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Sucker punched by the invisible hand: the world financial markets and the globalization of the US mortgage crisis[1]

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The worldwide financial crisis that began in 2007 was set off by the collapse of the subprime mortgage market in the USA. The crisis simultaneously reverberated to banks around the world, and eventually brought about a worldwide recession. The biggest banks in the developed world got in trouble because they were pursuing the same strategies to make profit as the American banks. They had joined the market in the USA for mortgage-backed securities and funded them by borrowing in the asset-backed commercial paper market. When the housing market turned down, they suffered the same fate as their US counterparts. Financial deregulation played a complex role in this process. Most of the banks that participated in this market came from countries where financial deregulation occurred. But not all banks from countries with financial deregulation entered this market. Countries with high levels of financial deregulation also experienced deeper recessions, suggesting that in the home market, banks had taken on riskier loans as well. Our study makes a broader theoretical point, suggesting that subsequent studies of global finance and financial markets need to consider the identities and strategies of the banks as their tactics explain a lot about how the global markets for different financial products are structured.

Keywords: financial crisis, financial markets, firm strategy, globalization, economic sociology, banks

JEL classification: F65 economic impacts of globalization: finance, G15 international financial markets, G23 non-bank financial investors-financial instruments, institutional investors

[1]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 like a sucker punch, unexpected and not well understood. We thank the reviewers for their useful comments.

1. Introduction

The price of houses in the USA began to fall in 2006 and defaults on subprime mortgages began to increase. This rising wave of defaults spread to the wider mortgage market. By the fall of 2008, banks in the USA and Western Europe were announcing devastating losses, touching off a financial panic that culminated in a wave of bank failures in the USA and at least 10 different European nations during September and October of that year. By one count, 23 countries experienced a systemic banking crisis by the end of 2009 (Laeven and Valencia, 2010). These crises were followed by a deep and long-lasting recession.

There are three unusual features of this financial crisis. First, it started in the USA. While the USA has not been immune to financial crises in the post-war era (Kaufman, 2009), they have tended to be mostly contained and not to spread to other countries. Secondly, the crisis was most severe in the advanced industrial societies and in particular Western Europe. Most of the cases of economic contagion in the post-war era have involved less developed countries, but this crisis did not spread to the less developed world. Finally, the crisis spread almost instantaneously in the fall of 2008. Most developed countries found themselves in recession before the end of 2009. What theories are useful to explain what happened?

In international economics and political economy, economic contagion and the mechanisms by which financial crises spread are a central concern (Claessens *et al.*, 2001; Forbes and Rigobon, 2001; Moser, 2003; Forbes, 2004; Allen and Gale, 2007; Reinhart and Rogoff, 2008, 2009; for a recent review, see Claessens and Forbes, 2004). This perspective has been applied to the current crisis (Claessens *et al.*, 2010; Rose and Spiegel, 2010). Here, scholars have drawn mostly negative conclusions. There is little evidence that countries that went into recession in 2008 and 2009 shared fundamental features that may have left them more likely to have a recession or pushed financial investors towards a flight to safety.

Our goal is to provide a different account of what happened. We suggest that scholars ought to pay more attention to the strategies of banks making up the global financial markets. We show that after 2001, the largest banks in the USA and in other developed countries—mostly in Europe—came to hold massive amounts of securities based on American mortgages. In essence, banks from around the world came to be major players in the same market and pursued the same strategies as their American counterparts to make profit. This means that these banks shifted from buying and selling in international markets for relatively safe products such as government bonds to much riskier financial investments based on American mortgage-backed securities. When the housing market in the USA turned down and the financial instruments that supported that market began to unravel, banks around the world suffered the same crisis that American banks did. The banking crises then became the basis of economic downturn and

caused recessions in many countries. Our account thus offers an explanation for which countries were affected by the crisis and the rapidity of the spread of the crisis.

Social scientists interested in the globalization of finance have tried to document the origins and spread of new financial markets, financial motives and financial flows at the national and the international level (Fligstein, 2001; Martin, 2002; Stockhammer, 2004; Krippner, 2005, 2011; Erturk *et al.*, 2008; Davis, 2009; Hardie, 2012). Most have focused on the role of the various kinds of new financial instruments, particularly the securitization of assets such as mortgages, as being at the core of this integration of global financial markets (Carruthers and Stinchcombe, 1999; Knorr Cetina and Bruegger, 2004; Bryan and Rafferty, 2009; MacKenzie 2011; Schwartz, 2009; Schwartz and Seabrooke, 2009; Leyshon and Thrift, 2007; Aalbers, 2008, 2009). What is missing in these accounts is a way to understand how American mortgage-backed securities and collateralized debt obligations based on those securities (hereafter MBS and CDO) became so important to the strategies—and the fates—of so many American and European banks. We use Fligstein's (1996, 2001) 'markets as politics' approach to explain why the largest banks in the global financial system adopted the same strategy to make money as their American counterparts after 2001. The main source of profit for the largest banks became their investments in American MBS and CDO that were bought using short-term finance procured in the US asset-backed commercial paper market (hereafter ABCP).

We present descriptive evidence showing that between 2001 and 2007, banks from mostly Western European countries dramatically increased their holdings of US MBS and CDO. They funded these purchases by using ABCP, the financial market where banks borrow short term usually for less than a year (see Adrian *et al.*, 2011 and Stigum, 1989 for an account of how these markets work). We use quantitative data to show how the holdings of MBS and ABCP were the direct cause of the banking crisis across countries and these crises were the most significant factor predicting economic downturn. We consider the role of financial deregulation as a cause of the crisis. We show that in countries where financial deregulation occurred, banks were more likely to enter the MBS and ABCP markets. However, banks in many countries that deregulated their financial systems did not enter the MBS and ABCP markets, suggesting that financial deregulation may have been a necessary but not sufficient condition for predicting the financial crisis. Once the crisis began, countries that had high levels of financial deregulation experienced deeper recessions. This implies that there was also riskier lending within countries and as the economy turned down, these risky loans defaulted producing even more of an economic decline. Our models also include controls that measure alternative explanations of the crisis based on various theories of contagion. We show that these factors have little or no effect on banking crises in line with the previous literature.

This paper has the following structure. First, we review the literature in sociology, economics and political economy to develop the hypothesis proposed above. Then we consider how economic theories of financial contagion offer some alternative hypotheses. 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.

2. Theoretical discussion and hypotheses

Our goal is to understand why the downturn in US housing prices beginning in late 2006 eventually caused widespread economic devastation in the USA and Western Europe but not in countries in Africa, Asia, Latin America and the Middle East. Our purpose is not to explain the rise and fall of the housing market in the USA, but to treat that event as the catalyst for banking crises in different countries and the subsequent global recession.[2] We argue that countries where banks engaged in buying MBS by using ABCP were exposed to the same downturn as the USA, and this explains the rapidity of the spread of the crisis and the differential spread to certain countries and not others.

