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The Global Financial Situation and its Impact on the Bioeconomy[1]

By

William A. Knudson

Introduction

Due to several factors, the financial system in the U.S. has undergone a serious crisis throughout the late summer and fall of 2008 and has continued into 2009, although some of the fundamental problems took several years to develop. Among the sources of the problems were the subprime mortgage market and the relationships between the housing markets and other financial markets; the credit swap market, and the various policies that created additional financial instruments without regulation and policies that reduced the level of regulation of financial markets.

As a result of these problems several emergency measures have been instituted. Fannie Mae and Freddie Mac received $200 billion in support from the government. The federal government also paid $85 billion to obtain an 80 percent share in the American International Group (AIG) in order to keep that firm in business and preserve savers who had money in insured money market accounts. The Federal Reserve (the Fed) has also increased the money supply and reduced interest rates. However, despite these actions interest rates are relatively high, credit requirements are becoming more stringent, and even credit worthy customers are increasingly finding credit more difficult to obtain. As a result economic activity is declining.

Due to the level of integration of global markets, the problem has spread throughout the world. Despite reductions in interest rates and widespread government intervention in financial markets some countries, such as Iceland, are effectively bankrupt or are facing severe difficulties. As a result international trade has declined. Among some of the countries that asked for aid from the International Monetary Fund are Pakistan, Iceland, Hungary, Serbia and Ukraine (Wikipedia, Financial Crises of 2008). The situation has deteriorated throughout the world, and the recession could last throughout 2009, and there is a strong likelihood that the recovery will be weaker than the typical recovery.

This has impacted and will continue to impact the bioeconomy. Commodity prices have already declined from their unsustainable highs of the spring and summer of 2008. One impact of the global economic slowdown is the decline in the price of oil and oil based products such as gasoline. This in turn has affected the ethanol market which as also adversely impacted the price of corn. Another impact on the bioeconomy is the likely reduction in private sector investment due to the difficulty in obtaining credit and corporate profits decline. As a result, the growth in the bioeconomy will become more dependent on government support.

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This paper will analyze the factors that have led to the current global economic situation, with particular attention to the U.S. housing market, and the regulatory environment that fostered the current situation. How this impacts the bioeconomy will then be analyzed as will the impact of the Stimulus Bill on the bioeconomy. Finally some policy prescriptions will be offered.

Background

The Housing Market

Several policies were in acted in the 1980s through the early 2000s that contributed to the current problem. Among the policies instituted were the elimination of usury laws which allowed interest rates to rise; the creation of government sponsored enterprises such as Fannie Mae and Freddie Mac which got the U.S. government involved in mortgage industry; elimination of restrictions on interstate banking which integrated what were local real estate market conditions into a national banking industry; and federal laws that required lending in low and moderate income areas which increased the risk of mortgage defaults. Each of these policies in and of themselves probably would not have caused the current reduction in home values and increase levels of default, but taken together they have been a major contributing factor in shaping the current economic environment.

However, the biggest contributor to the problem is the securitization of mortgages. This allowed for mortgages to be aggregated into pools and offered to third parties in the form of bonds. Theoretically, this would allow for risk to be spread over many individual mortgages and thereby reduce the total risk. However, this created an incentive for mortgages to be written whether or not the home buyer was a good credit risk. Rising home values exacerbated this problem, if a person couldn't pay back the loan, he or she could sell the house and still make a profit. When home prices stopped rising, the problem was compounded, and the number of foreclosures increased dramatically. It is estimated that 15.4 million homeowners which represents 30 percent of total homeowners had have zero or negative equity in their homes by the end of 2008 (Paulson).

Contributing to this problem were policies enacted in 1999 and 2004 that encouraged lending to low and moderate income borrowers (Wikipedia Fannie Mae). This increased the level of risk in the mortgage market. Some mortgages were likely extended to people who had no chance of paying off their mortgage.

From 1970 to 2007 the number of securitized mortgages increased from less than one percent of all mortgages to 56 percent of all mortgages (Schweikhardt). The percentage of subprime mortgages rose from 8.6 percent of the total in 2001 to 20.1 percent in 2006 (Schweikhardt). Also 52 percent of all mortgages were originated by companies with no federal supervision (Schweikhardt). Also, bond rating agencies were unable to correctly assess the level of risk the bonds backed by mortgages possessed, and rated them too highly; giving the holders of these bonds a false sense of security. Many of these bonds were held by banks.

