

Chapter 8 in Financial Crises, 1929 to the Present, Second Edition, by Sara Hsu

Chapter Eight: Late 2000s: The Great Recession of 2008

In the years just before the Great Recession, the global economy appeared to be running smoothly, with high levels of consumption in the West (due to cheap production in China) and a functioning Eurozone. China and other emerging markets were growing like gangbusters, low income Americans were able to purchase homes for the first time, and the world was becoming increasingly globalized or interconnected. Crises had occurred in emerging markets—Western economists viewed this as tragic but not shocking—and were never expected to happen in developed countries. Hence the Great Recession dumbfounded and dismayed economists and policy makers. It was never supposed to happen in developed, sophisticated nations; it could not happen.

Yet the unthinkable did occur. The Great Recession caused the most severe and globalized recession since the Great Depression¹. Markets across the world, connected to the US financially or through trade, went into decline as US mortgage assets and their derivatives tumbled beginning in 2007². We refer to this crisis as the Great Recession of 2008 because it was in this year that global stock markets tumbled and global banks experienced failure on a large scale. This was the year that panic set in. Eventually the crisis laid bare and greatly exacerbated structural problems in the Euro regions.

As is widely known at this point, the Great Recession began in the US with excessive overleveraging of subprime mortgage assets. Subprime mortgages were given out to individuals who lacked sufficient income or other financial resources to repay the loans. It was viewed at first as a problem among subprime mortgage owners—as these individuals lost their homes, the existence of new synthetic mortgage-backed assets based on these subprime loans came to light. These assets were widely owned across the financial system and worth billions of dollars. As US home prices fell, mortgage-based assets tumbled and threatened to bring down the most powerful financial institutions in the world. The crisis spread rapidly to Europe's financial system, bringing down some prominent financial institutions, and reversing carry trades. The crisis in Europe then gained virulence as it was brought to light that Greece's government had been covering up its true budget deficit, which was of course much higher than had been reported.

The causes of the crisis are numerous, and can be classified as both systemic and local, stemming from a lack of appropriate financial regulations, the enormous size of financial companies, problems inherent to the dollar-centered world financial order and with the rules governing the European Monetary Union.

¹ Bordo and Landon-Lane (2010) make the case that the Great Contraction is only fourth in ranking of severity compared to crises occurring in 1880, 1890-91, 1907-08, 1913-14, 1931-32, 2007-08. We find this result questionable, particularly because the authors include only countries that have consistent data in all of these periods (i.e., other countries that were affected, in particular Eastern European and Asian countries, are not included in the analysis).

² Home prices began their decline in 2006.

Poor regulation and structural imbalances existed and wreaked havoc when the crisis hit. These were often worsened by political bickering.

As in other crises, such as the Nordic and the Japanese crises, the bursting of a real estate bubble in the US triggered the crisis. It was a very apparent symptom of underlying disease, excessive speculation in the real estate and financial sectors. The symptom forced economists and financial agents to question the stability of the financial system at its very core.

The crisis developed in the medium term as follows: a real estate bubble had developed after the dot com crash of 2000, when the US Federal Reserve lowered interest rates. An increasing number of risky borrowers took out mortgages in this environment. Mortgage lenders pushed to customers excessively risky mortgages that were misleadingly highly rated by mortgage rating agencies. The Federal Reserve failed to take on the burgeoning real estate bubble and impose appropriate mechanisms to hinder runaway home prices and ensure transparency in banking and securitization practices, since the general consensus was to allow markets to resolve their own problems. When the real estate bubble burst, home prices fell, the risky mortgages failed, and the assets built upon those mortgages posed a threat to the entire US financial system. That a real estate bubble in a subsector of the US economy could have threatened to ruin the US financial system as a whole revealed that something fundamentally wrong was happening in the world of finance. And it was this: the financial system was not only underregulated, it favored the pursuit of profit by any means while pushing risk to other subsectors, without attention to the impact of this activity. Incentives were wrong—bonuses were paid for this type of profit-seeking behavior rather than for building real economic value, the Federal Reserve was commended for maintaining monetary stability rather than for intervening in the creation of systemic risk.

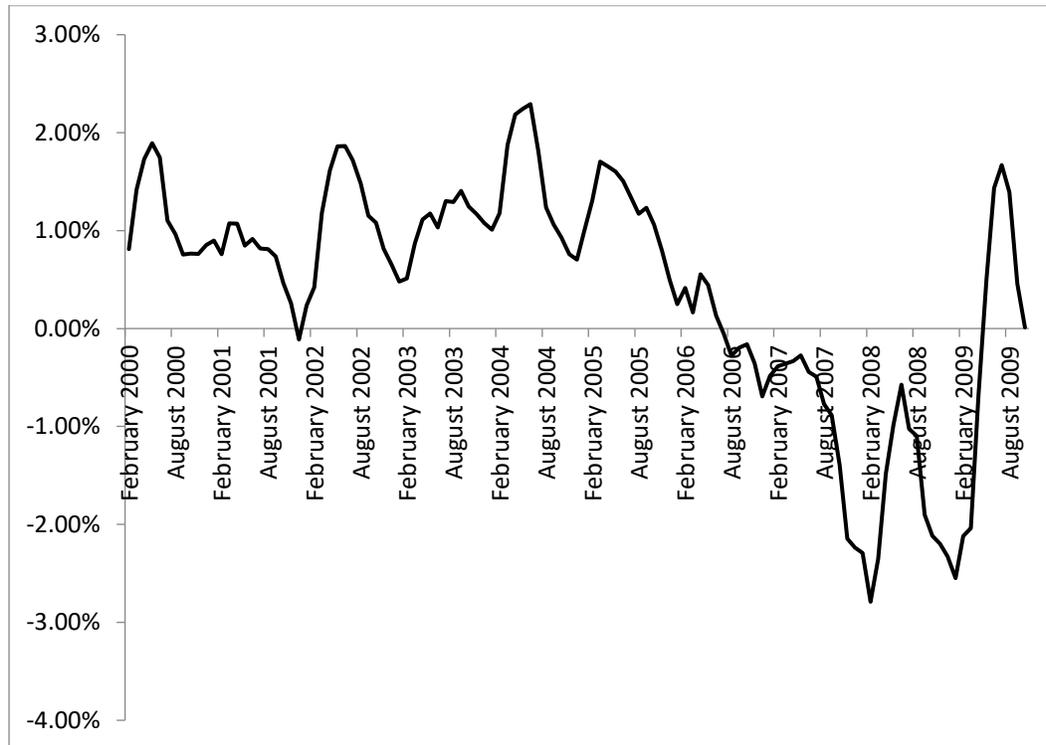
The crisis spread directly to European banks that held these risky assets, and indirectly abroad through a sharp increase in unemployment and an accompanying decline in spending in the US. In the short run, countries for which the US and Europe are major export markets faced increasing unemployment and rising poverty. Carry trade reversals in Europe also forced several countries into near-default. European problems became the focus of attention at the end of 2009, with the emergence of the Greek debt crisis and the eventual exposure of the Eurozone's structural weaknesses that have yet to be resolved. In this chapter, we describe the causes, events, and outcomes of the Great Recession.

Causes of the Crisis

The immediate causes of the crisis were far less conspicuous than the crisis itself. Therefore they went unnoticed as systemic risk increased. The crisis began at the bottom of the economic pyramid in the US, with new products that allowed subprime, or higher-risk borrowers, to take on risky loans. As housing prices declined and interest rates increased, the subprime borrowers were unable to repay the loans.

The following figure shows the steep decline in home prices in the ten original Case-Shiller metro areas.

Figure 8.1: Percentage Change in Case-Shiller Composite-10 Home Price Index



Source: Case-Shiller Home Price Index

One can see from this graph that the home price index rose from 2003 through 2005, and then plunged from 2006 onward. The indices are calculated from data on repeat sales of single family homes. As home prices dropped, subprime borrowers were unable to refinance the new type of adjustable rate mortgage (ARM) loans to reasonable interest rates and began to default on their loans. These new ARMs that brokers had sold to risky borrowers offered low introductory interest rates that borrowers were able to pay initially. The ARMs then increased in interest rates over time, which the risky borrowers could not pay and were not able to refinance. As a result, many subprime borrowers had their homes foreclosed upon by their banks.

Although the percentage of subprime loans was not high in comparison to the mortgage loan pool as a whole (about 20% at the peak of the subprime lending boom³), the failure of these loans to poorer individuals spread to mortgage brokers and banks who securitized the loans and sent them on to the large financial institutions, many of which leveraged the loans up to more than ten to twelve times the original value (Laubsch 2009). The securitization of subprime loans involved reorganization of the loans themselves (slicing and bundling) and the tranching of risk in very complicated Collateralized Debt Obligations (CDOs), Collateralized Loan Obligations (CLOs), and Structured Investment Vehicles (SIVs), all of which were instruments that did not trade on an exchange but rather traded over the counter (OTC).

³ See Katz (2007)

Because no public trading took place, market discipline which could have reduced the prices of these securities in tandem with the onset of falling home prices and increase in risk did not occur. The signal, then, that these were extraordinarily risky instruments was unavailable, and instead the assets were marked to model, not to market.

Marking to model implies that the financial model used to price assets is accurate. However, financial officials somehow did not realize that these bank models, especially the Gaussian Copula Function, did not include periods of prior crises or steep asset price declines (Salmon 2009). Therefore they mispriced the assets at a higher rate. Marking to model and the absence of a risk pricing signal resulted in massive “herd” behavior that failed to take into account the external financial climate.

The extensive use of over the counter trading for CDOs, municipal bonds, and credit derivatives created a climate of non-transparency. The volume of OTC derivative contracts expanded from \$93 billion in 1997 to \$595 trillion in 2007 (BIS 2009). As Dodd (2008) notes, often, in markets that do not electronically post trades, only the dealer and customer observe the price quotes and execution of OTC transactions. These transactions can take place between individuals and dealers, or between dealers themselves. In this climate, particularly when market disturbances occur, it is difficult to value securities or derivatives. After the crisis began, investors did not know who was or was not exposed to subprime risk (Dodd 2007).

