undermine regulations that govern the credit extended by, and the leverage of, financial regulations, they attack two critical regulatory functions. As noted above, these regulations both mitigate the magnitude of bubbles and promote the resiliency of financial institutions and markets to popped bubbles. When these regulations weaken and leverage increases, asset prices climb, as does the fragility of financial institutions and entire markets. Bubbles fed by credit and marked by highly leveraged financial institutions generate the worst crises.

Many of these same credit and leverage regulations also have a role in protecting the "safety and soundness" of financial institutions. These regulations serve a heightened purpose of mitigating systemic risk – or the risk of losses to entire markets, from which investment diversification offers little shelter.[45] Regulations governing bank liquidity and deposit insurance are also intended to mitigate systemic risk, by protecting financial institutions from liquidity shocks and the classic problem of bank runs.[46] Policymakers should then be concerned when any of the elements of the Regulatory Instability Hypothesis – regulatory subsidies (particularly deregulation and under-enforcement), compliance rot, frenzies of regulatory arbitrage, and procyclical or herd-promoting regulations – threaten to subvert systemic risk regulations. When these regulations buckle, bursting bubbles threaten to create economic chaos.

The Regulatory Instability Hypothesis therefore provides a framing device for a series of recurrent and even cyclical threats to what should be considered the overriding *ur*-purpose of financial laws: mitigating the damage to financial markets and to the "real" economy from financial crises. Asset price bubbles, which have been a persistent feature of financial history, can both spawn financial crises and subvert financial laws. The collapse of bubbles has tended to generate the most significant changes in financial laws.[47] It is not that large a leap then to say that the animating purpose of financial regulation born of crisis and bubble is – or should be – to ensure that future crises do not become severe enough to melt down capital markets and the economy, if not to prevent crises altogether.

However, lawmakers can lose sight of the forest in the trees. Attempts to address what are perceived to be the immediate causes of the last crisis or to solve particular market failures may distract from the original and overarching objective: reducing the likelihood that a financial crisis will generate widespread economic and social devastation. This *ur*-purpose of financial regulation tends to be forgotten slowly during long intermissions between financial crises. Efforts to fine-tune various securities and banking laws may lead focus to shift towards subsidiary policy goals. This change in focus, together with a tendency to exult in the ability of markets to govern themselves during prosperous economic periods, obscures the most important purpose of regulation: to protect markets and societies from the worst-of-the-worst market meltdowns. These factors may also obscure the recurrent dynamics that cause the deterioration and decay of financial laws and undermine their ability to serve this fundamental objective.

The descriptive tools and aims of this book: a preview of shadow banking

The primary objective of this book is not to generate a simple list of policy proposals. Instead, the boom aims to describe in broad brush and fine grain the challenges to financial regulation during bubbles. It looks to elaborate on the Regulatory Instability Hypothesis as a construct to organize and understand those problems. Although the focus is on law, the book looks heavily to insights from history and economics. The longest chapter of the book, Chapter 2, provides a historical background to financial regulation and fraud before, during, and after over a dozen bubble periods. The book also surveys economic research (both microeconomic and macroeconomic) on asset price bubbles and financial regulation. Still the overall focus remains on describing and examining the Regulatory Instability Hypothesis. Thus the book does not seek to match a historian's thick or comprehensive description of financial history or the econometrician's intense quantitative analysis.

In setting forth the Regulatory Instability Hypothesis, this book of course discusses the Panic of 2007–2008. However, it does not seek to provide a soup-to-nuts account of that crisis; bookstores are already crowded with texts that attempt to do just that.[48] Rather it situates the Panic in a larger historical and

economic context and uses elements of the current crisis to illustrate the components of the Regulatory Instability Hypothesis.

One facet of the current crisis bears particular mention now. In various places, the book analyzes the growth over the last two decades of the so-called "shadow banking system" and how that system contributed to the Panic of 2007–2008. Part IV of the book describes the shadow banking system in great detail. However, a simple definition should suffice for this introduction: the shadow banking system describes a web of complex financial instruments that connected household and corporate borrowers to investors in capital markets.[49] These instruments included asset-backed securities (securitization), asset-backed commercial paper, money market mutual funds, repurchase agreements, and credit derivatives.

Securitization created one of the most important arteries in this system. It funneled credit from capital markets to households and businesses and transferred credit risk in the opposite direction. Securitization describes a transaction in which mortgages or other loans are pooled together and sold to an investment vehicle. The vehicle purchases these assets with the proceeds of securities it issues to investors (called "asset-backed securities"). The future cash payments on the underlying mortgages and loans fund (and provide collateral for) the payments to investors on those securities.[50]

This system or network of financial instruments is called "shadow banking" because it constructs a bypass around the traditional banking system, in which banks borrow money from depositors and lend to consumers and businesses. Like banks, the shadow banking system provided an important source of credit in the economy, but it offered some theoretical advantages to the model of traditional deposit-taking banks. Traditional banks face the problem of having highly illiquid and long-term assets (mortgages and loans with maturities far in the future), but short-term liabilities (given that depositors often have the right to withdraw their funds on demand). This mismatch, combined with the fact that banks earn profits by lending out most of the money they take in from depositors, leaves banks vulnerable to bank runs. In a run, depositors flock to withdraw their funds, fearing either that the bank will suffer huge losses or that other depositors will withdraw first and leave the cupboard bare.[51] Highly illiquid assets like loans means that banks also can suffer from heavy and long-lasting concentrations of risk to certain types of borrowers or certain geographic areas.[52]