Scholars in political science, sociology and geography have shown how global finance has evolved since the early 1970s (Block, 1978; Frieden, 1991; Helleiner 1994; Arrighi, 2010; Seabrooke, 2001, 2006; Epstein, 2006; Montgomerie, 2008; Harvey, 2010). The American government gave up on a more coordinated approach to global finance as laid down 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 (Seabrooke, 2001; Krippner, 2011). This American-led transformation of the global financial system dramatically increased the size of such markets and the cross-border trade of financial products of all kinds (Montgomerie, 2008; Krippner, 2011). It also spurred the development of new techniques for converting investments into standardized financial products (Carruthers and Stinchcombe, 1999; Leyshon and Thrift, 1997, 2007).

Over the past 30 years, scholars have amply documented how financial markets, financial motives, financial institutions and financial elites have become increasingly important at the national and the international level in the operation of the economy and its governing institutions (Epstein, 2006; Seabrooke, 2006; Erturk *et al.*, 2008;

[2]There is now a small mountain of literature on why the US mortgage market got so overheated and how the implosion of that market produced the financial crisis to the USA. Recently, for example, Lounsbury and Hirsch (2010) have collected two volumes of papers that consider various aspects of that crisis in the USA from a sociological perspective.

Schwartz, 2009; Hardie, 2012). 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. This pushed investors to look elsewhere for both riskier forms of investment with higher returns, including currency, credit and various kinds of asset markets.

Securitization is one of the core strategies in finance. It emerged in the mortgage market in the USA for the first time in 1970s, when the American government issued the first MBS (Fligstein and Goldstein, 2010: 37).[3] The US mortgage market remained heavily dependent on the government which orchestrated the production of MBS through the so-called 'government-sponsored enterprises', otherwise known as Fannie Mae and Freddie Mac (Carruthers and Stinchcombe, 1999; Seabrooke, 2006). Carruthers and Stinchcombe (1999) provide a lucid discussion of how mortgages, which are contracts made with individuals who live in different places and have differing abilities to pay back their mortgages, can be turned into standard products such as bonds. They argue that turning mortgages into mortgage-backed securities and using bond ratings to describe their riskiness takes messy individual mortgages and turns them into standard products whose riskiness and return can be evaluated 'objectively'. These products then can be easily bought and sold without buyers having knowledge of individual borrowers, thus allowing a large and liquid market in mortgages (Carruthers and Stinchcombe, 1999).

Securitization strategies and products quickly spread to other markets and across the world. 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. 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. Leyshon and Thrift (2007) view the securitization of assets as one of the key financial innovations underlying the integration of global finance. Indeed, the growth of global finance was to a large degree attributable to asset-backed securities. Today, markets for asset-backed securities and their derivatives are among the largest worldwide. ABA Alert.com reported that in 2010, there were over $93.5 trillion in asset-backed securities worldwide.

[3] 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 are then rated by credit-rating agencies. The riskier the investment is, the higher the rate of return. Securities may be backed by insurance policies and more exotic financial products that mimic insurance.

2.1 The globalization of the USA: mortgage-backed securities market

Banks in other developed countries joined the market for American MBS and CDO. By joining that market, those banks decided to emulate the tactics of the highly profitable American banks. Here, we do not try to predict which banks decided to enter these markets, but instead focus on the effects of their having joined those markets. Theoretically, the way to make sense of what happened is to view the market for MBS as made up of a set of players who observe one another and then position themselves in a role structure (Fligstein, 2001; White, 2004). Fligstein argues that it follows from this definition that for a market to be global, that market must contain participants from countries around the world who form a field where they watch one another and are organized around a recognizable set of rules and strategies (Fligstein, 2001, p. 224). Beginning in 2001, foreign banks decided to enter the US MBS and CDO markets in a massive way. This created a new international financial market centred on MBS and CDO.

Why did this market prove so large and inviting? In the period 2001–2006, interest rates were low in many countries, and therefore investors got low returns for holding government bonds. What they were seeking were investments with higher returns that were relatively low risk. What they found was products based on American mortgages (Seabrooke, 2006; Schwartz, 2009; Schwartz and Seabrooke, 2009). Aalbers (2008, 2009) argues that US MBS and CDO became a huge source of investment for banks around the world after 2001.[4] These investments were consequential because they involved large sums of money, had high bond ratings (mostly AAA) and were quite profitable. The US mortgage origination market fluctuated between $2 and $4 trillion a year from 2001 to 2007 (Fligstein and Goldstein, 2010). About 90% of these mortgages were packaged into securities. In 2003, these markets comprised about 9% of GDP and 7% of employment in the economy, but the American banks involved produced 40% of the profits in the US economy (Krippner, 2011). Foreign banks saw this opportunity and began to emulate the tactics of American banks in order to try to make such outsized profits for themselves.

An important missing link in our argument is why American MBS became the core investment of the largest banks in the USA and Western Europe between 2001 and 2007. One potential cause of the spread of American MBS is financial deregulation across the world. Figure 1 presents data on the relationship between financial deregulation, MBS holdings at a country level and whether or not a country had a

[4]Aalbers has also argued that the US 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.

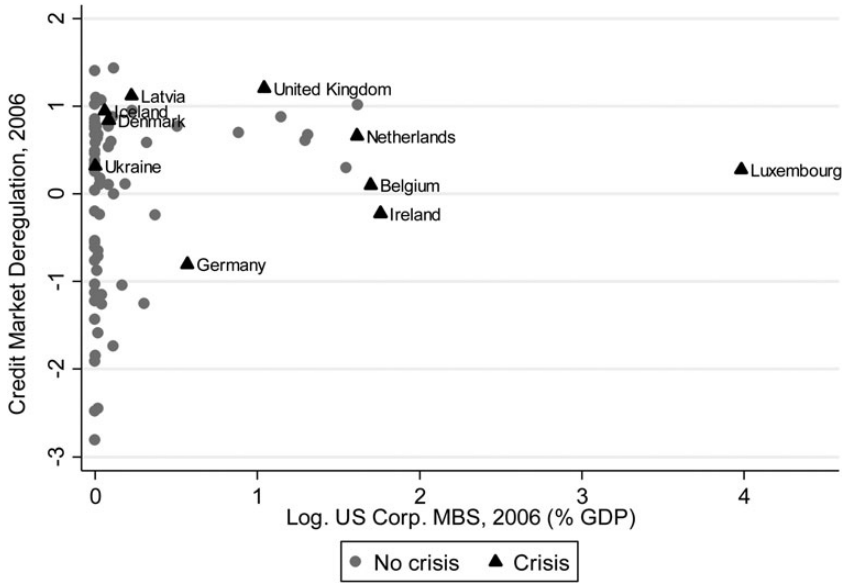

Figure 1 Scatterplot of 75 countries, by 2006 credit market deregulation and log corporate MBS holdings.

banking crisis in 2008 (see the Data and Methods section for description of the measures). The figure shows quite clearly that many of the countries that had high rates of purchase of MBS also experienced financial deregulation. But, not all of the countries that had financial deregulation participated equally in the MBS market. This suggests that financial deregulation might have been a necessary but not sufficient condition for participation in the American MBS market. One distinct outlier was Germany, which had relatively low rates of deregulation but high rates of purchase of MBS and a banking crisis. The strongest predictor of a banking crisis seems associated with high levels of purchase of MBS. We will confirm this linkage in our models later in the article.