It was not an easy task to monitor the bundling of subprime mortgages and their subsequent transfer to financial branches of banks or financial institutions. With the Gramm-Leach-Bliley Act of 1999, institutions could act as both banks and investment banks and these were not subject to stricter banking regulations (i.e., supervision by the Federal Reserve). Banks moved these subprime mortgage bundles off balance sheet and sold them to external investors (Crotty 2009). Therefore, the highly risky assets escaped the notice of auditors and regulators. In addition, banks were undercapitalized and had borrowed large amounts of money through repurchase agreements, leading to a triparty repo market of possibly \$2.75 trillion at its peak (Paulson 2010).

Many parties can be faulted for playing a role in building the excessive risk that caused the crisis. These include those who promoted the gross expansion of banking activities, financial analysts who used the mark-to-model pricing mechanism that could not account for market risk, mortgage lenders who offered excessively risky loans to high risk borrowers, and credit rating agencies that marked up the rating of securities which did not merit this type of approval. Some also blame the US Federal Reserve for following a policy of low interest rates after the dot-com crash in 2000, but the Federal Reserve may be more to blame for failing to regulate a climate of improbable financial growth. Blame can be easily placed in retrospect; at the time, the lurking damage these assets could cause was entirely unforeseen. Indeed, the migration to usage of “shadow banking” (non-traditional banking) assets was part of a slow transition away from the traditional banking sector and toward the non-traditional banking sector, as the share of presumed-safe assets fell increasingly into non-bank categories. These include money market mutual fund shares, commercial paper, federal funds and repurchase agreements (“repo”),

short-term interbank loans, Treasuries, agency debt, municipal bonds, securitized debt, and high-grade financial-sector corporate debt (Gorton, Lewellen and Metrick 2012).

Fraud was also a factor. In a report put out in 2007 by Fitch Ratings, Fitch cited a study that was carried out by Basepoint analytics LLC which examined over 3 million mortgage loans originated between 1997 and 2006. This firm found that as many as 70% of early payment default loans contained fraudulent applications (Galbraith 2014). Sheila Bair and Neil Barofsky indicate in their memoirs that they became aware of pervasive financial fraud as a precursor to the 2008 crisis.

Spread of the Crisis to the Financial System

As subprime borrowers defaulted, hedge funds trading the bundled subprime securities stopped trading. Mortgage originators could not sell their loans, and therefore banks, mortgage brokers, and in turn, the six largest financial institutions that comprise 60% of GDP in the US (Johnson 2009), began to face the specter of serious losses. The shocking losses announced by investment bank Bear Stearns in July 2007, the collapse of Germand Sachsen Landesbank in August 2007, and the run on Northern Rock in September 2007 revealed that the subprime trouble was beginning to spread. At year-end 2007, the US Federal Reserve coordinated an action by five leading central banks around the world to offer billions of dollars in loans to banks (Guillén 2009).

Following that, 2008 was a year of excruciating financial drama. To start the year off, a group of Treasury officials traveled to Europe to analyze the state of the European banking system, concluding that European banking was in a weak state (Paulson 2008). Global stock markets plunged in January, foreclosure rates increased, and US financial institutions suffered over the course of the year: Bear Stearns was bought out, Fannie Mae and Freddie Mac were taken over by the government, Lehman Brothers went bankrupt, and AIG received a government bailout. Indy Mac Bank became the largest thrift bank ever to fail in the US (Guillén 2009).

Fannie Mae and Freddie Mac were created in 1938 and 1970, respectively, and were both private institutions as of the 1970s that purchased and securitized mortgages (Dodd 2007). They were critical to providing financial backing for consumers to borrow home loans and obtain consumer finance. Due to fears over increasing losses from home foreclosures, these corporations were placed into government conservatorship in September 2008, bringing in new management and receiving injections of liquidity from the Treasury and Federal Reserve under close monitoring of these institutions.

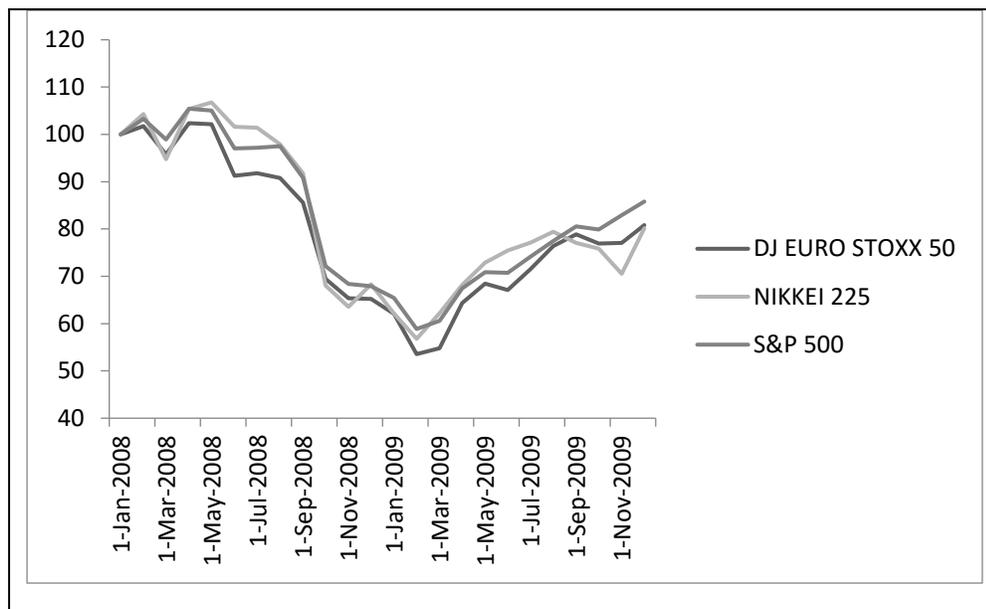
Bear Stearns, exposed to the subprime securities crisis, was bought out by JP Morgan Chase in a Federal Reserve and Treasury-engineered purchase in March 2008. This angered some congresspeople and frightened European leaders (Paulson 2010). In continuing government intervention, and just after the government takeover of Fannie Mae and Freddie Mac, the imperiled investment bank Lehman Brothers sought a buyer. However, when Lehman Brothers could not find a buyer, the Federal Reserve and Treasury were unable to bail out the firm, and on September 15, 2008, Lehman Brothers declared

bankruptcy. Lehman Brothers' bankruptcy represented the largest bankruptcy in US history, with over \$600 billion dollars in debt (Mamudi 2008).

Ferguson and Johnson (2009) and others question the government's actions to bail out Bear Sterns and then refuse to bail out Lehman Brothers, which opened a floodgate of panic in the market. In light of US Treasury Secretary Henry Paulson's (2010) book on the subject, it is clear that the Federal Reserve and Treasury were unable to legally bail out Lehman Brothers due to its real capitalization, as opposed to liquidity, problems. Paulson and other talented industry and government workers worked strenuously to find a buyer for Lehman Brothers in a matter of days, to no avail.

Due to large Lehman Brothers' losses in the Reserve Primary Fund, the oldest US money market fund, the Fund reduced its share value. In response, US Treasury Secretary Henry Paulson announced that the Treasury would support all money market mutual funds for a fee (Weiner 2009). AIG, which had insured or purchased mortgage backed securities to cover large losses in its securities lending program, then facing potentially further losses, was bailed out by the government one day after the Lehman Brothers failure. Equity prices fell dramatically across the world, particularly after the Lehman Brothers bankruptcy, which caused banks to hoard liquidity (Fender and Gyntelberg 2008). Figure 8.2 shows the fall in equity indexes during this period.

Figure 8.2: Adjusted Closing Index Prices (Closing Price on Jan 31, 2008=100)



Source: Tel Aviv Stock Exchange (2011)

The sharp decline in stock indexes reflects real losses of value and a worldwide crisis of confidence in financial markets across the globe. Grammatikos and Vermuelen (2012) show that financials in Europe became much more dependent on Greek-German CDS spreads after the collapse of Lehman Brothers.

It is difficult to convey the extent to which the suddenness of the downturn took individuals and policy makers alike by surprise. Former US Federal Reserve Chairman Alan Greenspan himself was startled by the crisis. As he testified in October 2008⁴:

In recent decades, a vast risk management and pricing system has evolved, combining the best insights of mathematicians and finance experts supported by major advances in computer and communications technology....This modern risk management paradigm held sway for decades. The whole intellectual edifice, however, collapsed.

In the US, it seemed as if the trouble would never end. Bank of America agreed to a \$50 billion rescue package for Merrill Lynch. Morgan Stanley and Goldman Sachs converted from investment banks to traditional commercial banks. Washington Mutual, the largest savings and loan company in the US, was seized by federal regulators and sold to JP Morgan for \$1.9 billion (Guillén 2009). Wells Fargo acquired Wachovia Bank. Citigroup was bailed out in an asset relief package of \$306 billion and eventually split into two entities. Larger financial institutions had engaged in much riskier behavior, mainly through increasing leverage (Bhagat, Bolton and Lu 2015). Tail risks of bank stocks surged in the US as the crisis hit (Straetmans and Chaudhry 2015).

The prospect of mounting failure created circular deterioration in balance sheets even among banks that did not hold claims against their cohorts. This is because, as overall asset prices declined due to the activities of some financial institutions, balance sheets of organizations that held such assets weakened, forcing the institutions to become overleveraged and reducing the size of their balance sheets (Brunnermeier et al 2009).

In response to the crisis, and to prevent a downward spiral in asset prices, the US Federal Reserve's reaction was to again lower interest rates and work closely with the Treasury to "stop the bleeding." The first proposed solution was embodied in the Troubled Assets Relief Program (TARP), which initially set out to buy bad debts from failing institutions, but then was used to inject liquidity directly into failing institutions in return for government ownership of preferred stock. On behalf of the TARP program, it was argued that the failure of large financial institutions would indeed cause a Great Depression rather than a large-scale recession. Large financial institutions were determined to be "too big to fail," even as issues of insolvency at the bottom of the pyramid, among the subprime mortgage holders, increased.

