Testimony of Sidney G. Winter

Submitted to the Congress of the United States, House Science and Technology Committee

July 20, 2010

Mr. Chairman and members of the Committee, this hearing explores some fundamental and relatively neglected questions related to the recent financial crisis, and I am pleased and honored to be asked to participate.

My name is Sidney Winter. I am the Deloitte and Touche Professor of Management, Emeritus, at The Wharton School of the University of Pennsylvania, where I spent 15 years in the Management Department. I am trained as an economist, and I previously was a tenured faculty member in two economics departments, those of Yale University (13 years) and the University of Michigan (8). One of my central roles there was to teach microeconomic theory at the PhD level. Between Yale and Wharton, I spent four years as the Chief Economist of what was then called the U.S. General Accounting Office (now the U.S. Government Accountability Office).

One of the reasons that I wound up in a management department is that it offered me a more supportive environment for my kind of research, which is more concerned than is the economics discipline with the realities of business behavior, and of organizational behavior generally. It should be clear that my background and research do not qualify me as any sort of macroeconomist, theoretical or applied. What I offer here is a different perspective, which I hope the Committee will find useful in the context of this hearing.

The concern of this hearing, the shortcomings of the DSGE model, represents the tip of a very large iceberg, an iceberg which comprises almost all model-building and theorizing in the discipline, both macroeconomic and microeconomic. A distinctive feature of economics among the sciences is the degree to which most economists, especially most theoretical economists, are oblivious to behavioral realities at the levels of the fundamental units of the complex system they study.

In absolute number, there are many dissenters from that dominant view, and much constructive work is done from different viewpoints. I will take note of some it later on. One can reasonably argue that a slow trend has favored the dissenters for a few decades now. Relatively speaking, however, the dissenters are still few and their aggregate research effort is a fraction of what the mainstream tradition mounts, especially in core, policy-relevant domains like macroeconomics and public finance. Relative to the mainstream, the dissenters do not get much attention, and do not carry much weight.

I was asked to discuss "what is left out" of the dominant DSGE model. All theories must leave out almost everything, since the idea of theory is to try to tell the truth while not aspiring to telling the *whole* truth – because the latter ambition is hubris-ridden and ultimately counterproductive. But DSGE is an extreme case of the tendency to analyze hyper-stylized versions of economic problems, thereby suppressing or denying quite observable realities. In the DSGE case, the suppressed realities include the fact that economic actors are diverse and have diverse interests. Like many other economists, I would argue that the divergence of interests is one fundamental source of the difficulty society has in settling on good rules for the economic game. Macroeconomic dysfunctions like financial crises and involuntary unemployment are among the problems that good rules could help prevent – but for our difficulties in agreeing on enforceable ones. On this view, representing the macroeconomic problem as one confronting a single optimizing actor is an approach that is off target from the start.[1]

It is useful to think of economic models as parables. True, the great teachers of history did not typically use mathematical notation when they used a parable to get a point across. Putting aside the notation issue, and also the level of professed concern with logical consistency, there are strong parallels between

[1] To be fair, the economy-as-single-actor approach does have its own substantial history in the discipline, as illustrated by discussions of hypothetically perfect central planning.

what those teachers sought to do and what economic modelers seek to do. The objective is not to tell "the whole truth," but to get the point across. "When you think about this complex world we live in, or about how to get to heaven as your next stop, you might find it helpful keep this in mind: (insert parable here)"

Robert Solow put this very well when in characterizing his own approach to economic theory:

> "My general preference is for small, transparent, tailored models, often partial equilibrium, usually aimed at understanding some little piece of the (macro)-economic mechanism." (Solow 2008).

Arguably, almost all of what economic theorists "know" today about how the economy works can reasonably be thought of as a string of logically tight parables, some with a degree of empirical grounding, many not. The DSGE model is consistent with this broad approach to understanding the economy, but stands out for the ambitious scope of its subject matter, as well as for its high commitment to analyzing the optimal behavior of a single, fictitious type of actor.

Thus, if improving the model is the problem, the challenge is to locate the zone where there is an interesting case for an incremental adjustment, identifying specific things that should be in but are now excluded. However, in my view, improving the model is not the only thing that deserves attention. We should really be talking about how to organize ourselves to meet the real needs for economic policy guidance.

