CURRENT TOPICS IN MANAGEMENT

VOLUME 13 • 2008

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FROM SUBPRIME CRISIS TO A RECESSION

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Two main factors contributed to the declining world's inflation rate: production shift to low-cost countries (e.g., "Chindia" factor: cheap imports of consumer goods from China, and outsourcing of services to India), and smaller fiscal deficit due to fiscal consolidation and economic reforms, especially in the traditionally large deficit countries (e.g., Latin America). This has allowed many countries to lower their interest rates. In the US case, the low rate was first prompted by the fear of a deflationary pressure following the 1997 Asian Financial Crisis. Subsequently, the Fed adopted a more accommodative policy to forestall looming problems created by the bursting stock, high-tech, and telecommunications bubbles that came along with the recession in 2001. This enabled the U. S. economy to avert a deeper and longer-lasting recession.

But as the recovery began, the environment of easy money also produced record levels of home equity borrowing and home sales, funded among others by "creative" financial companies that operate like hedge funds. This led to borrowing-fueled speculative spree especially in the housing market, similar to the internet-stock mania a decade ago. The rules and regulations governing these financial companies are generally less restrictive than those for banks, mutual funds, and other financial institutions.

The first part of the chapter discusses the background of subprime crisis that led to the turbulences in the U. S. and other markets, and how they could bring the economy into a recession. The policy analysis showing why the loosening monetary policy and the stimulus package are not effective is presented in the subsequent section. More particularly, the focus of the analysis is on the interrelations between exchange rate and output growth, and on the sources of the pressure that has caused a major slowdown in the economy. On the latter, the

aggregate demand shocks are heeded separately from the aggregate supply shocks, allowing alternative policies to be explored.

Today's recession has been predicted as early as the end of last year. I wrote in my first draft of this chapter last October, 2007: *"I come to a disturbing prognosis about the US economy: high likelihood of a recession."* Several financial meltdowns and foreclosures later, my prognosis is: the US economy will definitely fall into a recession, if not already so.

Reality Check

Since the LTCM debacle in 1998, and despite pressures on the US financial authorities to put tougher controls on hedge fund operations, practically no major improvements have been made on the financial regulation.[1] This partly explains why "creative" financial activities have increased in number. One of such activities involves the asset-backed commercial chapter used to finance mortgage firms, credit card companies, auto lenders, etc. Many of the issuers of such commercial chapter are real estate-related financial companies. They usually package the loans into securities pools before selling it to investors. They essentially collect the monthly principal and interest payments from borrowers and disburse them to investors who hold the commercial chapter. In addition to profits earned from interest payments, these companies will be paid fees for performing such services. To the extent that such loans are financed directly by investors rather than indirectly by bank depositors, it is clearly not the same with the traditional lending system.

Mortgage lending has been growing fast since the Tax Reform Act of 1986 which stipulates, among others, that interest deductions on mortgage debt remain intact, while deductions for consumer and auto loans are eliminated. To deal with the high-risk borrowers (low income households who want to take mortgage), the legislative reform also enables lenders to deliver risk-adjusted pricing rather than shut the door on them altogether. This has served the early growth of credits of the subprime type, i.e., loans offered at a rate above prime because the low credit ratings of the recipients do not qualify them for the prime rate loans. It was not until 1998 that the craze began when large numbers of people decided that real estate, which still had not recovered from the early 1990s slump, became a bargain. The combination of wanting to fulfill the "American dream," the lucrative interest rate, and the expectation that housing prices would continue to rise, offered an opportunity for homeowners-to-be, and handsome profits for lenders.

Lured by the prospect of huge profits, some investment banks jumped in, doing beyond just performing as the underwriter for the mortgage companies, instead getting directly involved into the mortgage loan scheme. Driven by a similar belief, many investors were also attracted, making it easier for banks to finance the scheme. This opened up more opportunities for brokers and real-

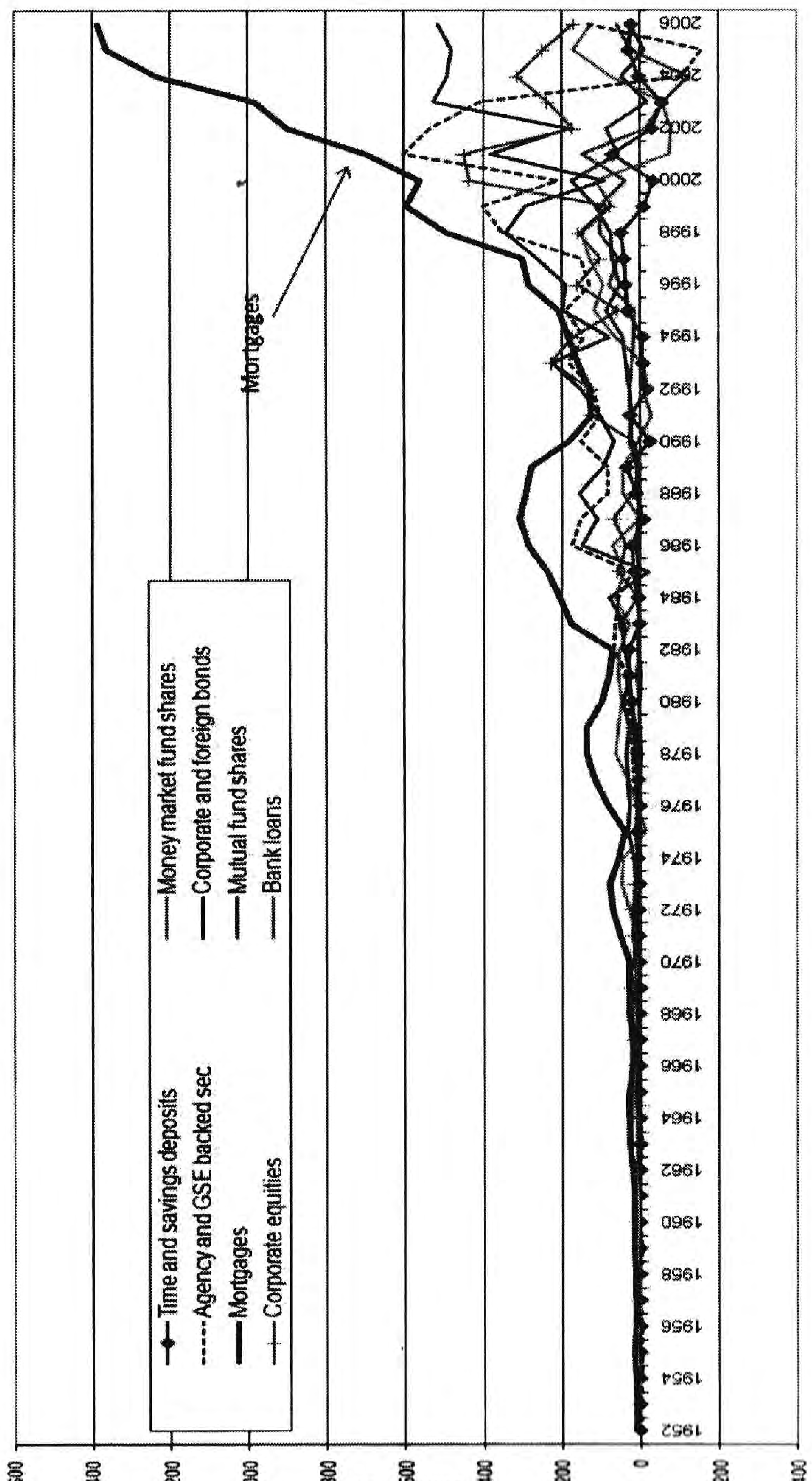
tors too. The conviction that housing prices would always go up was so strong that everybody did not want to miss out the opportunities. A complex web of connections has emerged: through a financial engineering called securitization, mortgage lenders pass the rights to the mortgage payments and related credit/default risk to third-party investors via mortgage-backed securities (MBS) and collateralized debt obligations (CDO). As shown in Figure 1, during the last few years, the growth of funds invested by the US financial sector in mortgage assets has been indeed unprecedented. Such assets have not only dominated the sector's investment but it has also grown the fastest.