The sociology of markets also pushes us to ask how banks were making money in these markets. Many American banks made money from fees on originating mortgages, packaging them into securities and selling MBS to investors. But the bulk of the money they were making came from holding onto the financial products they were producing. Gorton (2010) and Brunnermeier (2009) document how American banks made money by borrowing money using short-term loans to pay for these securities. Acharya *et al.* (2013) show that banks in the USA and Europe financed the purchase of these bonds by borrowing money in the ABCP market.

The ABCP market has a long history (Stigum, 1989, tells this story). The market was originally created by the Federal Reserve in 1914 so that banks could make loans backed by collateral on a very short-term basis (usually 1–90 days). For much of the

history of the market, government bonds were the form of assets that was most frequently put up as collateral. The original purpose of the market was to aid exporters who might have to wait weeks for their goods to arrive overseas before they were paid. They would borrow short term using ABCP to cover their expenses. But over time, both banks and other large non-financial corporations saw the advantage of being able to borrow money to fund their short-term needs as well as to lend money to others. The ABCP market is part of what is referred to as 'shadow banking'.

In the wake of the stock market crash of 2001, interest rates were very low. Banks could borrow money at 1–2%. They searched for assets with higher yields in which to invest this money. They found MBS and CDO that could pay 5–7% and were often rated 'AAA'. Acharya *et al.* (2013) and Adrian *et al.* (2011) show that during the early 2000s, the market for ABCP became the source of cheap money to buy MBS and CDO. Between 2003 and 2006, for example, Acharya *et al.* show that something like 75% of the $1.4 trillion ABCP market was issued to buy MBS and CDO. Gorton (2010) describes these investments as 'borrowing short to buy long'.

The market for MBS and CDO and the strategy of 'borrowing short to buy long' was not just for the US 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 CDO with borrowed money. Beginning in 2003, they entered the market with a vengeance. By 2007, the market for US MBS and CDO was a global market. 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 US and foreign banks, were pursuing the same strategy: use ABCP to buy MBS and CDO. In Section 3 of this article, evidence will be provided for this assertion.

This global market was directly connected to the fortunes of the US mortgage market and housing prices. When US housing prices stopped rising and foreclosures were increased, many foreign banks found themselves facing the same liquidity crises as American banks. The money they were borrowing short term came due and many of these banks were unable to find new funding to cover their MBS and CDO holdings. Because of the foreclosures, there was little market to buy these bonds. This proved to be a big problem when banks found themselves in the summer of 2008 with large amounts of MBS and CDO that were losing value and had to quickly raise funds to cover their borrowing. It was this crisis that spread across US banks, but also across the foreign banks who were now key players in this 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 crisis. That crisis brought that country's economy into recession.

Hypothesis 1: Countries where banks had large holdings of US MBS and ABCP were more likely to experience a banking crisis because when the underlying value of the MBS began to drop, these losses were transmitted through the banking system via these financial instruments. The crisis made credit difficult to come by in those countries and declines in economic growth followed.

2.2 *Other factors that might explain the spread of the crisis*

Economists use the word 'contagion' to describe how financial crises in one country can spread to other countries (Claessens *et al.*, 2001; Forbes and Rigobon, 2001; for a formal model, see Allen and Gale, 2007). There are three sorts of mechanisms by which economic crises in one country can move to other countries. First, the fate of different countries can be closely related because they have similar underlying structures to their economy. When something happens in one economy, it quickly occurs in others with similar characteristics because of common fundamentals. Secondly, 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 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 is termed the 'flight to safety'. Each contagion mechanism suggests a different set of factors that might explain the spread of the crisis that began in 2007.

One obvious structural factor exposing countries to crisis and recession is financial deregulation. Allowing banks to enter into many markets potentially encourages them to take more risks (Minsky, 2008). In the context of the current crisis, deregulation meant that banks with lots of risky assets were unprepared to take on the challenges of the downturn (Schiller, 2003; Johnson and Kwan, 2009; Kaufman, 2009). These risks were not just limited to buying MBS with ABCP, but also included making speculative loans to businesses and highly leveraging assets. This implies that in countries with higher levels of deregulation, we should observe more banking crises and a deeper recession.

Hypothesis 2a: Countries with recent financial deregulation were more susceptible to bank crises and declines in economic growth because of higher levels of risk and indebtedness in those countries.

There are several elaborations of this argument that one could be usefully tested. Figure 1 implies that financial deregulation might actually have been the

explanation for why non-US banks were able to buy lots of MBS by using ABCP in the first place. Financial deregulation is a necessary condition for entry into these markets and thus an antecedent variable in explaining the crisis. One would expect that the effect of financial deregulation on banking crises is mediated by the level of MBS and ABCP held in a particular country (Hypothesis 2b). This hypothesis can be tested by examining the effects of financial deregulation and seeing what happens to them when MBS and ABCP are added to the equation. Similarly, one might expect that countries with high levels of financial deregulation and high levels of MBS and ABCP would be more likely to have banking crises and worse recessions (Hypothesis 2c). This implies that there might be an interaction between financial deregulation and purchasing MBS with ABCP.

Another factor that might explain having a banking crisis and recession is the presence of a housing bubble in a country. Housing prices increased dramatically in many countries after 2001. Banks had a booming business loaning as much money to as many people as possible. Borrowers who faced rising house prices took out ever-larger loans expecting that prices would continue to rise. This created a speculative bubble (Reinhart and Rogoff, 2008, 2009). Many borrowers were so stretched that they took out adjustable rate mortgages that put them in the position of having to re-finance every 2 or 3 years or face steadily increasing mortgage payments. They paid for refinancing out of price increases in the underlying value of the house (Davis, 2009). When housing price appreciation started to slow down, it created a wave of defaults on loans. These defaults cascaded and produced lower housing prices and more defaults. We would expect that countries that shared in the rapid appreciation of housing prices would be more susceptible to a banking crisis and the resulting recession. Once a banking crisis took hold, there might have been an interaction between an overheated housing market and a weakened financial sector such that the ensuing recession was made worse.

Hypothesis 3a: Countries that experienced housing price increases between 2000 and 2006 were more at risk of both a banking crisis and a decline in economic growth because of their exposure to defaults when those prices turned down.

Hypothesis 3b: Countries with a large housing price increases and a banking crisis were likely to experience an even more severe decline in economic growth.

