Sucker Punched by the Invisible Hand*

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*This title is a play on Gorton's 2010 book Slapped in the Face by the Invisible Hand. The punch delivered by the financial crisis was certainly more than a slap and its rapid spread across the developed world was certainly unexpected and not well understood. A version of this paper was presented at the Center for the Study of Social Organization at Princeton University, April 2011 and the Annual Meetings of the American Sociological Association, Denver, Co., August 2012. The paper was also presented at the Scandinavian Sociological Association Annual Conference as part of a keynote address and the European Sociological Association. We would like to acknowledge the helpful comments of these audiences. We would also like to acknowledge the comments of Adam Goldstein and anonymous reviewers.

Abstract

The worldwide financial crisis of 2007-2010 was set off by the collapse of the subprime mortgage market in the U.S. This crisis caused widespread banking failure in the U.S. and forced the federal government to provide a massive bailout to the financial sector. The crisis simultaneously reverberated to banks around the world, and eventually brought about a worldwide recession. This paper documents why Western European countries were so susceptible to the housing price downturn. We explore various mechanisms by which the financial crisis might have spread including the existence of similar regulatory schemes, government deficits and current account imbalances, export connectedness, and the presence of a housing bubble. We present a surprising result: European banks went down because they had joined the market in the U.S. for mortgage backed securities and funded them by borrowing in the asset backed commercial paper market. They were pursuing the same strategies to make profit as the American banks, and when the housing market turned down, they suffered the same fate as their U.S. counterparts. Our study makes a broader theoretical point suggesting that subsequent studies of global finance and financial markets need to know something about the identities and strategies of the banks that structure the main markets for different products. This insight has implications for the literatures on financialization, globalization, and the sociology of finance.

Introduction

Home sales in the United States began to fall in 2006 and defaults on subprime mortgages began to increase. Beginning in 2007, this rising wave of defaults spread to the wider mortgage market. These events undermined the large banks that were heavily invested in mortgage origination, mortgage securitization, and the buying and selling of mortgage-backed securities (MBS) and instruments based on those securities, collateralized debt obligations (CDOs) (for an account of these events, see Fligstein and Goldstein, 2010). The banks themselves began to fail in the spring of 2008 and this caused a financial panic. Eerily, this panic hit large foreign banks at the same time. By one count, 23 countries experienced a systemic bank crisis by the end of 2009 (Laeven and Valencia, 2010). These crises were followed by a deep and long-lasting recession.

There are two unusual features of this financial crisis. First, the crisis started in the U.S. While the U.S. has not been immune to financial crises in the postwar era (Kauffman, 2010), they have tended to be localized and mostly contained. For example, the savings and loan crisis of the late 1980s destroyed a large part of the savings and loan industry and dramatically affected the economy of the southwestern U.S. Yet it failed to even cause a recession in the U.S. (Barth, 2004). Second, the crisis was most virulent in the advanced industrial societies and in particular Western Europe. Most of the cases of economic contagion in the postwar era have involved less developed countries, but this crisis did not generally spread to the less developed world. Indeed, one of the most stunning features of the worldwide recession precipitated by the collapse of the subprime mortgage market in the U.S. was that for the first time since the Great Depression, many advanced industrial societies went into a deep and sustained recession together. This

economic collapse happened in just a little over a year. What theories are useful to explain what happened?

There are two main theoretical perspectives that have tried to understand international financial crises and their spread. The first originates in international economics and political economy (Forbes and Rigabon, 2001; Reinhart and Rogoff, 2008; 2009; Claessens, Dornbusch, and Park, 2001; Allen and Gale, 2007; Moser, 2003; Forbes, 2004, for a recent review, see Claessens and Forbes, 2004). The literature argues that financial contagion occurs across countries in three main ways. First, there may be some fundamental cause that affects multiple countries. This might include shocks, like a rapid increase in the price of oil or similar regulatory problems. Second, they might also be related to trade linkages whereby a turndown in one country directly impacts the economic path of another. A third set of causes has to do with the behavior of international financial investors. Here, financial investors may disinvest in a second country in order to protect their financial assets because of the downturn in a first country. They may do so because they believe that the underlying economic and political conditions in a second country are similar to those in the first. In essence, they move their assets from countries they consider generally more risky as investment sites to less risky investments like U.S. treasury bills producing what is called a “flight to safety”. To analyze the spread of any given crisis, analysts try and partition these forms as explanations of what happened.

This perspective has been applied to the current crisis (Rose and Spiegel, 2010, Claessens, et.al., 2010). Here, scholars have drawn mostly negative conclusions. Surprisingly, there is little evidence that countries that have gone into recession share fundamental features that may have left them more likely to have a recession or pushed financial investors towards a flight to safety. Rose and Siegel (2010) note that the thing most of the countries that had a deep

recession appear to have shared in common was that they were amongst the richest countries in the world.

This paper uses a more sociological perspective to gain some leverage on what happened. We develop an argument drawing on the sociological literatures concerning financialization, the globalization of finance, the sociology of markets, and the sociology of finance. This literature suggests that the nature of the linkages between countries has fundamentally changed in recent decades, increasingly exposing countries' economies to shared risks through the global market for financial products. Financialization is the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and the international level (Epstein, 2006). Scholars interested in financialization have tried to document its origins and spread, including its effects on households (Ertuk, et. al., 2008; Martin, 2002; Krippner, 2005; 2011; Stockhammer, 2004; Fligstein, 2001; Davis, 2009; Zorn, et. al., 2004; see Carruthers and Kim, 2011 and Keister, 2002 for reviews).

The globalization literature takes up financialization as one of its central themes. This literature begins with the premise that financial markets and financial products have now been deployed on a global basis. The main mechanism in this argument to explain why this has happened comes from neomarxist theories (Arrighi, 1994; Harvey, 2010; Boyer, 2000, Blackburn, 2006; Engelen, 2002; Froud, et. al. 2000). The basic argument is that in advanced industrial countries, investment opportunities have declined. This pushes financial capital to seek out new opportunities around the world for profit. In the past 30 years, this has produced a constant search for the next new thing. Money flows into less developed countries seemingly poised for an economic take-off. It also flows into activities such as currency trading and the

trading of financial instruments where returns might be higher than investments in government bonds.

The sociology of finance has focused on how the various kinds of financial instruments have come to be at the core of this integration (Knorr Cetina and Bruegger, 2004; McKenzie, 2006; 2011; Aalbers, 2009; 2010; Zaloom, 2006; Leyshon and Thrift, 2007; Carruthers and Stinchcombe, 1999; Bryan and Rafferty, 2006). Carruthers and Stinchcombe (1999) provide a lucid discussion of how the problem of liquidity in such markets is resolved by the standardization of various financial products including MBS and CDO. They argue that turning mortgages into MBS and using bond ratings to describe their riskiness takes messy individual mortgages and turns them into standard products. These products then can be easily bought and sold without buyers having knowledge of the individual borrowers thus allowing a large and liquid market in mortgages (Carruthers and Stinchcombe, 1999). Leyshon and Thrift (2007) argue that the core of the financialization process is the international search for investment opportunities that involve either direct investment or loans for underlying assets that produce a reliable income stream. They view the securitization of assets as the key financial innovation underlying the integration of global finance.

The existence of financial flows and financial products does not tell us anything about which ones are important and how they actually become organized on a world scale. What is missing in these more sociological accounts is a way to understand why American mortgage backed securities became the most important product being traded by American and European banks. We argue that this is because the sociology of finance and globalization approaches omit one key factor in their attempts to understand the global financial system: how the banks themselves are organized in these various markets. The main theoretical innovation in this paper

is our use of the sociology of markets to understand how the many of the largest banks in the global financial system came to make their core investment American mortgage backed securities.

In essence, what happened is that what was once a U.S. financial market, the market for mortgages and mortgage backed securities became a global market; i.e. a market with participants from Europe. We use Fligstein's "markets as politics" (1996; 2001) conceptual framework to show that the European banks began to join the field of U.S. mortgage backed securities in the early 2000s. According to that model, one would expect that European banks would follow the lead of the American banks in buying even the riskiest subprime MBS and CDO using borrowed money. The evidence shows they did.

Foreign banks dramatically increased their holdings of such securities by $1 trillion from 2003-2007. Just like their American counterparts, the mostly large Western European banks borrowed short term in the asset backed commercial paper market (hereafter ABCP) sometimes referred to as the interbank loan market, the repo market, or "shadow banking" (see Adrian et. al. (2011) and Stigum (1989) for an account of how these markets work). We present descriptive evidence showing that banks from mostly Western European countries joined these markets and made these purchases.