For a while, the subprime boom enriched everybody. It also allowed hundreds of thousands of Americans to buy homes they never believed they could afford. The offered loans were mostly subprime. Most borrowers were low income households wanting to own house, car, or credit card, and the probability of default was usually high. The transactions were not transparent. For example, in commercial paper programs a.k.a conduits, where banks as lenders typically used the off-balance sheet vehicles on behalf of the chapter issuer, the transparency of the conduits contents was very poor. It is a paradox that in the current world of financial globalization the amount of transparency is less, not more. While huge amounts of money was being made by underwriting subprime loans, banks and mortgage companies all but abandoned their prime loan guidelines. Many loans were made under NINJA conditions (no income, no job and no asset). Lenders tend to get greedy during the good time, trying to extract as much juice from the borrower as possible by extending credit without much, if any, regard for borrowers' ability to repay the full amount.

Take the case of a real estate finance company *Countrywide* that aggressively made $470 billion in loans in 2006. In its website the company's efforts to lure borrowers was obvious: "*We offer you products and services at a lower cost or with greater convenience by sharing limited information within our Countrywide family of companies and with carefully selected business partners.*" They basically function like a hedge fund, where the investors are wealthy individuals and institutions. They are usually exempted from many of the rules and regulations governing other financial institutions such as banks and mutual funds. This explains why hedge funds tend to be aggressive in their investing strategy. However, many banks did it too. *Citigroup* and *Bank of America* did it on a larger scale than any of the other banks in the U.S. Before long, there were just a few handfuls of banks that were not part of these risky investments.

The same thing happened across the Atlantic. In Europe, the asset-backed bonds (also known as the "covered bonds") are most well-known. The key difference from the U.S mortgage-backed securities is that, in Europe banks that make loans and package them keep those loans on their books. This means that when a company with mortgage assets on its books issue the covered bond, its balance sheet grows.

Figure 1
U.S. Financial Sector's Investment in Financial Assets



Source: Author's calculation based on a series of U.S. Flows-of-Fund

From Market Turmoil to a Recession

Pandemonium set in when homeowners began to have a difficulty with their repayments. They struggled to get loans for subprime refinance deals. A wave of foreclosure (hangover from a heady time) suddenly hit the housing market. Investment banks involved in the subprime lending had to force margin calls to protect themselves from the collapsing loan value, and mortgage companies and hedge funds were being forced to sell assets to meet these margin calls. As the value of the underlying mortgage assets declined, corporate, individual and institutional investors holding MBS or CDO faced significant losses,.

What would you do if you invest in such companies? Vote with your feet! That was exactly what happened: most investors tried to withdraw. But it turned out many of them lived on credits granted by the same investment banks who tried to force the margin calls (e.g., *Lehman Brothers, Merryl Lynch*, or large companies' financial branches like *General Motors*). Other major financial companies such as *Bear Stearns* and *Bank of America* had also to face a sudden wave of withdrawals by investors. Many of them acted like both a bank and a hedge fund. The bank part made loans to hedge funds, including its own, and hedge funds part used the loans to buy other loans and bonds. They also faced difficulties to sell the loans. Some of the loans could not be sold to government-sponsored enterprises like *Fannie Mae* or *Freddie Mac* because they were too big. As the number of firms needing more cash increased, a liquidity problem emerged. Each tried to borrow liquidity from others. As a result, inter-bank rates shot up, creating a liquidity crunch in the financial market. It was hedge-fund equivalent of a bank run: the 21st-century run!

In Europe, a large German Bank, *IKB Deutsche Industriebank*, holding a substantial share of subprime investments, came close to a collapse. Fearful that it may create systemic effects, the Bundesbank (Germany's central bank) decided to bail it out. France's largest bank, *BNP Paribas*, also had to stop withdrawals from its asset-backed securities funds, saying it could no longer value them accurately because of problems in the subprime market. In a matter of days, more funds and companies had either closed or halted investor withdrawals as they sorted out the value of their subprime and other mortgage-related investments.

