

Understanding the Sources and Way Out of the Ongoing Financial Upheaval

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The present moment of great instability is also likely to become known as the end of an era, an era of economic calm and of policy consensus on how to maintain market stability.

After a period of several decades known by macroeconomists as the Great Moderation, a period in which we assumed we knew how to prevent economic crises such as a recurrence of the Great Depression, we are facing in the US, and in many countries, the likelihood of the worst and longest recession in decades. I will address where we are today, the source of the crisis, and what can be done in the short and longer run to assist in the recovery.

WHERE WE ARE TODAY

As of February 2009, the US economy appears to be heading towards the worst downturn since the Great Depression. With credit flows seized up, a self-reinforcing adverse cycle has developed. The eroding financial system is upending the economy, putting further pressure on the financial system. This crisis differs from previous postwar recessions in the US not only in its severity but in the collapse of the financial system itself. In response to this crisis, the Federal Reserve System and the Treasury have vastly expanded their roles. In addition, a large fiscal stimulus package has been legislated. But more is needed: for private credit flows to resume, confidence in the financial system must be restored. Restoring confidence requires an understanding of what went wrong as well as an immediate response to stem the worsening decline.

(Box 1 about here)

Going forward, the economic outlook is bleak. Angst in the banking system continues to drive the spread between three-month Libor and three-month T-bill rate as shown in figure 1. Credit markets remain badly shaken, with no private label MBS issuance and very little issuance of emerging market debt and anything other than very low risk corporate bonds. As figures 2 and 3 indicate, commodity and stock markets have been roiled, with US stock prices off about a stunning 50% from their peak in 2007. In the US, real GDP fell in Q4 of 2007 and again in Q3 and Q4 of 2008, with this latest decline at 6.2%. Additionally, the economy has shed 3.5 million jobs so far on net (through January 2009), raising the unemployment rate by over 2 percentage points to 7.6%.

(Box 2 about here)

(Figure 1, 2 and 3 about here)

Reduced availability of credit and declining wealth are feeding the ongoing economic deterioration. Net worth has fallen by about \$15 trillion, more than \$5 trillion from a 25% decline in house prices, as shown in figure 4, and \$10 trillion from the almost 50% decline in stock prices since their relative peaks.

(Box 3 and figure 4 about here)

Monetary and fiscal responses are also unprecedented. Monetary initiatives include a near zero federal funds target rate. The Fed has ramped up lending through credit facilities. Financial institutions can use securities as collateral to borrow from the Fed. Additionally, the Fed can now purchase almost all securities it deems necessary. As a result of the Fed's actions, Libor and commercial paper rates have fallen and the volume of new issuance of commercial paper has sharply increased, and Fannie/Freddie mortgage rates have fallen to approximately 5%, as of February 2009, their lowest level in decades, but bank lending and private issuance of mortgage credit is limited to nearly nonexistent.

(Box 4 about here)

The goal of fiscal stimulus measures is to maximize the near-term boost to return to economic growth within two years. It has been estimated (Zandi, 2009) that without fiscal stimulus, real GDP would decline for seven quarters, falling by 2.5% in 2009 and unemployment would exceed 10% with nearly 5 million jobs lost by mid-2010. The nearly \$1 trillion fiscal stimulus plan in 2009 will hopefully help contain losses in real GDP and employment. Even so the stimulus would allow the economy to reach full employment only by the end of 2012.

Nonetheless the nature of the crisis is such that these responses cannot return the economy to growth.

UNDERSTANDING THE SOURCES OF THE ONGOING FINANCIAL UPHEAVAL

While these steps are necessary for recovery, they are not sufficient. The monetary authorities in the US have gone beyond traditional monetary policy to quantitative easing but in the absence of continued direct funding to credit markets by the Fed, the Keynesian limits of pushing on a string have proven to be correct. Fiscal policy also has its limits. The previous consensus on the difficulty of timing such stimulus so that it actually helps stem economic decline has been overcome both by the severity of the current event and the likelihood that the decline will be prolonged.

Thus fiscal and monetary stimulus will not suffice. The lesson from Japan is that for growth to occur again, financial markets must function. Banks' balance sheets have to be restructured, forcing the writing off of bad loans. The housing market needs to be dealt with so that nonperforming and underwater mortgages do not fuel an overshooting price decline, given the impediments to optimal workouts that currently exist in securitized pools.

Moreover there needs to be confidence again that financial institutions are safe for investment and that there will be demand for their growth. Re-instilling confidence will require far greater certainty than exists today that the financial system will not expose investors to risks of unknown dimensions. For this we will need to improve our understanding of the source of the current crisis and therefore of appropriate steps to prevent a recurrence.

While monetary policy reforms in many countries have helped to bring inflation under control, in past decades, asset price bubbles have worsened over time, with today's extreme debacle only one in a

series that include the Savings and Loan crisis in the US, the Asian Financial Crisis and the earlier lost decade in Japan. Thus we must improve our understanding of the source of this macro-instability.