I attempt three things in this testimony. First, I will point to a piece of economic reality that was fundamental to the recent financial crisis but was not reflected in the DSGE model or in any macroeconomic model I know of. Second, I will suggest the difficulties and prospects of getting this piece of reality reflected in the models. Third, I will expand on the need to extend the quest for policy guidance beyond models and their improvement.

Building Toward Crisis: The Insidious Evolution of the U.S. Mortgage Market

The reality I speak of is the process by which the residential mortgage business evolved into a system where, when the loans were being made, *nobody really cared* whether the loans were going to be repaid. This meant not attending carefully to the credit-worthiness of borrowers, and not seriously appraising the collateral. These practices developed slowly, driven by familiar considerations of self-interest and opportunity, with attendant thoughtful advocacy – until in the end, traditional lenders, with traditional incentives, had almost gone extinct as an economic species. Those who remained presumably still cared, but they were largely replaced by new species of players who, collectively, lost track of the problem of loan quality. At least some of those new players suffered great financial losses as a consequence of their errors, but the losses inflicted on the taxpayers and society as a whole were, and continue to be, much larger.

That is a pretty shocking thing to happen in an economy in which self-interest is regarded as a fundamental, and generally constructive, guiding force. It may be particularly shocking to economic theorists, because it beautifully illustrates a type of behavioral reality that most theorists tend to deny, since it seems so sharply at odds with conventional, oversimplified, images of economic rationality. What, lenders didn't care about loan repayment? Most theorists would be so sure it couldn't happen that they wouldn't bother to check.

This insidious transformation happened "sensibly," at least until quite a late stage (Jacobides 2005). Private sector actors responded to incentives in a largely familiar way, though with an unusually strong component of "financial innovation." (While we tend instinctively to celebrate "innovation," it should be remembered that "innovative" often means "untested and hazardous.") Government authorities and other observers commented on some of these developments, and there was some questioning and some level of warning was heard. Authoritative figures, however, largely pronounced the developments to be acceptable or even benign. (See for example (Greenspan 2002).)

What was involved in the evolutionary transformation that brought us to a regime where "the lender doesn't care"? It is a complex question for which I can only sketch an answer. Though there are some

gaps, many of the relevant facts are well known by now. There remains in any case the problem of putting the facts in the required order to help make sense of the crisis, and that is what I attempt here.

To unravel this complex story, it is simplest and also immediately instructive to start with the role of the mortgage broker. The broker is effectively an "out-sourced" sales arm for financial institutions that originate mortgages, i.e., that advance the money in the context of the actual sale of a property. The mortgage broker role did not always exist; the job of finding and hand-holding mortgage customers was formerly a task for employees of the financial institution that made the loan. Brokers became particularly important to mortgage banks, non-depository financial institutions that originated mortgage loans and financed them through the capital markets. As of 1988, brokers were involved in about 10% of loan originations by mortgage banks. There was a jump to about 35% by 1991, partly because troubled savings and loan institutions were cutting payrolls in the context of an industry crisis. Released sales employees became independent contractors, initially for former employers, but ultimately performed the brokerage function in a wider market. By 1999 the broker-mediated fraction was over 60% and has remained at similarly high levels since. (Jacobides 2005).[2]

Like most brokers, a mortgage broker is paid on commission, a percentage of the value of the deal. Once the deal is done – meaning the financing arranged and the house purchase closed – the broker takes a commission and leaves that scene and looks to facilitate another deal. This means that the direct self-interest of the broker is to facilitate deals and collect commissions, and the quality of the collateral and the probability of repayment do not enter into that directly. In this sense, it is clear that the broker "doesn't care" – at least in his or her assigned theoretical role as a self-interested economic agent. (But is the mortgage broker "the lender"? Clearly not. We will look further for a true lender, one who might still have cared, even in the world with mortgage brokers.)

This is a huge example of what economists call an "agency problem" – the agent may not have the interest of the principal at heart. The solution to the agency problem, if it is not available in the incentives, is in controls. Mortgage applications typically involve the completion of a lot of forms that are supposed to provide whatever assurance is reasonably available about the collateral and the creditworthiness of the borrower. From the viewpoint of the broker, the problem is to get these forms completed, and *completed in essentially reassuring ways*, so the financing can be arranged and the commission can be collected. And that indeed was what happened, at least until a late stage when even the nominal defenses of loan quality crumbled and documentation-light loans became commonplace – all the way to the extreme of the NINJA loan. ("No Income, Job or Assets"). To interpret the evolution as a whole, it is important first to understand that if something was going to resist the degradation of loan quality, it emphatically was not the incentives operating on mortgage brokers.