Another problem facing subprime mortgage holders was the number of mortgages that were adjustable rate mortgages. Many borrowers had low initial interest rates that rose, often dramatically over time. This made it difficult for borrowers to pay their mortgages and made foreclosures more common. The banks, who had these bad loans on their books had to write them down, and their assets and income declined dramatically as a result. Securitization also made renegotiating mortgages more difficult. The borrowers may have had no idea who owns the mortgages and the mortgage holder may have not any knowledge of the borrower. Banks reacting to this have made credit more difficult to obtain.

Securitization was also used in foreign housing markets with similar results. Also, many foreign banks and other foreign institutions have bought U.S. bonds backed by securitized mortgages. This is one reason the financial problems have become worldwide in scope.

The Banking Sector

Bad mortgages eventually led to a dramatic restructuring of the banking sector. Lehman Brothers declared bankruptcy and the government facilitated the sale of Bear Stearns to JPMorgan Chase. Merrill Lynch was purchased by Bank of America. The two largest remaining investment banks, Morgan Stanley and Goldman Sachs, have reorganized as regular commercial banks, subject to tighter regulations and more oversight than investment banks. American Express has also chosen to become a commercial bank.

Despite movements by the Fed to make credit easier to obtain by reducing interest rates, and increasing the money supply credit it appears that credit is becoming more difficult to obtain. A recent survey by the Fed indicates that most banks are charging higher interest rates while being less willing to lend (Norris). The percentages of the 50 banks surveyed by the Fed who have tightened lending standards since July of 2008 and November of 2008 by credit instrument are shown in table 1.

Table 1: Percentage of Banks that have Tightened Credit Standards Since July 2008 to November 2008 by Credit Instrument

Credit Instrument	Percentage of Banks with Higher Lending Standards
Commerical and Industrial Loans	71
Commerical Real Estate	67
Credit Cards	59
Home Equity Lines of Credit	79
Prime Residential Mortgages	71
Nontraditional Mortgages	90

Source: Norris

Credit appears to becoming more difficult to obtain for business, as well as consumers and home buyers. This is despite the monetary policies pursued by the Fed. This indicates that this problem has less to do with the amount of money available to lend as much as a crisis in trust in confidence in borrowers and the financial system as a whole. Lending agencies have become more risk averse.

The figures in table 1 also point to another important issue; the flight to quality in credit markets. The interest rates for high quality U.S. treasury bills have declined, but the interest rate for other credit instruments have increased or have only declined slightly. In fact in for approximately 2 days in September of 2008, the interest rate for 3 month U.S. treasury bills was essentially zero percent. The effective federal funds rate is well below the Federal Reserve Bank's target of 1.0 percent (Economist.com). Increasingly, lenders have been willing to sacrifice returns for safety. The level of uncertainty and inability to effectively assess risk have led to banks and other financial institutions restrict their lending and have reduced access to credit to what were previously considered good credit risks.

Credit Swaps

Credit swaps are unregulated insurance instruments that originally were designed as a form of insurance for owners of bonds. Bondholders could purchase a credit swap a pay a premium to insure full repayment of the bond in the case that the original issuer of the bond defaulted. Conceptually credit swaps are easy to understand and serve a useful purpose, but like securitized mortgages serious problems have developed.

One problem is that like securitized mortgages many credit swaps have been sold several times, and some who have purchased swaps have had difficulty getting their claims paid, because they do not know who is supposed to pay their claims (Morgenson). Also, the amount of credit swaps far exceeds the face value of corporate bonds underlying the market. At the end of the third quarter of 2007, the largest 25 banks held credit swaps worth $14 trillion, and the total size of the market is $45 trillion (Morgenson), although obtaining an accurate estimate of the true value of the credit swaps is difficult if not impossible

A major shortcoming of the credit swap market is the fact that it is completely unregulated, and in fact, regulation of this market is currently prohibited. When first introduced, credit swaps were traded among banks and investors who understood the market and knew who they were buying and selling these instruments to (Morgenson). Over time, the market expanded, speculators replaced risk managers and buyers and sellers no longer know each other. These factors have led to a breakdown of the credit swap market.