One may wonder, why didn't the policy makers see the potential systemic risk of such risky investment, and how did investors get interested with it at the first place? No one worried about risk spreading because banks had sold off the underlying mortgages to investors. But as it turned out, many banks had also sold complex insurance policies on the mortgage debt. When homeowners who had taken out the mortgage could no longer get out of it by selling their house for a profit, these banks suffered. For investors, they jumped in because they could get returns through leverage, e.g., making $100 million bets with only $1 million of their own money and $99 million in debt. If the value of the

investment rose, they could easily multiply their money. Also, the mortgage loans allowed interest rates to be reset from low teaser to high levels, thereby promising a larger cash flow than prime loans that carried lower fixed rates. Investors, ranging from hedge funds to wealthy individuals, had confidence in the arrangement because even if the loan or credit went bad, they perceived that securities backed by bad credit could be safe. In addition, most of the securities had received good ratings from agencies like *Moody* and *Standard & Poor*. Even international investors piled into this debt market.

The idea that the risks are shared collectively with other parties, i.e., issuers, underwriters, borrowers, is appealing. But these features mean very little when the delinquency rate gets higher. While the complex and synergic relationships have created a system that can be favorable in terms of risk-sharing, when there is a shock in the market they can create a "domino effect," raising the risk of a system-wide failure. Since some of the lending carried prohibitive prepayment penalties, effectively made refinancing impossible, investors could be on the hook for bad mortgages. Before late (some were already too late), they tried to quit. With less money available in the market, the liquidity crunch was exacerbated.

When the US second-biggest home lender *American Home Mortgage Investment Corp* filed for bankruptcy in early August, the commercial chapter market felt the shockwaves. As other lenders fell into a similar situation, many of them took the option of delaying payment for the money they borrowed from investors. There was a clause allowing such a practice in the unlikely event lenders could not refinance. All of sudden, the 30–day notes you bought became, say, 240–day notes. Who would not shun such commercial paper?

One by one major financial institutions disclosed their problems associated with subprime lending and mortgage-backed assets. *Deutsche Bank* had to write down its losses (estimated at $3.1 billion). *Citigroup* and *UBS* had to do the same thing. *BNP Paribas* and *Société Générale*, two big French institutions, and *Barclays* of Britain were next on the line. Even in Japan, where banks typically did not sell high-risk mortgage products such as subprime loans, losses were inevitable. In early October, its largest bank, *Mitsubishi UFJ*, reported ¥5bn losses on sub-prime loan linked investments. The list got longer, not counting many smaller banks and other financial institutions that suffered from losses associated with subprime lending too.

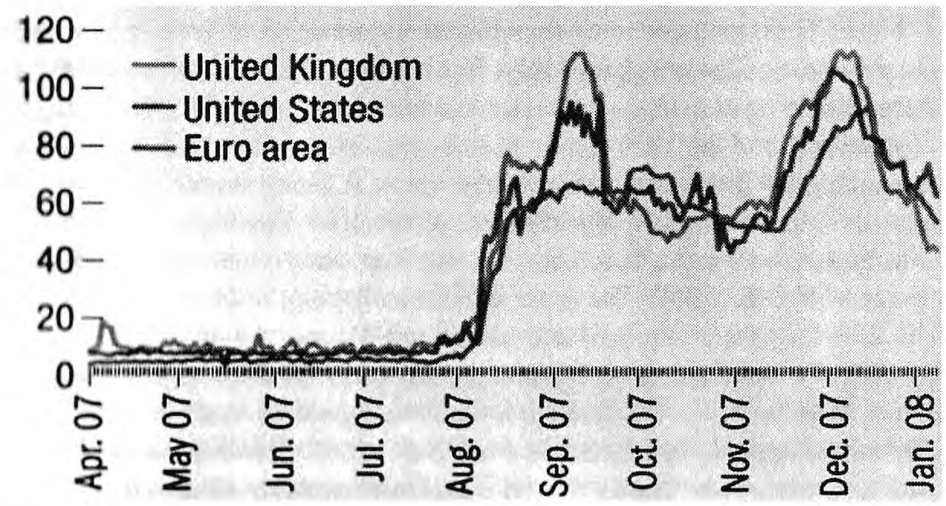
In essence, any institution that seems to have a high-risk portfolio began to face the double whammy: investors demand their money back, lenders shut the door in their face. As some of these troubled institutions were forced to close down, the problem of insolvency set in. With over 2 million U.S. households either on the brink or already gone to foreclosure, and about 100 subprime mortgage lenders had gone belly up, the problems were no longer just illiquidity, but also insolvency.

A liquidity crisis was clearly evident as many commercial banks needed more liquid assets (very short-term loans) and longer-term liabilities, but these

were no longer available in the market. As shown in Figure 2, beginning in August the spread between 3–month LIBOR and the expected overnight rates widened as liquidity concerns had been priced into terms rates. To avert a full-blown catastrophic credit squeeze, a series of massive liquidity injections was conducted by the Fed, the European Central Bank (ECB), Bank of Japan (BOJ), and other central banks.

But the meltdown continued. At the time of the writing, the latest casualty is *The Bear Stearns Co Inc*, one of the biggest players in securities industry. The problem began in June 2007, when two hedge funds operated by the company slipped to the brink of collapse because of their exposure to sub-prime mortgages. Nearly a third of its revenue came from fixed-income trading. The liquidity problem was so severe that the probability of default increased sharply, and the spreads on its CDS (credit default swap) soared to 1,000 basis points, meaning that it cost $1 million to insure against a default of $10 million face value of bonds. Had *Bear Stern* defaulted, the market would have had to try to unravel the complex web of trades that could create a logistical headache for bankers, because a CDS contract in effect pledged to protect an investor against loss from a default. Being counterparty on so many trades, which theoretically meant *Bear Stern* needed to get hold of bonds to pay back many investors, the complexity would have been unprecedented. This is the reason why a "bail out" scheme was enforced, in which the Fed arranged a guarantee for a forced marriage of *Bear Stearns* to rival *JPMorgan Chase & Co* (the acquiring cost is $2 per share, way below $80 in the weeks before). A similar 'bail out' scheme also took place last August when *Bank of America* acquired a $2 billion equity stake in *Countrywide* in a bid to bolster the confidence of creditors and investors in the failing mortgage lender.