We come next to the originator, the financial institution that initially advances the money. If the originator were going to hold the loan, there would be an incentive to actually read those forms describing the loan and assess the prospects of repayment. Here is where "mortgage backed securities" (MBS) and the "originate and sell" business model enter the story. Many originators made money by becoming, in effect, another kind of broker – taking a cut but not holding a continuing interest, or very little. They forwarded the mortgages to Wall Street firms, who packaged them into MBS. Thus the originator did not retain an interest in the asset and, like the broker, had little direct incentive to be concerned with loan quality. If the forms that accompanied the application were supposed to defeat the obvious agency problem at the broker level, we confront the question of who had the incentive to actually attend to that information. Under the "originate and sell" model, the originator is not that party. In fact, intense local competition among originators often deflected managerial attention away from loan quality and toward the increase in volume.

The securitization of mortgages is an important financial innovation. It has a substantial history that can for present purposes, be dated from its introduction in the 1970s by the government sponsored

[2] An institution that used its employees in the sales function rather than brokers would have superior opportunities to control loan quality, but might choose to exert control in the "wrong direction" – a possibility dramatically illustrated in the case of Washington Mutual, which not only complemented its thrift business with a mortgage bank, but allowed the risky practices of securitized loans to become the norm in the rest of the organization, as the recent Senate hearings demonstrated.

enterprises (GSEs), Ginnie Mae, Fannie Mae and Freddie Mac. Initially, the loans themselves were made under governmental loan guarantee programs (FHA, VA). That constraint was subsequently relaxed, and private sector securitizers, mostly investment banks, followed the governmental lead. All of this was widely celebrated for its benign effects on housing finance, even by some conservative economists who credited the government leadership with reducing informational imperfections in the market. As the bubble peaked in 2006, private sector securitization activity had risen above 40% of total securitization As the crisis broke 2007-2008, it collapsed. Overall, securitization played an increasing role in the mortgage finance system over the long period, as Table 1 indicates.

The economic rationale of securitization is based on the reduction of investment risk through diversification and the related capacity to raise housing finance through the capital markets rather than individual financial institutions. Because individual borrowers face diverse circumstances affecting repayment, it is possible to improve things by pooling risks and offering an investor the opportunity to invest, in effect, in the average performance of the pool. The economic logic is sound, provided certain conditions hold. Unfortunately, the "certain conditions" are not very certain at all, if by that one means that it is objectively easy to determine the degree to which they obtain. One condition is that the repayment histories of individual loans do not respond too much to the causal factors they inevitably share, such as influences on the general level of housing prices. Another is that the quality of loans in MBS pools remains uncorrupted by the feedback from the securitization itself. That feedback includes not only a reduced incentive to look carefully at individual loans, but also the learning of self-interested agents about the exploitable weak spots in the control system. (The latter parallels a problem commonly noted in the context of government regulation: Both public and private "regulators" have trouble staying ahead in their games with the "regulatees.")

In the end, of course, somebody has to be putting money at risk to finance mortgage lending. It does not follow, however, that these individuals or organizations are in a position to provide a secure anchor for the chain of agency problems, effectively insisting that everybody down the line to the mortgage broker has an eye on loan quality. We can indeed locate, in the history of the crisis, some people who seemingly had the "right incentives" and some of them should, in retrospect, have been more careful. Nevertheless, most of them are best called *investors* rather than lenders, because the actual apparatus of loan-making was very far removed from them. In effect, the parties who put up the money mostly had an investor interest comparable to that of a typical stock market investor, a role which generally does not entail delving into the question of whether, for example, corporate management is making a good decision about the location of the next plant the company builds. Similarly, investors in MBS and related derivatives did not delve into the quality of the actual mortgage loans behind those securities.

Their institutional distance from the action left most investors poorly positioned to make good investment choices, and in many cases – such as ordinary people with their retirement money invested through funds of various kinds – they did not remotely have practical incentives to attack the very large problem of understanding where their money went. The big investors did not fare that much better, for they did not get a lot of help with understanding what was happening to their money. Their perceived "needs" – to invest their money at a good return – were met by waves of financial innovation that took the form of ever-more complex repackaging of underlying mortgage debt, plus new ways to place bets for or against particular securities.[3] This process made the information gulf widen until, it appears, it even swallowed some of the parties who were creating it.