The TARP program incited concern and even rage from a number of parties, including the United Steelworkers Union. In a letter to Treasury Secretary Paulson, the Steelworkers (2008) wrote on the overvalued purchase of assets:

Your investments do nothing to deal with the causes of the current crisis. Now that even Chairman Greenspan has discovered a "flaw" in his theories, wouldn't it make sense to have some reason to believe that the recipients of this government largesse won't just take the money

⁴ Concisely cited by Davidson (2009)

and do it all again? Perhaps there is some reason I do not understand that you have seemingly handed this chicken coop back to the very same foxes who have been pillaging it for the last two decades?

In retrospect, economists, such as Simon Johnson⁵, Joseph Stiglitz, and Paul Davidson have pointed out that policy measures such as the TARP contained critical flaws. First, there was the failure to address the problem of risk after the crisis began. The main problem preventing resumption of normal financial activity was not of liquidity, which was provided in spades, but of risk, not knowing how much banks held in bad assets, since these could not even be quantified. Mortgages were allowed to remain on the books of financial institutions at face value, whereas the market value of these assets is obviously much, much lower.

Secondly, the TARP program did not require financial institutions to refrain from paying out large bonuses to executives, which essentially transferred taxpayer funds to the wealthiest tier of American workers. There was much outcry over the payment of bonuses to top level executives who were responsible for creating the crisis to begin with.

And finally, the underlying yet unstated contract behind the program itself was not really fulfilled. The idea was that the additional liquidity would be used to generate loans and alleviate the credit crunch. However, most of these funds were not lent despite prodigious growth in excess reserves, possibly because regulators or banks viewed themselves as undercapitalized due to higher expected losses (Edlin and Jaffee 2009).⁶

This series of events, particularly including the Lehman Brothers bankruptcy, as well as the AIG collapse, the run on the Reserve Primary Fund, and the political opposition faced by the TARP program, had a significant negative impact on markets, and were reflected in the rising spread between the interest rate on interbank lending, measured by the LIBOR on three-month Eurodollar deposits), and the interest rate on three-month US treasury bills, referred to as the TED spread (Mishkin 2011). Before this period, it appeared possible to contain the crisis. Afterward, however, it became apparent that the financial system was part of a huge “carry trade,” borrowing at low interest rates and purchasing assets that promised higher interest rates along with higher risk. The series of events also strongly challenged government response, and the rejection of the TARP plan significantly weakened the credibility of the government in handling the growing crisis.

⁵ See, for example, Johnson (2009b), Stiglitz (2009a) and Davidson (2009).

⁶ The Public-Private Investment Program (dubbed the “Legacy Loans program”), proposed in March 2009, which revived the original TARP plan in the sense of providing government backing for purchase of troubled assets, was, like its predecessor, so unpopular that it was cancelled. This program proposed to guarantee private investment in troubled assets through the FDIC, and to co-invest funds through the Treasury. Banks found the program so appealing that they requested purchasing these toxic loans from their own books (Enrich, Rappoport, and Strasburg 2009). This would have expanded the role of the government to become the “market maker of last resort” (Buitter 2007).

The Federal Reserve's creation of a temporary Term Auction Facility (TAF) that enabled banks to borrow anonymously contributed positively to the view of government (Mishkin 2011). The Federal Reserve's purchase of mortgage-backed securities beginning in November 2008 was also a significant step toward lowering residential mortgage rates and improving housing demand.

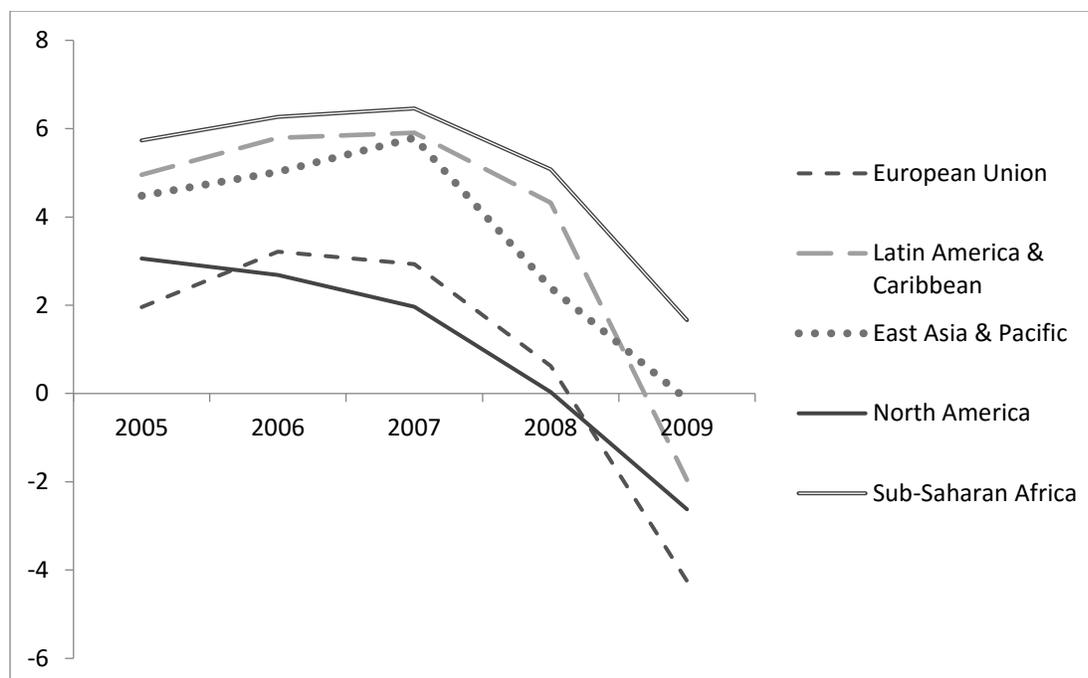
Much damage, however, was already done. The American automobile manufacturing industry was the biggest non-financial industry victim of the crisis. The industry, which suffered from ongoing reduced competitiveness and a sudden decline in demand due to the crisis, was forced to turn to the federal government for assistance. General Motors, Ford and Chrysler faced difficult times, and General Motors and Chrysler filed for bankruptcy.

The climate of uncertainty seeped into every pore of the economy, and was transmitted to Europe and beyond. Global losses due to the credit crisis jumped to \$510 billion by the end of August 2008 (Fender and Gyntelberg 2008). In the UK, the mortgage lender Bradford and Bingley was taken over by the government. The Belgian banking and insurance company Fortis and Germany's Hypo Real Estate received capital injections. Worse, as the carry trade, in which investors borrow in low-yield currencies and lend in high-yield currencies, reversed, currency crises loomed large in Eastern Europe. We next turn to the crisis abroad.

The Crisis Abroad

The crisis was particularly virulent in Europe, but affected virtually all areas of the globe, as can be seen in Figure 8.3, which shows the annual GDP growth rate. Since the US was the center of the global economy, the crisis spread rapidly through a number of channels.

Figure 8.3 Annual GDP growth (%)



Source: World Bank

The crisis spread abroad directly, through falling values of subprime mortgages and falling demand for global goods, and more widely, indirectly, through a run on global financial institutions (“herd behavior”), the interconnection and dependence of financial systems on short-term funding, and increasing mark-to-market losses that resulted in large sell-offs of asset-backed securities (Kamin and DeMarco 2010). Financial institutions with heavy reliance on short-term funding experienced runs. The crisis in the asset-backed commercial paper market sharply reduced ABCP conduits’ ability to fund assets. Foreign exposure to asset-backed securities backed at least in part by US loans were substantial, and declines in asset prices resulted in mark-to-market losses in foreign banks, amounting to \$300 billion⁷ by the end of 2008.

Europe’s trouble started with Northern Rock in 2007. Northern Rock, a British retail bank, received emergency support from the Bank of England after losing money from flagging wholesale mortgage markets. The consequence was a run on some of the bank’s branches, resulting in the British government’s full guarantee of all bank deposits. Fear in the mortgage market affected other British banks, and in response, the Bank of England temporarily allowed banks to swap high-quality securities for treasury bills (Goddard, Molyneux, and Wilson 2009). Bradford and Bingley suffered from mortgage arrears and was split into two entities. Half was nationalized, half was purchased by Spanish bank Santander. London Scottish Bank entered administration. Royal Bank of Scotland was affected by fear (not fundamentals) at the end of 2008, resulting in a low stock share price (Aldrick 2008), while HBOS

⁷ About \$160 billion were linked directly to asset-backed securities.

was acquired by Lloyds TSB in order to prevent its collapse. To restore confidence, the British government created in October 2008 a 50 billion pound recapitalization fund for troubled banks.

Like Northern Rock, Germany's IKB Deutsche Industriebank was affected in 2007, as its structured investment vehicle Rhineland Funding attempted to call on a line of credit underwritten by IKB and other banks. The line of credit was not universally delivered, and IKB had to be bailed out by Kreditanstalt für Wiederaufbau (Goddard, Molyneux, and Wilson 2009). Sachsen LB was acquired by Landesbank Baden Württemberg. Hypo Real Estate, a holding company for property finance banks, faced severe liquidity problems and was bailed out by the Bundesbank and a group of German banks in an initial 50 billion euro rescue package. The Bundestag issued an informal guarantee of all non-banks' bank deposits in October 2008. In December 2008, the German parliament passed a 31 billion Euro stimulus package. Commerzbank, Germany's second largest bank, was partly nationalized in January 2009. Germany then announced its second stimulus package of 50 billion Euros.

Ireland entered crisis as the subprime bubble burst. Anglo Irish Bank, Bank of Ireland, and Allied Irish Banks encountered large losses as the Irish real estate bubble exploded, starting in 2008 (Lewis 2011). Ireland's large construction sector encountered rising unemployment. Irish banks had borrowed from abroad, mainly Germany, to finance the lending boom. The banks were bailed out by taxpayers, since the government issued a guarantee of bank bonds in September of 2008. Anglo Irish Bank was nationalized in January of 2009. Ireland received IMF and EU bailout funds at the end of 2010.