Figure 2
Spread between 3–Mo LIBOR and OIS



Source: Gray and Stella (2008, January)

As mortgage delinquencies and foreclosures continue to rise, the growing excess supply of homes brings prices down, causing reductions in homeowner's equity. The pressure on prices gets bigger as more people and lenders are forced to sell homes. With lower asset value and falling consumers' income, spending also declines. This causes producers' income and investment spending to fall. The economic losses arising from lower asset prices and falling income and spending exacerbate the financial sector's predicament. In turn, this translates into problems in the real sector. Thus, a set of virtuous cycles sets in. What was once called the subprime mortgage crisis has since transformed into an economy-wide credit chill, raising the probability of a recession.

One has to start from somewhere to stop the cycle. Fed Chairman Ben Bernanke argued that the only thing that will end the cycles is the end of the housing bust. Yet, the gloomy prospect of housing market is likely to prolong for the following reasons: (1) recent expansion in the housing market has been the longest in the last fifty years; (2) historically, housing recessions started to bottom out after close to 40 percent drop from the moving average peak, while the current drop so far is still less than that number; and (3) even with falling prices in some states housing construction has not stopped (Roubini & Menegatti, 2007). It is also worth to note that, historically, housing downturn preceded an economy-wide recession.

One indicator confirming that the subprime and mortgage crisis had spread to other credit markets was the widening spread between high quality bond yield (e.g., corporate bonds rated BBB and AAA) and Treasury notes. What did this mean for the economy in general? First was the effect on investment or capital expenditure. The incentive to invest weakened because the cost of money was higher as reflected in the widening spread. Added by an increased uncertainty, this caused total investment to stagnate. Although the day-to-day performance of the stock market fluctuated, the general trend clearly went south. Tobin's q, the ratio of the market value of an asset to its replacement cost, suggests that this will pull investment downward. In response, the Fed began to cut the Federal Fund rate more aggressively. It turned out that the lower rate did not end the market upheaval, and the credit crunch continued. Unlike during the LTCM debacle and the 2001 recession, this time the problem of illiquidity were compounded by insolvency, uncertainty over the amount and holders of the losses, and the numerous types of assets involved in the risky scheme.

Nothing is more important than consumption since it constitutes more than 70 percent of U.S.' GDP. The most direct mechanism is through the wealth-effect. Housing expenditures have accounted for more than one fifth of the U.S.' GDP. When housing wealth and capital gains from home sales increase, consumers spend more. Interestingly, the housing sector tends to be strong no matter what happens with the stock market. If the stock market is strong (e.g., during a bubble), home prices receive a lift from investors' decision to shift the stock gains into real estate. When stock values fall, home prices also receive a

boost as investors pull money out of the stock market and put it into real estate in search of positive returns.

According to Belsky and Prakken (2004), the effects of changes in housing and stock wealth on consumer spending are different in timing. It takes only about one year for spending from housing wealth to reach four fifths of a long-run effect, compared with several years for stock wealth. Thus, the effect of housing wealth is more immediate. An important reason of it is that, consumers are more cautious about changing their consumption behavior based on near-term movements in stock prices that can well prove unsustainable. It is also revealed that while liquidation of home equity and realization of capital gains from home sales can add significantly to growth in consumer spending, the impacts are only temporary. Thus, an increase in home prices imparts more lasting benefits. This explains why historically the correlation between home prices and economic growth has been stronger.

During the last few years, housing related effects of low interest rates accounted for at least one quarter of growth in personal consumption expenditures. This was primarily responsible for the robust economic recovery after the 2001 recession (Greenspan, 2003). While the episode shows that a relatively aggressive expansionary monetary policy was capable of providing a rapid and substantial lift to consumer spending and GDP growth, the same policy may not be as effective in the current crisis. Besides the insolvency problem and low market confidence, another important reason is that the risk of falling dollar value is now higher as the US current account deficit (CAD) gets bigger.

Discussion

Reaching at an annual rate of roughly $800 billion, or 7 percent of GDP, the U.S. current account deficit (CAD) represents roughly 70 percent of the global current account deficits. This is unprecedented, and plays a key role in the current global imbalances (Azis, 2007). When a country has a large CAD, two things happen: large capital inflows to "finance" the deficit, and weakened currency. What is the evidence? We know that there has been a large sum of foreign capital flowing to the US market, especially from surplus countries such as East Asia including China, India, and oil producing countries. At the same time, we have also observed the depreciation of US dollar. Before market turbulence, the depreciation occurred relatively orderly, but during and post turbulence the fluctuations increased.

Foreigners may start to wonder about investing in the greenback. It is not unlikely that they will pull some of their assets out from US dollar investment. When the CAD continues to widen but capital inflows shrink, a further dollar weakening is inevitable, implying that importing goods from the US will be much cheaper but import prices that US consumers must pay will get more expensive. One scenario coming out of it would be a faster growth of export.

If this is the case, CAD will decline. But given the persistent dependence of U. S .consumption on imports, this does not seem to be the most likely scenario, at least not in the short run. Even if CAD can be narrowed, the inflationary pressure from dollar's sharp depreciation, i.e., imported inflation, may force the Fed to raise the interest rates. This can be a nail in the "R" coffin. A recession in the U.S. will translate into falling demand for imported goods. China will be among the most affected, and the neighboring Asian countries will be inflicted, although the ripple effects can be reduced if they adopt a basket currency system (Azis & Puttanapong, 2008).

Thus, two unwelcome scenarios can arise from the current global imbalances: a sharp fall in dollar value, and a recession. Before the subprime crisis began, very few analysts believed that the recession scenario was very likely; most of them believed that the U.S. economy could instead have a soft landing, in which the U.S. dollar would depreciate in an orderly fashion. But with the subprime crisis and its contagion effect coming into the real sector, the probability of a hard landing has increased significantly. This poses serious dilemma for policy makers. Higher interest rates are necessary to strengthen the dollar, but it raises the likelihood of a recession. On the other hand, lowering the interest rate to avoid a recession may push the dollar down further. What is then the alternative?