In sum: Between the investors, large and small, and the mortgage originators, there were first the securitizers and then other institutional actors who might possibly have played a role in maintaining attention to loan quality – but didn't. In these layers, the story became complex and even exotic, ultimately taking leave of the domain of "sensible" economic motivation.

While much of this detail can be left aside, it is important to take specific note of the role of the rating agencies. These for-profit organizations exercised quasi-governmental authority by virtue of regulatory requirements restricting insurance companies, pension funds and other significant institutional investors

[3] Varying levels of detail about collateralized debt obligations (CDOs), synthetic CDOs credit default swaps (CDSs), tranches and the like are available from sources at varying levels of readability. One good source is (Pozen 2009). For the highly readable version, see (Lewis 2010).

to invest only in "investment grade" securities – a determination left to designated rating agencies. These agencies, however, were customers of the securitizers. They naturally tended to have "customer satisfaction" at heart, as any respectable for-profit actor in a market economy tends to do. Like the mortgage broker role, the customer orientation of rating agencies toward issuers was not always a feature of the system. Here again we note the role of institutional evolution: The rating agencies used to have investors as their customers, not issuers. The very important change of the business model occurred in the early 1970s. (See (White 2009) on the evolution of the rating agencies.)[4]

In retrospect, it appears that the rating agencies took customer satisfaction a good deal too seriously. Their ratings, and the related regulatory restrictions on investments, served to sustain the demand for MBS and related derivatives in the face of disastrous weakness in the underlying loans, with extremely adverse consequences for investors in the U.S. and around the world.[5]

We can thus explain how the insidious transformation happened, how there gradually evolved a mortgage lending system that had lost track of the loan quality issue. Traditional mortgage lenders with traditional incentives became an endangered species as a consequence of a series of incremental changes in institutions and industry architecture, and hence in the operative incentives. Many of those changes were of a readily identifiable, datable kind, or were marked by measurable trends. Mortgage borrowers, and "lending" as an activity concretely manifested at real estate closings, became far separated from the investors who had the ultimate stake in loan principal. In that gap there evolved layer upon layer of related business practices that seemed to "work" in the prevailing context. Like most such practices, they were retained while they worked, or perhaps a bit longer.

It remains for me to place the business practices of the residential mortgage sector in context among the candidate causes of the crisis. One can find on the website of the Financial Crisis Inquiry Commission a list of the 22 topics and substantive areas of concern to the Commission, all of which can plausibly be colored as contributing "causes" of the crisis. Undoubtedly, it was a complex event, with numerous factors involved. Assigning weights among multiple causes of a complex event is intrinsically a difficult thing to do, and no one has a credible claim to having sorted this one out completely.

If, however, we examine the *aspects that distinguish this event from other historical episodes of bubble-and-crisis*, it is very clear that residential mortgages and the practices related to them were central to the distinctive features of THIS crisis – and to where the bailout money went. The collapse of Bear Stearns, Lehman, AIG and others largely resulted from practices related to mortgages and derived securities. While excessive leveraging of investments in those securities was a major factor, the risks of leverage depend in general on the resistance to price decline presented by the leveraged assets. Thus, when the fundamental weakness of the mortgage-related assets became apparent, the havoc wrecked by the excessive leverage was all the more extreme. Further back along the causal chain, laxity in underwriting practices not only produced the loans that underpinned flawed securities, but contributed to the housing bubble in a manner similar to the role played by low interest rates – a causal factor strongly emphasized by some economists (e.g., (Taylor 2009)). Because loans were made that shouldn't have been made,

[4] The importance of that change as a factor in the crisis is challenged by some who emphasize the overwhelming levels of demand for the securities, itself the result of other factors. Charles Calomiris points to the role of asset managers looking for yield on behalf of their clients – and afflicted by yet another agency problem inherent in the way they were rewarded (Calomiris 2008). Ultimately, it might be difficult to disentangle the underlying strength of demand from the influence of obfuscation and misrepresentation. An accurate forecast of the events of September 2008 certainly would have discouraged a lot of demand.