In discussions 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. 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 USA would trigger a banking crisis or a recession as well. One might also expect that once a banking crisis took hold in a given country, the dependence on exports led to an even more severe recession as the two events interacted.

Hypothesis 4a: Countries with large amounts of exports and exports to the USA in particular were more likely to have a banking crisis or declines in economic growth because as the US economy turned down, their economies turned down as well.

Hypothesis 4b: Countries with large amounts of exports and exports to the USA that had banking crises were likely to have even more declines in economic growth.

The last factor to discuss is the 'flight to safety'. There are several ways to measure the risk of capital flight. One is the current account deficit (measured as the gap between a country's imports and exports), which requires countries to borrow to fund the deficit. A second measure is whether or not a government is running a large and unsustainable government debt. 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 debt funded. 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. This flight could cause a systemic banking crisis and a recession. It was this kind of contagion that some have argued caused the Asian financial crisis of the late 1990s (Claessens and Forbes, 2004; Halliday and Carruthers, 2009). One might expect that such countries that also experienced a banking crisis would be even larger targets for currency flight and thus, have even deeper recessions.

Hypothesis 5a: Countries that were running a large budget public debts or current account deficit were more susceptible to financial crisis. These deficits led to both a financial crisis and decline in economic growth as investors sold assets to buy safer assets.

Hypothesis 5b: Countries that were running a current account deficit or had large government debt that had banking crises were likely to have even more declines in economic growth.

3. Who held US:MBS and ABCP?

In this section, we consider what is known about foreign ownership of US MBS and ABCP in the period before the crash.[5] Data from Inside Mortgage Finance (2009)

[5]It is quite difficult to get detailed data on the holdings of foreign banks in any of these markets. There is no central reporting of these statistics nor do national governments generally break these data out. This means that we must rely on fragmented sources of evidence or data painstakingly collected by scholars on a deal-by-deal or a bank-by-bank basis.

show that between 2002 and 2007, investors increased their holdings of American MBS dramatically. The US commercial banks' holdings increased from about $700 billion to almost $1.1 trillion in these years. Mutual fund holding doubled from about $425 billion to almost $850 billion. But the most dramatic increases came from foreign investors. In the space of 5 years, foreign holdings of US MBS grew from about $200 billion to over $1.2 trillion, an increase of nearly 600%.

These data do not allow one to decompose the holders of those bonds by country. The US Treasury, however, gathers this data on a yearly basis (U.S. Department of the Treasury, 2007: Table 11, p. 15, and Table 24, p. 51–55). Table 1 provides evidence on the largest holders of US MBS by country in 2006. The 10 countries that were the largest holders were the UK, Belgium, Ireland, Japan, Germany, Iceland, the Netherlands, Norway, Switzerland and France. All of the largest holders of American MBS were advanced industrial societies and 9 out of 10 were in Western Europe.

Unfortunately, neither Inside Mortgage Finance nor the U.S. Treasury collects information about individual bank holdings of US MBS or CDO. But during the crisis, the Federal Reserve Bank bought $1.25 trillion of government-sponsored

Table 1 Foreign countries with the highest amount of MBS/GDP, 2006 and with the highest amount of ABCP/GDP

Highest MBS/GDP[†]
Ireland
Belgium
France
Germany
Iceland
The Netherlands
Norway
Switzerland
UK
Japan
Highest ABCP/GDP[‡]
The Netherlands
Belgium
Germany
UK
France
Canada
Switzerland
Japan
Denmark
Spain

[†]*Source:* U.S. Treasury Department (2007).
[‡]*Source*: Acharya *et al.* (2013).

enterprise MBS from 13 banks, including 7 foreign banks. 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. These foreign banks were all in advanced industrial countries, and most were in Europe. Beginning in January 2008 the Federal Reserve expanded its short-term loan activities to aid distressed banks. By 2010, the Federal Reserve had lent money to 438 banks of which 156 were branches of foreign-owned banks. Most of the banks (138) were branches of European banks.

A very similar pattern is apparent in the market for ABCP. Table 1 contains information on the countries of origins of the largest issuers of ABCP as of January 2007. These include the Netherlands, Belgium, Germany, the UK, France, Canada, Switzerland, Japan, Denmark and Spain. We note that this list overlaps with the list on MBS for 7 of the 10 countries, implying a link between country's banks purchasing MBS and CDO and the ABCP market.

We have some information on the identity of the largest banks in the ABCP market. Table 2 presents the 20 largest foreign banks in that market and the 8 largest US players. The foreign bank list confirms that many of the world's largest banks were substantially involved in the ABCP market. And 18 of the 20 banks were European. 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 US list, all of the banks either were 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 MBS market during the peak of the housing bubble. They increased their holdings 600% in a 6-year period and came to own almost $1.2 trillion in American MBS. The bulk of these banks were located in Europe, with a few in Japan. Many of these banks were funding their purchases of MBS by using the ABCP market. What remains to be seen is the degree to which these purchases are the main mechanisms by which one can explain whether or not their countries suffered a banking crisis and a recession.

4. Data and methods

It is useful to begin our discussion of our data and methods by discussing our research design. We have two dependent variables. First, we attempt to model whether or not a country had a systemic banking crisis, using variables pertaining to our hypotheses. Secondly, we model the depth of a recession in any given country using the same variables and including an additional variable indexing the presence of a systemic banking crisis.

Table 2 Largest sponsors of ABCP conduits with country of origin

Foreign
ABN Amro (the Netherlands)
HBOS (UK)
HSBC (UK and Hong Kong)
Deutsche Bank (Germany)
Societe Generale (France)
Barclays (UK)
Mitsubishi (Japan)
Rabobank (the Netherlands)
Westdeutsche Landesbank (Germany)
ING Groep (the Netherlands)
Dresdner Bank (Germany)
Fortis (Belgium)
Bayerische Landesbank (Germany)
Credit Agriciole (France)
Lloyds Banking Group (UK)
Hypo Real Esate (Germany)
Royal Bank of Canada (Canada)
BNP Paribas (France)
KBC Group (Belgium)
Bayerische Hypo-und Vereinsbank (Germany)
USA
Citigroup
Bank of America
JP Morgan Chase
Bear Stearns
GMAC
State Street Corporation
Lehman Brothers
Countrywide Financial

Source: Acharya *et al.* (2013).

To test our hypotheses, we must address several serious data problems. The systemic banking crises and the recessions occurred very close in time, and it is difficult to untangle these events. Macroeconomic data are rarely available at any finer temporal resolution than the quarter and only for the wealthiest and most developed countries. This problem is compounded by the fact that choosing an onset date for a systemic banking crisis is difficult. For example, in the USA, did 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 Programme (TARP) by the Congress in October 2008, or the banks acceptance of TARP money in December 2008? The official definition of a recession as two straight quarters of GDP decline also makes it hard to date the beginning of a recession. 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.