Each of these episodes was preceded by an unsustainable build-up of debt. In this crisis also household and financial debt as a share of GDP was pushed to unprecedented heights. But the question that is not addressed by this description of the crisis is why and how do debt to income ratios became unsustainably high. At the time that these chronic imbalances were developing the response was that asset prices correctly reflected low interest rates and thus debt to asset ratios were not out of balance. If assets were correctly priced, it was argued, high debt to income ratios would not present a crisis since loans would be repayable.

(Box 5 about here)

However the problem was not simply low cost debt, rather the problem was underpriced debt. As Pavlov and Wachter (2008) shows, inflated asset prices are the inevitable outcome of underpriced credit risk. If the default option in mortgage loans is underpriced, the inevitable outcome is an unsustainable rise in house prices. When asset prices deflate, credit seizes up, and the high debt-to-income ratios become the immediate source of defaults. However, it is the asset price inflation and then deflation, and the mispriced credit that is responsible for defaults and the ever-widening crisis. Households, in the aftermath of the bubble, are then exposed both to higher cost of credit and to loans that they cannot repay due to the collapse in collateral values. The current crisis derives from a credit bubble which led to an asset bubble; in the absence of the asset bubble, the credit bubble would not have occurred. The credit bubble and asset bubble together are responsible for the severity of the global financial turmoil.

Although the crisis was preceded by a world- wide credit bubble, the US housing mortgage and housing markets are arguably at the center of the crisis. Abraham et al. provides evidence that the volatility adjusted run-up in US housing prices, particularly after 2003, exceeded price increases among trading partners of the US, and so far the downturn in US housing prices has been the most severe (see figure 5 , Abraham, Pavlov and Wachter, 2008). The US run-up in housing prices was itself induced by a credit bubble of historically unprecedented dimensions. The introduction of subprime and other nontraditional mortgage loans rapidly expanded after 2003 at terms that could not be repaid (Table 1). These aggressive loans allowed credit constraints to be overcome expanding the demand for homes. The underpricing of the put option imbedded in these loans also increased the price of the housing asset collateralized by the newly affordable, easy to get, and cheap loans.

(Figure 5 about here)

The market share of these loans grew from under 15% to almost half of originations by 2006 (the sum of the market share of Helocs, alt a, and subprime as shown in *table 1*). Within these loan types, the consolidated loan to value ratios also increased, as shown in *table 2*. Also, as shown in *table 2*, as systemic risk increased with higher CLTVs (and with the growth in market share of these difficult -to-repay loans), the price of risk did not increase. In fact the price of risk decreased.

(Table 1 and 2 about here)

These loans were extended in states where mortgages were previously not affordable, thus expanding the market. Figures 6, 7, and 8 respectively show where housing was not affordable as of 2000 and the concentration of subprime teaser rate ARMs and low documentation loans as they increased their market share from 2003 to 2006. When in the spring of 2007, credit conditions reversed, of course it was these markets that were most vulnerable to declines. The same phenomenon of poorly underwritten, initially affordable but then non-affordable loans, such as teaser rates loans whose required payment could double, occurred (although to a lesser extent) throughout the United States. But it was in the high priced difficult to develop, so-called sand states, that housing prices exploded with the wave of aggressive mortgage product and then imploded, as the tsunami receded (figure 9).

(Figure 6, 7, 8, and 9 about here)

The problem of falling house prices and mortgage defaults and foreclosures are not now confined to the subprime market. In fact financial losses due to foreclosures arising in the far larger prime market may be greater in total dollar amount than in the subprime market. The extension of credit increased the demand for all homes (and overall indebtedness of the U.S. household) and the subsequent withdrawal of credit reversed this. These mortgages were originally underwritten generally using reasonable 80% loan to value ratios, but they are now also underwater. As home prices fall and as unemployment rises, borrowers are defaulting on these loans as well. It was not foreseen that there would be difficulty in repaying these loans because loan to value ratios were in fact in balance. With subprime credit no longer being extended, in markets reliant on this source of funding, price collapses were inevitable, impacting the default rate for prime loans as well.

Today's crisis in the US emerged from a shift in the source and pricing for funding mortgage backed securities. While securitization has played a large role in the US; in the trading of MBS, investors have historically only been exposed to interest rate risk. Mortgage default risk was contained by underwriting, not priced, and not borne by investors. With the growth of private label subprime market, this all changed.

(Box 6 about here)

In the process, fees drove the demand for securitization at every stage of the newly functionally differentiated production of mortgages. Banks received fees to originate to distribute, the secondary market received fees to bundle mortgages, rating agencies received fees to rate the pools. At each stage, entities were able to book fees without exposure to long run risks. Ultimately investors purchased MBS. But investors could hedge their risk also. With the purchase of newly available credit default swaps their positions could be insured against possible loss. There was counterparty risk to be considered, but if this was evaluated, investors might have concluded that these instruments had to be backed up or the entire system would fail. The providers of the credit default swaps perhaps would have been viewed and certainly in the event they were "too big to fail."