UBS in Switzerland (and to a lesser degree Credit Suisse) also experienced heavy losses in mortgage investments (Goddard, Molyneux, and Wilson 2009). UBS's troubled assets were transferred to a new fund, and the bank received a capital injection from the Swiss government through a convertible bond issue.

Although France did not experience extensive damage to its financial system, French savings bank Caisse d'Épargne announced large losses due to market volatility, and was later merged with Banque Populaire (Guillén 2009). French bank Societe General also showed a sharp fall in net profits in November 2008. French President Nicolas Sarkozy announced a 26 billion Euro stimulus plan to invest in the public sector and to extend loans to troubled French carmakers.

Fortis Holdings, a large financial services corporation based in Belgium, the Netherlands, and Luxembourg, faced severe liquidity problems and was saved by the three governments. BNP Paribas acquired Fortis Bank while the governments became minority shareholders (Goddard, Molyneux, and Wilson 2009). The same governments also recapitalized Dexia Group. The Dutch government also recapitalized ING Group and injected 3 billion Euros into the insurance company Aegon. The Belgian government injected 3.5 Euros into KBC bank.

Non-European developed countries also suffered. Japan's Nikkei index fell by almost 10 percent, and the country entered recession in November 2008. The Japanese government injected funds into ailing companies in return for equity stakes (Guillén 2009). Japan also passed several stimulus packages to

improve employment, help small businesses, and boost consumer spending (BBC 2010). Australia's second largest investment bank, Babcock and Brown, went into administration in March 2009 (Guillén 2009).

Stress from the US and Europe resulted in increased volatility in exchange rates in emerging markets (Coudert, Couharde and Mignon 2011). As contagion quickly spread to developed and then developing countries, many countries implemented fiscal stimulus packages and altered monetary policies in order to reduce unemployment and falling GDP. The central banks of the United States, European Union, Britain, China, Canada, Sweden, and Switzerland made coordinated interest rate cuts for the first time in history. China, India, and the EU announced large stimulus packages to stir domestic demand and production. As Shirakawa (2009) points out, most of these stabilization programs were often implemented without global coordination, creating gaps in government guarantees for depositors and creditors between countries. Shirakawa and others viewed coordination as an important aspect of crisis containment because it directly affects the smooth liquidity transfer across currencies and regions. But policy makers were executing emergency measures.

The crisis continued and international and domestic authorities sought to stop the financial free fall, as international banks failed, the carry trade from Japan and Switzerland unraveled, and demand for exports in developed countries plunged. The IMF provided emergency loans to Hungary, Ukraine, Iceland, and Latvia, which had suffered severe reversals in the carry trade. Governmental collapse in Iceland was followed by that in Belgium and Latvia. The IMF also signed stand-by agreements with Byelorussia, El Salvador, Georgia, Greece, Ireland, Pakistan, Serbia, Seychelles, and Romania.

Iceland's collapse occurred after the three largest commercial banks found they could not refinance their short term debt. Iceland's crisis began before the global financial crisis (Landler 2008), as the country's commercial banks had expanded its assets to several times Iceland's GDP. The real exchange rate had fallen greatly in the lead-up to the debt default as foreign investors questioned whether Iceland's banks might default on their foreign loans. A number of Icelandic bank experienced sharp liquidity problems. Glitnir was the first, and was taken over by the government (BBC 2009). The nation's largest bank, Kaupthing, was also taken over by the government. The Icelandic internet bank Icesave froze deposits in October 2008 (Guillén 2009). Landsbanki, first seized by the Icelandic Financial Supervisory Authority, entered bankruptcy in December 2008. A long boom period was threatened with imminent reversal and necessitated an emergency loan from the IMF.

Hungary's crisis occurred as foreign investors in the country's government securities withdrew their funds as the global crisis hit, causing enormous downward pressure on the currency. Many housing loans had been denominated in foreign currencies. Latvia requested IMF assistance after it found itself unable to pull out a sharp recession, due to falling demand caused by high inflation and contagion from the global crisis. Hungary and Latvia both had net foreign currency liabilities of close to 50 percent of GDP in 2008 (Mihaljek 2009). These two countries were among a group of EU transition countries, including the Czech Republic, Hungary, Poland, Romania, Bulgaria, Estonia, Latvia and Lithuania, that had formerly been Communist countries and were financially liberalized with accession to the EU (Gardó

and Martin 2010). The EU transition countries experienced rapid growth and stronger integration with the EU leading up to the crisis and strong, foreign-financed credit growth. It was reversals in foreign lending, as well as interruption of trade, which threatened the countries from the last quarter of 2008 through the first quarter of 2009. Hungary and Latvia were casualties of a severe credit crunch during this period.

Greece faced potential sovereign default due to excessive government deficits and cheap loans whose interest rates increased after the crisis hit. National debt was larger than the country's economy (CNN 2010). Greece's credit rating was downgraded to the lowest in the Eurozone. The country was extended a loan by the IMF in May 2010, and leaders imposed austerity measures to sharply cut the deficit. Spain and Portugal were strongly affected by Greece's troubles due to their own indebtedness. Portugal negotiated loan terms with the IMF. Spain implemented a relatively large fiscal stimulus package of 1.1 billion Euros to create 300,000 jobs in November 2008, but the stimulus package did not prevent continuing fears of a sovereign debt crisis.

Developing countries such as China, Thailand and Vietnam experienced immediate shortfalls in their large export sectors (Johanssen 2010). The effect of a sudden decline in demand for exports abroad, as well as in external credit availability, strongly affected export-oriented economies. Export-oriented countries at a higher level of financial development weathered the crisis better than those who experienced a sudden tightening in credit. Sub-Saharan Africa, for example, was impacted by a sudden decline in demand for exports, as well as a decline in trade-related finance (Benedictus 2011). Sub-Saharan Africa lost access to global financial markets, although official development assistance continued to be honored (Bandara 2014). Countries and, in particular, industries, that were financially vulnerable during the crisis were very sensitive to the cost of credit (Chor and Manova 2010).

China announced a \$586 billion stimulus package to stimulate domestic demand by expanding infrastructure and improving social welfare programs. The stimulus package focused on spending, over two years, on health care, education, low-income housing, environmental protection, programs to promote technological innovation, transport and other infrastructure projects, and reconstruction after the Sichuan earthquake (Economist 2008).

Singapore slid into recession in October 2008 (Guillén 2009). India's central bank cut short-term lending rates in response to the global crisis. South Korea announced a \$130 billion financial rescue package for its faltering economy. Malaysia implemented two stimulus packages to boost the private sector. Pakistan, on the verge of default, was granted an emergency loan by the IMF.

Russia moved into crisis even before the global fallout hit. Threats by Prime Minister Putin against companies over back-taxes and the Russian invasion of Georgia caused massive capital flight, resulting in a stock market plunge (Mankoff 2010). A fall in commodity prices due to reduced global demand greatly harmed Russia's export market and led the country into crisis (Gaddy and Ickes 2010). In response, the government implemented a large stimulus package, which helped to contain unemployment and poverty. The ruble underwent speculative attacks and was stabilized by a series of small devaluations.

Signs of Recovery in the US, Downturn in Europe

As the crisis spread, US President Barack Obama was sworn into office in February 2009, and immediately instituted a large fiscal stimulus package to create jobs, increase welfare funding, and provide tax cuts. The package was a compromise between Democrats and Republicans, and its impact has been effective even though the components of the package itself have been criticized⁸. The US fiscal stimulus package provided \$282 billion in tax cuts, and \$505 billion on new projects in energy, science and technology, infrastructure, education, and health care (Teslik 2009). Quantitative easing, particularly under programs such as the Large Scale Asset Purchase (LSAP) program in which the Federal Reserve purchased long-term assets, provided a buffer against recession in the US and elsewhere (Chen et al 2015).

In Europe, the European Commission put into place an economic recovery plan worth 200 billion Euros to reduce unemployment and stimulate spending. The plan provided funds (outside of automatic stabilizers) to improve infrastructure, bolster key sectors, and provide social insurance for the unemployed (European Commission 2009). The goal was to promote regional competitiveness in the medium run.

At this point in time, despite the depth of the crisis, the international environment was hopeful and primed to instill a new financial architecture that could potentially address some fundamental problems with the existing world order that have created global imbalances and excessive financial interdependency. Much hope was pinned on the G-20 meeting in April 2009 to reduce the dominance of the dollar and reform the role of finance. Some economists hoped that a new, universal currency or basket of currencies might be created to reduce the hegemony of the dollar and shrink global trade and wealth imbalances, and that the role of finance in profit and politics, which has led to global instability, might be reduced.

However, this important meeting resulted instead in promises to improve financial regulation and commit some IMF funds for loans to developing countries in crisis. The moment for the creation of a new Bretton Woods-style financial restructuring passed, and this was underscored both by the quieting of voices for systemic reform, as well as by the US Treasury's proposal put forth in June 2009 (passed in 2010) for moderate reform of the financial regulatory system (US Treasury Department 2009).

Fortunately for the US, external funding through bond sales remained high as investors fled to safer assets (Caballero 2010). This was in sharp contrast to most other crises, in which investors fled the crisis countries, and it was continuing bond purchases that allowed the US to escape the same fate as crisis nations with less attractive assets. The flight to safety, however, harmed developed countries in Latin America, Africa, eastern Europe, and Southeast Asia, resulting in a rise in interest rates (Soros 2012).

⁸ See Zacharias, Masterson, and Kim (2009)

Although the impact of the crisis varied by country and social group, at the end of 2009, a few signs that the global economy was improving were present. In July 2009, China reported a 7.9% growth rate in the second quarter due to the effects of its stimulus package. In October 2009, the Dow Jones Industrial Average closed above 10,000 for the first time since 2008, when it plunged under the benchmark number (Healy 2009).

Developing countries that had ample “buffer” space for absorbing shocks that were able to implement countercyclical fiscal policy and had strong banking and financial sectors before the crisis, appeared to recover quickly (Nabli 2010). Although global GDP growth was reported at 3.9 percent in 2010, and was at 3 percent in 2011, developing country growth rose to 7 percent in 2010, and to 6 percent in 2011 (World Bank 2011).