Securitization offered to solve these problems for banks and other lenders by allowing them to make loans and then sell them to an investment vehicle in a securitization. Banks thus offload illiquid assets and risk, and receive cash, which they can redeploy in making new loans. Investors purchasing asset-backed securities gain because they can participate, indirectly, in lucrative loan markets, while limiting their exposure to just a sliver of the risk from a pool of loans. The pooling of loans provides further diversification. Moreover, the investment vehicle often issues multiple classes or categories of securities to customize the level of risk and reward for individual investors. Different classes of securities would have different rights (or priorities on payment) to the cash streams from

the underlying assets.[53] By linking capital markets to borrowers, shadow banking allowed the credit risk of loans to be spread widely and efficiently (at least theoretically). This lowered the borrowing costs for households and businesses.[54]

Note how often the paragraph above makes the "theoretically" qualification. As this book will sketch out in Part IV, the shadow banking system broke down in the Panic of 2007–2008. Its failure demonstrated that this system was actually subject to many of the same economic risks as traditional banking, while subject to far fewer regulatory safeguards. Perversely, a system designed to solve banking risks and evade banking laws came to suffer from a banking crisis. Even more perversely, the crisis prompted the government to use many of the same tools it uses to address banking crises to save the shadow banking system. Shadow markets thus enjoyed the cake – being free from bank regulations – and got to eat it too – enjoying the benefits of bank-style government rescue.

The analysis of the shadow banking system in Part IV provides a master class in the Regulatory Instability Hypothesis. This system has its origins in deregulation and regulatory subsidies granted to particular financial markets and institutions.[55] It flourished and its individual constituent financial markets fused together because of regulatory arbitrage.[56] Indeed, in the later years of the U.S. real estate bubble, just before the Panic of 2007–2008 struck, some economists argue that the explosive growth of shadow banking markets was propelled primarily by financial institutions purchasing financial instruments to game bank capital regulations and dramatically increase and camouflage their leverage.[57]

In these late stages, an epidemic of law-bending and law-breaking erupted throughout the system – from abuses by subprime mortgage lenders to the aggressive masking of leverage by financial institutions such as Lehman Brothers.[58] During this period, regulators failed to aggressively enforce consumer laws.[59] Moreover, policymakers actively encouraged institutions to invest more in the riskiest sectors of the shadow banking system. For example, legislators and regulators pushed mortgage giants Freddie Mac and Fannie Mae (and those giants lobbied hard to be allowed) to purchase subprime mortgages and subprime-related mortgage-backed securities.[60] Regulations encouraged U.S. and European financial institutions to herd into the same supposedly safe and liquid financial markets, including investment grade asset-backed securities and asset-backed commercial paper, repos, and money market mutual funds.[61] Moreover, economic studies indicate that financial institutions used the shadow banking system to increase their leverage at the same time, putting in motion a dangerously procyclical leverage cycle.[62]

All the dynamics of the Regulatory Instability Hypothesis were thus at work in the shadow banking system. Ominously, these dynamics worked against the most crucial kinds of financial regulations: legal rules governing financial institution lending, leverage, and systemic risk. These dynamics fueled the growth of shadow banking and the inflation of the real estate bubble. They also set the stage for economic catastrophe.

Disconcertingly, in the years leading up to the Panic of 2007–2008, regulators and the Federal Reserve seem to have missed the larger implications of the rise

of the shadow banking system. They realized that individual markets for shadow instruments were flourishing, but they failed to see how the pieces fit together to create a system that rivaled the size of the traditional banking sector. They missed the monetary effects of shadow banking. In fact, the Federal Reserve chose to stop monitoring a broader measure of the money supply just when it would have signaled the alarm (perhaps not coincidentally this was approximately the same moment when economists believe regulatory arbitrage via shadow banking skyrocketed).[63]

They of course, also failed to perceive the way financial laws governing financial institutions and markets were deteriorating. They paid little heed to the dangers framed by the Regulatory Instability Hypothesis: cycles of regulatory stimulus, compliance rot, regulatory arbitrage, and procyclical and herd-promoting regulations.

The prescriptive aims: towards robust financial regulation

The bulk of this book is descriptive, on the theory that "a problem well put is half-solved."[64] However, Part IV and the conclusion venture into the realm of policy prescription. They consider what architects of financial regulation could and should do in light of bubbles and the Regulatory Instability Hypothesis. Recommending regulatory changes after arguing that very ancient, powerful, and recurrent phenomena undermine regulation is, to understate the case massively, a daunting task.

The prescriptive elements of this book attempt to navigate between twin myths: a Scylla that law can do nothing about asset price bubbles and the Charybdis that law can abolish bubbles. The first myth may have several variants. One version sees bubbles as simple products of irrational investors. The moral of this myth is that there is little law can do to remedy human folly and that attempts to do after the fact may only provide insurance to gamblers.[65]

If it would be error to say there is nothing that law can do about asset price bubbles, it would also be a grave mistake to assume they can do too much. Financial regulation can neither abolish nor prevent financial crises altogether; history has shown that both bubbles[66] and financial crises[67] more generally are remarkably robust phenomenon. They have formed with regularity throughout financial history in countries with different cultures, forms of government, and regulatory architectures. Bubbles have also proven remarkably resilient in economic experiments conducted in simulated bond markets.[68] Thus the objective of financial regulation should not be to eradicate bubbles, let alone to eliminate business cycles.

Instead, the objectives should be more modest: to reduce the incidence and severity of bubbles or, moreover, to mitigate their effects of financial markets. A regulatory redesign would focus on shoring up financial laws against fraud and law-breaking. It would aim to make households, financial institutions, and markets more resilient to the bursting of bubbles.

To meet these objectives, the book's conclusion explores ways to make financial regulation more robust in the face of asset price bubbles and to contribute less to the development of those speculative booms. This means confronting the five elements of the Regulatory Instability Hypothesis head-on by designing regulations and institutions that:

- *withstand political pressures* as the regulatory stimulus cycle turns and the tide rolls against policymakers preserving and vigorously interpreting and enforcing financial laws;
- *promote and reinforce compliance* in the face of bubble pressures that undermine obedience by market participants with critical legal rules;
- *manage and adapt to regulatory arbitrage* and ensure that policymakers keep pace with financial innovations and evolving markets and treat similar economic risks similarly;
- *reduce procyclicality and promote counter cyclicality in regulations*; and
- *reduce incentives for financial institutions to engage in dangerous herding* and mitigate correlated risk-taking among financial institutions.