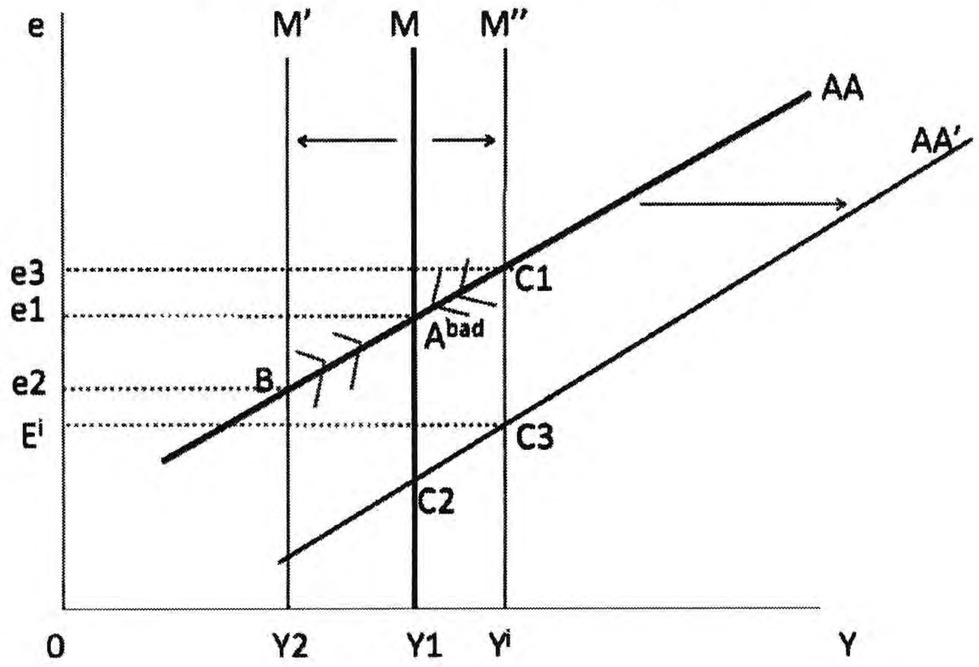
Policy Analysis

In Figure 3, suppose the ideal exchange rate is e^i (optimal prices for exporters and importers), and the long-run equilibrium level of output is Y^i. Given the market turbulence that led to a credit crunch and falling dollar discussed earlier, equilibrium point A^{bad} is at the intersection of money supply M and aggregate demand AA, where output level and the exchange rate are, respectively, Y_1 and e_1. In a crisis, this "bad" equilibrium is stable.

The following analysis focuses on policy scenarios that allow the system to depart from A^{bad}. If the dollar value is to be strengthened, the Fed can raise the interest rates. Essentially, money supply line is shifted to the left from M to M'. At the new equilibrium B, the dollar value strengthens to e_2 (note that Figure 3 is drawn such that an upward movement along the y-axis implies a weakening dollar; vice-versa). But this will pull output level further to Y_2, raising the risk of a recession. The exchange rate adjustment under such circumstances is: U.S. dollar weakens (exports expand). Thus, point B is dynamically unstable.

On the other hand, if bringing back output level to its long-run equilibrium is the priority, the Fed must lower the interest rates or raise the money supply to M. The move by the Fed to inject liquidity in the market and lower the Federal Fund rate reflects this shift. As clearly shown in Figure 3, this will weaken the dollar value further to e_3. The resulting increase in import prices can lower consumption and investment expenditures, causing output to fall. Thus, the

Figure 3
Trade-off between Dollar Value and Recession



original output increase due to the accommodative monetary policy cannot be sustained; i.e., C_1 is dynamically unstable. Therefore, the only stable equilibrium is A^{bad}, which is a position we are trying to depart from.

On the expenditure front, an expansion shown by a rightward shift to AA' would result in a stronger dollar, i.e., point C_2. At this equilibrium, however, the dollar appreciation fails to stimulate output, presumably due to a dampened growth of exports. But when increased expenditure is combined with accommodative monetary policy, output will increase to Y^i, and the exchange rate will be in E^i, still stronger than E_1.

While such a combined policy is desirable, however, it may not be easy to implement. First of all, to increase government expenditure given the prevailing fiscal deficit is politically difficult. Also, the Fed may restraint from a more accommodative policy if the inflation expectation is on the rise due to factors other than exchange rate, e.g., higher oil prices, rising trade protection, etc. But a series of interest rate declines since the fall of 2007 and the stimulus package issued in March 2008 indicate that the Fed and the Bush administration are more concerned with the risk of a recession. The question is: will it be effective?

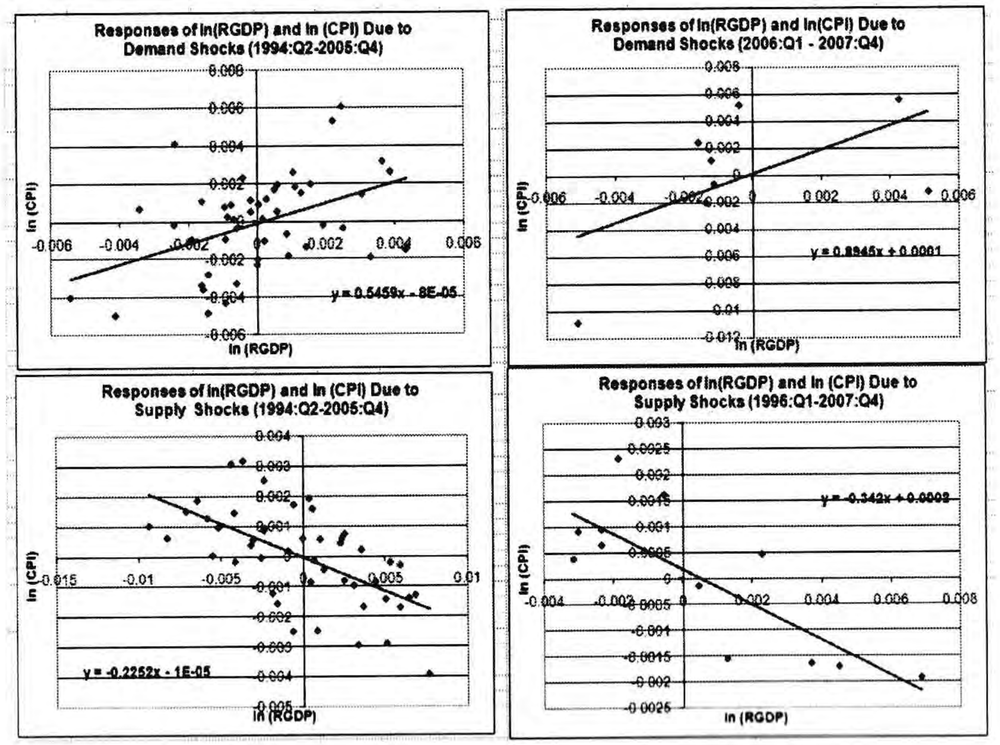
Policy choices should not be delinked from the symptoms and causes of the crisis. The monetary and fiscal policy discussed above would have been effective if the main source of the slowing output growth is of the aggregate demand (AD) type. On the other hand, if the main reason of the economic slowdown is the aggregate supply (AS) shock, the effectiveness of such a policy is limited.