Government Sponsored Enterprises (GSEs)

The government sponsors three separate entities that sell mortgage backed securities; Freddie Mac, Fannie Mae and Farmer Mac. Freddie Mac and Fannie Mae focus

primarily on household mortgages. They both purchase and securitize mortgages, and sell bonds backed by these mortgages. The primary goal of both Freddie Mac and Fannie Mae is to spread the risk of mortgages and in so doing adds liquidity to the mortgage market and in so doing, allow people who may not otherwise obtain a mortgage to get one.

One important consideration is that until recently, the GSEs were essentially private agencies created by the government. Furthermore, the bonds were not guaranteed by the federal government. They were also quite large; according to one source Fannie Mae and Freddie Mac owned or guaranteed half of the U.S. $12 trillion in mortgages in 2008 (Wikipedia, Fannie Mae).

Given their size it is not surprising the issues facing the banking industry in the subprime market also impacted Fannie Mae and Freddie Mac. In 2007, Fannie Mae lost $5.1 billion and Freddie Mac lost almost $6.0 billion (Wikipedia, Fannie Mae, Freddie Mac). On September 7, 2008 the federal government assumed conservatorship of Fannie Mae and Freddie Mac, and infused a total of $200 billion into these agencies.

Velocity

The tightening of credit markets, the lack of trust, economic uncertainty and fear of an impending recession has affected spending patterns. Money is not changing hands as fast as it usually does; velocity is declining. Velocity can be defined by the following equation:

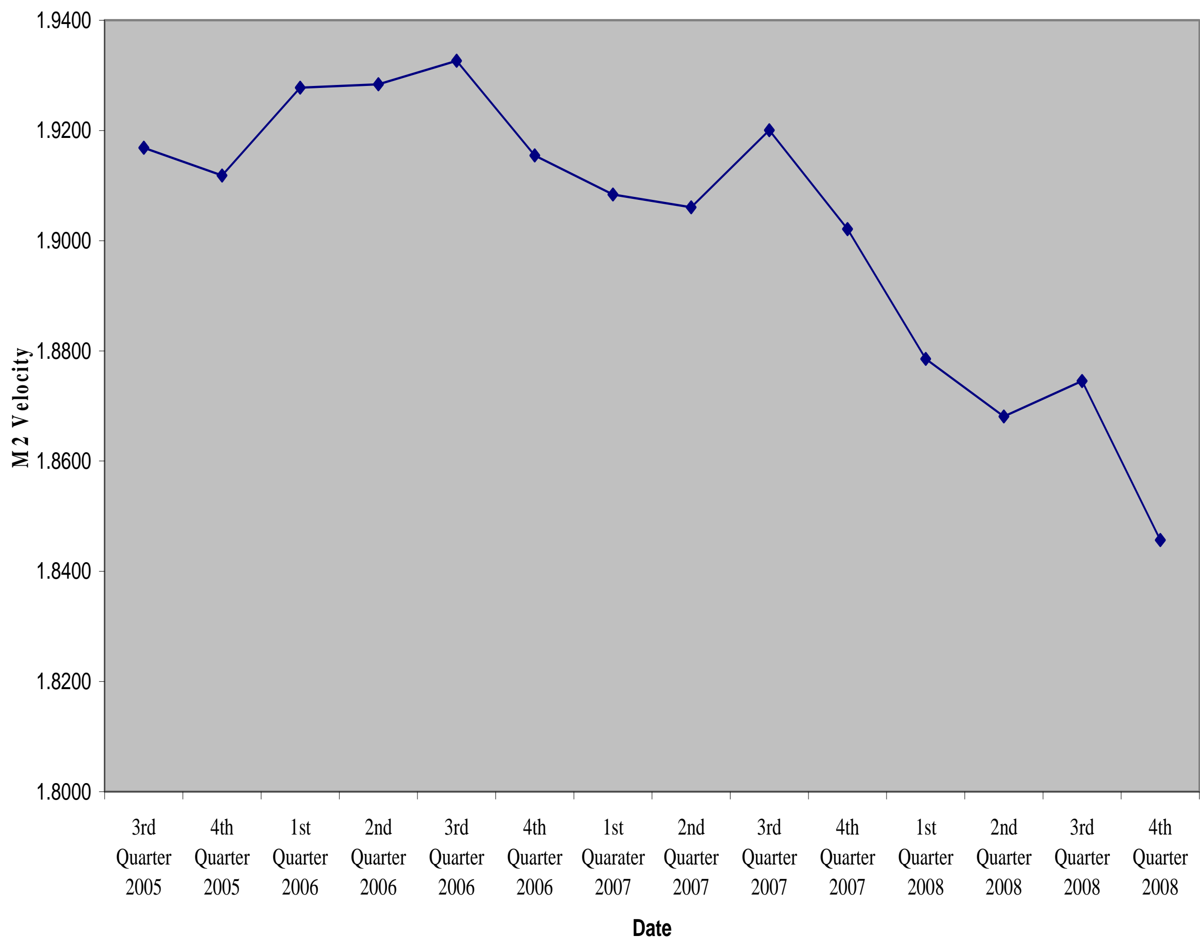
$$V = \frac{PY}{M}$$

Where P = general price level
Y = goods and services produced
M = the money supply
V = velocity

PY can be thought of as nominal GDP, the money supply for purposes of this paper is M2, which consists of currency, checking accounts, money market accounts, savings, and small certificates of deposit. Velocity can be considered the number of times the money supply is spent or turned over in a given time period. If the rate of spending is high velocity will increase, if rate of spending is declining velocity will also be declining.

Figure 1 shows what has been happening to velocity from the third quarter of 2005 to the beginning of the fourth quarter of 2008.

Figure1: Velocity 3rd Quarter 2005 - 4th Quarter 2008



Sources: Federal Reserve Bank, Bureau of Economic Analysis

From the 3rd quarter of 2005, through the 3rd quarter of 2006, velocity trended upward. Since the third quarter of 2006 velocity has trended downward and this downward trend has appeared to have accelerated since the third quarter of 2007.

This reduction in velocity has important implications for monetary policy. If individuals and firms are spending less, and banks and other financial institutions are less likely to extend credit, expanding the money supply and lowering interest rates will not translate into increased economic activity and lower rates of unemployment. The economy may find itself in a "liquidity trap" a situation where there is little, if any interest in lending and borrowing no matter how low interest rate is; the perceived risk is too great. The implication of this is that if the economy enters a recession fiscal policy, in the form of increased government spending or reduced taxes, is the only tool the government has at its disposal to reduce unemployment and increase economic activity.

Inflation, Deflation, Both?

There is a great deal of uncertainty about the future direction of prices. Generally speaking, it is expected that increases in the money supply will eventually lead to inflation. Expansionary fiscal policy, in the form of lower taxes or increased government spending would also generally lead to increased levels of inflation. However, the current situation may be different, and may reflect the situation during the Great Depression. The U.S. and the world may be facing a situation referred to as "debt-deflation". Debt-deflation occurs when firms and consumers with high levels of debt pay-off their debts and do not increase their spending (Economist, Depressing Times). As a result total demand declines and prices fall: the result is deflation despite expansionary government policy. Reduction in spending by the private sector overwhelms increases in government spending.

This appears to be occurring in other nations as well. Retail sales and capital goods orders are declining throughout world, and the level of inflation in Europe in the 2009 is anticipated to be near zero (Economist, Depressing Times).

Deflation, if it occurs, further reduces the effectiveness of monetary policy. It could be that while nominal interest rates are at or near zero, the real interest rate, the nominal interest rate plus deflation could be rather high, and act as a further discouragement to spending and investment. Again, this would make expansionary fiscal policy more effective compared to monetary policy as a method to boost economic activity are reduce the rate of unemployment.

Impacts on the Bioeconomy

Financial Markets

Despite the increase in the money supply since the late summer of 2008, the value of the U.S. dollar has risen compared to many other currencies. This is a reflection of the "flight to quality" a global interest in safe investments no matter how low the rate of return. U.S. treasury bills and other securities issued by the U.S. Treasury are considered very safe investments. Also, as the world economy has contracted trade has declined.