Economists often debate whether central banks can address potential asset price bubbles as they develop by adjusting monetary policy to "lean into" the economic wind.[69] The final chapters ask whether legal rules can do the same. Can policymakers adjust financial regulations – or create regulations that adjust automatically – to adapt when the climate for financial law harshens as financial markets begin to bubble? A very loose analogy might be drawn between creating adaptive regulations that adjust to bubbles and the economic objectives of Keynesianism. The comparison is, however, inexact. This book does not propose using financial regulations to smooth business cycles, nor does it examine the right and wrong ways to manage financial crises.

The concluding chapter emphasizes not so much changing the substance of financial regulation, as it does rethinking the design of regulatory institutions. How can institutions be redesigned to make them resilient to economic and political pressures that thwart effective financial regulation? How can regulators be given the capacities and incentives to adapt legal rules to bubble periods? Here the tension between the different models that explain regulatory failure – rational, behavioral, and norms/ideologies – comes to the fore. For example, rational models may call for increasing carrots and sticks to market participants and policymakers. Yet this approach may undermine efforts to cultivate norms and the intrinsic motivations of legal actors.

The concluding chapter also returns to another of the book's core themes: the regulatory problems created by various powerful feedback loops. It examines whether this feedback could be dampened by decoupling political, regulatory, and economic cycles. The linkages among these cycles pose the greatest dangers when they affect regulations that govern the lending and leverage of financial institutions. Part IV and the conclusion of this book therefore examine how financial regulation and monetary policy might be better integrated. One of the core

lessons of those parts is that simply knowing and communicating the extent to which regulations deteriorate during bubbles and the microeconomic and macroeconomic impact of that deterioration would represent significant advances.

Achieving simpler and more modest goals may be challenging enough. Indeed, the Regulatory Instability Hypothesis may inject the reader with a strong dose of fatalism. It may leave her or him skeptical that any laws that attempt to ameliorate bubbles or their effects will be counterproductive, rolled back, or rendered ineffective. If most of the book bears witness to the cyclical failings of financial regulation, the conclusion looks to provide at least some balm from Gilead.

The Regulatory Instability Hypothesis and fundamental value

Both the prescriptive and descriptive aims of this book must confront a standard objection to scholarship on asset price bubbles, namely that it is difficult to identify bubbles in hindsight, let alone to identify them *in media res.* Indeed, several prominent economists have questioned whether some of the more prominent historical episodes identified as bubbles could in fact be explained by the fundamental values of assets.[70] Identifying bubbles as they develop requires determining that prices cannot be justified by future cash flows. The inherent uncertainty of this determination has led many macroeconomists, including Ben Bernanke (while he was still an economist at Princeton and before his apotheosis to the U.S. Federal Reserve Chairmanship) to argue against using monetary policy to curb inflation in financial markets.[71]

As the work of a legal scholar, this book will add little to the ability of economists to measure the fundamental value of assets. However, the problem of measuring fundamental value with precision poses a serious threat to neither the descriptive nor the prescriptive parts of this book for several reasons. First, many macroeconomists and central bankers are more comfortable than Chairman Bernanke that central banks can and should use monetary policy to curb the threat of inflation in asset markets affecting the macro economy.[72] The Panic of 2007–2008 may have tipped the scales in the debate towards this more activist, anti-bubble view, as heads of central banks in Europe[73] and Canada[74] have warmed to using monetary policy in this way.[75] These economists believe central bankers can exercise judgment as to whether prices in a particular market constitute a bubble or are otherwise justified by economic fundamentals.[76]

To be sure, exercising judgment in determining whether a bubble has formed presents its own set of challenges both for central bankers, as well as for the banking and securities regulators who are more the focus of this book. Judgment as to when markets are overheating – and when the elements of the Financial Instability Hypothesis pose particular dangers – requires that regulators have considerable capacities. They would need among other things, new training, sophisticated economic data and models, and financial resources. Moreover, regulators must be able to withstand the political pressure that would work against

strenuous regulation during boom times. Modern macroeconomics also provides the insight that market expectations of future economic conditions and future policy changes matter.[77] Regulatory changes may be frustrated when they fly in the face of those expectations and markets doubt the resoluteness of policymakers. None of these challenges to the exercise of judgment by regulators are, however, insurmountable.

Second, a lack of certainty as to when bubbles form may not pose the dire economic consequences that the Bernanke camp fears should financial regulators attempt to adjust to market bubbles. Chairman Bernanke argued that using traditional monetary policy to raise or lower overall market interest rates to curb potential asset price bubbles created significant spillover costs.[78] For example, raising interest rates to dampen what may be a bubbly stock market would also act to dampen investment in real estate markets that might not be overheating. Higher interest rates might also impact labor markets, currency exchange rates, foreign trade, and a host of other sectors. Bernanke famously labeled this use of monetary policy as "surgery with a sledgehammer."[79]

However vivid this metaphor may be, it should not obscure that many financial regulations can target credit and leverage flowing into asset markets (which Bernanke concedes can feed bubbles) more surgically than broad brush monetary policy tools. Chapter 9 will explain how various financial regulations can restrict credit flowing into particular asset markets. Moreover, even if financial regulations are not used as monetary policy levers, it is important to understand how regulatory changes can have unintended monetary effects. The roll back, underenforcement, compliance rot, or other weakening of these regulations may have significant macroeconomic consequences and contribute to asset price inflation. Chapter 9 and Part IV examine more closely the nexus between regulations governing financial institution lending and leverage and monetary conditions.