Since in reality AS and AD exert some shocks simultaneously, one needs to measure both, and evaluate which of the two shocks exerts the largest pressure on the output growth. The strength of each shock can be reflected by the size of the slopes of the AS and AD curves. It is known that generating these two curves cannot be done by simply plotting the data of GDP growth and inflation. To the extent that both shocks jointly determine the changes in output and price, a decomposition procedure needs to be applied.

By using the structural vector autoregression (SVAR) technique and the Blanchard-Quah decomposition, I found that since the credit crisis began the slopes of both the AS and AD curves in the U.S. economy became steeper. While the absolute size of the AS slope was always greater than that of the AD slope, during the crisis the gap between the two widened (i.e., from .55 versus .23, to .89 versus .34, see Figure 4). What does this mean? A steeper AS curve during the crisis implies that the effectiveness of an AD policy shock was more limited: a slight increase in output would cause a large increase in the inflation rate. During the earlier period (1994–2005), such a policy would have been more effective since the slope of the AS curve was smaller. On the other hand, during the crisis an AD tightening policy would be effective to control inflation, i.e., the price decline was larger than the output fall.

Figure 4

US Aggregate Supply (AS) and Aggregate Demand (AD) Slopes



Source: Author's calculation based on SVAR and the Blanchard-Quah decomposition

Such a conclusion is also consistent with the finding based on the dynamic analysis of the AS and AD slopes. As shown in Figure 5, the downward pressures on the output during 2007 originate in the supply shock, not demand shock. The latter dominates the source of the upward pressure on inflation. Thus, based on this analysis it is clear the stimulus package issued by the administration and the loosening monetary policy by the Fed will not be effective to counter a major slowdown in the economy. That is, the policy will not be able to avert a recession.

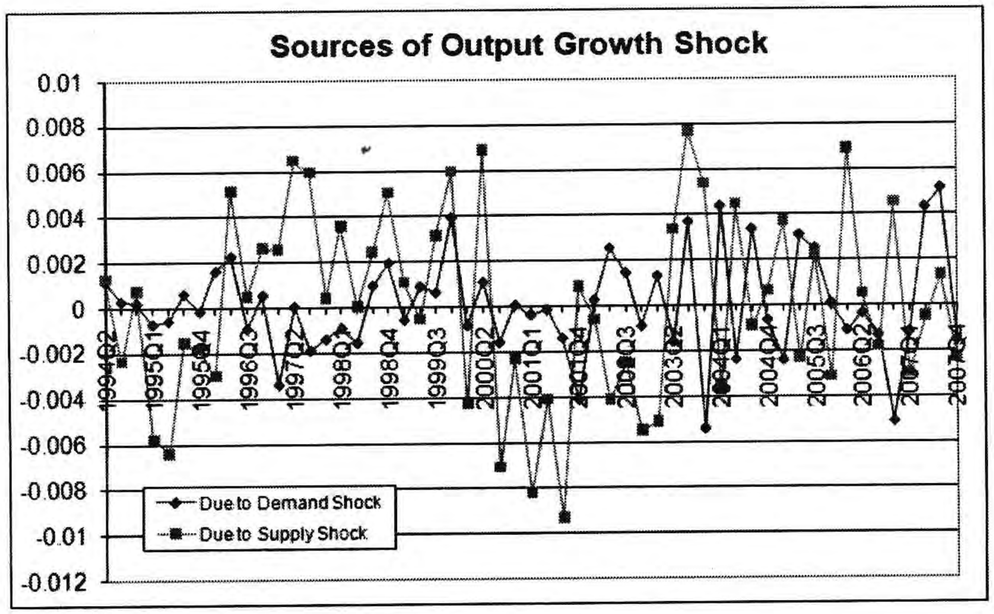
Challenges for Financial Managers and Investors

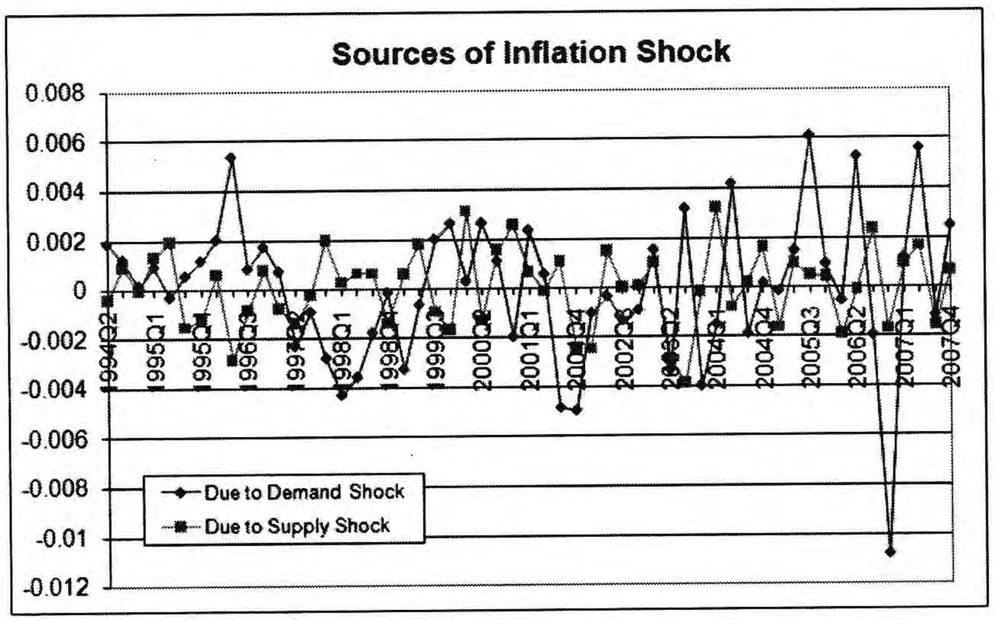
Nothing is more challenging for financial managers and investors than to operate during the market turbulence. The financial managers' main task of protecting companies or clients' portfolio gets more difficult, and the challenge of finding safe investment is more formidable. The most immediate test is to deal with the bearish stock market. This is not because of the turbulence alone, but for some years the market has been in the best of times. History shows that some of the sharpest and most prolonged stock-market declines began precisely when it was booming. When it co-exists with market turmoil, however, the question becomes: will the downward trend only temporary or long-lasting. No one knows exactly. Even the best econometric forecast model is likely to miss the turning point, let alone discontinuous events like a crash. I often hear analysts' claims that they knew before a bear market began. Nonsense! It is merely the benefit of 20–20 hindsight.

