sanity, humanity and science

real-world economics review

Formerly the *post-autistic economics review*

Issue no. 46, 20 March 2008 back issues at www.paecon.net

Subscribers: 9,838 from over 150 countries

In this issue:

The housing bubble and the financial crisis

Dean Baker [Center for Economic and Policy Research, USA]

The central element in the current financial crisis is the housing bubble. The irrational exuberance surrounding this bubble created an environment that was ripe for the cowboy financing that got Wall Street and the country into so much trouble. Of course the cowboy financing fed into the bubble, allowing it to grow to proportions that would not have been possible with a well-regulated financial system.

This essay first describes the circumstances under which the bubble began to grow. It then discusses how financial innovations and the lack of a proper regulator structure allowed the bubble to grow to ever more dangerous levels and eventually to crash in a way that has placed unprecedented strain on the country's financial system. The third part outlines key principles for reform of the financial system.

The origins of the housing bubble

The housing bubble in the United States grew up alongside the stock bubble in the mid-90s. The logic of the growth of the bubble is very simple. People who had increased their wealth substantially with the extraordinary run-up of stock prices were spending based on this increased wealth. This led to the consumption boom of the late 90s, with the savings rate out of disposable income falling from close to 5.0 percent in the middle of the decade to just over 2 percent by 2000.

The stock wealth induced consumption boom also led people to buy bigger and/or better homes, since they sought to spend some of their new stock wealth on housing. This increase in demand had the effect of triggering a housing bubble because in the short-run the supply of housing is relatively fixed. Therefore an increase in demand leads first to an increase in price. As prices began to rise in the most affected areas, prices increases got incorporated into expectations. The expectation that prices would continue to rise led homebuyers to pay far more for homes than they would have otherwise, making the expectations self-fulfilling.

Government data show that inflation adjusted house prices nationwide were on average essentially unchanged from 1953 to 1995.[1] Robert Shiller constructed a data series going back to 1895, which showed that real house prices had been essentially unchanged for 100 years prior to 1995.[2] By 2002, house prices had risen by nearly 30 percent after adjusting for inflation. Given the long history of stable house prices shown in the government data, and the even longer history in the data series constructed by Shiller, it should have been evident that house prices were being driven by a speculative bubble rather than the fundamentals of the housing market.

[1] Baker, D. 2002. "The Run-Up in House Prices: Is It Real or Is it Another Bubble." Washington, D.C.: Center for Economic and Policy Research [http://www.cepr.net/index.php/publications/reports/the-run-up-in-home-prices-is-it-real-or-is-it-another-bubble/].

[2] Shiller, R. 2006. *Irrational Exuberance* (2nd edition). Princeton, NJ: Princeton University Press.

The fact that rents had risen by less than 10 percent in real terms should have provided more evidence to support the view that the country was experiencing a housing bubble. If there were fundamental factors driving the run-up in house sale prices they should be having a comparable effect on rents. However, the increase in rents was far more modest and was trailing off already by 2002.

The second phase of the housing bubble

The run-up in prices in both the ownership and rental markets was having a substantial supply-side effect, as housing starts rose substantially from the mid-90s through the late 90s. By 2002, housing starts were almost 25 percent above the average rate over the three years immediately preceding the start of the bubble (1993-95). The increase in building showed up first as an over-supply of rental housing, with the vacancy rate rising to near record levels above 9.0 percent in 2002, compared to a rate of 7.5 percent in the mid-90s.[3]

If the course of the bubble in the United States had followed the same pattern as in Japan, the housing bubble would have collapsed along with the collapse of the stock bubble in the years 2000-2002. Instead, the collapse of the stock bubble helped to feed the housing bubble. The loss of faith in the stock market caused millions of people to turn to investments in housing as a safe alternative to the stock market.

In addition, the economy was very slow in recovering from the 2001 recession. It continued to shed jobs right through 2002 and into the summer of 2003. The weakness of the recovery led the Federal Reserve Board to continue to cut interest rates, eventually pushing the federal funds rate to 1.0 percent in the summer of 2003, a 50-year low. Mortgage interest rates followed the federal funds rate down. The average interest rate on 30-year fixed rate mortgages fell to 5.25 percent in the summer of 2003, also a 50-year low.

To further fuel the housing market, Federal Reserve Board Chairman Alan Greenspan suggested that homebuyers were wasting money by buying fixed rate mortgages instead of adjustable rate mortgages (ARMs). While this may have seemed like peculiar advice at a time when fixed rate mortgages were near 50-year lows, even at the low rates of 2003, homebuyers could still afford larger mortgages with the adjustable rates available at the time.