Furthermore, this sledgehammer critique does not strike at the prescriptive aims of this book. Again, this book is principally engaged with the effectiveness of financial regulations. It does not focus on using regulations to eradicate or pop bubbles. Accordingly, the spillover effects that rightly trouble Bernanke pose less of a concern when policymakers look to fix microeconomic regulations rather than to set macroeconomic policy. More modest goals and less dire spillover costs require less certainty as to whether a bubble exists.

Third, many of the most important dynamics of the Regulatory Instability Hypothesis do not strictly depend on whether asset prices have risen above fundamental value. Therefore, it is not necessary to determine fundamental value to determine when these dynamics are at work in a booming market. Measuring fundamental value does not present a prerequisite to developing policies that address the Regulatory Instability Hypothesis. Indeed, the models outlined in the following chapters explain the dynamics of the Regulatory Instability Hypothesis not by reference to fundamental values, but rather to other factors at work during prolonged market booms. A combination of booming prices, investor herding, behavioral biases, and shifting norms and ideologies cause the deterioration and decay of financial regulation. For example, deteriorating enforcement

by regulatory agencies during booms can stem from regulators becoming overwhelmed as transaction volumes rise while their budgets remain flat. Booms may change regulator behavior by exacerbating disaster myopia and other behavioral biases or by reinforcing shifts in social norms, in each case, *regardless of whether or not market prices exceeded fundamental value*.

In many cases, the same causal factors that may contribute to the formation of a bubble may also drive regulatory failures. It is more important to draw a causal connection between these factors and regulatory failure than to find a causal relationship between a bubble (and the relationship between asset prices and fundamental value) and regulation. Consider deregulation and the regulatory stimulus cycle during a period of surging prices in the financial markets. Surging markets may give financial institutions more resources to lobby for deregulation, contribute to the disaster myopia of regulators, and overwhelm the resources of even vigilant regulators. Similarly, compliance with financial regulations may deteriorate, as sustained price booms undermine the deterrent effect of liability rules and weaken norms of compliance. All of these regulatory failures can occur even if there is a debate among economists on whether a bubble has formed according to a strict economic definition.

Even if it is at times difficult to see the precise mechanisms that subvert financial regulation during booms, it is easier to see many of the troubling consequences. Policymakers can measure increased financial institution leverage (even though financial institutions make efforts to cloak this). Policymakers can track (albeit imperfectly) alleged violations of the law and the development of regulatory arbitrage structures (although care must be taken in attempting to measure law-breaking and compare it across historical periods). Policymakers can use historical market data to see when financial institutions are engaging in procyclical behavior and when they are herding into particular asset classes.

If describing the problem does not require certainty as to fundamental value, neither would prescribing and analyzing remedies for the dynamics of the Regulatory Instability Hypothesis. For example, addressing the decreased incentives and resources of financial regulators to regulate during prolonged booms would not require a determination of fundamental value. Even simple solutions, such as increasing regulator budgets during boom times, might advance the cause.

None of this suggests that rethinking regulatory design in the face of the Regulatory Instability Hypothesis does not require empirical data or good economic modeling. Yet neither does it suggest that mending and reinvigorating regulatory institutions requires answering one of economics' most contentious questions, namely "how do we measure the fundamental value of assets."

A roadmap to the chapters that follow

The following provides a brief overview of the structure of this book.

Part I provides background for the remainder of the book by discussing the economics and legal history of asset price bubbles. Chapter 1 discusses how asset price bubbles have been defined in the economic literature and the

problems with those definitions. The first chapter outlines the most influential economic research on how bubbles form. Chapter 2 examines the legal history of over a dozen asset price bubbles over 300 years and across several continents. This chapter does not aim to provide a comprehensive or colorful history of each episode – other books have already done that – but, instead, focus on certain aspects in each of these bubbles. The chapter looks at the regulatory stimulus cycle at work in each of these historical episodes, i.e., how governments provided regulatory stimulus as bubbles inflated, as well as the regulatory backlash after they popped. Chapter 2 also describes the prevalence of financial fraud and other law-breaking during each bubble studied.

Part II of the book then unpacks the Regulatory Instability Hypothesis. Chapter 3 provides three models – one rational, one behavioral, and one based on shifting ideologies and social norms – to explain the political economy of this regulatory stimulus cycle. Chapter 4 examines the causes of outbreaks of fraud epidemics during bubbles. It uses three similar models to explain first how bubbles undermine compliance with antifraud rules and then how they subvert obedience by financial institutions with prudential banking regulations. Chapter 5 extends this analysis to explain increasing regulatory arbitrage during bubbles. Chapter 5 also provides a case study of regulatory capital arbitrage.

If previous chapters attempted to isolate elements of the Regulatory Instability Hypothesis, Chapter 6 argues that they can also provide virulent feedback for one another. That chapter provides a model of how deregulation/regulatory subsidies and regulatory arbitrage can trigger or reinforce one another. It then looks at how this model explains the legal dynamics during the real estate bubbles in Sweden and Japan in the 1980s. It also considers whether this model sheds light on certain aspects of the U.S. subprime bubble, particularly the interactions between Freddie Mac and Fannie Mae on the one hand, and "private label" securitization, on the other.

Chapter 7 explores the final two elements of the Regulatory Instability Hypothesis. It analyzes procyclical regulations. It then looks in greater depth at the problem of herd behavior during asset price bubbles, and examines the connections between the economics of bubbles and bank runs. Chapter 7 then investigates how certain regulations and government interventions promote herding by financial institutions.

Part III of the book analyzes whether regulations can be used to fight asset price bubbles. Chapter 8 examines evidence of the effectiveness of various legal rules and policies in preventing or pricking bubbles or dampening their magnitude. This chapter sifts through evidence from experimental economics, particularly experimental asset markets (a kind of simulated bond market used to conduct economic experiments).