More stringent lending requirements may also reduce exports because it makes it more difficult for exporters and other to obtain letters of credit for shipments. This appears to have already occurred. The Baltic Dry Index, which measures shipping rates, was at its lowest level in 9 years in the fall of 2008 (Coucoulas and Cyran). Before the current situation the exporter would collect payment from the buyers open account when the goods were delivered, however, increasingly exporters and importers are demanding banks to guarantee transactions. Banks, given their increasing reluctance to extend credit are unwilling to do this (Coucoulas and Cyran).

Commodity Prices

The stress on international trade and the potential of deflation have clearly impacted commodity prices. Gas prices which were well over $4 a gallon this summer are now under $2.50 a gallon. As a result, ethanol which is a substitute for gasoline has also seen a dramatic price decline. Corn prices which were at $8 a bushel this summer is now below $4.50. Wheat, soybean, and other commodities prices also declined.

One implication of these price gyrations is that there is now a great deal of uncertainty in the agricultural sector. While it is unlikely that prices will decline to the level of mid-1980s or late 1990s they could still be well be below current levels. Conversely, if there is an international incident or the price of oil rebounds, commodity prices could increase. Adding to the uncertainty is high input costs, especially fertilizer and in some cases land prices and rents. If these input costs do not decline, grain crop farming may not be profitable in 2009.

Table 2 shows the break even analysis for an ethanol plant with different crude oil prices.

Table 2: Impact of Different Oil Prices on Ethanol

Crude Oil Price (dollars per barrel)	Maximum Bid Price of Ethanol Processor for Corn Costs (dollars per bushel)
60	3.35
70	3.97
80	4.58
90	5.19
100	5.81

Source: Good and Irwin

The current price oil is below $60 a barrel but has been trending up since April. The figures in table 2 are a good reflection of the difficulty the ethanol industry continues to face. Those firms that have low fixed costs are still able to break even, or at least cover their variable costs by producing ethanol. Those firms that have pursued an aggressive growth strategy through debt financing or who are locked into high corn prices through their purchases earlier in the year are facing dramatic losses. This is what has happened with VeraSun. Lower oil prices have seriously adversely affected the ethanol industry. The slow increase in oil prices has improved the profit outlook for ethanol.

The same holds true for biodiesel. Lower oil prices have made biodiesel less competitive compared to petroleum based biodiesel. Currently many biodiesel facilities are idle.

One important conclusion of table 2 is the wide range of potential prices. While it is unlikely that the price of corn is 2009 will be less than $3.00 a bushel or more than $6.00 a bushel that is still a wide range of potential prices. Using the cumulative distribution functions developed by Jim Hilker there is a 60 percent chance that the price of corn will be between $6.59 and $2.92 a bushel in December of 2009, a difference of $2.77 or more than the price of corn in many years.

This price uncertainty also extends to wheat and soybeans as well. Using the same technique as that used for corn shows that there is a 60 percent change that the price of wheat in July of 2009 will be between $8.22 and $4.22 a bushel, a spread of $4.00. For soybeans, there is a 60 percent chance that the price will be between $11.81 and $6.18 a bushel, a difference of $5.63 a bushel.

Policy Response

Regulation

One result of the breakdown of the global financial markets has been the call for more regulation of financial markets, in both the U.S. and other countries. On November 14, a group of 20 nations will met in Washington to discuss this issue. There is consensus that greater transparency and regulation of financial markets (Landler). Some European nations believe there should be greater regulation of hedge funds, and credit default swaps (Landler).

It appears the Obama administration will eventually support more stringent regulations in the banking sector. As a result of the crisis investment banks no longer exist giving the Federal Reserve System more control over the banking system. Regulation of credit swaps and other financial instruments may be forthcoming.