[5] See Michael Lewis's best-selling book, *The Big Short*, for particularly vivid testimony on the character and behavior of the rating agencies, as well as other matters. While academic norms should discourage me from citing a popular journalistic book as "evidence," I see a lot of face validity in this testimony. Hence, if there is genuine disagreement on its factual accuracy, it seems that it would be useful for somebody to orchestrate an orderly confrontation on whatever is said to be disputable. There are several excellent books on the origin of the crisis to which the same remark applies.

there was more demand for houses than there should have been, leading to higher prices, and thus more home equity to borrow against, further delaying the day of reckoning.[6]

To assess the "cause" of the crisis *without* reference to mortgage-related business practices would seem to be a bold exercise in hypothetical history. However sound and factual such an account might be with respect to interest rates, asset bubbles, speculative psychology and other matters, it has a weak claim to being about the Financial Crisis of 2008. Without the mortgage-related practices, there might still have been a crisis at some point, but it would not have been much like the Financial Crisis of 2008. It might also have been a lot less severe, and thus more in line with several previous crises in U.S. financial markets.

Does the Residential Mortgage Sector Belong in Macroeconomics?

Is the foregoing story about things that macroeconomic theory should or could make room for? The housing bubble, the financial crisis and the great recession are major macroeconomic events and ones with a clear (though partial) basis in long-maintained economic behavior patterns of private sector actors. The events were not basically "shocks" from technology or misguided public policies, though both of those did play a role.[7] Given the importance of the events and their sources in economic behavior, it might seem that there is a presumption that the relevant mechanisms do "belong in the model."

Yet, it is hard to imagine that much of the story that I have summarized here is eligible for inclusion in macroeconomic theory as we conventionally understand it. Deferring my discussion of the broader implications of that conclusion, I accept for the moment the conventional framing where progress is achieved through the accumulation of parables -- partial models that each illuminates some little piece of the economic mechanism.

In that perspective, there remains abundant opportunity to improve macroeconomics by adding realism to the characterization of the problems faced by the different sorts of economic actors. Though not favored in the DSGE camp, this line has been vigorously pursued for a long time.[8] There is a wide range of possibilities as to how exactly one goes about this; they differ particularly in the degree to which they seek to reconcile realism with a standing commitment to the traditional theoretical tools of optimization analysis.

In my view, the best path to further progress of this general kind is to develop models that are more securely grounded in an appreciation of the behavioral phenomena at the micro-levels -- business firms and organizations, as well as individuals and households. By "grounded in an appreciation," I mean, "attentive to the available evidence on the phenomena and prepared to concede it presumptive validity." I emphatically do *not* mean that it is possible to avoid the trouble of thoughtful theorizing by somehow "copying" observed behavior directly into a model.

With respect to individuals and to a lesser extent households, there has been much progress of this kind in recent years. In their recent book, (Akerlof and Shiller 2009) review a number of areas where insights from behavioral research, combined with more conventional economic research greatly illuminate issues of macroeconomic significance – e.g., the origins of involuntary unemployment, saving behavior, and the role of speculative psychology. (As noted above, both speculative psychology and more considered

---

[6] For many homeowners, the threatened "reckoning" involved upward adjustments in mortgage interest rates on adjustable rate mortgages – with the result that the continued affordability of the mortgage was dependent on a continuing increase in the price of the house, generating equity that could be borrowed to pay the higher interest..

[7] Neither can the collapse be attributed to the occurrence of some highly improbable event, which however was more probable than previously expected because the relevant probability distributions had "fat tails." Recognition of the empirical importance of fat-tailed distributions is long overdue, and was effectively promoted by (Taleb 2007). But fat-tailed distributions have little to do with the crisis. What happened was an extended process of "more of the same, only worse" --- until in the end there was too much of the same, and it was much worse, and the system collapsed. It seems that Taleb emphatically agrees; see http://www.fooledbyrandomness.com/imbeciles.htm.

[8] I participated myself in one significant effort of that general kind (Phelps 1970).

speculative motives undoubtedly played a role in the housing bubble, but perhaps were less central to the eventual collapse than is sometimes suggested.) Behavioral understanding has been furthered by experimental economics and by the work of the small band of researchers following the recently-opened paths to grounding behavioral understanding in human neurophysiology.