In Europe, however, trouble was brewing. In October 2009, Greece declared that its budget deficit was higher for 2009 than had been reported, much higher, and would be high relative to expectations for 2010 as well. This caused panic through the Eurozone, as banks in many countries held Greek debt, which suddenly plummeted in value as its near risk-free status was lowered to Very Risky. Greece’s debt amounted to 113 percent of GDP, almost double the Eurozone limit of 60 percent (BBC 2012).

The Eurozone Crisis

The Eurozone crisis began with Greece and threatened other nations as well, as the fear of overindebtedness climbed. Greece had engaged in overspending before it joined the euro, and only increased spending afterward. Tax evasion prevented the government from obtaining much needed funds to cover increases in spending. With the coming of the Great Recession, Greece experienced an external shock that exposed its high levels of indebtedness and made it impossible for the government to continue paying on its debts. The new Greek socialist government elected in October 2009 announced higher than reported debt levels.

The Greek crisis spread as little to nothing was done to stop the decline in Greek debt. By May 2010, Greece was presented with a bailout package of €22 billion from the Eurozone and IMF (BBC 2012). The crisis spread to other countries that were in deficit, including Spain and Italy, and in response, the European Financial Stabilization Fund of €750 billion was created. The fund did little to reassure markets, since conditions for fund distribution were dictated by Germany, which was unwilling to bail out deficit countries (Soros 2012). Germany fell back upon the Maastricht Treaty as a guideline for conducting emergency activity (stating that no bailouts shall be carried out) within the European Union, refusing to change the rules to meet the needs of debtor countries. Even so, due to the fear that Greece’s descent into crisis would sharply damage the Eurozone through interconnectedness of the financial sectors, a second bailout package of €109 billion was agreed upon to prevent contagion to other economies.

The peripheral euro zone economies had remained relatively uncompetitive before the crisis struck. Wages increased more quickly than productivity, while education and other institutions lagged behind.

These countries were therefore quite susceptible to the crisis. Portugal fell into crisis and was bailed out at €78 billion by the European Union and the IMF. The country received funds for bank recapitalization-- BCP and BPI received €3.5bn and €1.5bn in return for convertible bonds--and committed to austerity measures that would reduce wages and pensions and even cut some national holidays (Evans-Pritchard 2012). Portugal had, like Greece, engaged in over-spending, and had an increasingly large current account deficit. The global crisis acted as an impetus for Portugal's debt crisis as investors withdrew funds from savings certificates and bonds, raising bond yields.

Spain was forced to bail out savings banks and municipalities. The country had also experienced a real estate boom, with housing prices rising 44% between 2004 and 2008, and a corresponding crash (BBC 2012b). By April 2012, the government had injected over €34 billion into its banks. In addition, Bankia, the country's fourth-largest bank, received €19 billion before it was nationalized. Spain was to borrow up to €100 billion from the European Financial Stability Facility and/or the European Stability Mechanism to continue to shore up its banking sector.

Smimou and Khallouli (2015) find that contagion of the global crisis was transmitted to Eurozone countries through liquidity channels, as wealthy investors in one nation reduced investment in another nation in an atmosphere of increased risk, and overall liquidity declined. Negative shocks stemmed from financial linkages within European stock markets and from US financial channels.

Changes in financial flows occurred as the crisis played out. Acharya and Steffen (2015) characterize changes in financial flows within the euro zone as carry trade behavior. The carry trade is generated by positive loading on peripheral bonds and negative loading on German bonds. The authors explain this behavior through regulatory capital arbitrage and risk shifting by undercapitalized banks, home bias of banks in peripheral countries, and inducement by sovereign bodies and home countries to maintain bond holdings. Large banks and banks with high levels of short-term leverage, high risk weighted assets, and low tier 1 capital ratios held larger quantities of peripheral sovereign debt. In addition, peripheral banks that were bailed out held higher levels of peripheral bonds.

Fiscal tightening both at the center and periphery of the European Union did not help matters. France, Spain, Ireland and Greece were ordered to reduce their budget deficits starting in April 2009 (BBC 2012). Greece's austerity plan became a source of major unrest, as successive budget cuts were made to appease international lenders. Portuguese workers protested austerity measures as the government followed the measures closely. Spain passed a constitutional amendment that required to limit future budget deficits, while Italy passed a large austerity budget with an eye to balancing the budget by 2013.

In Europe, austerity measures bred anti-government protests, as social protection was in some cases decreased rather than increased even as workers lost their jobs. The decline in social protection was particularly worrisome in a region that already had a relatively high rate of unemployment, at 7 percent in 2007 and at 15.5 percent for younger workers, before the crisis took hold (Euzéby 2010).

Monetary policy measures carried out by the European Central Bank were relatively cautious. Non-standard monetary policies included fixed-rate full-allotment for longer term refinancing operations (LTRO), Covered Bond Purchase Program, Securities Markets Program and Outright Monetary Transactions. The 3 year LTRO carried out in December 2011 and February 2012 represented the biggest attempt to inject liquidity into the European banking system (Pronobis 2014). The ECB also purchase sovereign bonds in order to lower the borrowing costs of Greece, Italy, Portugal, and Spain.

As the crisis wore on, country debt was downgraded in the US and the Eurozone. At the end of the summer in 2011, Standard and Poor's downgraded US debt for the first time, from AAA to AA+, due to the country's inability to curb deficits. In January 2012, Standard and Poor's downgraded sovereign debt ratings of nine Eurozone countries: France, Austria, Spain, Italy, Portugal, Malta, Cyprus, Slovenia and Slovakia (Gauthier-Villars 2012). Greece's sovereign debt rating slid far further down the ratings scale, to 'selective default' in February 2012. Sovereign downgrades, coupled with political uncertainty, played a key role in increasing Greek sovereign spreads (Gibson, Hall and Tavlas 2014). To underscore this, Kazanas and Tzavalis (2013) find that credit ratings impacted Greece separately from economic fundamentals; these affected credit spreads independently from real indicators.

The EU approved a macroeconomic surveillance structure that consisted of a European Banking Authority, a European Securities and Markets Authority, a European Insurance and Occupational Pensions Authority, and a European Systemic Risk Board (ESRB) (European Commission 2010). These entities were set up to reduce systemic risk, ensure regional rule compliance, and regulate cross-border firms. However, it has become clear that there are structural flaws in the Eurozone that must also be overcome if the Eurozone is to survive long-term. Eichengreen (2012) makes the case that these flaws in the Eurozone are parallel to those in the global financial system. Specifically, the absence of a sufficient adjustment mechanism to account for imbalances, where devaluation of currency for one country is impossible given the zone-wide use of the currency, and the lack of bank regulation at the union level, which encourages neglect of cross-border impacts of policies, remain a problem. The European Banking Authority may ameliorate the latter problem, but implementation of policies is local. Similarly, currency and financial regulation policy imbalances remain problems at the global level.

Germany was strongly and negatively impacted by the global crisis through export channels, but rebounded rapidly. The cause of its resilience has been attributed to wage competitiveness as well as to technological prowess. Stockhammer (2011) states that German growth has been based on wage suppression. Storm and Naastepad (2015) make the case that Germany's technological, or non-price competitiveness and high-tech productive capabilities trump other reasons for its rapid post-crisis restoration of growth, based on Kaldor's theory which states that the effects of relative costs on exports are relatively weak.

Greece's Tragedy

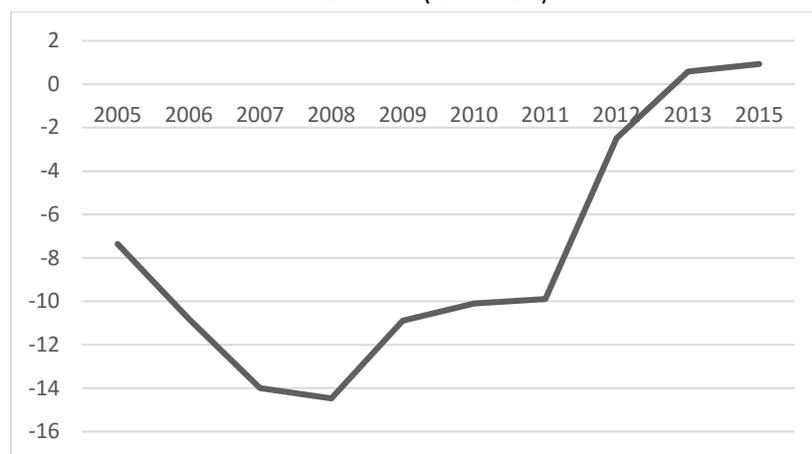
Greece had been considered a post war growth miracle --economic growth was much higher than the OECD average in the 1960s and 1970s as Greece industrialized, according to Tsafos 2013. During the

1980s the state expanded sharply and state spending increased radically, as subsidies for state owned enterprises and social transfers grew. Incentives to increase productivity declined, as did the process of industrialization. Growth prospects therefore declined.

Greece joined the Eurozone on January 1, 2001. Greece's living standards were low in comparison to the rest of Europe in the early 2000s. State expenditures were only rising and increased greatly in 2009. Greece was also on a path of expanding neoliberalism before the crisis hit. Morales, Gendron and Guenin-Paracini (2014) argue that the crisis presented a critical juncture, at which Greece might have abandoned its neoliberal track, but that rather than doing so, Greece chose to consolidate the neoliberal agenda. In addition to short-term austerity measures, long-term neoliberal structural changes were recommended. An increase in labor market flexibility and emphasis on the tradeable rather than the non-tradeable sector was stressed. However, wages in the tradeable sector rose by 5.5% between 2000 and 2009 and 16.5% in the non-tradeable sector, indicating that adjustment should come from internal devaluation in the non-tradeable sector (Kouretas 2010). Much of the wage growth occurred in the public sector, and was coupled with an increase in the number of public sector employees. As such, Tsafos (2013) classifies Greek debt as a symptom of its structural economic problems, which arose from its inefficient civil-service, excessive spending on pensions, corruption, tax evasion, a poor business environment, and an overregulated private sector.