These extraordinarily low interest rates accelerated the run-up in house prices. From the fourth quarter of 2002 to the fourth quarter of 2006, real house prices rose by an additional 31.6 percent, an annual rate of 7.1 percent. This fueled even more construction, with housing starts eventually peaking at 2,070,000 in 2005, more than 50 percent above the rate in the pre-bubble years. The run-up in house prices also had the predictable effect on savings and consumption. Consumption boomed over this period with the savings rate falling to less than 1.0 percent in the years 2005-07.

Of course the bubble did begin in burst in 2007, as the building boom led to so much over-supply that prices could no longer be supported. The record vacancy rates switched from the rental side to ownership units in 2006. By the fourth quarter of 2006, the vacancy

[3] These data are taken from the Census Bureau's quarterly releases on residential vacancies and homeownership. The release for the fourth quarter of 2007 is available at http://www.census.gov/hhes/www/housing/hvs/qtr407/q407press.pdf.

rate on ownership units was almost 50 percent above its prior peak. By the middle of 2007, prices nationwide had peaked and began to head downward. This process accelerated through the fall of 2007 and into 2008.

Just as the bubble created dynamics that tended to be self-perpetuating, the dynamics of the crash are also self-perpetuating, albeit in the opposite direction. As prices decline, more homeowners face foreclosure. This increase is in part voluntary and in part involuntary. It can be involuntary, since there are cases where people who would like to keep their homes, who would borrow against equity if they could not meet their monthly mortgage payments. When falling house prices destroy equity, they eliminate this option.

The voluntary foreclosures take place when people realize that they owe more than the value of their home, and decide that paying off their mortgage is in effect a bad deal. In cases where a home is valued far lower than the amount of the outstanding mortgage, homeowners may be to able to effectively pocket hundreds of thousands of dollars by simply walking away from their mortgage.

Regardless of the cause, both sources of foreclosure effectively increase the supply of housing on the market. In the first quarter of 2008, foreclosures were running at a 2.8 million annual rate (RealtyTrac), which was nearly 60 percent of the rate of sales of existing homes in the quarter. In many of the hardest hit areas, the number of foreclosures actually exceeded existing home sales. In effect, by forcing more foreclosures, lower prices were leading to an increase in the supply of housing.

A similar dynamic took hold on the demand side. During the run-up of the bubble, lending standards grew ever more lax. As default rates began to soar in 2006 and 2007, banks began to tighten their standards and to require larger down payments. The most severe tightening took place in the markets with the most rapidly falling prices. With lenders in these markets requiring down payments of 20 percent or even 25 percent, many potential homebuyers were excluded from the market. These thresholds not only excluded first-time buyers, but even many existing homeowners would have difficulty making large down payments, since plunging house prices had destroyed much of their equity.

By the end of 2007, real house prices had fallen by more than 15 percent from peak.[4] House prices in many of the most over-valued markets, primarily along the two coasts, had fallen by more than 20 percent. Furthermore, the rate of price decline was accelerating, with prices in these cities falling at more than a 30 percent in annual rate at the beginning of 2008.[5] The rate of price decline in the Shiller indexes imply that real house prices will be down by more than 30 percent from their 2007 peaks by the end of 2008. This would mean a loss of more than $7 trillion in housing bubble wealth (approximately $100,000 per homeowner). The lost wealth is almost equal to 50 percent of GDP. There is no way that an economy can see a loss of wealth of this magnitude without experiencing very serious financial stress.

[4] This is based on the Case-Shiller U.S. National Home Price Index, available at [http://www2.standardandpoors.com/portal/site/sp/en/us/page.article/0,0,0,0,1148433018483.html].

[5] This statement is based on a comparison of data from January, 2008 with data from October, 2007 in the Case-Shiller 20 City Indexes, available at [http://www2.standardandpoors.com/portal/site/sp/en/us/page.article/0,0,0,0,1145923002722.html].

The excesses of the housing bubble

As the house prices grew further out of line with fundamentals, the financial industry adopted more sophisticated financial innovations to support its growth. A key part of the story was the growth of non-standard mortgages. Until the boom began to take off in the mid-90s, the vast majority of mortgages had always been fixed rate mortgages. However, adjustable rate mortgages became a growing share of mortgages issued during the boom, peaking at close to 35 percent in 2004-06. Not only did these mortgages not provide the security of fixed rate mortgages, they were often issued with below market "teaser rates" that would reset to higher levels after two-years, even if interest rates did not rise.

These "2-28" mortgages were especially common in the subprime segment of the mortgage market. Subprime mortgages were loans issued to people with poor credit histories. Homebuyers who got subprime mortgages were typically people with intermittent employment records or who had defaulted on some loans in the past.[6] The interest rates on subprime loans were typically two to four percentage points higher than the interest rate available at the time on prime loans given to people with solid credit histories.