Chapter 9 evaluates one category of anti-bubble laws that appears to be the most effective in preventing, pricking, and dampening bubbles: those that constrict the flow of credit to financial markets. In doing so, this chapter also outlines the deep connections between certain regulations of financial institutions and markets, on the one hand, and monetary policy, on the other. Regulations

that affect financial institution leverage and regulatory preferences that allow certain financial instruments to take on more of the economic characteristics of money can have enormous monetary and macroeconomic effects.

Part IV then fits the pieces of the book together to show how they help explain one pivotal factor behind the Panic of 2007–2008, the rise of the shadow banking system. Chapter 10 provides a primer on the shadow banking system and its component markets for financial instruments. Chapter 11 then describes how the Regulatory Instability Hypothesis helps explain the origins and phenomenal growth of shadow banking. It also examines how this burgeoning parallel credit sector facilitated regulatory arbitrage, law-breaking, and procyclical and herd behavior by financial institutions.

As there are no precise cookbooks for financial regulation in light of bubbles, the concluding chapter examines the cooks. It proposes ways in which to give regulators and policymakers the capacities and incentives to resist the political pressure of the regulatory cycle to deregulate and dial down enforcement during boom times. It recommends measures to ensure that regulators keep pace with law-breaking and regulatory arbitrage. It examines fixes for procyclical and herd-promoting regulations. The last chapter thus addresses one of the least-explored questions in the wake of the Panic of 2007–2008 – not whether regulators need new tools, but how should we design legal institutions to ensure that regulators appropriately use the powers at their disposal. More broadly: how should legal institutions be designed so that law retains its force when it is most needed?

Notes

1 I chose this label to harken back to Hyman Minsky's Financial Instability Hypothesis, which models how financial markets are prone to booms and crashes. Hyman P. Minsky, *Can "It" Happen Again? Essays on Instability and Finance* (1982, M.E. Sharpe).

2 This colorful term reflects the fact that the crisis assumed full force over these two years as credit markets started to seize up and mammoth financial institutions began to founder. This term should not, however, distract from the fact that the crisis had roots far earlier than that year and, unfortunately, has continuing effects that will last long after.

3 For short versions of this story told by economists in popular books, see, e.g., Raghuram G. Rajan, *Fault Lines: How Hidden Fractures Still Threaten the World Economy*, 32–45 (2010, Princeton University Press) (describing expansion of subprime mortgage market in the United States); Nouriel Roubini and Stephen Mihm, *Crisis Economics: A Crash Course in the Future of Finance*, 18–19 (2010, Penguin).

4 For an account of the impact of the collapse of the U.S. mortgage-backed securities markets on European financial institutions, see Dalvinder Singh, U.K. Approach to Financial Crisis Management, 19 *Transnational Law and Contemporary Problems* 872 (2012).

5 Mark Landler, Housing Woes in U.S. Spread Around Globe, *New York Times*, April 14, 2008, at A1.

6 Cesar Bacani, Is a China Stock Bubble Forming? *Time*, July 1, 2009 (online edition) available at www.time.com/time/world/article/0,8599,1908032,00.html (last visited July 12, 2013).

7 Chris Isidore, Is China Another Real Estate Bubble? *CNN Money*, April 15, 2010 available at http://money.cnn.com/2010/04/15/news/economy/china_bubble/ (last visited July 12, 2013).

8 Robert Lenzner, Gold is the Ultimate Asset Bubble, Forbes.com, March 12, 2010 available at www.forbes.com/2010/03/12/soros-paulson-novagold-markets-gold-bubble.html (last visited July 12, 2013).

9 Katrina Nicholas, "Man on Street" Bond Buyers Signal Bubble, Credit Agricole Says, *Bloomberg Businessweek*, September 10, 2010 (online edition) available at www.bloomberg.com/news/2010-08-27/-man-on-street-buying-bonds-may-signal-price-bubble-credit-agricole-says.html (last visited July 12, 2013).

10 Joseph Marr Cronin and Howard E. Horton, Will Higher Education Be the Next Bubble to Burst? *Chronicle of Higher Education*, May 22, 2009, at 56.

11 Some of the classics in the economics field include: Charles P. Kindleberger, *Manias, Panics, and Crashes* (4th ed. 2000, John Wiley & Sons) (providing a non-quantitative, narrative economic analysis of historical bubbles); Minsky, *supra* note 1 (presenting non-quantitative theoretical models of the formation of bubbles and financial crises). For a more modern, quantitative analysis of bubbles that builds on this older generation of work, see Andrei Shleifer, *Inefficient Markets: An Introduction to Behavioral Finance*, 154–74 (2000, Oxford University Press). For another technical economic work, see Markus K. Brunnermeier, *Asset Pricing under Asymmetric Information* (2001, Oxford University Press). For a more accessible, popular book on bubbles by a prominent economist, see Robert J. Shiller, *Irrational Exuberance* (2000, Princeton University Press). For one older, non-scholarly collection of bubble histories, see Charles MacKay, *Extraordinary Popular Delusions and the Madness of Crowds* (1980 [1841], Crown Trade Paperbacks).

12 See, e.g., Robert P. Flood and Peter M. Garber, Market Fundamentals Versus Price-Level Bubbles: The First Tests, 88 *Journal of Political Economy* 745, 746 (1980); Henry T.C. Hu, Faith and Magic: Investor Beliefs and Government Neutrality, 78 *Texas Law Review* 777, 794 (2000). At times, economists have expanded this basic definition to include a proposed reason that asset prices diverge from their fundamental values. Markus K. Brunnermeier, Bubbles, in *The New Palgrave Dictionary of Economics*, 578 (Steven N. Durlauf and Lawrence E. Blume eds., 2nd ed. 2008, Palgrave Macmillan) ("Bubbles refer to asset prices that exceed an asset's fundamental value because current owners believe that they can resell the asset at an even higher price in the future").