We then test the degree to which the level of holding American mortgage backed securities and ABCP were the direct cause of a banking crisis in particular countries and the recession that ensued. We operationalize the kinds of factors that have been suggested in the economics and political economy literatures as measures of what might have caused that crisis. We reproduce the results presented by Rose and Siegel (2010) using more elaborated measures and show that the contagion factors have little or no effect on banking crises. We demonstrate

that the strongest predictor of a banking crisis in a particular country was the level of holdings of American mortgage backed securities and their use of ABCP. We also demonstrate that these banking crises were the most important explanation of pushing countries into recession.

This paper has the following structure. First, we review the literature in economics, political economy, and sociology more extensively and develop some hypotheses about potential factors that may explain the origins of this particular international banking crisis and recession. We do this in two parts, the first focusing on the mechanisms proposed by authors in the economics and political economy literature and the second, based on a reading of the more sociological literature on globalization, the sociology of markets, and the sociology of finance. Next, we discuss our data and methods and provide results. In our conclusion we return to the empirical case and how our theoretical approach might inform subsequent research on financialization, globalization, and the sociology of finance.

Theoretical Discussion and Hypotheses

At the core of this paper is the attempt to understand why the downturn in U.S. housing prices beginning in late 2006, which later caused many U.S. banks to fail, spread so quickly to mainly Western European countries. Our purpose is not to explain the rise and fall of the housing market in the U.S. but to treat that event as the catalyst for bank crises in different countries and the subsequent recession. There is now a small mountain of literature on why the U.S. mortgage market got so overheated. Recently, for example, Lounsbury and Hirsch (2010) have collected two volumes of papers that consider various aspects of that crisis in the U.S. from a sociological perspective.

There are literatures that attempt to explain how financial crises spread across countries in economics, sociology, and political science. We would argue that there is actually quite a bit of agreement on the mechanisms by which such contagion is possible. Scholars on all sides agree that fundamental conditions in each country make them more or less susceptible to economic crises. They also agree that the international integration of financial markets plays a role in creating more direct and possibly consequential linkages that can cause crises.

The disagreements are more in the overall judgments scholars apply to whether or not such linkages are a good or bad thing. Economists generally see more trade and more open financial markets as a good thing. Free trade lowers prices for consumers and makes goods and services more widely available. Open financial markets provide capital for people, firms, and governments that might not be provided for in closed national capital markets. They understand there are winners and losers and possible risks in market opening projects. But, they believe those risks can be managed and that in the long run, the benefits outweigh the costs. Economists also believe that governments can regulate such markets in a way that lessens the impact of the bad effects and cushions downturns.

Sociologists and political scientists tend to see the risks as being more substantial. They worry that governments are losing sovereignty and control over their economies (Strange, 1996; 1998; Cerny, 1994). They also worry that financial integration is too unregulated and that contagion happens both more frequently and with dire consequences for many countries, particularly poor ones. Finally, sociologists and political scientists tend to be more skeptical that the gains from free trade and open finance are both large enough and distributed sufficiently widely that they justify the risks. They tend to see much of financial integration as being akin to legalized gambling and thereby serving no obvious economic function.

In the economics literature, the word "contagion" is often used to describe how crises in one country can spread to other countries (Forbes and Rigobon, 2001; Claessens, Dornbusch, and Park, 2001; for some formal modeling, see Allen and Gale, 2007). However this term is used in at least three different ways to describe the mechanisms by which economic problems in one society can move to other societies. First, the fate of different countries can be closely linked simply by having similar underlying structures to their economy. Hence when something happens in one economy it quickly occurs in others with similar characteristics because of common fundamentals, rather than any mechanism of transmission. Second, financial crises may spread via links between countries' economies. Countries dependent on trade or remittances may experience spillover effects when their trading partners experience adverse economic conditions. Finally, contagion may occur through the actions of financial intermediaries. In the context of financial crises, financial investors may perceive the risks in one society as high relative to others and therefore they shift their investment strategies by moving funds from one place to another in response to extreme uncertainty. Here, the principal mechanism is that investors disinvest in the local stock, bond, or property markets in order to reinvest in markets where there is less risk. This form of contagion is particularly rapid and difficult to predict, and is closest to our common sense view of the term. Given its dependence of investor uncertainty, true contagion may involve true panicked investors punishing countries that exhibit neither similar underlying conditions, nor particularly strong connections, nor higher forms of risk. Not surprisingly, most economists believe that most of the time, contagion is rational, i.e. motivated by actors who experience or surmise similarities in underlying conditions or riskiness (see the reviews by Moser, 2003; Forbes, 2004; Reinhart and Rogoff, 2008: 240-7).

We now turn to consider the types of factors that might be relevant to discovering how common fundamentals and the connections between countries might help explain the spread of the crisis that began in 2007. There are two main structural factors that economists have identified as exposing countries to the risk of crisis. The first is deregulation in the financial sector. Economists have generally thought that the financial deregulations of the past 30 years have produced a wider availability of credit for all kinds of borrowers, helped create jobs, and by implication, economic growth. But financial deregulation is a two edged sword. Allowing banks to enter into many markets potentially makes them take more risks (Schiller, 2003; Minsky, 2008; Nestailova, 2011). In the context of the current crisis, some have argued that banks were unprepared to take on the challenges of the downturn because they were not regulated enough (Johnson and Kwan, 2009; Kaufmann, 2010). This suggests that in countries with higher levels of deregulation, we should observe more banking crises and a deeper recession.

Hypothesis 1: Countries with recent financial deregulation will be more susceptible to bank crises and recession because of the high level of risk and indebtedness in those societies.

The second and most important structural factor that economists have focused on is the housing bubble itself (Reinhart and Rogoff, 2008; 2009). The basic argument is that the financial crisis was caused by house prices rising too quickly. This created a speculative bubble that fed on itself. In this version of the story, as the bubble went up, banks had a booming business loaning as much money to as many people as possible. Borrowers in the housing markets where prices were rising dramatically took out ever larger loans. Some of this was that buyers had no choice if they wanted to buy a house in the face of rising prices. But some was also driven by speculation. Many borrowers took out exotic loans that put them in the position of having to re-finance every two or three years or face steadily increasing house payments. They paid for these refinancing out of price increases in the underlying value of the house (Davis, 2009). When

housing price appreciation started to slow down, this created a wave of defaults on loans. These defaults affected the entire banking structure of the mortgage market from loan originators, to mortgage banks, commercial banks, and investment banks, and other institutional investors. For economists, countries that shared this rapid appreciation of housing prices were highly susceptible to a bank crisis and the resulting recession. Schwartz (2010) and Schwartz and Seabrooke (2008) have recently applied this perspective from comparative political economy to housing provision and similarly stress the dangers of speculation concomitant with liberalization of mortgage markets.

Hypothesis 2: Countries that experienced a housing price increase from 2000-2006 were more at risk of both a financial crisis and a recession when those prices turned down.

In economists' discussion of contagion through direct linkages between economies, the dependence of a country on exports for economic growth is commonly seen as the most important factor. One of the main ways in which countries can experience economic downturn is through a slowdown in economic activity of their principle trading partners. If trading partners experience a recession (here induced by the housing bubble bursting followed by a systemic banking crisis), then they will simply import less. To the degree that any given economy is more dependent on export partners for growth, they are likely to suffer a recession themselves. So the most likely countries to be affected by economic recession are those that are highly dependent on exports. One could also argue that a high level of trade with the U.S. would trigger a bank crisis or a recession as well. Given the U.S. economy entered a steep recession, it follows that countries with lots of exports to the U.S. would experience an economic slowdown.

Hypothesis 3: Countries with large amounts of exports and exports to the U.S. in particular found themselves more likely to have a recession because as the U.S. economy turned down, their economies turned down as well.

Finally, wherever investors in financial markets worry about the ability of a given country to continue to avoid a banking crisis or a recession, the dependence of a country on external creditors will be a crucial factor. One of the main measures of the vulnerability of a particular economy to such crises is the current account deficit. A second measure of that vulnerability is whether or not a government is running a large and unsustainable budget deficit. Countries that are running a high current account deficit or have governments that are deep in debt may not be able to raise sufficient funds to keep that deficit funded. If debts cannot continue to be paid, then defaults will happen. Defaults on government bonds, commercial paper, and other loans will weaken a national banking system and may even cause a systemic banking crisis. Such a crisis will also precipitate a recession. Investors who are worried that a given country will not be able to continue to service its debts, will liquidate their holdings and flee to what they view as safer investments. It was this kind of contagion that some have argued caused the Asian financial crisis of the late 1990s (Claessens, et. al., 2004; Halliday and Carruthers, 2009).