We therefore use a cross-sectional design that predicts the occurrence of events within a particular time frame. Our independent variables are 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 econometric analyses. 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 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. To produce the cleanest possible model, we chose to focus only on countries where a banking crisis had clearly occurred by the end of 2008, and employed change in GDP in 2009 only as our second dependent variable. 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. As a test of our central hypotheses, it is more conservative and also more compelling.

Selecting a sample of countries is also 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 a serious recession. We are highly limited by data availability. We have relatively complete data for 75 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 does not exist.

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 75 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 with the results from the 44 cases. We do this by first recoding the house price appreciation variable so that it codes the percentage change in house price appreciation from 2000–2006 if there are no data as '0'. Then we created a second variable coded '0' if the data are not present and '1' if they are present. This allows us to examine the effect of having

Table 3 List of countries in the analysis, by first year negative change in GDP

2008	2009		No recession	
Bahamas	Armenia	Lithuania	Albania	South Korea
Denmark	Austria	Macedonia FYR	Argentina	Kyrgyz Republic
Estonia	Belgium	Malaysia	Australia	Mauritius
Ireland	Brazil	Malta	China	Morocco
Italy	Bulgaria	Mexico	Colombia	Panama
Japan	Canada	The Netherlands	Dominican Rep.	Peru
Latvia	Chile	Norway	Egypt	Poland
Luxembourg	Costa Rica	Paraguay	Haiti	Sri Lanka
New Zealand	Croatia	Russia	Indonesia	Tunisia
Portugal	Cyprus	Singapore	Israel	Uruguay
Sweden	Czech Rep	Slovakia	Kazakhstan	
	Ecuador	Slovenia		
	El Salvador	South Africa		
	Finland	Spain		
	France	Switzerland		
	Georgia	Thailand		
	Germany	Trinidad/Tobago		
	Greece	Turkey		
	Guyana	Ukraine		
	Hong Kong	UK		
	Hungary	Venezuela		
	Iceland			

or not having data on whether or not countries are more likely to have a financial crisis. Finally, we estimated models for sample selection and missing data, which we do not report here. Models using the Heckman correction for censored data and Bayesian multiple imputation do not change the substance of the results.

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 (a) banks required extensive injections of liquidity, (b) banks were required to significantly re-structure their activities, (c) governments engaged in significant asset purchases from banks in order to provide them with liquidity, (d) governments provided significant guarantees on liabilities and (e) governments nationalized some banks. A systemic banking crisis is said to have occurred if a country meets at least four of these five criteria. We also ran a regression analysis

Table 4 Countries that experienced a banking crisis, 2008–2009

Systemic banking crisis (13 countries)	Borderline banking crisis (10 countries)
Austria (late 2009)[†]	France
Belgium	Greece
Denmark	Hungary
Germany	Kazakhstan
Iceland	Portugal
Ireland	Russia
Latvia	Slovenia
Luxembourg	Spain
Mongolia (late 2009)[†]	Sweden
The Netherlands	Switzerland
Ukraine	
UK	
USA	

Source: Laeven and Valencia (2010).
[†]We treat these cases as non-incidences of systemic banking crises in our models because they did not meet Laeven and Valencia's conditions for a systemic banking crisis before the end of 2008.

where the dependent variable was a count of the number of conditions a country experienced. The results are similar to the ones reported here.

Table 4 presents the list of 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 USA and Great Britain are both on the list. We also note that Iceland, Ireland, Latvia 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 the criteria of a banking crisis.

The second dependent variable in the analysis is the per cent 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.

Our measure of country holdings of MBS codes holdings of US non-agency MBS (that is, issued by private lenders and not enjoying guarantees from the US 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 US dollars, and we have standardized this measure by making it a percentage of GDP and logging the result. We added 1% to the ratio so that countries that had no MBS ended up with a log value at '0'. The importance of scaling for the size of a countries economy is intuitively clear. We logged the variable in order to adjust for outliers because small countries that house large banking centres such as

Bermuda and Luxembourg have MBS 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 Acharya *et al.* (2013).

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 1 to 10. The higher the score, the more deregulated is the country's credit market. This is a score that many scholars who study the effects of financial deregulation on economic growth (Giannone *et al.*, 2010; Rose and Spiegel, 2010) have found useful as a metric to measure the degree to which societies have taken government regulation and intervention out of their financial sector. This measure was scaled from 0 to 9, but most of the cases were clustered in the 6–8 range. As a result, we decided to re-scale the measure as a *z*-score. This has the effect of making the mean on the variable '0' and the standard deviation '1'.

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 per-centage of 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 per cent of GDP. We also coded up the percentage of exports that were sent to the USA in 2006. We tried these measures in both a logged and unlogged fashion, and the results were identical. Here, we report only the unlogged versions. The source was also the World Bank's Development Indicators.

Our measure of house prices was the per cent change in the price of the median residence from 2000 to 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. To deal with this heterogeneity, for each country, we chose the maximally inclusive annual measure of median house price available, and computed the per cent change in house prices between 2000 and 2006. Therefore, this measure is in units of per cent change with respect to a baseline of prices in 2000. The means and standard deviations of all of the variables are presented in Table 5.

We ran two kinds of models. First, we ran logit models predicting whether or not a banking crisis occurred during the period 2008. Then, we ran ordinary least squares regressions modelling the percentage change in GDP in 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.

Table 5 Summary statistics (see text for variable definitions)

Variable	Obs.	Mean	SD	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	0.00	1.00	−2.81	1.43
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 the 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, 2000–2006	44	54.35	55.91	−25.64	228.05

5. Results

Table 6 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. The first column of the table presents results for our sample of 75 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. The two strongest predictors of whether or not a country has a systemic banking crisis is the size of the US MBS as a percentage of GDP and the ABCP as a percentage of GDP. This confirms Hypothesis 1 that the cause of the banking crises around the world was the participation of that country in the US MBS and ABCP markets. The fact that both of these variables predict banking crises implies 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 the use of short-term ABCP to fund those and similar instruments was equally important. Obviously, in countries where both of these conditions were present, financial crises were more likely.

The models provide no support for Hypothesis 2a that credit market deregulation directly drove the banking crisis. It also provides no support for Hypothesis 3a that countries that experienced housing bubbles were more likely to have a banking crisis than countries that did not experience such house price increases. 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. While some countries that had the financial crisis also had a housing price bubble (Spain and Ireland are the cases most frequently referenced), many countries without a housing bubble also had a crisis (Germany, France and Switzerland), and some countries with rising house prices did not have a crisis (Canada).