The definition of a bubble as a divergence in market prices from fundamental value has several advantages over a simpler definition used by other historians and economists. For example, one study defined a bubble as "an upward price movement over an extended range that then implodes." Kindleberger, *supra* note 11, at 16. Although this simpler definition captures the intuitive shape of a bubble, it fails to single out any causal explanation for the rise and crash of prices and thus cannot generate any testable hypotheses or predictions.

Of course, defining bubbles as a deviation in asset prices from fundamental value leads to secondary questions of whether *any* divergence constitutes a bubble or whether prices must diverge to a pronounced extent and for a prolonged period.

13 See, e.g., Ellen R. McGrattan and Edward C. Prescott, Testing for Stock Market Overvaluation/Undervaluation, in *Asset-Price Bubbles: The Implications for Monetary, Regulatory, and International Policies*, 271 (William C. Hunter, George G. Kaufman, and Michael Pomerleano eds., 2003, MIT Press). One alternative to defining fundamental value in terms of future cash flows is to say that the best guess as to fundamental value is whatever the market price is. That tautology would make it impossible for prices ever to be "wrong."

14 Chapters 1, 7, and 9 and Part IV of this book examine the links between asset price bubbles and banking in greater detail.

15 For an overview of behavioral finance, see Nicholas Barberis and Richard Thaler, A Survey of Behavioral Finance, in *1B Handbook of the Economics of Finance*, 1054 (George M. Constantinides, Milton Harris, and René M. Stulz, eds., 2003, Elsevier North Holland).

16 E.g., Shleifer, *supra* note 11, at 10–12. The Efficient Market Hypothesis is described in Chapter 1, notes 18, 34–5 and accompanying text.

17 Kindleberger, *supra* note 11; Minsky, *supra* note 1.

18 Shleifer, *supra* note 11, at 154–74.

19 For the classic economic article that models bank runs, see Douglas W. Diamond and Philip H. Dybvig, Bank Runs, Deposit Insurance, and Liquidity, 91 *Journal of Political Economy* 401 (1983).

20 The dangers for money managers when they bet against a bubble are discussed in greater detail in Chapter 1. See also Markus K. Brunnermeier and Stefan Nagel, Hedge Funds and the Technology Bubble, 59 *Journal of Finance* 2013, 2030–2 (2004) (providing an example of a hedge fund that was forced to liquidate after refusing to invest in technology stocks during the late 1990s technology stock bubble and consequently losing investors).

21 See e.g., Ana Fostel and John Geanakoplos, Leverage Cycles and the Anxious Economy, 98 *American Economic Review* 1211 (2008); John Geanakoplos, The Leverage Cycle, Cowles Found, *Discussion Paper No. 1715* (July 31, 2009) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1441943 (last visited July 12, 2013).

22 Tobias Adrian and Hyun Song Shin, The Changing Nature of Financial Intermediation and the Financial Crisis, *Federal Reserve Bank of New York Staff Report No. 439* (March 2010).

23 Credit, leverage, and their contributions to bubbles are the subjects of Chapter 9 of this book. Leverage entices investors because of its near magical ability to magnify returns to equity holders. Of course, leverage also magnifies their potential losses. Investors can lose far more than their initial investment should market prices stagnate and asset returns cannot keep pace with the interest rate payments they owe to their lenders.

24 For an explanation of how leverage can increase liquidity in markets and the effective money supply in the economy, see Tobias Adrian and Hyun Song Shin, Liquidity and Leverage, 19 *Journal of Financial Intermediation* 418 (2009) [hereinafter, Adrian and Shin, Liquidity and Leverage]; Tobias Adrian and Hyun Song Shin, Money, Liquidity and Monetary Policy, 99 *American Economic Review* 600 (2009) [hereinafter, Adrian and Shin, Money, Liquidity and Monetary Policy]; Margaret M. Blair, Financial Innovation, Leverage, Bubbles, and the Distribution of Income, 30 *Review of Banking and Financial Law* 225 (2010).

To understand the basics, consider that financial institutions are in the business of borrowing money and then re-lending it at higher rates. These firms only keep a fraction of their total assets in reserve to cover their obligations to their creditors. They lend the remainder (a business model commonly known as "fractional reserve banking"). A financial institution may re-lend a portion of any money it borrows to another financial institution. That recipient financial institution may, in turn, re-lend again. This process creates a multiplier effect in which the initial dollar loaned may turn into many dollars.

Similarly, any investor or financial institution increasing leverage can increase the total amount of liquidity (or the supply of money) available to purchase assets. Liquidity also increases to the extent that the leverage of one financial institution is layered on top of the leverage of another. Greater liquidity chasing the same assets tends to push the prices of those assets higher. This mechanism clangs sharply into reverse and liquidity contracts when leverage is reduced. See Blair, *supra* this note. Chapter 9 of this book analyzes the economic links between credit, leverage, and asset

price bubbles in greater detail. Chapters 9, 10, and 11 explain how various financial regulations that directly and indirectly regulate credit and leverage by financial institutions play vital, if overlooked, roles in exacerbating or mitigating asset price bubbles.

25 See Geanakoplos, *supra* note 21; sources *supra* note 24; see also Chapter 9, "Dangerous feedback: when the Regulatory Instability Hypothesis matters most," Chapter 10, "Banking risks," and Chapter 11, "The Regulatory Instability Hypothesis and a perfect storm."

26 Asli Demirgüç, Enrica Detragiache, and Poonam Gupta, Inside the Crisis: An Empirical Analysis of Banking Systems in Distress, *World Bank Policy Research Paper 2431* (2000) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=237651 (last visited July 12, 2013); Vasudevan Sundararajan and J.T. Tomás Baliño eds., *Banking Crises: Cases and Issues* (1991, IMF). See also Carmen M. Reinhart and Kenneth S. Rogoff, *This Time is Different: Eight Centuries of Financial Folly*, 141–73 (2009, Princeton University Press) (providing data on historical banking crises).