Hypothesis 4: Countries that were running a large budget deficit or current account deficit were more susceptible to financial crisis as investors sold assets to buy safer assets. These deficits thus led to both a financial crisis and a recession as borrowing costs rose dramatically and loans were less available.

Scholars in political science, sociology, and geography have been interested in how global finance has changed and evolved since the mid-1970s. Some approaches in international political economy emphasize how neoliberalism and financialization have transformed the world system (Block, 1978; Hellener, 1994; Frieden, 1991; Strange, 1996; Cerny, 1994; Epstein, 2006; Harvey, 2010; Arrighi, 1994; Montgomerie, 2008). From this perspective, the American government in the 1970s gave up on a more coordinated approach to global finance as indexed by the Bretton Woods agreement (Block, 1978). Instead, they encouraged the deregulation of worldwide financial markets and the use of market mechanisms to determine exchange rates and

the allocation of capital in general. This dramatically increased the size of such markets and the cross border trade of financial products of all kinds (Montgomerie, 2008; Krippner, 2011).

Much of the debate in this literature has centered on how this process has affected the ability of governments to control their economies. It is widely thought that policies that create inflation, encourage current account deficits, and favor consumption over production are likely to result in financial investors removing their capital from a particular country. This can result in a run on the value of the currency that country and create a downward spiral whereby a banking crisis ensues and the economy tips into recession. As noted above, this literature has mostly viewed what goes on in this markets as speculative and not very economically productive (Schiller, 2003; Lipuma and Lee, 2004; Blackburn, 2006; Bookstaber, 2007). Strange goes so far as to call worldwide financial markets "casino capitalism" implying that they serve no useful economic or political function (1998).

The problem with this view is that it reduces all forms of financial integration to speculation. This raises the question of why investors would seek out investments in other countries. Harvey (2010) has argued that the growth of financial integration in the world economy reflects the fact that after the 1970s, investors in the richest countries could not find good and safe investments in their own countries. As advanced economies matured, the ability to make high returns by investing in manufacturing or new services were limited. This pushed investors to look elsewhere for both riskier forms of investment with higher returns, including currency, credit, and asset exchanges. Put another way, the breakdown of highly regulated international finance led to a set of new opportunities that allowed financial investors to seek out higher returns in other places.

In this environment, financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and the international level became increasingly important, as scholars have amply documented since the 1980s (see the papers in Epstein, 2006 and Ertuk, et. al., 2008). For those interested in political economy, the argument was that the "Fordist" form of production had declined and given way to a new set of ways to organize capitalism, what came to be called "financialization" (Boyer, 2000). Sociologists showed that in the U.S., one of the key manifestations of this was the "shareholder value conception of the firm". This set of ideas and practices argued that managers should only pay attention to shareholders and in doing so concentrate on making profit and raising the share price for the stock of the firm. This set of ideas came to restructure the relationships between boards of directors, top level managers, and financial markets (Fligstein, 2001; Davis and Stout, 1994; Davis, 2009; Useem, 1996: Zorn, et. al., 2004). As Krippner (2005; 2011) has shown, the financial sector of the economy increased its prominence in the economy by increasing its share of profits over this period. It also pushed managers of nonfinancial firms to increase their use of financial tools to produce profits.

For the expanding global trade in financial products, securitization was a crucial innovation, as Leyshon and Thrift (2007) have argued. Securitization allowed potentially nearly any kind of asset capable of generating revenue to be converted into a standardized financial product with an expected rate of return and risk.[1] Securitization emerged in the U.S. for the first time in 1969 when the American government issued the first mortgage-backed security (Fligstein

[1] Securitization is the process whereby one takes a given asset that generates a cash flow and one sells the rights on that cash flow to an investor in a standardized product that looks like a bond. The technology of securitization can be applied to a wide variety of financial assets. The riskiness of these assets and the likelihood of default can be rated by credit rating agencies. These ratings can then be turned into prices for bonds. The riskier the investment is, the higher rate of return. Securities are commonly backed by large packages of individual loans, but may be backed by insurance policies, court settlements, components of other securities, and even more exotic financial products.

and Goldstein, 2010). The U.S. mortgage market remained heavily dependent on the government which orchestrated the production of mortgage backed securities (hereafter MBS) through the so-called government sponsored enterprises, otherwise known as Fannie Mae and Freddie Mac (Carruthers and Stinchcombe, 1999). By the mid-1980s, the ability to create the tools to engage in securitization were well known in the mortgage market and had spread to credit cards, new car loans, manufactured housing, and industrial loans. Not surprisingly, securitization strategies quickly spread across the world. Banks in most of the advanced industrial countries used securitization to raise money, to buy assets, to create securities based on those assets and to both hold onto those securities and sell those securities to others. Markets for securitized products are amongst the largest financial investments worldwide. ABA Alert.com reported that in 2010, there were over $93.5 trillion in asset backed securities worldwide.

What is missing in these arguments is an account of why the financial market of choice for banks around the world came to be the U.S. mortgage backed securities market. Aalbers (2008; 2009) has argued that the U.S. mortgage market played an important role in the expansion of international finance. U.S. mortgage backed securities and related financial products became a huge source of investment for banks around the world particularly after 2000.[2] In the period 2000-2006, interest rates were low in many countries and therefore investors got low returns for holding government bonds. What they were seeking out was higher return investments that were relatively low risk. What they found was products based on American mortgages. These products frequently had high credit ratings (AAA) and were regarded by regulators and auditors as safe. Banks could use some of their capital to make what appeared to be safe investments that returned

[2] Aalbers has also argued that the U.S. mortgage market has further encouraged international financial expansion by providing a model for practices around using securitization to fund mortgages adopted by some countries. For the purposes of the analysis presented here, this kind of influence can be seen as an element of wider changes in the fundamental structural conditions of different countries, rather than the financialization of international linkages in the sense they are discussed here.

3-5% more than investing in government bonds, borrowing money at 1-2% and investing that money in mortgage backed securities (Brunnermeier, 2009). The main reason these investments were so consequential is because they were quite large and so profitable. The mortgage origination market in the U.S. fluctuated between $2-4 trillion a year from 2001-2007. Most of these mortgages were being packaged into securities. This meant there was a tremendous amount of mortgage backed securities for sale.

It is useful to draw in elements from the sociology of markets and the sociology of finance to make more sense of what happened. We start by noting that most arguments about globalization rarely define what a global market might be. Fligstein (2001: 222) argues that for a market to be global, the participants must come from countries around the world and form a field where they watch one another and are organized around a recognizable set of rules and strategies. This idea suggests that one more concrete way to understand the financial crisis and its simultaneous spread to mainly western European countries is to consider what exactly the market for U.S. MBS and CDO looked like circa 2000-2006, what the main tactics banks were pursuing in those markets, and the degree to which banks from rich countries came to be part of that market.

Fligstein and Goldstein (2010) have shown that many U.S. banks entered into all phases of the U.S. mortgage market by 2007. Many banks were originating both prime and subprime mortgages, packaging those mortgages into financial products like MBS and CDO, selling those products, and borrowing money to hold onto to those products. At the beginning of the crisis, one of the standard tropes about what happened was that banks were willing to make house loans to people who could not pay the loans back because they were making money off of the fees and selling off the risky mortgages to others. This was called the “originate to distribute model” and

was thought to be the main problem of why the market got out of control (Gorton, 2010). But, subsequently, the financial economics literature has realized that almost all of the banks who were originating these loans were holding onto a large amount of the financial products they were producing (Brunnermeier, 2009; Gorton and Metrick, 2009). In essence, banks were holding onto these products as investments.

The sociology of markets pushes us to ask the question about how banks were making money in these markets. The answer to this question is that these financial activities were tremendously profitable. In 2003, the banks that were involved in these markets which comprised about 9% of GDP and 7% of employment in the economy, were producing 40% of the profits in the economy (Krippner, 2011). What were they doing to make so much money? They, of course, were making fees off of originating mortgages and packaging mortgages into securities and selling them. But the bulk of the money they were making came from their holding onto the financial products they were producing. Gorton (2010) and Brunnermeister (2009) document that banks were making money by borrowing money on short term loans to buy these securities which as it turns out were not very liquid and had long durations (at least 10 years). Achara, et. al. (forthcoming) show that the main place that this money was borrowed was the part of the interbank loan market known as the asset backed commercial paper market. Gorton (2010) describes these investments as "borrowing short to buy long."