Table 6 Logit models predicting systemic banking crisis (see text for variable definitions)

Model	1	2	3
Log 2006 Corp. MBS % GDP	1.766† (0.955)	2.907* (1.283)	2.540* (1.246)
Log 2006 ABCP % GDP	3.036*** (0.883)	2.240** (0.717)	2.248** (0.696)
2006 Credit market Dereg'n	−0.648 (0.807)	−1.200 (1.077)	−1.129 (1.033)
2006 Current account % GDP	−0.113 (0.086)	−0.128 (0.099)	−0.129 (0.097)
2006 Gov't debt % GDP	−0.056† (0.033)	−0.039 (0.026)	−0.035 (0.025)
2006 Exports/GDP	0.009 (0.013)	−0.003 (0.015)	−0.004 (0.017)
2006% Exports to the USA	−0.081 (0.065)	−0.065 (0.052)	−0.041 (0.038)
Real housing price (no misses)		0.010 (0.012)	
Housing price reported?		4.494† (2.406)	
Real housing price App'n 2000–2006			0.009 (0.011)
Constant	−1.535 (1.851)	−6.394* (2.984)	−2.038 (1.903)
n	75	75	44
Ll	−13.243	−10.830	−10.640
Chi-square	29.891	33.311	24.679
d.f.	7	9	8

Robust standard errors are in parentheses.
†$P < 0.1$; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

There is no support for Hypothesis 4a that countries with large exports or exports to the USA experienced crises. Indeed, countries with lots of exports to the USA actually were consistently less likely to have a banking crisis than countries with large exports, though the effect is not significant. Finally, government debt and current account deficits (Hypothesis 5a) also do not have statistically significant effects on whether or not a country had a banking crisis. Our results confirm earlier work that the 'usual suspects' for causes of the spread of financial crises simply were not factors this time around.

Table 7 tests Hypotheses 2b and 2c. Column 1 of the table presents the model in Table 6 with only the variable indexing credit market deregulation. There is a weak (statistically significant at the 0.1 level) and positive effect of credit market deregulation on predicting a banking crisis. Column 2 shows the model with the measures of MBS and ABCP in the model. The coefficient for the measure of credit market deregulation decreases slightly and becomes even more insignificant. Hypothesis 2b is not supported. Columns 3 and 4 add interaction effects. Column 3 shows a statistically significant interaction between holdings of MBS and credit market deregulation. But the coefficient goes in the opposite direction as the hypothesis. When all of the variables are added into the model, both of the interactions are statistically insignificant. Hypothesis 2c is not supported.

Table 8 presents the results for predicting GDP change in 2009. There is a large statistically significant negative effect of the presence of a banking crisis on change

Table 7 Logit models predicting systemic banking crisis with interaction effects (see text for variable definitions)

Model	**1**	**2**	**3**
Log 2006 Corp. MBS % GDP		1.218* (0.484)	3.225* (1.408)
Log 2006 ABCP % GDP		1.508** (0.511)	2.276*** (0.630)
2006 Credit market Dereg'n	0.689† (0.395)	0.583 (0.512)	−0.662 (1.502)
2006 Current account % GDP			−0.115 (0.105)
2006 Gov't debt % GDP			−0.037 (0.031)
2006 Exports/GDP			−0.010 (0.023)
2006 % Exports to the USA			−0.060 (0.054)
Real housing price (no misses)			0.010 (0.013)
Housing price reported?			4.000 (4.165)
Log Corp MBS × Cred. Dereg'n			−0.705 (2.475)
Log ABCP × Cred. Dereg'n			−0.655 (1.097)
Constant	−2.022*** (0.380)	−3.215*** (0.542)	−5.819 (4.142)
n	75	75	75
Ll	−28.075	−18.685	−10.522
d.f.	1	3	11

Robust standard errors are in parentheses.
†$P < 0.1$; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

in GDP in both samples. Having a systemic banking crisis in 2008 reduced GDP by 5–7% 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 two of the models (the ones for 75 countries that includes the measure for systemic banking crisis), there is an 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 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 Hypothesis 1.

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 greater decreases in GDP (although this effect disappears in the regression with 44 cases) implying that this part of Hypothesis 2a is true. One interpretation of this result is that following the onset of the banking crises and recessions, countries with highly deregulated credit markets found that years of easy lending had left borrowers in those countries vulnerable in the economic downturn. In this case, the banking crisis caused by MBS and ABCP precipitated an economic decline.

Table 8 OLS models of 2009 change in GDP (see text for variable definitions)

Model	1	2	3	4
Log 2006 Corp. MBS % GDP	0.424 (0.624)	1.657* (0.650)	1.212† (0.690)	1.525 (1.194)
Log 2006 ABCP % GDP	−0.603 (0.619)	1.249 (0.794)	1.278† (0.713)	0.878 (0.829)
Systemic banking crisis		−6.567** (2.244)	−5.432** (2.005)	−4.898* (2.240)
2006 Credit market Dereg'n	−1.879*** (0.532)	−2.067*** (0.524)	−1.593* (0.665)	−1.498 (1.139)
2006 Current account % GDP	0.062 (0.055)	0.017 (0.050)	0.014 (0.046)	0.086 (0.081)
2006 Gov't debt % GDP	0.022 (0.024)	0.006 (0.023)	0.001 (0.023)	−0.028 (0.023)
2006 Exports/GDP	−0.006 (0.012)	−0.003 (0.012)	−0.005 (0.012)	−0.021 (0.014)
2006% Exports to the USA	0.027 (0.021)	0.018 (0.021)	0.006 (0.024)	0.042 (0.036)
Real housing price (no misses)			−0.020 (0.013)	
Housing price reported?			−0.686 (1.269)	
Real housing price App'n 2000–2006				−0.026† (0.014)
Constant	−3.751* (1.707)	−2.890† (1.600)	−1.335 (1.884)	0.142 (2.129)
n	75	75	75	44
Ll	−211.924	−205.546	−202.872	−115.526
R-square	0.281	0.393	0.435	0.499
d.f.	7	8	10	9

Robust standard errors are in parentheses.
†$P < 0.1$; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$

Similarly, we also found a nearly significant effect of a local housing bubble on negative GDP growth providing some evidence for Hypothesis 3a, but only in the sample with 44 cases. There is no evidence for Hypotheses 4a and 5a that government debt, current account deficits or exports drove economic decline.

Table 9 explores whether or not any of the interaction effects predicted by our hypotheses are true. Columns 2 and 3 explore Hypotheses 2b and 3b. In both models, there is evidence that in countries with an economic crisis, having had a large credit market deregulation actually makes GDP decrease less worse, contrary to the prediction of Hypothesis 3b. There is no evidence that having had a banking crisis interacts with either a current account deficit or deep government debt. Hypothesis 3b is not supported. Column 4 investigates Hypotheses 4b and 5b. There is no evidence that the crisis interacts with either exports or housing price appreciation to make GDP decline. Taken together, there is little evidence that the crisis interacts with any of the variables measured at the country level to make GDP decrease.

6. Conclusions

We began by pointing out that the 'Great Recession' originated in the USA and spread mostly to Europe. Our empirical work shows that the main path to the crisis was through the American housing market. The housing price bubble in the USA fuelled the production of MBS and CDO. 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 ABCP. Foreign investors mostly in Europe increased their holdings of these securities by $1 trillion between 2001 and 2007. As those securities began to lose their value in 2007 and 2008, banks in the USA and in these countries began to fail. It was these failures that spurred systemic banking crises in many countries around the world. Governments intervened 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 where years of easy lending brought about bankruptcy and recession. Put colloquially, it was the global character of the American mortgage-backed security market that sucker punched the world economy and brought it to its knees.