With respect to business firms and organizations, however, mainstream economics has shown little tendency to reach a *modus vivendi* with relevant lines of research, even to the limited extent that this is done with respect to behavioral research at the individual level. A basic fact is omitted from the mainstream models. Where there are plausible ways of dealing with this troublesome fact that are available from heterodox economic approaches, management and organization studies, and other social science disciplines, these opportunities tend to be ignored by the mainstream discipline.

The basic fact is that, in almost all real decision situations, neither the nature of the decision problem nor the list of available options is presented at the start with anything like the clarity posited in a mainstream model. Problems have to be discovered and framed; options have to be invented and designed. Consequently, it is far from the case that a mere optimization calculation (given some criterion) is all that separates the actor from a good decision – as mainstream modeling practice suggests. In the cases where this generalization does not hold – and there are important examples – the reason it does not hold is that the hard work has already been done in the past, and the power of systematic optimization techniques can readily be accessed to produce actionable results. Of course, that investment of "hard work" was itself an application of human ingenuity, and it may be flawed. The optimization may yield the right answer to quite the wrong problem, or fall short because of implementation difficulties within a frame that is basically sound.

The manifestations of the omitted fact are diverse, being quite different in the domain of high-level strategic decisions than they are in, say, pricing and inventory control in a department store or supermarket. Empirical behavioral research at the strategic level is often hampered by problems of access, and definitive results are also elusive because of the fog of uncertainty and complexity that is typical at that level. Lower in the hierarchy, however, the opportunities for observation and understanding by researchers are much greater.

It has been understood for a very long time that decisions about things like hiring, production techniques, output levels and pricing – the things featured in the economics texts as what firms decide about -- are often not the subject of high-level managerial attention on a continuing basis (see. e.g., (Gordon 1948) or (Cyert and March 1963)). At least, they are not handled that way in the large organizations that account for the bulk of economic activity. It could hardly be otherwise, for there are just too many such decisions to be made.

Of necessity, and for a variety of specific reasons, firms commit for extended periods of time to systematic ways of doing things, including ways of making the "decisions" classically featured in the textbooks. These systematic ways often involve specialized equipment and personnel – computers and software, engineers and HR managers, for example. (Note that the personnel in these roles are "agents" as distinguished from principals, and incentives are not necessarily well aligned.) This decision apparatus is just as much an intermediate-term "given" in a typical firm as the plant and equipment is; it is open to reconsideration, but only over time and as the occasions warrant. For example, as noted previously, savings and loan institutions embraced the mortgage broker system initially in the context of crisis, as a cost control measure – not because it was identified as an "optimal" way to market mortgages. Once they had it in place, they stuck with it, it evolved on its own, and it seemed to succeed. In the financial markets, programmed trading provides an extreme example of the reality of systemization and automation in domains that economic theory treats as (intelligent? human?) "decisions".

To explore this basic reality, we need instructive models based on "business practice" –an idea that does not appear in any mainstream economic theory text that I know about. Other keywords to look for in the index would include habits, skills, organizational routines, organizational capabilities, business systems, business processes. Such terms are commonplace in the discourse about business problems *outside* of economics, but all seem to be virtually absent from the economics texts. This is probably because they are in some ways at odds with the theorist's standard assumption that businesses reliably get the *right answer* to the problems they face, As illustrated in the evolution of the mortgage market, business practices can produce social outcomes very different from those anticipated in standard theory

While extending the theoretical parables in the "business practice" direction would be helpful, it remains true that parables are by nature limited in aspiration and effectiveness relative to the challenge of understanding the mechanism as a whole. The mechanism as a whole is a complex system with many tightly interconnected parts, and fragmentary analytical models are as unlikely to illuminate it fully as they would be for a commercial airliner. You would not want to take the inaugural flight in a new type of airliner where the relevant experts explained merely that they believed they understood isolated fragments of its mechanism. But that is the sort of flight the whole U.S. economy took with its "new" mortgage market.

The residential mortgage system is far more complex than the DSGE model represents the economy as a whole to be. The DSGE model does not contain even a rudimentary representation of the financial sector at the level of the "IS-LM" model that has long been a staple of the macroeconomics textbooks, much less a reflection of the richer representations of asset markets and financial intermediation to be found in the broader research traditions of macroeconomic theory and financial economics. The DSGE economy cannot be brought low by the behavior of its brokers and bankers, because it doesn't have any.