The Troubled Asset Relief Program

On October 1, President Bush signed a bill that would allow the government to purchase up to $700 billion in “toxic assets” primarily bad mortgages. Since the legislation was signed however, the government has backed away from this concept. Most of the funds are now geared toward adding liquidity to the banking sector, although the Fed has announced that it will purchase up to $500 billion in mortgaged backed securities that have been purchased by Fannie Mae (Isidore). Some of these funds have also gone into purchases of preferred stock in banks and insurance companies. While this program is sometime referred as a “bailout” there is a potential that the assets purchased by the government will appreciate in value and the government will earn a profit. However, there is no assurance that these assets will appreciate, and if it does it will take several years to occur.

Another issue with the Troubled Asset Relief Program is the impression, if not the fact, that banks remain uninterested in extending loans despite the government taking the toxic assets off the banks books. There is an increasing concern that the program will not be

effective in promoting economic activity and giving relief and support to those who need it the most. As a result there is growing interest in providing funds to homeowners who are having difficulty in meeting their mortgage payments and would improve their potential to keep their house. There is also a great deal of interest in increasing the regulation of the credit card industry, especially in respect of setting interest rates and disclosure to credit cards users. While the Troubled Asset Relief Program has not fostered increase lending by banks it has been successful in preventing bank failures. The banking system has been stabilized by the program.

State and local governments are another group seeking aid. Due to the economic slowdown among other factors, many states and cities are facing deficits, in some cases very severe deficits. Without some level of support, they will be forced to reduce spending which will further reduce economic activity and increase unemployment. The size of local and state deficits will also reduce the effectiveness of the stimulus package; reductions in state and local spending will offset some of the increase in federal spending.

The Department of Treasury and the Fed have recently committed themselves to several policies. The government invested $20 billion in Citigroup to improve the bank's financial position. The Federal Reserve Bank of New York is lending up to $200 billion to holders of securities backed by consumer debt (Isidore). The hope is that this will encourage lending by financial institutions. Lending has declined precipitously over the last few months.

The Stimulus Bill

One potential source of increased demand for biobased products is found in the American Recovery and Reinvestment Act, often referred to as the Stimulus Bill. This act has several provisions that promote the bioeconomy. The Department of Defense is to receive $4.24 billion to update and repair facilities including investments in energy efficiency. An additional $5 billion is appropriated for the Weatherization Assistance Program. Loan guarantees are available for "Leading Edge Biofuel Projects". To be eligible the project has to be a pilot or demonstration projects that are likely to become commercial technologies. The General Services Administration allocates $4.5 billion to convert government buildings to High-Performance Green Buildings. The Department of Housing and Urban Development receives $250 million for grants or loans for energy retrofit and green investments in assistant living housing.

Additional funds are available to schools and universities to update their buildings provided that the institutions use a recognized building rating system for their updates. The National New Energy Clean Energy Bond program is increased by $1.6 billion.

The Stimulus Bill also extends and increases a number of tax credits and deductions. There is a temporary increase in the tax credit for alternative fueling property, and a credit for buying plug-in electric motor vehicles. The bill also offers a credit equal to 30 percent of the cost of the investment for qualified advanced energy projects: qualified projects include wind solar and geothermal projects; fuel cells and microturbines;

alternative electric grids; property designed to capture and sequester carbon dioxide emissions; property designed to refine or blend renewable fuels or to produce energy conservation technologies; plug-in electric vehicles; other advanced energy property designed to reduce greenhouse gas emissions. The total amount of these credits is not to exceed $2.3 billion. Some projects could also qualify for grants in lieu of credits.

Most investments also qualify for bonus depreciation. Personal property purchased in 2009 (2010 for certain longer lived property) is eligible for a 50 percent depreciation deduction in the first year. This is available for all types of businesses.

Conclusion

The current credit situation is another source of uncertainty for firms in the bioeconomy. Despite very low interest rates credit is tight, and banks appear to be very cautious when extending loans. Firms will have to have better financials in order to obtain credit. Tight credit extends throughout the economy.

The lack of lending despite low interest rates makes monetary policy comparatively ineffective especially in the short run. Expanding the money supply will not increase economic activity and reduce unemployment especially in the short run if no one is willing to spend or lend that money. As a result fiscal policy, in the form tax cuts or even bigger government spending, will be more effective in reducing unemployment and expanding economic activity. The Stimulus Bill offers several spending, grants, and tax incentives to enhance the bioeconomy. Special emphasis has been placed on alternative energy.

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