Some caveats are in order. First, we acknowledge that just because in this case the alternative explanations of the crisis do not help explain the spread of this crisis, does not mean that in some future crisis they will not be operative. Secondly, in the years since the financial crisis began in 2008, the market for non-agency American MBS dropped dramatically and the subprime market virtually has disappeared (Inside Mortgage Finance, 2009). The use of ABCP to fund these securities has also ceased as the contracts supporting those purchases expired and were not renewed

Table 9 OLS models of 2009 change in GDP, standardized credit market deregulation

Model	1	2	3	4
Log 2006 Corp. MBS % GDP	1.212† (0.690)	1.652 (1.180)	1.777* (0.758)	1.792 (1.147)
Log 2006 ABCP % GDP	1.278† (0.713)	1.031 (1.540)	0.072 (1.104)	0.409 (0.925)
Systemic banking crisis	−5.432** (2.005)	−6.504** (2.181)	−10.184*** (2.816)	−6.072** (2.029)
2006 Credit market Dereg'n	−1.591* (0.664)	−1.753* (0.710)	−1.729* (0.680)	−1.562* (0.680)
2006 Current account % GDP	0.014 (0.046)	0.013 (0.046)	0.018 (0.047)	0.020 (0.046)
2006 Gov't debt % GDP	0.001 (0.023)	−0.001 (0.024)	−0.001 (0.023)	0.005 (0.023)
2006 Exports/GDP	−0.005 (0.012)	−0.005 (0.012)	−0.007 (0.012)	−0.006 (0.012)
2006% Exports to the USA	0.006 (0.024)	0.006 (0.025)	0.007 (0.025)	0.004 (0.025)
Real housing price (no misses)	−0.020 (0.013)	−0.024 (0.016)	−0.019 (0.015)	−0.010 (0.020)
Housing price reported?	−0.686 (1.269)	−0.431 (1.340)	−0.477 (1.338)	−1.236 (1.351)
Log Corp. MBS × Crisis		−0.472 (1.199)		
Log ABCP × Crisis		0.458 (1.745)		
Cred. Dereg'n × Crisis		2.340† (1.334)	3.620** (1.299)	
Current Acc't × Crisis			0.024 (0.129)	
Gov't debt × Crisis			0.100 (0.062)	
Exports × Crisis				−0.050 (0.050)
Exp'ts to USA × Crisis				0.051 (0.203)
Housing price × Crisis				−0.034 (0.032)
Constant	−1.335 (1.884)	−1.347 (1.947)	−1.298 (1.983)	−1.469 (1.963)
n	75	75	75	75
Ll	−202.872	−202.141	−201.294	−201.617
R-square	0.435	0.446	0.458	0.454
d.f.	10	13	13	13

Robust standard errors are in parentheses.
†$P < 0.1$; *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

(Acharya *et al.*, 2013). From the point of view of the sociology of markets, this particular international financial market no longer exists as most of the big players went bankrupt, were reorganized or exited the market. This implies that whatever the next financial crisis is, it will not emanate from this particular market and this strategic use of financial instruments.

It is useful to speculate on the role of financial deregulation in what happened and what might happen next. Our results show that bank deregulation opened up opportunities for non-US banks to enter the MBS and ABCP markets. Not all banks in all countries did so, but many large European banks did. While in hindsight, entry into these markets looks foolish, at the time these banks bought these financial instruments, they had high credit ratings and were highly profitable. One of the main policy responses across countries has been to re-regulate banks. Most of these responses will push banks to hold more reserves to protect them in a market downturn. Very few of these new policy responses will prevent the largest banks from entering new markets around the world. None of these regulations offers protection against investments on as large a scale as MBS and ABCP. What will happen if a market as large as the MBS and ABCP market develops and turns down is anyone's guess.

Our study has implications for the study of financialization, global financial markets and the sociology of finance more generally. 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 banks 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, how what they are doing changes over time and how people are making money.

This implies that scholars interested in the sociology of finance and its role in globalization should dissect each market by the identities of the market participants, their tactics and what is causing either crisis or growth. 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 USA 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? One can see from our results that banks that existed in both liberal and organized capitalisms (Hall and Soskice, 2001) participated in these markets.

Before the crash, hardly anyone saw that American mortgages were the hottest commodity being traded across this system. While the next international financial crisis will not be caused by a housing bubble originating in the USA, it will require some of the same conditions. There will have to be a huge 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 by believing they can control those risks. Dissecting these markets and their dynamics requires delving not just into the flows and the instruments, but to the social structure of these markets as well.

References

Aalbers, M. (2008) 'The Financialization of Home and the Mortgage Market Crisis', *Competition and Change*, **12**, 148–166.

Aalbers, M. (2009) 'The Sociology and Geography of Mortgage Markets: Reflections on the Financial Crisis', *International Journal of Urban and Regional Research*, **33**, 281–290.

Acharya, V., Schnabl, P. and Suarez, G. (2013) 'Securitization without Risk Transfer', *Journal of Financial Economics*, **107**, 515–536.

Adrian, T., Begalle, B., Copeland, A. and Martin, A. (2011) 'Repo and Securities Lending', Staff Report No. 529, New York, New York Federal Reserve.

Allen, F. and Gale, D. (2007) *Understanding Financial Crises*, Oxford, UK, Oxford University Press.

Arrighi, G. (2010) *The Long 20th Century: Money, Power, and the Origins of Our Times*, London, Verso.

Block, F. (1978) *The Origins of International Monetary Disorder: A Study of United States International Monetary Policy from World War II to the Present*, Berkeley, CA, University of California Press.

Brunnermeier, M. (2009) 'Deciphering the Liquidity and Credit Crunch 2007–08', *Journal of Economic Perspectives*, **23**, 77–100.

Bryan, D. and Rafferty, M. (2009) *Capitalism with Derivatives*, New York, Palgrave.

Carruthers, B. and Stinchcombe, A. (1999) 'The Social Structure of Liquidity: Flexibility, Markets, and States', *Theory and Society*, **28**, 253–282.

Claessens, S. and Forbes, K. (2004) 'International Financial Contagion: The Theory, Evidence, and Policy Implications', Paper Presented at the Conference 'IMF's Roles in Emerging Market Economies', 18–19 Nov. 2004, Amsterdam, The Netherlands.

Claessens, S., Dornbusch, R. and Park, Y. (2001) 'Contagion: Why Crises Spread and How They Can Be Stopped'. In Claessens, S. and Forbes, K. (eds) *International Financial Contagion*, Boston, MA, Kluwer, pp. 19–41.