In the world of contemporary practical affairs, and on into many branches of pure science, extremely complex systems are effectively managed by complex organizations that seek to leave nothing to chance. Many of these systems are of extraordinary reliability – though we are recently reminded that big disasters can happen. This reliability is an accomplishment of social organization as much as it is of technology, and it involves effective integration of many different specialized skills and partial understandings. Although the stakes involved in macroeconomic policy management are much higher than in, say, space exploration, the ambition to surmount the challenge of complexity appears to be largely missing.[9]

I argue, therefore, that we are a long way from being able to understand the economy and generate macroeconomic policy guidance at a level commensurate with the stakes. The parables approach is constructive, and it can be more helpful in the future, but it is not adequate to the task. The discussion of the mortgage market and its role in the crisis suggests that it will be very difficult to correct this situation while staying within the frame of "improving the model."

Meeting the Needs for Policy Guidance

I return to my suggestion that we may need to look beyond the models and theories, and beyond academic economics as practiced now, to find the kinds of adjustments that are fundamentally needed and appropriate.

There are, to begin with, issues about research funding and allocation, in particular, about the scale and character of projects that deserve public support. To devote more attention to how the system's pieces fit together, as well as to what the pieces actually amount to in behavioral terms, we need research projects at a larger scale than has been typical. We also need intense and sensible (i.e., not theory-blinded) attention to economic phenomena. And we need these things on a continuing basis, enabling the tracking of the actual evolution of the system.

A panel of experts convened by the Pew Foundation commented as follows on the collective failure of the regulatory agencies to do that sort of tracking in the years leading up to the crisis:

> "The crisis revealed both gaps in regulation and unanticipated interconnections among different types of financial institutions and markets. Yet no one was charged with understanding these interconnections, looking for gaps, detecting early signs of systemic threats and acting to mitigate them. During the years preceding the crisis, no regulator

[9] I must leave aside discussion of the applied side of macroeconomics represented by the econometric forecasting models. Although those models represent a higher ambition in terms of addressing the complexity of the system by assembling understanding of the pieces, the crisis of 2008 demonstrated that , for them too, far too much was evidently left out of the model. In particular, the dramatic events in the financial markets in the fall of 2008 were not significantly reflected in model forecasts by December 2008 – there was only a continuation of a year-long trend toward a more pessimistic view of 2009 (as shown in the changing "Blue Chip consensus").

> was tasked with monitoring and understanding the overall health of institutions and markets and the connections between them across the entire breadth of the financial system. Nor was any regulator charged with taking the lead in responding to any early signs of systemic risks. So, for example, several years ago there were widely recognized signs of unusual credit expansion and increases in leverage associated with an unprecedented rise in housing prices. These developments signaled the beginning of a bubble with the potential to destabilize the entire system. No action by any government agency was taken to address this." (Pew 2009)

I argue that the economics discipline was complicit to a degree in this regulatory shortfall, since the task of "monitoring and understanding the overall health of institutions and markets and the connections between them across the entire breadth of the financial system" is certainly one in which economists should be productively involved, but the prevailing research orientations of the discipline do little to support the development of competence at such an ambitious level. To improve the situation, change is needed not only in the regulatory agencies, but in academe. The two change agendas are inevitably closely related.

Given the highly individualistic way that economic research is organized in universities, the regulatory agencies may in fact be the most promising place to organize research of requisite scale and continuity. Given that the new financial reform legislation implies broadened responsibilities for the Federal Reserve, as well as the creation of a new Federal Stability Oversight Council, it may be an opportune time to reconsider the channels by which economic research can usefully inform policy and practice at the federal level.

This suggestion, however, begs a number of important questions about the training, recruiting, pay and supervision of the government economists who might participate in such initiatives. The universities will continue to play the central role in the training of new economists and in doing so they will continue to impart an image of what is desirable in terms of style and focus in economic research. If, as I argue, some adjustment in style and focus is needed, then some of that adjustment must happen in universities or it will not happen at all. Beyond that, the universities compete with the government in the market for talent, and thereby constrain what agencies can do. My own impression is that the academic research model is more influential than it should be among economists in government, given that the latter should be oriented toward different objectives. My own experience tells me that this can be hard to resist, given the relative pay scales and the role of the promised job content in the recruiting process.