The asset backed commercial paper market (ABCP) has a long history (Stigum, 1989 tells this story). The market was originally created by the Federal Reserve in 1914 in order to provide a market so that banks could borrow or lend money on a very short term basis (usually 1-90 days) that was backed by collateral. For much of the history of the market, government bonds were the form of collateral that was most frequently put up as assets. The original purpose of the

market was to aid exporters who might have to wait for their goods to arrive overseas before payment arrived. They would borrow short term to cover their expenses until payment arrived. But over time, both banks and other large nonfinancial corporations saw the advantage of being able to borrow money to fund their short term needs as well as to lend money that they did not immediately need. Achara et. al. (forthcoming), Gorton and Metrick (2009) and Adrian et. al. (2011) show that during the early 2000s, the market for ABCP became dominated by borrowing money to buy MBS and CDO. Between 2003 and 2006, for example, Achara, et. al, show that something like 75% of the $1.4 trillion ABCP market was issued to buy MBS and CDO.

For our story, the important thing that happened is that foreign banks began to enter the U.S. market and emulate the American banks by buying MBS and CDO in great quantity beginning in 2003. They also did it with ABCP. We will turn to the evidence for this in a moment, but it is useful to draw out the implications of what happened. The market for MBS and CDO and the strategy of "borrowing short to buy long" was not just for U.S. banks and financial firms. Foreign banks were drawn into this market and they formed a huge part of it between 2003 and 2007. They recognized that American banks were making record profits by buying "AAA" rated MBS and CDOs with borrowed money. Beginning in 2003, they entered the market with a vengeance. The market for U.S. MBS and CDO was a global market by 2007 because it contained players from many countries around the world who held substantial shares of MBS and CDO and purchased those products by borrowing money in the ABCP market. Its main players, both U.S. and foreign banks were pursuing the same strategy: use ABCP to buy MBS.

This global market (most of the buying and selling of the products in this market was done in New York and London) was directly connected to the fortunes of the U.S. mortgage market and housing prices. When U.S. housing prices stopped rising and foreclosures begin to

occur, many foreign banks found themselves facing the same kind of liquidity crises as American banks. The money they were borrowing short term came due and many of these banks were unable to find funding for their MBS and CDO holdings. There was little market to buy these holdings as their value was unknown. This proved to be a big problem when banks found themselves in the summer of 2008 with large amounts of mortgage backed securities that were losing value and had to quickly raise funds to cover their borrowings. It was this crisis that spread across U.S. banks, but also to the financial investors around the world who were also key players in this now global market. To the degree that banks and investors in many countries had purchased such securities, the banking systems in those countries plunged into a systemic banking crisis. That crisis brought that country's economy into recession.

Hypothesis 5: Bank crises around the world were caused by foreign banks holding MBS and CDO which they were funding with ABCP. When the underlying value of the MBS and CDO began to drop, this caused a liquidity crisis for banks holding these instruments and produced a financial crisis for their country. The crisis made credit difficult to come by in those countries and recession followed.

Who held U.S. mortgage backed securities?

It is useful to consider what we know about the foreign ownership of U.S. mortgage backed securities in the period before the crash. As we have already noted, one of the key features of the financial crisis and the recession of the 2007-2010 period is its spread across the richest countries in the world. If the hypothesis about the role of American mortgage backed securities is right, then it follows that we ought to observe that the foreign holdings of those securities should have increased dramatically after 2000 and that these holdings were disproportionately held by investors in the richest countries. In this section, we provide evidence for both of these assertions. We show a dramatic increase in foreign purchase of mortgage

backed securities from 2001-2008. Most of the purchases were by banks and investors in the most advanced industrial countries. We demonstrate that many of these banks were heavily involved in the ABCP market. We then turn to multivariate analysis to see if ownership of American MBS and CDO using ABCP was related to bank crises and recession.

Figure 1 presents data on the largest holders of U.S. mortgage backed securities from 2001-2008. This data was collected by Inside Mortgage Finance (2009), a company that specializes in gathering data on the U.S. mortgage industry. We can see from the graph that during the real estate bubble, large investors increased their holdings of American mortgage backed securities dramatically. U.S. commercial banks increased their holdings from about $700 billion to almost $1.1 trillion, an increase of over 50%. Mutual fund holding more than doubled from about $425 billion to almost $850 billion. But the category that showed the most dramatic increase was foreign holdings of mortgage backed securities. Holdings grew from about $200 billion to over $1.2 trillion at the peak. In the space of five years, foreigners increased their holdings of U.S. mortgage backed securities by $1 trillion, an increase of nearly 600%. This is direct evidence that at during the most dramatic growth in the real estate bubble, the main purchasers of mortgage backed securities, particularly those based on subprime mortgages, were foreign buyers. This figure is a kind of smoking gun that shows the strong linkage between world financial markets and the American mortgage backed security market. This confirms our argument that foreign holders became big players in the market for mortgage backed securities.

(Figure 1 about here)

The Inside Mortgage Finance data does not allow one to decompose the holders of those bonds by country. The U.S. Treasury, however, gathers this data on a yearly basis (2008: table 11, p. 15, table 24, p. 51-55). Table 1 provides evidence on the ten largest holders of MBS in

2007. The ten countries who were the largest holders of American mortgage backed securities in 2008 were the United Kingdom, Belgium, Ireland, Japan, Germany, Iceland, Netherlands Norway, Switzerland, and France. All of the largest holders of American mortgage backed securities were advanced industrial societies.

There are two other ways to figure out who the foreign holders of American mortgage backed securities were. During the financial crisis, the Federal Reserve Bank bought American mortgage backed securities that had been issued by Fannie Mae or Freddie Mac as part of their effort to stabilize the financial markets. The Federal Reserve bought about $1.25 trillion worth of these securities from 14 banks. Bank of America, Citigroup, Goldman Saks, JP Morgan, Merrill Lynch, and Morgan Stanley sold about $600 billion to the Federal Reserve in 2008-2009. Barclays (UK), BNP Paribas (France), Credit Suisse (Switzerland), Deutsche Bank (Germany), Mizoho (Japan), Normura (Japan), RBS (UK), and UBS (Switzerland) sold almost $625 billion to the Federal Reserve during the same period. This list of banks includes some of the largest banks in the world. Again, of the foreign banks, all were in advanced industrial countries and most were in Europe. Finally, the Federal Reserve also expanded its short term loan activities for banks. These were loans that were made to banks to help them through a “liquidity crisis. During the period 2008-2009, the Federal Reserve lent money to 438 banks of which 156 were branches of foreign owned banks. Most of the banks (138) were branches of European banks.

(Table 1 about here)

Table 1 also contains information on the 10 largest holders of asset backed commercial paper in 2007. These include the Netherlands, Belgium, Germany, United Kingdom, France, Canada, Switzerland, Japan, Denmark, and Spain. We note that this list overlaps with the list on MBS for seven of the ten countries. This implies that the strategy of borrowing short term money

to buy MBS was being pursued by banks in most of these countries but not all of them. It turns out in our multivariate models that holding MBS and holding ABCP have independent effects on a country having a banking crisis. This suggests that there are two mechanisms by which the shock of the decline in the U.S. mortgage market affected banks and helped to cause a banking crisis: through the decline in value of the MBS and the use of short term funding to purchase those instruments.

(Table 2 about here)

We have some information on the identity of the largest players in the ABCP market. Table 3 presents the 20 largest foreign players in that market and the 8 largest U.S. players. The foreign list confirms that many of the world's largest banks were substantially involved in the ABCP market. All of these banks with the exception of Mitsubishi and the Royal Bank of Canada were either substantially reorganized or went bankrupt during the crisis. On the U.S. list, all of the banks were either bailed out by the government or went bankrupt. We note that both Bear Stearns and Lehman Brothers are on the list. Lehman Brothers failure is seen by most observers as the event that caused the crisis to spike (Swedberg, 2010).

It is clear that the largest banks in the world financial system became players in the American mortgage backed securities market during the peak of the housing bubble from 2001-2007. They increased their holdings 600% in a six year period and came to own almost $1.2 trillion in American mortgage backed securities. The bulk of these banks were located in Europe and Japan. It is also clear that many of these banks were funding their purchases of MBS by using the ABCP market. U.S. mortgage backed securities were huge investment vehicles for the largest banks and investors in the developed world. Now we turn to considering whether or not

their presence on the balance sheets on banks and investors around the world caused bank crises and recessions.