(Box 7 about here)

Of course, fees were collected for the rapidly growing provision of credit default swaps as well.

The “too big to fail” entities behind CDS and the lack of observable market trading of CDS, or private label MBS more generally, allowed the expansion of these products without exposing them to better informed market observers who might have evaluated the pricing of these instruments and shorted them at their current prices. To reiterate (*as shown in table 2*), as systemic risk increased, the price of risk did not.

A NEW PARADIGM: THE PRO-CYCLICAL PRODUCTION OF RISK

Lenders who are attempting to gain market share and increase their fees may do so by accepting additional risk. As they compete for product market share and expand their supply of risky loans, the average risk premium on these loans would increase if the premium correctly reflected the additional risk. However, as Table 2 indicates and as Pavlov and Wachter (2006) explain, in the production of nonrecourse loans collateralized by real estate, this does not occur, rather due to incomplete markets, the price of risk decreases as lenders compete for market share. The result was the underpricing of risk and the overpricing of assets (Pavlov and Wachter, 2008).

(Box 8 about here)

Due to heterogeneity and illiquid markets, mortgage backed securities and related derivatives traded infrequently, thus short selling these assets that were overpriced was infeasible. Mortgage backed securities were marked to model not to market and could not be traded to drive prices to fundamental levels through short selling pressure.

The result of this underpriced risk and the lack of short-selling was that asset price increases could persist and increase with further easing of credit. With artificially inflated asset prices, financial institutions’ balance sheets were also artificially inflated (Pavlov and Wachter, 2009). Thus higher priced assets did not reflect the risk of real estate loans on banks’ balance sheets. As Herring and Wachter show, real estate booms and banking busts tend to go together. In fact, the current financial upheaval is only the most recent in a series of financial crises in which property based asset booms are accompanied by increases in a collapsed financial system. Asset bubbles, in the absence of arbitrage, occur and the result is increased systemic risk as liquidity providers who hold these assets are de-capitalized.

Would derivative trading in these markets have made a difference and contained the asset bubble? In the US, derivatives market (the ABX), were introduced in 2006, which may have helped to contain the risk, although from the timing it is difficult to tell. It was not until March of 2007 that the ABX signaled mispricing and even at that point aggressive priced subprime lending continued. Derivative trading in the UK, which was predicting a collapse in property markets prior to 2007, was not sufficient to prevent continued provision of credit into an overextended market.

HOW IS THIS TO BE AVOIDED?

As long as entities have the financial incentive to maximize profits in the short term, they will continue to underprice risk. This clearly includes “too big to fail” entities which use demand deposit insured funds or other “protected” borrowing sources to garner short term profits and market share. Historically the credit induced asset bubble covers up the deterioration in credit standards with the result of a more extended period in which the bubble continues to form and in which the credit risk under-pricing becomes more severe.

The symptom that a credit induced asset bubble formation is occurring is observable in the correlated easing of credit with (non-fundamentally) derived asset price inflation. Regulation and prudential supervision can limit bubbles in property markets that are the result of pro-cyclical deterioration in underwriting standards. In analyzing the Asian Financial Crisis we present evidence that countries experienced a more moderate property crash where under-pricing of credit was kept under control exactly by prudential supervision by regulatory authorities. In particular, we show that the Monetary Authority of Hong Kong did accomplish this. Thus it quite appropriate that this conference on property markets and finance is held at the Hong Kong Monetary Authority (Koh, et al. 2004). In order to take action to avoid property market bubbles induced by pro-cyclical erosion in credit standards it is necessary to observe that this is occurring. Without market indicators and understanding of this phenomenon regulators will not be prompted to take appropriate prudential action. There is now an emerging consensus that balance sheets of banks and non-bank large entities must be kept well-capitalized. But how is it to be known that capital that includes value deriving from property is sufficient?

When asset prices are negatively correlated with lending spreads, this raises the potential for the correlated risks of poor underwriting and of asset price declines. When this occurs, consideration should be given to instituting “speed bumps” that would require higher minimum capital reserves. In order to observe the joint correlation of these risks, we first need to observe, measure, and track asset pricing and also the pricing and terms of financing. To quote Chairman Bernanke, “The events of the past year or two have highlighted regulatory gaps and deficiencies that we must address... As we recover from the current crisis, it will be important to address these issues as soon as possible, to develop a regulatory structure that will better respond to future economic challenges.” (*Wall Street Journal*, October 14, 2008) There is much work to be done.

Many of the researchers at this conference are advancing this work. I wish you well going forward in this important research.

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