27 Ben S. Bernanke, *Essays on the Great Depression*, 41–69 (2004, Princeton University Press).

28 See Geanakoplos, *supra* note 21; sources, *supra* note 24.

29 Shleifer, *supra* note 11, at 154–74.

30 These various strands of economic research should not be understood as attempting to demolish the Efficient Markets Hypothesis or neoclassical macroeconomics. The thrust of behavioral economics is not to demonstrate that markets fail to work efficiently all the time, but instead to understand the instances when they do not. It is those instances, when markets experience profound bouts of disequilibrium, which should concern financial regulators the most.

31 See generally Stuart Banner, What Causes New Securities Regulation? 300 Years of Evidence, 75 *Washington University Law Quarterly* 849, 850 (1997); Joseph A. Grundfest, Commentary: Punctuated Equilibria in the Evolution of United States Securities Regulation, 8 *Stanford Journal of Law, Business and Finance* 1 (2002) (describing how capital market events stimulate regulation "between relatively tranquil periods of common law interpretation"); Larry E. Ribstein, Commentary: Bubble Laws, 40 *Houston Law Review* 77, 77–8 (2003) (describing a historic cycle of stock market bubbles inflating then bursting, followed by increased regulation).

32 There is, however, one obscure recent exception. Section 946 of the Dodd-Frank Act requires the Financial Stability Oversight Council to conduct a study on new rules in that statute that require the originators of loans in asset-backed securities transactions to retain part of the risk of those loans. The study must address whether these rules might have "macroeconomic effects" including "minimizing real estate price bubbles."

33 Dodd-Frank Wall Street Reform and Consumer Protection Act (Public Law No. 111–205) [Hereinafter "Dodd-Frank Act"].

34 The desire to protect consumers after the subprime crisis animated Dodd-Frank Act's controversial creation of a new Bureau of Consumer Financial Protection within the Federal Reserve Board. Dodd-Frank Act, §§ 1001 et seq. The following law review article is widely considered to have created the intellectual foundations for this consumer financial regulator: Oren Bar-Gill and Elizabeth Warren, Making Credit Safer, 157 *University of Pennsylvania Law Review* 1 (2008). See also Dodd-Frank Act, §§ 1400 et seq. (creating new regime for regulation of residential mortgage loans).

35 Dodd-Frank Act, Title VII, Subtitle A.

36 Dodd-Frank Act, §§ 951–7.

37 For a critical view of the notion that deregulation caused the current financial crisis, see Mark A. Calabria, Did Deregulation Cause the Financial Crisis? 31 *Cato Policy Report* 1 (July/August 2009).

38 Chapter 5 argues that financial institutions view regulatory capital requirements as form of tax. Higher taxes encourage these institutions to devise structures (regulatory arbitrage) to minimize their tax rates. Chapter 5, "Capital requirements as regulatory tax." See also David Jones, Emerging Problems with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues, 24 *Journal of Banking and Finance* 35, 38–9 (2000).
39 Fostering a more expansive, nuanced, and sociological view of law and legal system is one of the central objectives of the law and society movement. See Lawrence M. Friedman, The Law and Society Movement, 38 *Stanford Law Review* 763 (1986). For an early, contemporaneous introduction to the much earlier Legal Realism school, see Lon L. Fuller, American Legal Realism, 82 *University of Pennsylvania Law Review* 429 (1934).
40 See Geoffrey P. Miller, The Role of a Central Bank in a Bubble Economy, 18 *Cardozo Law Review* 1053, 1076–7 (1996) (describing political pressures operating against a central bank taking active measures against a bubble).
41 Jack M. Guttentag and Richard J. Herring, Disaster Myopia in International Banking, 3–4 *Working Paper*, Princeton University International Finance Section (1986).
42 The following example and discussion borrows from the following: Jaime Caruana, Banking Provisions and Asset Price Bubbles, in *Asset-Price Bubbles: The Implications for Monetary, Regulatory, and International Policies*, 537 (William C. Hunter, George G. Kaufman, and Michael Pomerleano eds., 2003, MIT Press); see also Jeffrey Carmichael and Neil Esho, Asset Price Bubbles and Prudential Regulation, in *Asset-Price Bubbles: The Implications for Monetary, Regulatory, and International Policies*, 481, 495–7 (William C. Hunter, George G. Kaufman, and Michael Pomerleano eds., 2003, MIT Press).
43 Diamond and Dybvig, *supra* note 19.
44 See Chapter 7, "Financial institution herding and homogeneity."
45 George G. Kaufman and Kenneth E. Scott, What is Systemic Risk, and Do Bank Regulators Retard or Contribute to It? 7 *Independent Review* 371, 371 (2003); see also Steven L. Schwarcz, Systemic Risk, 97 *Georgetown Law Journal* 193 (2008).
46 Chapter 7 "Legal preferences for financial instruments and trading liquidity."
47 *Supra* note 31, and accompanying text.
48 See e.g., Roubini and Mihm, *supra* note 3.
49 Gary Gorton and Andrew Metrick, Regulating the Shadow Banking System, *Brookings Papers Economic Activity*, 261 (Fall 2010).
50 Erik F. Gerding, Code, Crash, and Open Source: The Outsourcing of Financial Regulation to Risk Models and the Global Financial Crisis, 84 *Washington Law Review* 127, 147–9 (2009).
51 See Diamond and Dybvig, *supra* note 19.
52 See generally Frank J. Fabozzi, *Bond Portolio Management*, 491 (2nd ed. 2001, John Wiley & Sons) (describing concentration risk).
53 Gerding, *supra* note 50, at 149.
54 See generally Ronald J. Gilson and Charles K. Whitehead, Deconstructing Equity: Public Ownership, Agency Costs, and Complete Capital Markets, 108 *Columbia Law Review* 231 (2008).
55 Chapter 11, "Regulatory stimulus and the legal origins of the shadow banking system."
56 Chapter 11, "Regulatory capital arbitrage revisited."
57 Chapter 11, notes 95–102 and accompanying text.
58 Chapter 11, "Law-bending and breaking along the securitization pipeline."
59 Chapter 11, notes 92–3 and accompanying text.
60 Chapter 6, "Securitization and the U.S. subprime crisis."
61 Chapter 7, "How financial regulation contributes to investment herding."
62 Chapter 11, "Money: the emergence of a shadow monetary transmission belt, financial regulation, and herding."