Data and Methods

It is useful to begin our discussion of our data and methods by discussing our research design. Figure 2 portrays our basic underlying model of the process. Our argument has two elements. First, we attempt to predict whether or not a country had a systemic banking crisis. Our argument is that two sorts of conditions might predict why this has occurred. There may be similar regulatory or economic processes in each country that affect the likelihood of a systemic banking crisis. We have also argued that the main predictor of such a crisis will be the mortgage-backed securities holdings and the use of asset backed commercial paper to fund those securities in that country. The second element of our argument is to examine how these underlying conditions predicted the depth of a recession in any given country. Here, we use the underlying conditions in the country plus a variable indexing whether or not a country had a systemic banking crisis.

(Figure 2 about here)

There are several serious data problems in trying to use this model. First, much of our theorizing has been about the conditions under which the crisis would spread. This implies a model whereby we are able to predict the time ordering of banking crises and entry into recession as the crisis spreads from one country to another. Unfortunately, the systemic banking crises and the recession occurred very close in time and it is difficult to untangle exactly the order in which countries entered into each of them sequentially. Macroeconomic data is rarely

available at any finer temporal resolution than the quarter, and at that level only for the wealthiest and most developed countries. This problem is compounded by the fact that any date selected for declaring a systemic banking crisis will be somewhat arbitrary. In the U.S., for example, does the crisis begin with the collapse of Bear Stearns in the spring of 2008, the government takeover of Fannie Mae and Freddie Mac in September 2008, the collapse of Lehman Brothers a week later, the passage of the Troubled Asset Relief Program (TARP) by the Congress in October 2008, or the government forcing banks to be reorganized and accept TRAP money in December 2008? The official definition of a recession as two straight quarters of GDP decline makes it hard to exactly date the beginning of a recession. Moreover, these events moved very fast and in the space of less than a year many countries experienced both a systemic banking crisis and the onset of a recession.

Thus, we are not able to study the how the crisis moved from one country to another directly and have to pursue another strategy in order to assess which of these conditions led to a banking crisis. Much of the economics literature reviewed above argues that the risks of financial contagion can best be explained in terms of similarities and differences in the fundamental conditions of different countries' economies. Therefore, we treat our variables as initial conditions that might be useful to predict whether or not a country had a systemic banking crisis or a recession. This approach is standard in macroeconomics, and implies a cross-sectional data design of events that did or did not occur in a particular time frame. For the sake of avoiding problems of endogeneity in constructing our model of "causation", all of our independent variables refer to measurements that occurred before 2007, the earliest one might date as the beginning of the crisis.

The inclusion of banking crises in our model as an explanatory factor for the onset of recession creates a similar problem. Both the systemic banking crises and countries' entry into recession unfolded over the same time period from 2008 to 2009, meaning that our measure of banking crisis may be an effect of the crisis not its cause. In order to produce the cleanest possible model, we use as a measure of economic performance, the change in GDP in 2009. In coding which countries had banking crises, we chose to focus only on countries where we could clearly identify that the banking crisis had occurred by the end of 2008. This leaves us with a smaller set of cases of banking crises, but gives us a stronger claim that the crisis occurs before the change in GDP. It is a more conservative test of our central hypotheses but also a more compelling test.

Selecting a sample of countries also was difficult. Ideally, we would like to have data on as many countries as we can in order to include as many countries as we can who did and did not have a financial crisis and who did and did not suffer a serious recession. We are highly limited by data availability. We have relatively complete data for 77 countries. These are listed in Table 3. They include countries that are both very rich and very poor, and countries from many parts of the world. However, they tend to exclude the very poorest parts of Africa, the Middle East, and Latin America because the legal and institutional infrastructure for collecting the relevant macroeconomic indicators simply do not exist.

(Table 3 about here)

One of the biggest problems is missing data on house price appreciation. Using multiple sources, we were still only able to find comparable data on this variable for 44 countries, and these countries were overwhelmingly developed European, North American, or Asian countries with liberalized economies, creating major selection problems. We tried several strategies to deal

with this problem, and report three types of models in order to mitigate it. First, we ran models without this variable on the whole sample of 77 cases and models including this variable on the reduced sample of 44 cases. Then, we ran models where we treat the missing data as a variable in the 77 cases and compare it to the results from the 44 cases. We do this first recoding the house price appreciation variable so that it codes the percentage change in house price appreciation from 2000-2006 if there is data and is coded "0" if there is no data house price appreciation. Then we created a second variable coded "0" if the data is not present and "1" if it is present. This allows us to examine the effect of having or not having data on whether or not countries are more likely to have a financial crisis. Finally, we created models for sample selection and missing data which we do not report here. Models using the Heckman correction for data censoring and Bayesian multiple imputation do not change the substance of the results.

(Table 3 about here)

The two dependent variables refer to 2008 and 2009. All of the independent variables refer to conditions that existed in the country in 2006 unless otherwise indicated. Systemic banking crisis is measured with a dichotomous variable coded "1" if there was a systemic banking crisis in 2008 and "0" if there was not such a crisis, following Laeven and Valencia (2010). Laeven and Valencia use five criteria to determine whether or not a systemic banking crisis has occurred in any given country. These include: (1) banks required extensive injections of liquidity, (2) banks were required to significantly re-structure their activities, (3) governments engaged in significant asset purchases from banks in order to provide them with liquidity, (4) governments provided significant guarantees on liabilities, and (5) governments nationalized some banks. A systemic banking crisis is said to have occurred if a country meets at least three of these five criteria.

Table 4 presents the list of the countries that fit our definition. One can see from the list the predominance of developed countries in general and European countries in particular. We note that the U.S. and Great Britain are both on the list. We also note that Iceland, Ireland, Greece, and Spain are on the list as well. Less well known is the fact that Germany experienced a systemic banking crisis, and that both France and Switzerland met at least some of the criteria of a banking crisis. Given the events of the past five years, the list suggests a kind of face validity to the measure of systemic banking crisis.

(Table 4 about here)

The second dependent variable in the analysis is the percent change in real GDP in 2009. We constructed this measure using real GDP as reported by the Economist Intelligence Unit (2010). This measure can take on both negative and positive values. So, a positive effect of a given independent variable indicates an increase in GDP over the course of the year, while a negative effect of an independent variable indicates a decrease in GDP.

It is also useful to describe the measures of our independent variables. We have created a measure that codes holdings of U.S. non-agency mortgage-backed securities (that is, issued by private lenders and not enjoying guarantees from the U.S. federal government) in each country in 2006 using securities data reported by the U.S. Treasury's International Capital System (2007). Holdings are measured in millions of U.S. dollars and we have standardized this measure by logging it and making it a percentage of GDP. The importance of scaling for the size of a countries economy is intuitively clear, but we also logged the variable in order to adjust for outliers because small countries that house large banking centers like Bermuda and Luxembourg constituted significant outliers in these data, often with mortgage-backed securities holdings

several times the size of GDP. Our measure of ABCP as a percentage of GDP was created in a similar fashion. The source for this data was Achaya, et. al. (forthcoming).

To obtain a measure of credit market deregulation, we used each country's 2006 Credit Market Freedom Score, from the Fraser Institute's Economic Freedom of the World Index. The score is scaled from one to ten. The higher the score, the more deregulated the country's credit market. This is a score that many scholars who study the effects of financial deregulation on economic growth (e.g., Rose, 2009; Rose and Speigel, 2010; Giannone 2010) have found useful as a metric to measure the degree to which societies have taken government intervention out of their financial sector.

In order to measure the vulnerability of a country to default in the event of an economic downturn, we use a variable measuring the current account balance in 2006 as a percentage of real GDP. The source for this measure was the World Bank's "World Development Indicators" database. We measured trade linkages in terms of export dependence using a measure that reflected exports in 2006 as a percent of real GDP. We also coded up the percentage of exports as a percentage of GDP that were sent to the U.S. in 2006. The source was also the World Bank's Development Indicators.

Our measure of house prices was the percent change in the price of the median residence from 2000-2006. To construct this variable we relied primarily on data from the Bank of International Settlements, but supplemented it with information from Claessens et al. (2010) and the European Mortgage Federation (2009). We note that this measure is tricky to interpret because the underlying way in which median house price was determined varied across countries. In compiling housing data, different countries may choose to include or exclude different regions of the country, different types of dwelling, and different vintages of housing

stock. In order to deal with this heterogeneity, for each country we chose the maximally inclusive annual measure of median house price available, and computed the percent change in house prices between 2000 and 2006. Therefore this measure is in units of percent change with respect to a baseline of prices in 2000. The means and standard deviations of the variables are in table 5.