Upsetting as it may, it is far more reasonable for financial managers to simply accept and recognize the turbulence after it begins, then carefully monitor the progress, and working with the new market sentiment. While this may sound easy, the fact is it is not. Consider the bear market of 2000–2002. Majority of analysts and financial managers at the time simply ignored the telltale signs, as shown by the fact that many of them maintained their "buy" or "hold" ratings on companies that were going bankrupt (Weiss Ratings, 2002). Examples also abound during the 2007 market turbulence. In early November, responding to the news that *Citigroup* and *UBS,* two of the largest financial companies in the world, were forced to take substantial write-downs due to subprime losses, many financial managers showed off their bravado by taking the "buy" position.

Making use of hedges is also worth to consider because past performance is no assurance of future results. Consider a fund that was set up to rise by, say, 2 percent for every 2 percent decline in the market. When a decline is confirmed, add bear-market hedges; vise-versa, when an end of the decline is confirmed. If it sounds conservative, it indeed is. Financial managers must use conservatism when they need it. The current turbulence is an episode where most managers need to be conservative. Historically, those who followed this strategy tend to produce reasonable good return. The evidence in early 2000 showed that they could generate a rather substantial profit during the bear-market period.

Figure 5
Sources of US Output Growth and Inflation Shocks





Source: Author's calculation based on SVAR and the Blanchard-Quah decomposition

It is a universal understanding that in turbulent times there is a flight back to quality, i.e., either liquidate shares and hold the capital as cash, or move into the blue chips or established shares that are more resilient. Two broad categories of investment can be considered: money market mutual funds and short-term CD. Money market funds are not backed by the Federal Deposit Insurance Corporation (FDIC), but the financial companies from which investors buy are likely to support the funds because the entire company would be destroyed if they let such funds go bust. But only reputable companies will step in. Also, this should be only a temporary investment before the next move when the market is back to normal. CD is preferable if investors wish to keep cash for a while. Short-term CD's (typically 6 months) are preferred because in a relatively flat yield curve long-term rates are not much higher than short-term rates. Yet, no matter how long the recession will be it is always the case that long-term rates will eventually increase.

It is also worth to note that market turmoil can provide another opportunity of trading, i.e., in foreign exchange (forex), which is the largest market in the world. Just about every industry (e.g., central banks, multinational corporations, governments, banks and other financial institutions, retail traders) directly or indirectly is involved in the currency market. However, given the current uncertainty, those managers dealing with foreign currency will have no easy time either.

In principle, the fundamentals behind currency movements are economic growth, interest rates, and debt levels. The fact that the U.S. economic growth has been weakening, the interest rates fall, and the nation's debt level soars to over 300 percent of GDP suggests that the general trend of U.S. dollar will be going nowhere but south. The experience of market meltdown in 2000 and 2001 showed that as the bubble in Nasdaq bursted and the U. S. economy entered into a recession, U.S. dollar fell until the Fed began to raise the interest rates (in 2005). As the prospect of further interest rates reductions remains good, there is no reason for financial managers to think differently in handling the current turbulence. Between using technical analysis (studying specific factors that can influence a currency) and relying on fundamental analysis, at times of great uncertainty the former may have to play a bigger role in forex trading, especially with the sure thing about the direction of dollar movement. This is rather different than in the stock market, where predicting future movement based on past performance is not a smart thing to do when market is in turmoil.

Direction for Future Studies

As suggested in the earlier policy analysis, the Fed's accommodative policy and the administration's stimulus package are not likely effective. Not only that the risks of credit and dollar crisis are now higher, but also the insolvency situation makes the problems more difficult to solve. Above all, repairing market con-

fidence is always far more difficult than anything else. The monetary authority also faces a dilemmatic problem since "creative" financial institutions involved in the debacle are outside its controlling screen since they are not banks. Like hedge funds, the products of these institutions are complex, not widely traded, exotic, involving so many types of assets such that they are hard to locate and difficult to value ("Where's Waldo" problem). Much of the financial losses also come from what is known as SIV or SPV (special investment and special purpose vehicle), some of which was set up by banks but their transactions do not appear in the banks' balance sheet. They may be located in tax-heaven places like Cayman Island.