63 Chapter 9, "The gathering storm," and Chapter 11, "A shadow monetary transmission belt."

64 John Dewey, The Pattern of Inquiry, in *Logic: Theory of Inquiry*, reprinted in John Dewey, *The Later Works: 1925–1953, Vol. 12: 1938*, 112 (Jo Ann Boydston ed., 1st ed. 1986, Southern Illinois University).

65 This view seems to have animated some judicial opinions during the wave of securities litigation after the 1990s technology stock bubble. As a case in point, see the opinion of Lewis Pollack, one of the more respected securities law experts then on the federal bench, in the following case: *In re Merrill Lynch & Co., Inc.: Research Reports Securities Litigation*, 273 F. Supp. 2d 351 (S.D.N.Y. 2003).

The flip side of the current media obsession with bubbles is to view the current crisis as a historical aberration, a 100-year storm, or a "black swan" event. This last metaphor has suffered a rhetorical hijacking and has been used to justify the impossibility of the private and public sectors to perceive the growing risk of financial meltdown. It is worthy of note that 100-year storms tend to occur much more often than once a century.

66 Kindleberger, *supra* note 11.

67 Reinhart and Rogoff, *supra* note 26.

68 Erik F. Gerding, Laws Against Bubbles: An Experimental-Asset-Market Approach to Analyzing Financial Regulation, 2007 *Wisconsin Law Review* 977 (2007).

69 See Chapter 9 of this book.

70 Peter M. Garber, *Famous First Bubbles* (2000, MIT Press) (arguing that price rises and crashes in the Tulipomania in Holland in 1637 and the Mississippi and South Sea bubbles in early eighteenth century France and England, respectively, can be explained by fundamental value of the assets that were traded). For a critique of Garber's analysis, see Edward Chancellor, *Devil take the Hindmost: A History of Financial Speculation*, 23–6 (1999, Plume Books).

See also McGrattan and Prescott, *supra* note 13, at 273 (arguing that the stock market was undervalued in 1929); Lubos Pástor and Pietro Veronesi, Was There a Nasdaq Bubble in the Late 1990s? University of Chicago Center for Research in Security Prices, *Working Paper No. 557* (2004) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=557061 (last visited July 12, 2013) (arguing that bubbles may not have existed in the 1920s and 1990s).

71 E.g., Ben Bernanke and Mark Gertler, Monetary Policy and Asset Price Volatility, in *New Challenges for Monetary Policy: Proceedings of the Federal Reserve Bank of Kansas City*, 77 (1999, Federal Reserve Bank of Kansas City).

72 See, e.g., Stephen G. Cecchetti, Hans Genberg, and Sushil Wadhwani, Asset Prices in a Flexible Inflation Targeting Framework, in *Asset-Price Bubbles: The Implications for Monetary, Regulatory, and International Policies*, 427 (William C. Hunter, George G. Kaufman, and Michael Pomerleano eds., 2003, MIT Press) (arguing that monetary policy should take into account asset price "misalignments").

73 Andrew Mountford, Leaning into the Wind: A Structural VAR Investigation of UK Monetary Policy, 67 *Oxford Bulletin of Economics and Statistics* 597 (2005).

74 Mark Carney, Governor of the Bank of Canada, Some Considerations on Using Monetary Policy to Stabilize Economic Activity, Remarks for Federal Reserve Bank of Kansas City Symposium, Jackson Hole, Wyoming (August 22, 2009) available at www.kansascityfed.org/publicat/sympos/2009/papers/carney.08.22.09.pdf (last visited July 12, 2013).

75 Chapter 9 outlines the arguments of the anti-bubble camp in more detail. The arguments of macroeconomists in favor of using monetary policy to target bubbles breaks into several parts. First, booming prices in a particular asset class may send a warning signal about the risk of inflation in the entire economy. Steven G. Cecchetti, Hans Genberg, John Lipsky, and Sushil Wadhwani, *Asset Prices and Central Bank Policy*, 8–9 (2001, International Center for Monetary and Banking Studies/Centre for

Economic Policy Research). Second, the risk that a collapsed bubble poses to a country's financial stability justifies taking action even in the face of spillover costs and potential uncertainty as to whether booming prices represent a bubble. Claudio E.V. Borio and Phillip W. Lowe, Asset Prices, Financial and Monetary Stability: Exploring the Nexus, *BIS Working Paper No. 114* (July 2002) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=846305 (last visited July 12, 2013).

76 William C. Dudley, President, Federal Reserve Bank of New York, Remarks at the Eighth Annual BIS Conference, Basel, Switzerland (July 3, 2009) available at www.newyorkfed.org/newsevents/speeches/2009/dud090702.html (last visited July 12, 2013).

77 See generally George W. Evans and Sepp Honkapohia, *Learning and Expectations in Macroeconomics*, 5–18 (2001, Princeton University Press) (discussing role of expectations and learning in macroeconomics).

78 Bernanke and Gertler, *supra* note 71.

79 Governor Ben S. Bernanke, Asset Price "Bubbles" and Monetary Policy, Remarks at the New York Chapter of the National Association for Business Economics, New York, New York (October 15, 2002) available at www.federalreserve.gov/BoardDocs/Speeches/2002/20021015/default.htm (last visited July 12, 2013).