Greece also faced a current account deficit before the crisis began, revealing problems with its fixed exchange rate regime as well as a decline in competitiveness.

Greece's Current Account Balance (% of GDP)



Source: World Bank WDI Online

Greece's government sector was tied to the private sector, since most business contracts came from the government. This system failed to promote competition and innovation in the private sector. Tax evasion was rampant, limiting government revenues. Furthermore, the government preceding the crisis, from 2004-2009, even decreased capital taxation by 10%.

Greece Government Debt to GDP



Source: Trading Economics, Eurostat

When the new Greek government announced a higher than realized government budget deficit in 2009, it became clear that Greece's case was serious. The country was not allowed at first to receive a bailout, to attain interest rate relief, or to default. The no-bailout clause was a component of the Maastricht Treaty. This posed an insurmountable barrier to debt reduction, as Greece was forced to borrow at very high interest rates to fund its deficit. Greece aimed to correct its own deficit by cutting bonuses and raising taxes. The aim was to reduce the deficit to 2.8% of GDP by 2012 from 12.7% of GDP in 2009. However, the results of these actions were relatively disappointing, and it had become clear that Greece would need a bailout to improve its debt position. After a liquidity crunch in global bond markets, finally, in May 2010, Greece received bilateral loans of 80 billion Euros pooled by the European Commission to be disbursed between May 2010 and June 2013. The IMF financed a stand-by arrangement of 30 billion Euros. Loans were to be aimed at covering the government's fiscal and medium to long-term liabilities until the end of 2011, and less thereafter. Greece attempted to eliminate some of its debts by reducing social security spending and pensions and privatizing public assets. The alternative to accepting a bailout and embarking on austerity measures was to default, which would most likely result in the collapse of the financial system and a severe depression. However, the market response to the bailout remained pessimistic, and the public response to austerity measures turned violent at times.

One of the major issues after the crisis began was that Greek labor markets increased in flexibility. Dismissal notice periods were shortened, permanent employees were replaced with part-time workers, collective dismissals (firing a large number of workers) were freed of restrictions, and employment protection declined. Gialis and Tsampra (2015) find that the negative impact of the crisis on national employment was severe and homogeneous across almost all regions. Closing businesses did not help

matters either. Many skilled workers lost their jobs with little job growth to compensate for the losses. The Greek people voiced their dissent through protests, as well as through the promotion of the leftist, anti-austerity political party SYRIZA.



Greece Uprising. Image of the Syntagma square garden. 100.000 people gathered at the centre of Athens on Sunday, 29/5/2011. It was the first day of the people's protest against IMF in european cities. Photo: Kotsolis at English Wikipedia, Creative Commons 3.0 License

George Papandreou was not up to the task of saving Greece. Papandreou created political crises in November 2010, in June 2011, and in October 2011. In 2010 he made the elections of votes on his premiership and on the bailout agreements, declaring success after the ambiguous first round results (Tsafos 2013). In 2011 Papandreou offered to the leader of the opposition to step down from his premiership but later announced a cabinet reshuffle. In October 2011 after a debt restructuring with the private sector Papandreou requested a vote on the debt restructuring plan. All of these moves undermined confidence in the prime minister's ability to lead the country out of crisis. In November 2011 Papandreou resigned and Lucas Papademos became the new prime minister.

Events in 2011 cast a negative light on Greece's economic situation. Greece's 2009 deficit was revised upward to 16% of GDP, while the Eurozone announced that crises after 2013 would require bailout participation of private creditors. Greece's implementation of austerity measures, strong through 2010, slackened in 2011 (Ardagna and Caselli 2014).

On March 14, 2012, the Second Economic Adjustment Programme for Greece was approved, with an additional 130 billion Euros to be used for 2012-2014, financed by the European Financial Stability Facility. Greece carried out a bond swap, swapping privately held bonds for longer maturity bonds at lower nominal values. Internal devaluation required the productive sector to devalue incomes, in an attempt to improve export performance. Elections held in May 2012 resulted in no overwhelming majority. A second round of elections was held in June 2012. Unemployment rose from 9.5% in 2009 to 24.2% in 2012, and surged to 27.5% in 2013.

A far-left, anti-austerity government headed by SYRIZA's Alexis Tsipras was elected in January of 2015, widening the gulf between Greek officials and European creditors. In June 2015, Greece defaulted on a loan payment to the IMF. In a referendum held on July 5, 2015, Greek voters rallied to reject austerity measures. One week later, Greece was given a third bailout package and Greece agreed to continue on the road to reform (Nelson, Belkin and Jackson 2015). Reforms were to continue in the same vein of austerity as before, aiming to improve tax collection, expand market liberalization, and reduce spending on pensions.

Observers have searched for an explanation of why Greece and the Eurozone failed to function in a healthy manner during the crisis. A dominant explanation is that within Europe, there were necessarily deficit and surplus nations with Germany being the most powerful surplus nation of all. Deficit nations had joined the euro zone in order to avoid constant devaluations. However necessarily low levels of inflation, required by the Maastricht treaty in exchange for joining the euro zone, led to a stagnation of wages in peripheral countries. Varoufakis (2013) makes the case that because Europe lacks an effective currency recycling mechanism in contrast to the United States its currency union has faced major issues. This is because Germany has relied upon peripheral countries as last resort sources of demand. In a deficit country the crisis would have an impact of requiring countries to reduce debt, cut spending; as a result, overall demand would decline, increasing unemployment and depressing prices --thus creating a cycle of debt and deflation.

To some degree, the problems with Greece were inherent to the Eurozone. Because Eurozone politicians guaranteed that no Eurozone countries would default, Greece's debt was initially overvalued to begin with, as Greece was allowed to borrow at German-type low-level interest rates (Soros 2012). This allowed Greece to run up its debt to begin with. What is more, the Eurozone lacked a common Treasury, so that individual countries were forced to take care of their own banks. Greece was unable to do so, even though Prime Minister George Papandreou insisted external assistance was unnecessary, and other countries were unenthusiastic about bailing Greece out.

Parallels have been drawn between the pre-1914 gold standard and other currency union crises and the European monetary crisis occurring after 2008. Bordo and James (2014) identify similarities between the pre-1914 gold standard and to be European monetary union today. The authors note that both currency structures are based on fixed exchange rates, monetary and fiscal orthodoxy, and a relationship between peripheral and core countries. In the case of the gold standard, countries were able to temporarily devalue their currencies, but the European monetary union lacked such a recourse.

Bordo and James also make the distinction between pre-1914 countries that were able to borrow in their own currencies versus countries that were unable to borrow in their own currencies, the latter which was dubbed "original sin." Financial centers without Original Sin and strong fundamentals were able to avoid financial crises. Similarly, core European countries remained stable during the current crisis while peripheral countries, particularly Greece, found it extremely difficult to absorb debt.

Another imbalance generated by the Eurozone union was the inability of countries to alter exchange rates. Papanikos (2015) argues that the Euro was overvalued, resulting in low levels of growth in Greece since Greece could not devalue the currency to promote exports and tourism.

When the Eurozone crisis hit, European banks found they had a great deal of Eurozone debt without a common European banking union. In response, the European Commission and the European Central Bank socialized bank losses and turned them into public debt. The makings of a public debt crisis were brought about by the surge in demand for credit default swaps taken out against peripheral countries like Greece.

Sovereign Risk

Greece's floundering financial status has led some financial experts to closely examine sovereign risk. Sovereign risk can rise when sovereign debt increases as a result of regular government spending and when sovereign debt increases in response to an external shock, such as a banking crisis. Both of these occurred recently, in some places together. As the Bank for International Settlements has noted, sovereign credit quality in developed economies has declined in recent years, although at the same time, the global crisis has necessarily increased the level of protection implemented against sovereign risk.

The global financial crisis that originated in the US and spread to Europe was the first to increase sovereign risk, as countries sought to bail out banks and implement fiscal stimulus packages to prevent contagion. Ludwig (2014) refers to the repricing of sovereign risk after the common shock of the financial crisis "wake-up call contagion." Pricing of sovereign risk behaved differently before and after the crisis, as market participants became more sensitive to risk and were impacted by regional, rather than strictly local, macroeconomic fundamentals (Gomez-Puig, Sosvilla-Rivero and Ramos-Herrera 2014). Fiscal stimulus, however, resulted in larger fiscal deficits and reduced the ability of governments to repay debt, pushing up sovereign risk. Banks and sovereigns became intertwined as the crisis spread. Heightened sovereign risk then impacted bank lending as funding costs increased, creating a liquidity squeeze (Cantero-Saiz et al 2014). Funding costs may rise as lenders' perceived economic risk increases, and/or as strained public finances raise the cost of financial intermediation (Corsetti et al 2012).

Banks' positions deteriorated as sovereign risk rose. Sovereign exposure by banks to potential contagion was impacted through several channels: a guarantee channel, an asset holdings channel, and a collateral channel (Bruyckere et al 2013). Assets or collateral held in the form of sovereign debt all faced potential losses, and explicit or implicit government guarantees lost credibility. Further, banks

and sovereigns became further connected as the crisis wore on, as public sector balance sheets were used to shore up financial sectors.

Assessing the true level of sovereign risk became critical at this time, as credit default swap (CDS) spreads failed to fully reflect the reality of sovereign risk (procyclically overstating or understating risk), Pricing of sovereign risk pre-crisis reflected country fundamentals far less than pricing of sovereign debt during the crisis, especially in the peripheral European countries that underwent a deterioration in sovereign debt (Beirne and Fratzscher 2013). CDS spreads followed a weak form of price efficiency during the crisis but remained volatile (Gündüz and Kaya 2014). Greece and Portugal experienced increasing spreads that reflected not only their own default risk, but also spillover effects of default risk from other peripheral countries (Kohonen 2014).