Not knowing exactly the size and who holds the losses will limit the policy scope of the Fed. In his interview with the Associated Press in August 2007, Nobel laureate Joseph Stiglitz remarked: *"We don't know how well the U.S. Federal Reserve will respond. The lack of transparency means we don't know how deep the problem is."*

If the market turmoil was relatively mild, and the problem was only about liquidity, the intervention would have been enough to end the turbulence. But historically there were almost no cases where a meltdown of this proportion could be halted with one single policy. It would need much more to stabilize market conditions especially when the source of the problem was so interlinked, involving different institutions, not just banks. While the source was complex, enabled by a new system of financing, the institutions that tried to "solve" the problem were those created to deal with the old system's problems.[2] These institutions have little regulatory oversight of the financial companies and securities that are in trouble and may not even know who is holding them. Thus, another important subject to study would be on the regulation and supervision for financial institutions of this type. For many years mortgage brokers are allowed to offer loans that were underwritten at the initial (teaser) rate. But now bank regulations require that loans be underwritten at the fully indexed rate. This is an example of rules in the right direction. There are still many other specific regulations of this type that need to be explored to prevent the repeat of a similar crisis, and protect the less-informed borrowers. It is also important to understand what really prevents regulators from adopting stricter rules on financial institutions like the hedge funds. It is appalling ten years after the LTCM debacle we are still in the same state of calling for better regulations. There has been a kind of regulatory laissez faire for the last few years despite the increased number of "creative" financial institutions in a brave new world of financial globalization.

As argued earlier, an accommodative monetary policy ought to be combined with fiscal expansion. But to select policy of this nature given the large fiscal deficit will not be easy. Another challenge for future study is therefore to explore alternative fiscal policy that would allow the system to raise business investment such that the equilibrium point C3 in Figure 3 can be reached. An

example of policy measure along this line is to revoke some tax cuts, and lower the marginal tax rates on capital income. The latter has been proven capable of producing large deadweight losses even when the effect on saving is small (Feldstein, 2006). Much of the current tax burden on investment stems from the 1986 Tax Reform Act. Switching to consumption tax instead of using investment tax may also be worth to consider. A study by Margo (2002) shows that if the US had switched in 1991 to a consumption tax system, instead of taxing investment heavily, the real GDP would have been 5 percent higher by 2004, and business capital spending would be 35 percent higher. Another alternative fiscal policy is at the state level, since taxes in many states have proved to be deterrence for business operations.[3]

Also warranted are studies that can identify non fiscal policies, e.g., those with a focus on productivity improvements that will increase other components of aggregate demand, i.e., investment, and exports. The focus should be to resolve critical factors that hampered the competitiveness in each sector of the economy.

On a global perspective, one may recall the episodes of financial crisis around the world where the standard policy response are to raise the interest rates, tighten the budget, and avoid a bailing out scheme. The IMF and the US Treasury were adamant with such a policy direction during the Mexico crisis in 1994 and the Asian crisis in 1997. Ironically, everything what the US administration and the Fed have been doing in the current crisis is exactly the opposite of what they preached. The US policy response to the current crisis *is* the one that makes more sense. It may not be enough, but it is in the right direction. It would therefore be useful to conduct a counterfactual policy analysis in crisis episodes around the world, and derive the important implications of the different policy response.

Limitations

Based on the trend since summer 2007, I believe that the US economy will fall into a recession. Not because every time we were in the year ending 7 a major shock hit the US economy (stock market crash of 1987, the Asian Financial Crisis of 1997), but because the crisis in subprime mortgages had been compounded by insolvency problem, persistent US dollar depreciation, and credit crunch that spread to investment and consumer credits, all of which exacerbate the market confidence. Central to my assessment is the high degree of uncertainty faced by policy makers that was caused a panic and made most policies ineffective. But it is precisely this uncertainty factor that can fault my prognosis. What if, for example, the Fed continues to lower the interest rates that the market sentiment will turn positive? After all, the Fed has so far not only reduced the Federal Fund Rate persistently (by the time of the writing the rate is already 2.25 percent, compared to above 5 percent during fall 2007), but also injected a massive amount of liquidity, lowered the discount rate to

2.5 percent, and even bypassed its own 2002 emergency-lending policies by letting securities firms borrow at the same interest rate as commercial banks. These were on top of $190 plus billion stimulus package. What if within a few months the true magnitude of the financial losses is finally revealed, that the authority can intervene with greater precision? Absent of detailed analysis about the nature and intensity of uncertainty, any prognosis about US recession is bound to be incorrect.

Another assumption I make in the analysis, particularly on the exchange rate crisis, is the reduced willingness of the rest of the world to "finance" the US deficit. This may not be the case if the surplus countries continue to intervene in their domestic forex market in order to prevent their currency from appreciating. Under such a condition, their reserves accumulation will persist, and the US deficit can sustain without exerting pressures on the dollar value; that is, a currency crisis can be averted.

The analysis based on Figure 3 assumes that there is an effective coordination between the Fed and the government (and the Capitol Hill). Yet, that is not always the case especially in the election year. Fiscal stimulus is always one place where economics and politics collide. If the government and congress refuse to make changes on the fiscal front, the dollar value will plunge even further to e_3 (equilibrium point C_1).

The bottom line is, there is a great deal of uncertainty about almost everything associated with the current financial meltdown: who perpetrated it, how much funds involved that need to be recouped and bailed out, in what way will market react to a particular policy, how foreign investors will respond to the continuing decline of dollar value, what fiscal policy the new administration and congress will favor? All these make the policy choices more difficult and the effect more unknown. As long as the market confidence is not restored, all remaining options are bad solutions.

Notes

1. LTCM (*Long Term Capital Management*) is a hedge fund founded in 1994 with $1.3 billion investment at inception. It made huge profits during a few years of operation. By early 1998, the fund had a leverage factor of roughly thirty to one, i.e., holding $5 billion equity and over $125 billion borrowing. The key reason investors were attracted to its strategy was the belief that the long and short positions were highly correlated so that the net risk was small (this is based on the complex computer models that LTCM used). Long story short, in September 1998 the LTCM lost substantial amounts of investors' equity capital, and was on the brink of default. To avoid the threat of a systemic crisis, the Federal Reserve orchestrated a $3.5 billion rescue package from leading U.S. investment and commercial banks, in exchange for 90% LTCM's equity.
2. The new financial transactions are so complex that many terms are not well understood. It has been reported that even the former Treasury secretary and current Citigroup executive, Robert Rubin, had a difficulty to explain what is "liquidity put," a new and obscure kind of financial contract that eventually hit Citigroup.

3. Take the case of New York State. From a survey conducted by *The Business Council of New York State, Inc* in March 2006, employers overwhelmingly agree that the state taxes undermine their ability to compete and prosper. More than half of respondents said they had considered leaving New York State, closing operations here, or putting growth in other states.

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