Especially in the market for well trained economists from the elite universities, there is a tendency to use the job perquisite of "research freedom" as a recruiting feature. In practice, this may often mean freedom to try to lay the groundwork for a possible future career in academe, and such "freedom" entails acceptance in the short term of the research orientations of academe. Elsewhere in the government, such as among young lawyers in the Antitrust Division of DOJ, the use of government employment as a career stepping-stone seems to produce acceptable results at a relatively low cost. While the stepping-stone system is not necessarily a bad one in principle, I think it works relatively poorly for economists. The divergence in job content is too great, and would become even greater if my suggested reorientations should come to pass. This again underscores the need for some change on the academic side if there is to be any prospect of significant change overall.

One way or another, we need to make sure that adequate intellectual resources are applied to the task of understanding what is happening in the economy, as opposed to what is happening in the models. Those seeking that understanding must draw on the valuable body of knowledge that mainstream economics has accumulated, but also on much broader sources. Historical perspective is particularly important. In the domain of modeling, we need more models that seek to capture systematic behavioral tendencies *as they are*, and *then* assess the implied outcomes in terms of service to private and social interests, rather than committing fully to the "right answer" framework at the outset.

Once again, I thank the Committee for the opportunity to appear here today, and for your attention.

Table 1: US Home Mortgage Origination
(Billions of dollars)
Source: Inside MBS & ABS

Year	Total MBS Issuance *(Dollars in Billions)*	Total Mortgage Origination *(Dollars in Billions)*	% Securitized
1990	259	458	56.6%
1991	317	562	56.5%
1992	545	894	60.9%
1993	667	1,020	65.4%
1994	422	773	54.6%
1995	318	639	49.8%
1996	440	785	56.1%
1997	487	860	56.6%
1998	929	1,450	64.1%
1999	833	1,310	63.6%
2000	615	1,048	58.7%
2001	1,355	2,215	61.2%
2002	1,856	2,885	64.3%
2003	2,716	3,945	68.9%
2004	1,881	2,920	64.4%
2005	2,156	3,120	69.1%
2006	2,045	2,980	68.6%
2007	1,865	2,430	76.7%
2008	1,227	1,500	81.8%
2009	1,785	1,815	98.4%

References

Akerlof, G. A. and R. J. Shiller (2009). Animal Spirits: How Human Psychology Drives the Economy and Why It Matters for Global Capitalism. Princeton, Princeton University Press.

Calomiris, C. W. (2008). The subprime crisis: What's old, what's new, and what's next. Maintaining Stability in a Changing Financial System. Kansas City, MO, Federal Reserve Bank of Kansas City.

Cyert, R. M. and J. G. March (1963). A Behavioral Theory of the Firm. Englewood Cliffs, NJ, Prentice-Hall.

Gordon, R. A. (1948). "Short period price determination in theory and practice." American Economic Review **38**: 265-288.

Greenspan, A. (2002). International financial risk management: Remarks before the Council on Foreign Relations, November 19, 2002. Washington, Federal Reserve Board.

Jacobides, M. (2005). "Industry change through vertical disintegration: How and why markets emerged in mortgage banking." Academy of Management Journal **48**: 465-498.

Lewis, M. (2010). The Big Short: Inside the Doomsday Machine. New York, Norton.

Pew (2009). Principles on Financial Reform: A Bipartisan Policy Statement. T. F. o. F. Reform, Pew Charitable Trusts.

Phelps, E. S. (1970). Microeconomic Foundations of Employment and Inflation Theory. New York, Norton.

Pozen, R. C. (2009). Too Big to Save? How to Fix the U.S. Financial System. Hoboken, NJ, Wiley.

Solow, R. M. (2008). "Comments: The state of macroeconomics." Journal of Economic Perspectives **22**(Winter 2008): 243-246.

Taleb, N. N. (2007). The Black Swan: The Impact of the Highly Improbable. New York, Random House.

Taylor, J. B. (2009). Getting Off Track: How Government Actions and Interventions Caused, Prolonged and Worsened the Financial Crisis. Stanford, CA, Hoover Institution Press.

White, L. J. (2009). A brief history of credit rating agencies: How financial regulation entrenched this industry's role in the subprime mortgage debacle of 2007-2008. Mercatus on Policy, No. 59, Mercatus Center, George Mason University.