(Table 5 about here)

We ran two kinds of models. First, we ran a logit model using whether or not a bank crisis occurred during the period 2008. Then, we ran an ordinary least squares regression modeling the percentage change in GDP from 2009. Because our sample is small and the distribution of cases is often quite skewed, we employ robust estimates of the standard errors in all cases. We will discuss the specification of the model in the results section. The correlation coefficients are in table 6.

(Table 6 about here)

Results

We begin by considering the causes of systemic banking crises. Table 7 presents the results of a logistic regression analysis where the dependent variable is whether or not a country has a systemic banking crisis in 2008-2009. The first column of the table presents results for our sample of 77 countries and the second column adds the variable for house price appreciation. The third column presents the model run only on the 44 cases for which we have data on house price appreciation.

(Table 6 about here)

The model provides no support for hypothesis 1 that credit market deregulation drove the banking crisis. It also provides no support for hypothesis 2 that countries that experienced housing bubbles were more likely to have a banking crisis than countries that did not experience such house price increases. The housing price appreciation variable's effect on a systemic banking crisis is worth discussing more extensively. This runs counter to many claims in the literature and in the press. But, our result is consistent with the results of other empirical studies. We modeled this effect two different ways. First, for the equation with 77 cases, we created a dummy variable coded "0" if the housing price was not reported and "1" if it was. We then also created a variable coded for the house price appreciation where present. This produces a spline function. In column 2 of table 3, one can observe that the change in housing prices has no effect on the 77 cases. But, there is a huge effect such that if a housing price is reported, then the country is likely to have had a systemic banking crisis. When we only include the 45 cases where we have complete data, the results are virtually identical to the results for the 77 cases without the house price variable. Recoding cases of late crises also has no effect on these results.

There is also no support for hypothesis 3 that countries with large exports or exports to the U.S. experienced crises. Indeed, there is one anomalous result in the table. Countries with lots of exports to the U.S. actually were less likely to have a banking crisis than countries with large exports. Finally, hypothesis 4 which focusses on the role of government debt and current account deficits as a cause of the financial crisis also does not have statistically significant effects. All if all, our results confirm earlier work that the "typical suspects" for causes of the spread of financial crises are simply not factors this time around.

The two strongest predictors of whether or not a country has a systemic banking crisis is the size of the U.S. mortgage backed securities as a percentage of GDP and the ABCP as a

percentage of GDP. This confirms hypothesis 5 that the cause of the banking crises around the world was the participation of that country in the U.S. MBS and ABCP markets. The fact that both of these variables predict banking crises imply that they exert independent effects on bank crises. Holding lots of MBS that were losing value pushed banks in many countries to the financial brink. But, equally important was the use of short term ABCP to fund those instruments. Obviously in countries where both of these conditions were present, financial crises were more likely.

Table 8 presents the results for the equations predicting GDP change in 2009. The first three columns present specifications that include 77 cases and the last column presents a specification only on the 44 cases with data on the house price appreciation measure. It is useful to review what does and does not predict change in GDP across model specifications and samples.

(Table 7 about here)

There is a large statistically significant negative effect of the presence of a banking crisis on change in GDP in both samples. Having a systemic banking crisis reduces GDP by 3-5% in 2009. This is a very large effect. There are no consistent effects for either the MBS or ABCP measures on change in GDP. We note that in one of the models (the one for 77 countries that includes data on housing prices), there is a positive effect of MBS as a percentage of GDP. This effect does not appear in the sample restricted to the 44 cases. Our interpretation of these results is that the effect of MBS and ABCP on economic growth goes entirely through the presence or absence of a systemic banking crisis. This exposure caused larger economic problems by precipitating a systemic banking crisis and that crisis triggered a substantial drop in GDP. Taken together, these results support our sociological version of the story which focuses on the

particular way in which mortgage backed securities became implicated in the global financial system.

There is some evidence for effects of some of the other variables on change in GDP. Countries with high levels of credit market deregulation experience more decreases in GDP (although this effect disappears in the regression with 44 cases) implying that at least half of hypothesis 1 is true. One interpretation of this, is that once the banking crisis got going and the economy turned down, countries with highly deregulated credit markets found that years of easy lending had left borrowers vulnerable in the economic downturn. In this case, the banking crisis caused by MBS and ABCP precipitated a cascading economic decline. Similarly, we also found effects of a local housing bubble on negative GDP growth confirming half of hypothesis 2. To the degree that countries had a bubble, their economies were more vulnerable to economic turndown. We interpret this to imply that once the banks went into crisis, lending dried up and the economic growth that had been propelled by house price increases dried up. There is inconsistent evidence that high exporting countries also faced a downturn (at least in the sample with 44 cases).

Taken all together, our multivariate models provide strong evidence that the banking crises experienced in Western Europe and the U.S. were mainly caused by high levels of participation in the MBS and ABCP markets. The bank crises then set off economic downturns. These crises were made worse in countries where credit standards were the most lax and housing prices had increased the most. These results bring together the two stories of the economic crisis in an interesting way (as suggested by Aalbers, 2009). Many countries followed the U.S. lead and deregulated credit markets to stimulate demand in the 2000s. This also led to housing bubbles in some places. What caused the downturn was bank participation in the global market

for American MBS. The purchase of those products plus their funding with ABCP was the tinder that started the downturn. When American house prices stopped going up, MBS started heading down. To the degree that these purchases were funded by ABCP, banks in these markets entered a crisis. The bank crisis caused a local recession that was made worse in countries that had emulated America's lax credit system and had produced a housing bubble.

Conclusions

We began by pointing out that the "Great Recession" originated in the U.S. and spread to the more industrialized world. Our empirical results offer a consistent story as to how this worked. The main path to the crisis was through the American housing market. The housing price bubble in the U.S. fuelled the production of mortgage backed securities. These securities were extensively sold and marketed around the world to banks and investors in the richest countries who funded much of these purchases with the ABCP. During the run up in the U.S. housing market from 2001-2007, foreign investors increased their holdings of these securities by $1 trillion. As those securities began to lose their value in 2007-2008, banks in the U.S. and in foreign countries began to fail. It was these failures which spurred systemic banking crises in many countries around the world. These crises forced governments in the rich world to intervene aggressively into their banking systems to stabilize them. But, the damage was so extensive that a deep recession followed. This recession was made worse in countries that had more deregulated systems of finance and had experienced their own housing bubbles. Put colloquially, it was the global character of the American mortgage backed security market which sucker punched the world economy and brought it to its knees in the richest countries.

Some caveats are in order. Since the financial crisis began in 2008, the market for American mortgage backed securities dropped dramatically and the subprime market virtually has disappeared (Inside Mortgage Finance, 2009). The use of ABCP to fund these securities has also disappeared as the contracts supporting those purchases expired and were not renewed (Achara, et. al., forthcoming). From the point of view of the sociology of markets, this particular international financial market no longer exists as most of the big players either went bankrupt or were reorganized. Those financial institutions that continue to exist have mainly been the so-called universal banks that had other kinds of businesses to fall back on. This implies that whatever the next financial crisis is, it will not emanate from this particular market and this strategic use of financial instruments. We also think that just because in this case the normal sort of variables that help explain the spread of these crises do not work, does not mean that in some future crisis they will work.

Our study raises a number of provocative issues for subsequent research. One of the most fascinating issues to explore is the link between the demand for mortgage backed securities and their funding by ABCP and the housing bubble in the U.S. In the low interest rate environment of the 2000s, investors in the U.S. and abroad were looking for safe investments that were returning more than 1-2%. American mortgage backed securities became the vehicle that made a lot of sense for those investors. But in 2003, the market for conventional mortgages to package into securities began to dry up. Beginning in 2004, the subprime market began to replace the prime market as the main source of mortgages to be securitized (Fligstein and Goldstein, 2010). Investors generally liked subprime mortgages because they could attain high credit ratings and they tended to have higher returns.

This implies that the demand for mortgage backed securities may have outstripped the supply of mortgages that could be used to construct them. One way to read what happened is that the demand for mortgage backed securities from American and foreign investors pushed forward the housing bubble in the U.S. In order to find people to take out new loans, banks needed to entice people to take out large loans with unconventional terms. The whole business of selling mortgage backed securities was obviously a big part of what banks were doing. But in order to keep that business going, they needed a steady supply of those loans. Future research should try and explore the links between the supply of mortgages for securities and the demand for those securities. There is certainly prima facie evidence consistent with the bubble being driven at least partially by the high demand for those securities. Gorton (2010), for example, alludes to this argument. This demand was partially being driven by foreign banks that discovered this market and the tactics to buy MBS.