A number of new models were proposed to better assess sovereign risk. Analysis based on macroeconomic fundamentals, most importantly the net international investment position to GDP ratio and the public debt to GDP ratio, has been proposed by Agliardi, Pinar and Stengos (2014). Modeling of sovereign risk contagion (“default risk connectedness”) based on CDS and bond yield data has been carried out by Gätjen and Schienle (2015). Commercial sovereign risk models have been created by Thomson Reuters (the Starmine Sovereign Risk Model), BlackRock (BlackRock Sovereign Risk Index), and others to prevent investment in countries with a Greece-like surge in sovereign risk. Even another aspect of sovereign risk was proposed, currency redenomination risk, referring to the risk that a euro asset would be redenominated into a devalued legacy currency (De Santis 2015).

At this point, it is well recognized that assuming zero risk for sovereign exposure is a mistake. European banks in particular held insufficient capital to guard against sovereign risk stemming from both domestic and non-domestic sovereign bond holdings. Korte and Steffen (2014) refer to this as the ‘sovereign subsidy,’ or amount of sovereign risk that is unaccounted for. The way in which the sovereign subsidy is applied is through classification of highly rated government bonds as highly liquid assets, exclusion of zero-risk weighted sovereign bonds from limits to large exposures, use of low capital requirements for government bond-collateralized exposures, and low capital requirements on select sovereign exposures. The European Systemic Risk Board (2015) produced recommendations to improve Basel III treatment of sovereign exposure. For banks, these include tightening Pillar 1 capital requirements to account for sovereign exposure, improving Pillar 2 requirements through implementation of stress tests or qualitative guidance on diversification, and enhancing Pillar 3 disclosure requirements on sovereign exposure. Still, reform is slow in the making because selling zero or low-risk bonds is extremely attractive to governments. Governments are loath to reclassify sovereign bonds as risky.

Another issue is that resources for dealing with this type of financial destabilization within the Eurozone must be strengthened. Macroeconomic stabilization tools available to countries within the Eurozone are limited, as there is no regional fiscal policy, but interest and exchange rates are shared (Ballabriga 2014). Eurozone countries cannot issue debt in their own currencies, a fact that has helped to transform heightened sovereign risk into sovereign crisis. Therefore while monitoring for sovereign risk is certainly important, it has limited effect if stabilization tools do not function well. Eurozone countries are not

equal in terms of risk, yet they are forced to operate within the same monetary and currency specifications without sufficient fiscal coordination.

While the European Central Bank (ECB) was forced to operate outside its mandate by purchasing sovereign debt as a lender of last resort, it was necessary to do so since member countries do not control the currency and therefore cannot guarantee that they will repay sovereign bonds. Going forward, however, a mechanism to promote the ECB as lender of last resort in the bond market would help to backstop sovereign bond markets in the face of increasing financial fragility. It has been noted that the lack of safe bonds presents a problem, as sovereign bonds reflect fiscal conditions outside the control of the central authority. To combat this problem, Illing and König (2014) suggest the construction of synthetic euro bonds, a portfolio of all euro bonds weighted by members' contribution to GDP.

Steps toward the creation of a European banking union have been made; this is one positive outcome of the Eurozone crisis. The banking union requires an integrated supervision system. However, the process of setting up a banking union has slowed as countries with strong banks balked at turning over supervision to a central authority. Therefore, centralized banking control has been limited and countries agreed to the supervision of 130 largest banks (Eichengreen 2015).

Conditions in the Eurozone's periphery gradually improved. Spain's level of sovereign risk has improved as fiscal austerity has been implemented to reduce the fiscal deficit. As Yuan and Pongsiri (2015) note, fiscal austerity practices generally led to reduction in CDS spreads. Ireland's sovereign risk has also declined due to the presence of economic growth and declining debt ratios. However, overall sovereign risk in the Eurozone's peripheral countries remains somewhat high as fundamentals lag behind. France, for example, has insufficiently adjusted its fiscal deficit in the face of high structural unemployment and low growth. Italy has rebounded even slower than France and other Eurozone peers as competitiveness has declined and unemployment has remained high. Cyprus continues to face high levels of debt and a weak banking sector. In the Eurozone overall, signs of weakness in the core financial systems are still apparent. In EU-wide bank stress tests conducted last October, 25 out of 130 banks failed. Credit risk exposure was responsible for the majority of these failures.

Greece in particular has faced a plunging sovereign rating, having been downgraded to CCC minus by Standard and Poor's after defaulting on a 1.6 billion Euro loan installment in June. Greece's fundamentals are quite poor, with extremely high unemployment and poor growth due to stifling austerity measures, an inefficient public sector and burdensome pension system. It has been projected that Greek debt may peak at 200% of GDP and fall at 150% of GDP by 2024; however, Cline (2015) asserts that the debt burden is lower than it actually appears due to concessional interest rates on debt owed to the euro area's official sector.

Sovereign risk is in a state of flux at present as recovery from the Eurozone crisis will take time to become fully established. Still, Calice et al (2013) show that coordinated action from the Eurozone dampened the sharply negative impact of the crisis on trade and sovereign debt instruments for several

troubled euro zone countries. The authors use time varying vector autoregression in order to illustrate the impact of cross liquidity effects on euro zone sovereign debt and CDS spreads during the crisis.

The Eurozone's quantitative easing policy has reduced returns on Eurozone bonds, with some returns even being sold at a negative yield. This policy has reduced yield spreads relative to the German Bund, compressing risk and reducing the overall size of the sovereign bond market. The risk of sovereign debt default is being shared between the European Central Bank and the national central banks, which hold 92% of purchased bonds on their balance sheets. The extent to which quantitative easing will get the Eurozone back on the path to growth and stability has yet to be seen; so far, the outcome is mixed. Going forward, it is hoped that Europe can overcome its exhausting state of sovereign fragility and move toward a unified recovery.

Outcomes

In September 2008, as bank failures spread and the depth of the crisis became clear, there was fear that the crisis would instigate a financial and economic disaster as profound as that of the Great Depression. Certainly, Eichengreen (2009) shows that the beginning of the US financial crisis was worse than the Great Depression in terms of declines in global stock markets and the volume of world trade. A Great Depression was avoided only through countercyclical fiscal and monetary policy. Indeed, the idea that fiscal and monetary policy used worldwide in the Great Recession, as compared to the Great Depression, effectively combated the crisis, has been successfully empirically tested by Almunia et al (2010) and others. Without countercyclical policy approaches, the crisis would have a much worse impact around the world.

The extreme fallout from the US portion of the crisis had mainly dissipated by the end of 2009, but the real effects of the crisis continued to be strongly felt. Jobs continued to lag and many citizens in the US remained disgruntled, fueling union protests. The Occupy Wall Street movement included a series of continuing, national protests against corporate greed and unemployment. Sixty percent of American households experienced a decline in wealth between 2007 and 2009 (Deaton 2011). Corresponding worry and stress followed, particularly as unemployment climbed.

In the US, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 was passed to create a consumer protection bureau, discourage too-big-to-fail bailouts, create an advance warning system of potential financial instability, and eliminate loopholes used to create destabilizing financial instruments (US Senate Banking Committee 2010). The law addressed both microeconomic and macroeconomic level regulation. In order to accomplish these goals, the bill created a Consumer Financial Protection Bureau, to regulate consumer protection, and a Financial Stability Oversight Council, the latter which would have the important responsibility of making recommendations to the Federal Reserve for stricter rules on capital and liquidity, increased regulation of non-bank financial institutions, and the breakup of large companies as a last resort. The Financial Stability Oversight Council would move toward designating particular shadow banking institutions as systemically

important, and put them under further supervision and further regulation (Lowrey 2012). Creation of the council was an attempt to prevent future crisis caused by systemic financial failure; whether it will be successful has yet to be seen.

Emerging market economies were more strongly affected by the 2007-2008 portion of the financial crisis (US and European financial crisis) than by the 2010-2011 portion of the crisis (sovereign debt crisis) (Chudik and Fratzscher 2012). The liquidity squeeze caused by a flight-to-safety reaction to the financial crisis in 2008 removed much needed funds from emerging markets, but after the shock was overcome, funds to emerging markets resumed, and the Eurozone crisis did not cause another reversal of capital inflows. Capital flows from emerging markets increased as a result of “push” factors (flight to safety) and flowed back into emerging markets because of “pull” factors (divergences in profitability between developed and emerging markets) (Fratzscher 2011).

There was little movement, at the national or regional levels, toward improving the impact of the current world financial order on the poor in both developed and developing nations. The UN and the WTO made suggestions for revising the global financial structure to improve the lot of the poor (UNa 2009). Some suggestions were to reduce procyclicality and volatility, to protect food and energy (commodities) from speculation, to implement global stimulus measures, and to ensure commercial practices do not destroy the environment. During the US financial meltdown, attention was certainly not trained on the world’s poor, and Eurozone austerity measures further impoverished families in the developed nations themselves. Although the IMF suggested that Eurozone authorities refrain from cutting programs that provide assistance to the poor, there was little the countries could do to avoid it in meeting Eurozone-IMF conditionality measures. What is more, the ongoing Eurozone crisis is affecting developing countries through trade channels, as well as through declines in remittances, foreign direct investment, cross-border bank lending and aid flows (Massa, Keane and Kennan 2012).