Claessens, S., Dell'Aricia, G., Igan, D. and Laeven, L. (2010) 'Global Linkages and Global Policies', *Economic Policy*, **2**, 267–293.

Davis, G. (2009) *Managed by the Markets: How Finance Reshaped America*, New York, Oxford University Press.

Epstein, G. (ed). (2006) *Financialization of the World Economy*, London, Edgar Elgar.

Erturk, I., Froud, J., Johal, S., Leaver, A. and Williams, K. (eds) (2008) *Financialization at Work*, New York, Routledge.

European Mortgage Federation. (2009) *Hypostat 2008: A Review of Europe's Mortgage and Housing Markets*, Brussels, European Mortgage Federation.

Fligstein, N. (1996) 'Markets as Politics: A Political-Cultural Approach to Market Institutions', *American Sociological Review*, **61**, 656–673.

Fligstein, N. (2001) *The Architecture of Markets*, Princeton, NJ, Princeton University Press.

Fligstein, N. and Goldstein, A. (2010) 'The Anatomy of the Mortgage Securitization Crisis'. In Lounsbury, M. and Hirsch, P. (eds) *Markets on Trial: The Economic Sociology of the U.S. Financial Crisis*, Bingham, U.K, Emerald Publishing, pp. 29–70.

Forbes, K. (2004) 'The Asian Flus and the Russian Virus: The International Transmission of Crises in Firm Level Data', *Journal of International Economics*, **63**, 59–92.

Forbes, K. and Rigobon, R. (2001) 'Measuring Contagion'. In Claessens, S. and Forbes, K. (eds) *International Financial Contagion*, Boston, MA, Kluwer, pp. 43–66.

Frieden, J. (1991) 'Invested Interests: The Politics of National Economic Policies in a World of Global Finance', *International Organization*, **45**, 425–451.

Giannone, D., Lenza, M. and Reichlin, L. (2010) 'Market Freedom and the Global Recession'. Paper Presented at the Conference', 'Economic Linkages, Spillovers, and Financial Crises', Paris, Paris School of Economics, 28–29 January.

Gorton, G. (2010) *Slapped in the Face by the Invisible Hand*, New York, Oxford.

Hall, P. and Soskice, D. (2001) *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford, UK, Oxford University Press.

Halliday, T. and Carruthers, B. (2009) *Bankrupt: Global Lawmaking and Financial Crisis*, Stanford, CA, Stanford University Press.

Hardie, I. (2012) *Financialization and Government Borrowing Capacity in Emerging Markets*, Basingstoke, UK, Palgrave Macmillan.

Harvey, D. (2010) *The Enigma of Capital*, Oxford, UK, Blackwell.

Helleiner, E. (1994) *States and the Emergence of Global Finance*, Ithaca, NY, Cornell University Press.

Inside Mortgage Finance (2009) *The Mortgage Market Statistical Annual*, Baltimore, MD, Inside Mortgage Finance.

Johnson, S. and Kwan, G. (2009) *13 Bankers*, New York, Wiley.

Kaufman, H. (2009) *The Road to Financial Reformation: Warnings, Consequences, Reforms*, New York, Wiley.

Knorr Cetina, K. and Bruegger, U. (2004) 'Traders Engagement with Markets'. In Amin, A. and Thrift, N. (eds) *The Cultural Economy Reader*, Oxford, UK, Blackwell, pp. 121–144.

Krippner, G. (2005) 'The Financialization of the American Economy', *Socio-Economic Review*, **3**, 173–208.

Krippner, G. (2011) *Capitalizing on Crisis*, Cambridge, MA, Harvard University Press.

Laeven, L. and Valencia, F. (2010) 'Resolution of Banking Crises: The Good, the Bad, and the Ugly', IMF Working Paper 10/146, Washington, DC, International Monetary Fund.

Leyshon, A. and Thrift, N. (1997) *Money/Space: Geographies of Monetary Transformation*, London, Routledge.

Leyshon, A. and Thrift, N. (2007) 'The Capitalization of Almost Everything', *Theory, Culture, and Society*, **24**, 97–115.

Lounsbury, M. and Hirsch, P. (2010) *Markets on Trial: The Economic Sociology of the US. Financial Crisis*, Bingley, UK, Emerald Publishing.

MacKenzie, D. (2011) 'The Credit Crisis as a Problem in the Sociology of Knowledge', *American Journal of Sociology*, **116**, 1778–1841.

Martin, R. (2002) *Financialization of Daily Life*, Philadelphia, PA, Temple University Press.

Minsky, H. (2008) *Stabilizing an Unstable Economy*, New York, McGraw Hill.

Montgomerie, J. (2008) 'Bridging the Critical Divide: Global Finance, Financialization, and Contemporary Capitalism', *Contemporary Politics*, **14**, 233–252.

Moser, T. (2003) 'What is Financial Contagion?' *International Finance*, **6**, 157–178.

Reinhart, C. and Rogoff, K. (2008) 'Is the US. Subprime Crisis so Different?' *American Economic Review*, **98**, 339–444.

Reinhart, C. and Rogoff, K. (2009) 'The Aftermath of the Financial Crisis', *American Economic Review*, **99**, 466–472.

Rose, A. and Spiegel, M. (2010) 'Cross Country Causes and Consequences of the Crisis', NBER Working Paper 16243, Cambridge, MA, NBER.

Schiller, R. (2003) *The New Financial Order*, Princeton, NJ, Princeton University Press.

Schwartz, H. (2009) *Subprime Nation*, Ithaca, NY, Cornell University Press.

Schwartz, H. and Seabrooke, L. (2009) 'Varieties of Residential Capitalism in the International Political Economy: Old Welfare States and the New Politics of Housing'. In Schwartz, H. and Seabrooke, L. (eds) *The Politics of Housing Booms and Busts*, London, Palgrave Macmillan, pp. 1–27.

Seabrooke, L. (2001) US Power in International Finance: *The Victory of Dividends*, Basingstoke, UK, Palgrave Macmillan.

Seabrooke, L. (2006) *The Social Sources of Financial Power: Domestic Legitimacy and International Financial Orders*, Ithaca, NY, Cornell University Press.

Stigum, M. (1989) *The Repo and Reverse Markets*, Homewood, IL, Dow Jones-Irwin.

Stockhammer, E. (2004) 'Financialization and the Slowdown in Accumulation', *Cambridge Journal of Economics*, **28**, 719–741.

Swedberg, R. (2010) 'The Structure of Confidence and the Collapse of Lehman Brothers'. In Lounsbury, M. and Hirsch, P. (eds) *Markets on Trial: The Economic Sociology of the U.S. Financial Crisis*, Bingley, UK, Emerald Press, pp. 71–114.

U.S. Department of the Treasury. (2007) Annual Report on Foreign Holdings in the U.S., Washington, DC, USA, Government Printing Office.

White, H. (2004) *Markets from Networks*, Princeton, NJ, Princeton University Press.