Our study has implications for the study of financialization, global financial markets, and the sociology of finance more generally. Overall, our results point to the usefulness of using the sociology of markets to make sense of global financial markets. The literature on global financial markets and the sociology of finance did not do a good job of discovering that American mortgage backed securities were so important to the global financial system. Our study suggests that scholars have made two sorts of errors. First, they have focused too broadly on global financial flows. This has caused them to not work to understand what banks and other financial institutions were actually doing in particular markets and the significance of those markets to the overall fragility or stability of the financial system. The other error has been to focus too narrowly on the construction of particular financial products. By watching how traders traded currencies, stocks, futures, or derivatives, scholars have missed how those traders were situated

in a larger system of banks and a larger set of coherent tactics. So, our study shows that buying MBS and CDO and using ABCP made countries particularly vulnerable to the housing market downturn.

The theoretical payoff of our study is that it adds a new conceptual tool for studies of global finance and financial instruments. The sociology of markets causes scholars interested in global finance and financial instruments to consider the embedding of those flows and instruments in the underlying structure of the market. This study has demonstrated the utility of extending our empirical work to the financial organizations that make up these markets. Scholars will get a clearer understanding of what is going on by considering who are the players, what are the main tactics, and how people are making money. While a few scholars did recognize that housing was being used as a securitized asset on the world market (i.e. Aalbers, 2008, 2009; Leyshon and Thrift, 2007; Schwartz and Seabrooke, 2009), few of those involved in the literature on financialization, global finance, or the sociology of finance saw the importance of the U.S. housing market in this period. They missed how important the market had become to some of the world's largest banks and how central American housing prices had become to the world financial order.

This implies a new research agenda for scholars interested in the sociology of finance and its role in globalization. These markets should be dissected by the identities of the market participants, their tactics, what is causing either crisis or growth, and most of all, how these markets are are connected to the larger financial systems in which they are embedded. There are many facts to be discovered. First, how many of these markets are really global, i.e. contain banks from many countries including those outside of the U.S. and Western Europe? What is the degree to which many of the global financial markets are actually dominated by a small number

of participants? Are these the same participants across markets implying that the 30-40 largest banks might be dominating all of these markets? Finally, and perhaps most importantly, how are these markets connected to one another and to particular national market systems?

Hardly anyone saw that American mortgages were the hottest commodity being traded across this system. The next crisis will certainly not be caused by a housing bubble originating in the U.S. But it will require some of the same conditions: a hugely large market of underlying assets that can be traded as securities, securities that can be rated for risk, and probably by a relatively few number of players who are pursuing very high returns without regards to those risks (following the insights of Carruthers and Stinchcombe (1999) and Leyshon and Thrift (2009)). Dissecting these markets and their dynamics requires delving not just into the flows and the instruments but the social structure of these markets.

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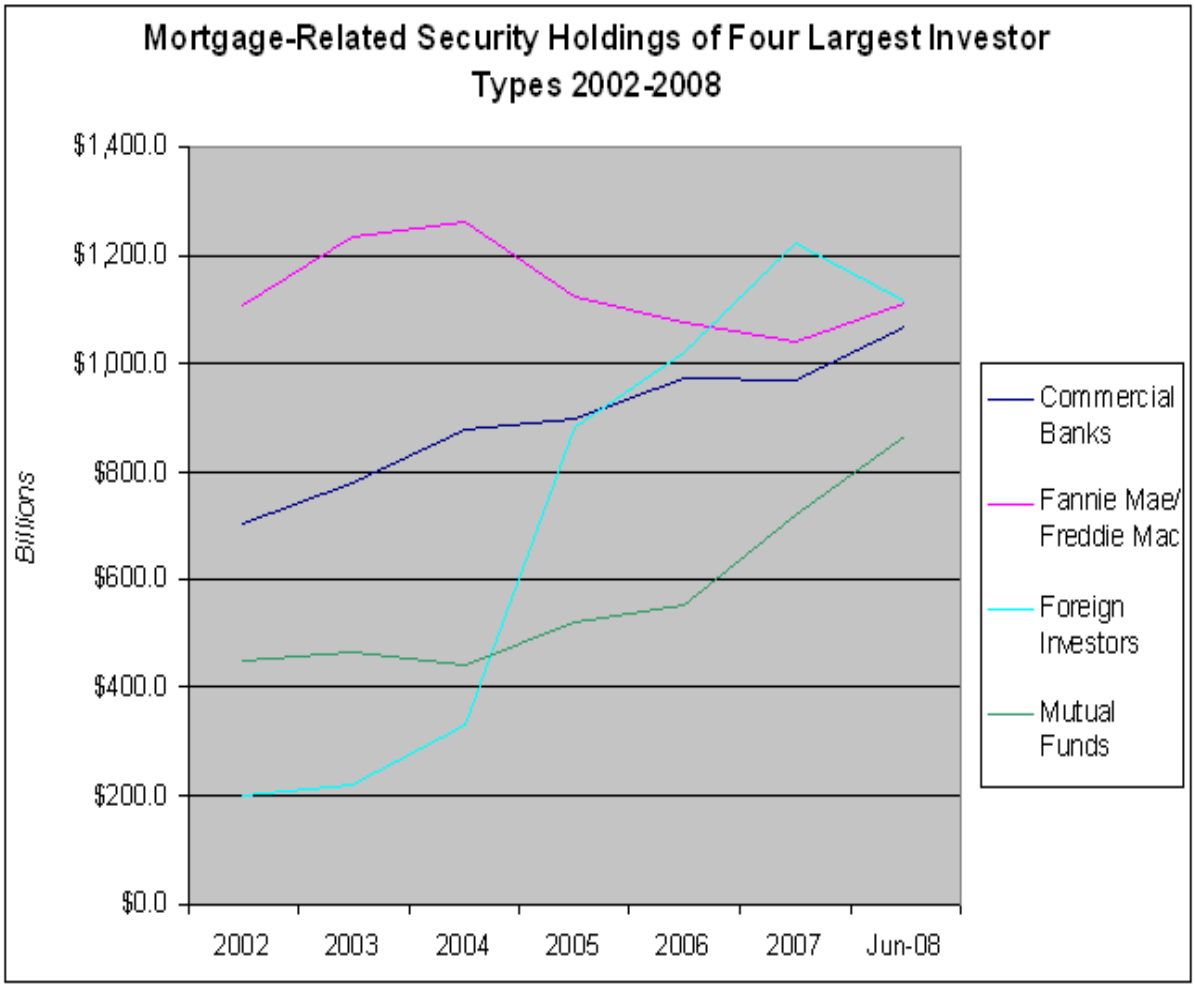
Figure 1: Mortgage related security holdings of four largest investor types. Source: Inside Mortgage Finance, 2009.



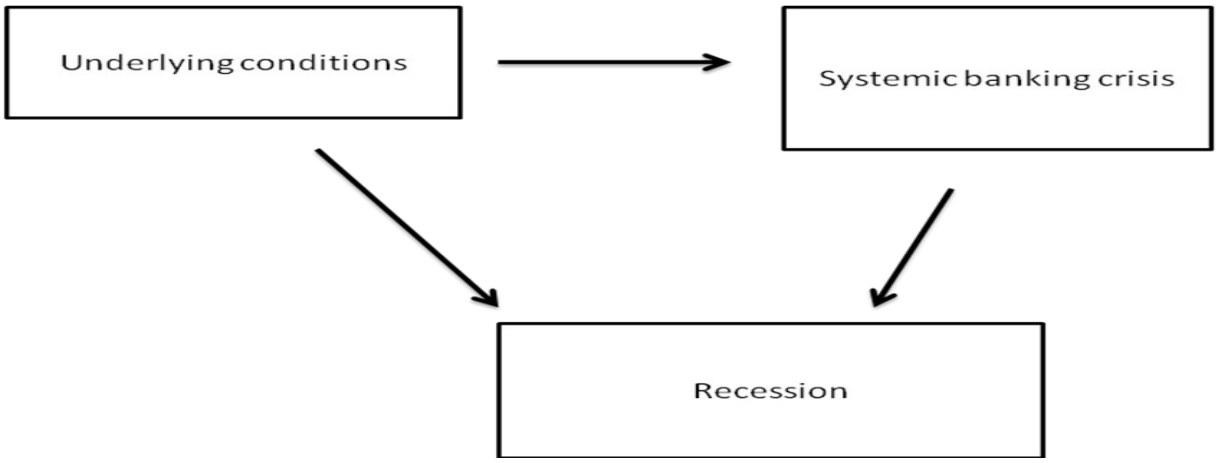


Figure 2: Model of process of bank crises and recession

Table 1: Foreign Countries with the highest amount of MBS./GDP, 2007 (Source: U.S. Treasure Department, 2008) and countries with highest amount of ABCP/GDP (Source: Achaya, et. al., forthcoming).