The crisis disproved the idea that financial markets tend toward efficiency. It was largely assumed, before the crisis, that financial crisis was a developing world phenomenon and that most developed countries did not experience such events because markets were efficient. However, the crisis showed that all financial markets are unstable and require constant supervision and regulation. In response to this, the IMF, in 2009, included a successor to the Financial Stability Forum called the Financial Stability Board, which has a strengthened mandate to watch for systemic risks. In addition, the G20 summit in April 2009 resolved to reduce procyclicality by year end, by working with accounting standard setters, including a requirement for banks to build buffers of resources in good times that they can draw down when conditions deteriorate (G20 2009).⁹

A number of models examined the impact of the Great Recession, seeking to draw conclusions about crisis effects and policy impacts. As Sarafrazi, Hammoudeh and AraújoSantos (2014) point out, the crisis

⁹ Brunnermeier et al (2009) recommend setting up countercyclical measures on a country by country basis, since business cycles vary by nation. Rodrik (2009) also makes the case that national regulation should be emphasized, with a thin layer of supranational regulation, since rules of sovereignty are not easily superceded, and when they are, a supranational regulator may create inadequate policies.

experience throughout the Eurozone countries was dissimilar. In some countries, the main trouble originated in the real estate market, while in others it stemmed from problems in the banking sector or from budget deficits. The extent and direction of the impact on Eurozone countries varied; Matousek et al (2015) find that bank efficiency in Eurozone countries declined as a result of the direct and policy impacts of the Great Recession, with the exception of Belgium, Sweden, and Portugal in 2008 and Germany and Portugal in 2009. The UK was hit more strongly than other countries in terms of bank efficiency, while the highest efficiency level in 2012 is in Greece, whose crisis was not triggered by the banking sector. Bank efficiency levels were generally slow to rebound across what the authors classify as original EU15 countries, as liquidity declined and non-performing loans rose. Relatedly, Macdonald, Sogiakas, and Tsopanakis (2015) use a financial stress index within a multivariate analysis to find that Eurozone countries are mainly responsive to their own financial stress, and to a lesser extent to regional financial stress. The financial stress index used is comprised of data from the banking sector, money market, equity market, and bond market. Financial conditions in Greece and Portugal were not found to strongly affect the Eurozone area.

The study of regional and country-level impacts of the crisis has resulted in assertions of a decoupling-recoupling among international financial markets (Dooley and Hutchison 2009), with contradictory evidence in the case of Greece (Floros, Kizys, and Pierdzioch 2013). Before the crisis hit in earnest, i.e., up to 2007, some economists asserted that emerging markets in Asia and Latin America had “decoupled” from advanced economies and in particular the US, in that they were able to generate growth without being affected by changes in the business cycles of developed nations. This can be explained, to some extent, by the emergence of China and its strength in the global economy, as some emerging markets “coupled” to the Chinese economy (Yeyati and Williams 2012). As the crisis spread abroad and heavily impacted emerging markets in late 2008, this theory was exchanged for the “recoupling” theory that emerging markets were closely connected to that of the advanced economies. Going even further, Felices and Wiedladek (2012) provide some evidence that decoupling occurred in only a few cases and that “coupling” around global factors has remained the norm.

Galbraith (2014) puts forward the idea that traditional economics played a role in bringing about the 2008 crisis, at least in its ignorance of the necessary importance of government or money. Therefore, when the 2008 crisis hit, the crisis could only be conceived of as an external shock, rather than as a breakdown of the existing system.

What is more, the critical assumption in modern economics, which allowed the economics profession to become more like science, was that the economic future could be estimated based on past behavior. But, as we have seen, complex financial models cannot predict the future. Factors such as human psychology and people’s expectations of the futures are not usually incorporated into such models. Pricing principles stem from a set of assumptions about the underlying asset as well as equilibrium criteria. Risk is hedged by balancing the asset with other assets that neutralize risk. Structured products are evaluated based on historical data, which in many cases is missing, requiring the input of results from simulations incorporating arbitrary assumptions on correlations between risk and default

probabilities. These models incorporated many assumptions that are potentially pernicious, particularly when assumptions do not incorporate major changes in the economic reality (Colander et al 2009).

In recognition of the riskiness of model-priced assets, banks in the United States became increasingly aware of the need to hold low-risk assets like cash and treasuries within liquidity pools, and of the need to stress test liquidity buffers. Stress tests were altered to reflect contingency risks, risks of off-balance sheet assets given a potential liquidity shortage (Sooklal 2012). This is a step in the right direction toward reducing financial sector risk. At present, however, the larger question of regulating off-balance sheet or shadow banking sector assets is still under consideration. Many assets are traded within the shadow banking sector and there is no guarantee that the pricing and risk of these assets will not present a future threat to financial stability.

The Eurozone crisis demonstrated that the structure of the Eurozone does not work for all countries. The Eurozone does not allow for countries to engage in higher domestic spending, wage increases, and inflation (Moravcsik 2012). Deficit countries needed to be committed to adopting German spending behavior, at no small cost to the local populace. However, they were not and external shocks from the US and European financial crisis induced a severe debt crisis in a number of nations. It is unlikely that the Eurozone will be restructured after the crisis, but this remains to be seen.

The euro zone crisis was much more than a financial crisis. It also represented a challenge to European integration. Glencross (2014) discusses the importance of national leaders in determining the outcome of the euro zone crisis. This is because bailout funds for imperiled debtor countries had to be guaranteed by national leaders. What is more, in response to implementation of the European Stability mechanism, creditor countries created the Treaty on Stability, Coordination, and Governance in the Economic and Monetary Union, which made it constitutionally impossible to run up long term government debt. Eurozone countries were thus required to commit to balanced-budgets. This exacerbated internal tensions within debtor countries, in particular regarding integration in the Eurozone.

This type of crisis, preceded by the ERM crisis of the early 1990s and the Great Depression, in which nations faced adverse economic conditions transmitted in part by adherence to the Gold Standard, is more than “just” a currency crisis. It is a crisis caused by monetary union, in which a group of countries agrees upon a relatively rigid exchange rate or adopts a single currency through a region and is as much of a currency crisis as it is a policy and political crisis. The policy crisis begins when necessary adoption of center-country monetary policies results in a conflict of interest in peripheral countries, and the political crisis stems from rising political dissent as a result of economic hardship in non-core countries. Under the Gold Standard and the ERM crisis, the way out of the crisis was to end or alter the currency union. In the Eurozone crisis, little was done to improve the economic structure of the European Monetary Union, which might attempt to improve the flexibility of the system and allow member governments to implement monetary and fiscal policies when needed. It does appear that austerity measures and conservative monetary policy from the center have created abysmal social and economic conditions in peripheral countries, namely Greece. To this author, based on the lessons from history, it

does not appear that the European Monetary Union can continue without experiencing similar crises going forward.

Political Economy of the Great Recession

Some analysts expected progressive politicians and policies to arise in response to the crisis which was caused by free markets, but this failed to come about. President Barack Obama, who was viewed as a potentially liberal politician, was more center/center-right president than expected. Congressional liberals in the US were voted out of office in the 2010 midterm election, while left-oriented governments in Portugal, New Zealand, and Britain lost their political base (Bartels 2013). Still, no consistent preference was shown for right or left-wing governments in the five years following the crisis. Voters mainly sought to punish incumbents for slowing growth and other economic ills; voters acted much as they would under normal circumstances.

What was unique about this period is possibly the scale of political instability and public expressions of outrage, witnessed in protests and even riots. Discontent with the bailout packages, austerity measures, unemployment, and perceived favoritism toward particular groups or classes led to protests in the US, Iceland, Greece, Spain, Portugal, Italy, Ireland, Hungary, France, Belgium, and other nations around the world. Political instability in Europe arose as countries moved into crisis mode themselves, and as the Eurozone debated whether, and how, to rescue Greece. Hostility toward austerity measures in particular, and the governments that accepted them, resulted in the rise of anti-austerity politicians.

The politics of the Eurozone crisis were especially complex and has comprised entire books. Political leaders held different perspectives of how the Eurozone should function, particularly between the core and periphery. The German core, led by Chancellor Angela Merkel, was devoted to fiscal discipline, while the debtor nation periphery tended to permit deficit spending. Germany was backed by the Troika of the European Commission, European Central Bank, and the IMF. Peripheral nations Italy, Greece, Spain, and Portugal protested against austerity measures that they felt punished taxpayers rather than those responsible for mounting debt.

Woodruff (2014) utilizes Polanyi's theory that market panic can be used as a political weapon to describe the reaction of European Central Bank and German leaders toward providing a palliative to peripheral countries. The "Brussels-Frankfurt consensus" required debtor nations to institute Ordoliberal policies, which included commitment to stable money, sound finances, and efficient labor-factor markets under state guidance. The European Central Bank threatened to withhold financial assistance until these policy changes were adopted.

The political economy of the Great Recession is too extensive to discuss in this volume, since it encompassed many countries over a relatively long time period. Suffice it to say that some politicians benefited from the crisis while others lost ground. The latter was especially visible in the widespread rejection of incumbent politicians in favor of those who promised better economic conditions, which is a normal outcome when voters suffer from real or perceived government policy ills.

Economic Theories of the Late 2000s

The post-Washington Consensus that developed in the early 2000s included requirements that differed somewhat from those of the Washington Consensus while continuing to maintain a market orientation. Post-Washington Consensus policies included anti-corruption, corporate governance, independence of the central bank, financial standards, flexible labor markets, WTO agreements, prudent capital account opening, non-intermediate exchange rate regimes, social safety nets, and targeted poverty reduction (Rodrik 2006).

The shift away from neoliberal policies in the early 2000s to a “post-Washington Consensus Consensus” proved insufficient in checking the global crisis, either because or despite the fact that neither the Washington Consensus nor the post-Washington Consensus could be applied wholesale to US policies. Still, in ideological orientation (if not in policy application, especially in the realm of fiscal discipline), the US leaned toward Neoliberalism and augmented this with complex financialization. Germany, at the center of the Eurozone, also favored Neoliberal-type policies. Therefore, despite a general consensus during this period among economists that growth through market orientation should neither imply unchecked expansion of free markets nor punishment of the citizenry in order to achieve policy targets, both extremes were applied at this time, bringing about or exacerbating crisis conditions.

Conclusion

The Great Depression and many intervening crises taught us much about how policy should respond in the Great Recession, but again we face new challenges. The US component of the financial crisis clearly warranted more attention than was given to the Great Depression in the short run.¹⁰ Governments around the world should be lauded for implementing fiscal stimulus packages and loose monetary policy to halt the crisis in its tracks. The Eurozone component of the crisis is less clear, especially since the downturn worsens countries’ debt positions, which in turn worsen the downturn, and the structural problem within the Eurozone has yet to be addressed. The crisis has been so severe around the globe that it will take some time for economic conditions to improve.

¹⁰ Some economists continued to vilify government intervention even after the crisis (Galbraith 2014). Even former Fed Chairman Alan Greenspan stated that post-crisis government intervention hobbled markets .