Highest MBS/GDP
Ireland
Belgium
France
Germany
Iceland
Netherlands
Norway
Switzerland
United Kingdom
Japan

Highest ABCP/GDP
Netherlands
Belgium
Germany
United Kingdom
France
Canada
Switzerland
Japan
Denmark
Spain

Table 2: Largest banks holding with country of origin holding ABCP (Source: Achaya, et. al., forthcoming).

Foreign

ABN Amro (Netherlands)
HBOS (United Kingdom)
HSBC (UK and Hong Kong)
Deutsche Bank (Germany)
Societe Generale (France)
Barclays (United Kingdom)
Mitsubishi (Japan)
Rabobank (Netherlands)
Westdeutsche Landesbank (Germany)
ING Groep (Netherlands)
Dresdner Bank (Germany)
Fortis (Belgium)
Bayerische Landesbank (Germany)
Credit Agriciole (France)
Lloyds Banking Group (United Kingdom)
Hypo Real Esate (Germany)
Royal Bank of Canada (Canada)
BNP Paribas (France)
KBC Group (Belgium)
Bayerische Hypo-und Vereinsbank (Germany)

U.S.

Citigroup
Bank of America
JP Morgan Chase
Bear Stearns
GMAC
State Street Corporation
Lehman Brothers
Countrywide Financial

Table 3: List of countries in the analysis

Bahamas	Antigua & Barbuda	Macau	Albania	Kyrgyz Republic
Denmark	Armenia	Macedonia (FYR)	Algeria	Lebanon
Estonia	Austria	Malaysia	Argentina	Libya
Ireland	Barbados	Malta	Australia	Mauritius
Italy	Belgium	Mexico	Bahrain	Morocco
Jamaica	Bermuda	Namibia	Belarus	Netherlands Antilles
Japan	Botswana	Netherlands	China	Oman
Latvia	Brazil	Norway	Colombia	Panama
Luxembourg	Bulgaria	Paraguay	Cuba	Papua New Guinea
New Zealand	Canada	Romania	Dominican Rep	Peru
Portugal	Chile	Russia	Egypt	Poland
Puerto Rico	Costa Rica	Singapore	Eq. Guinea	Qatar
Seychelles	Croatia	Slovakia	Haiti	Saudi Arabia
Sweden	Cyprus	Slovenia	Indonesia	Sri Lanka
	Czech Rep	South Africa	Iran	Swaziland
	Ecuador	Spain	Israel	Tunisia
	El Salvador	St. Kitts & Nevis	Kazakhstan	Uruguay
	Finland	Switzerland	Korea	
	France	Taiwan		
	Gabon	Thailand		
	Georgia	Trinidad & Tobago		
	Germany	Turkey		
	Greece	Turkmenistan		
	Guyana	UK		
	Hong Kong	Ukraine		
	Hungary	United Arab Emirates		
	Iceland	United States		
	Kuwait	Venezuela		
	Lithuania			

Table 4: Countries that experienced a systemic banking crisis, 2007-8
Source: Laeven and Valencia, 2010.

Austria
Belgium
Denmark
Germany
Iceland
Ireland
Luxembourg
Netherlands
United Kingdom
United States
France
Portugal
Spain
Sweden
Switzerland

Table 5: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
2009 Change in GDP	75	-2.62	4.85	-18.00	8.70
Log 2006 Corp. MBS % GDP	75	0.29	0.64	0	3.98
Log 2006 ABCP % GDP	75	0.21	0.58	0	2.98
Systemic Banking Crisis	75	0.15	0.36	0	1
2006 Credit Market Dereg'n	75	8.55	1.00	5.74	9.98
2006 Current Account % GDP	75	-1.02	10.42	-25.75	39.49
2006 Gov't Debt % GDP	75	47.16	30.02	4.41	191.34
2006 Exports / GDP	75	51.65	38.57	14.30	243.44
2006 % Exports to USA	75	16.75	20.29	0.93	85.97
Housing Price Reported?	75	0.59	0.50	0	1
Real Housing Price App'n '00-'06	44	54.35	55.91	-25.64	228.05

Table 6: Correlation Matrix

	2009 Change in GDP	Log 2006 Corp. MBS % GDP	Log 2006 ABCP % GDP	Systemic Banking Crisis	2006 Credit Market Dereg'n	2006 Current Account % GDP	2006 Gov't Debt % GDP	2006 Exports / GDP	2006 % Exports to USA	Real Housing Price App'n '00-'06
2009 Change in GDP	1									
Log 2006 Corp. MBS % GDP	0.101	1								
Log 2006 ABCP % GDP	0.060	0.574	1							
Systemic Banking Crisis	-0.448	0.519	0.446	1						
2006 Credit Market Dereg'n	-0.392	0.039	0.063	0.169	1					
2006 Current Account % GDP	0.422	0.426	0.196	-0.198	-0.195	1				
2006 Gov't Debt % GDP	0.240	0.158	0.219	-0.140	-0.356	0.287	1			
2006 Exports / GDP	-0.049	0.363	-0.079	-0.039	0.201	0.432	-0.039	1		
2006 % Exports to USA	0.282	0.122	0.121	-0.335	-0.099	0.206	0.216	-0.066	1	
Real Housing Price App'n '00-'06	-0.497	-0.169	-0.125	0.197	0.395	-0.453	-0.540	-0.150	-0.158	1

Table 7: Logit models of systemic banking crisis

Model	1	2	3
Log 2006 Corp. MBS % GDP	1.577*	2.341**	1.969*
	(0.776)	(0.828)	(0.944)
Log 2006 ABCP % GDP	2.043**	1.497*	1.533*
	(0.792)	(0.721)	(0.699)
2006 Credit Market Dereg'n	0.010	-0.388	-0.329
	(0.629)	(0.804)	(0.808)
2006 Current Account % GDP	-0.070	-0.090	-0.091
	(0.059)	(0.066)	(0.067)
2006 Gov't Debt % GDP	-0.023	-0.018	-0.015
	(0.026)	(0.020)	(0.018)
2006 Exports / GDP	0.004	-0.001	-0.002
	(0.009)	(0.010)	(0.010)
2006 % Exports to USA	-0.088*	-0.075*	-0.048+
	(0.045)	(0.038)	(0.027)
Real Housing Price (no misses)		0.004	
		(0.010)	
Housing Price Reported?		4.070*	
		(1.770)	
Real Housing Price App'n '00-'06			0.003
			(0.010)
Constant	-1.821	-2.324	1.088
	(5.684)	(6.888)	(6.763)
N	75	75	44

Ll	-17.521	-15.133	-14.821
Chi-square	30.737	34.695	24.733
d.f.	7	9	8

Notes: Robust standard errors are in parentheses.

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001

Table 8: OLS models of 2009 change in GDP

Model	1	2	3	4
Log 2006 Corp. MBS % GDP	0.424	1.411*	1.003	1.217
	(0.624)	(0.622)	(0.643)	(1.141)
Log 2006 ABCP % GDP	-0.603	0.802	0.918	0.536
	(0.619)	(0.785)	(0.688)	(0.799)
Systemic Banking Crisis		-5.366*	-4.459*	-3.912*
		(2.114)	(1.714)	(1.865)
2006 Credit Market Dereg'n	-1.879***	-1.939***	-1.469*	-1.270
	(0.532)	(0.528)	(0.660)	(1.154)
2006 Current Account % GDP	0.062	0.032	0.023	0.103
	(0.055)	(0.051)	(0.046)	(0.080)
2006 Gov't Debt % GDP	0.022	0.012	0.004	-0.026
	(0.024)	(0.024)	(0.024)	(0.024)
2006 Exports / GDP	-0.006	-0.005	-0.007	-0.023+
	(0.012)	(0.012)	(0.012)	(0.013)
2006 % Exports to USA	0.027	0.017	0.004	0.041
	(0.021)	(0.021)	(0.024)	(0.033)
Real Housing Price (no misses)			-0.024+	
			(0.013)	
Housing Price Reported?			-0.527	
			(1.289)	
Real Housing Price App'n '00-'06				-0.029*
				(0.014)
Constant	12.312*	13.623**	11.303+	11.255
	(5.040)	(5.083)	(5.783)	(10.696)

N	75	75	75	44
Ll	-211.924	-206.808	-203.589	-116.198
R-square	0.281	0.373	0.424	0.483
d.f.	7	8	10	9

Notes: Robust standard errors are in parentheses.

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001