The subprime market exploded during this period, rising from less than 9 percent of the market in 2002 to 25 percent of the market by 2005. In addition to this explosion in subprime loans, there was also a boom in the intermediate "Alt-A" mortgage category. These were loans given to homebuyers who either had a mixed credit record (better than subprime, but not quite prime) or who provided incomplete documentation of income and assets.

The Alt-A loans were in many cases of more questionable quality than the subprime loans. Many (perhaps most) of these loans were for the purchase of investment properties.[7] Furthermore, the Alt-A loans were more likely to be issued with incomplete documentation, earning some the status of "liar loans." The Alt-A loans were even more likely to have very high loan to value ratios, with many buyers borrowing the full value of the purchase price, or in some cases even a few percentage points more than the purchase price. Also, many of the Alt-A mortgages issues in the years from 2005-2007 were interest only loans or option-ARMs, which required borrowers to just meet interest payments on their mortgages, at least until a reset date, which was most typically five years after the date of issuance.

The subprime and Alt-A categories together comprised more than 40 percent of the loans issued at the peak of the bubble. The explosion of loans in these higher risk categories should have been sufficient to signal regulators, as well as investors, that there was a serious problem in the housing market. Just to take the case of the subprime market; it is absurd to think that the number of credit worthy people in the subprime category had more than doubled from 2002 to 2004, even as the labor market remained weak and wages lagged behind inflation. The increase in subprime lending over these years, by itself, was an unmistakable warning sign of the problems in the housing market. Unfortunately, instead of taking this

[6] There were also many people with solid credit records who were improperly issued subprime mortgages during this period. There is a long history of discrimination in bank lending, with African Americans and Hispanics being charged higher interest rates or being denied access to credit altogether.

[7] There is no easy way of knowing what percentage of the Alt-A loans were used for investment properties because it was common for buyers to claim that they intended to live in the home even if this was not the case. Interest rates are generally lower for owner-occupied homes.

warning, political leaders and most experts on housing celebrated the record rates of homeownership.

Wrong incentives everywhere

The surge in high-risk loans was made possible by the fact that there were misplaced incentives on all sides in the sale and financing of housing. The first area where misplaced incentives were evident is in the appraisal process. Appraisers typically operate as independent contractors. They get hired by the bank or mortgage issuer for an individual appraisal. In prior years, the banks would have valued an honest appraisal, since they wanted to be sure that the collateral in the house would cover the value of the loan.

However, during the housing bubble, in which mortgage issuers earned their money on issuing the mortgage, not holding it, mortgage issuers wanted to make sure that the appraisal would be high enough to justify the mortgage. This meant that they wanted high appraisals. This bias quickly got passed through to appraisers, since they realized that if they came in with appraisals that were too low to allow mortgages to be issued, they would not be hired again by the bank. This meant that appraisers had a strong incentive to adopt a high-side bias in their appraisals.[8]

An even more important set of misplaced incentives existed in the securitization process in the secondary market. This process was central since it was the existence of the secondary market that gave mortgage issuers incentive to approve mortgages where they knew that the borrower would be unable to meet the terms of the mortgage. The issuers generally faced little risk once the mortgage was sold into the secondary market, so their incentive was to issue as many mortgages as possible. They just had to ensure that the mortgages, on paper, were of sufficient quality to be sold in the secondary market. Since the issuers know very well the rules for qualifying mortgages for resale, they could and did make sure that their loans met these criteria.

The next step was the banks that bought and bundled the loans into mortgage banked securities (MBS). These banks also made their money on the fees associated with this process, not on holding the MBS themselves. This meant that the securitizers also had incentive to try to maximize volume with little regard for the actual quality of the loans that they were bundling or the underlying quality of the MBS that they were issuing.

Of course the ability of the banks to sell their MBS, which contained many loans of questionable quality, depended on their being able to secure good credit rating for their bonds. Here also perverse incentives played an important role. The bond rating agencies are paid by the banks who request the rating. In order to avoid losing customers to their competition, the credit rating agencies had a strong incentive to issue high ratings to the banks' securities.

This process was facilitated by the proliferation of new and more complex financial instruments. For example, the banks began to issue "collaterized debt obligations (CDOs)," which typically included mixes of mortgage backed securities along with other assets. The

[8] There is a very simple method for avoiding such perverse incentives. If the appraiser is picked by an independent board, as is common with non-residential real estate, then it eliminates the incentive to produce a biased appraisal.

CDOs would typically offer layered financing, with bonds of higher quality having first claim to payments.

Since these were new instruments, the credit rating agencies had little history on which to base their analysis. In the first years for which such instruments existed, default rates were very low, since rising house prices meant that the vast majority of mortgages would be paid. Remarkably, they do not seem to have allowed for the possibility that house prices could in decline when making their assessments of risk. As a result, the credit rating agencies often gave high investment ratings to CDOs that were largely filled with assets that were in turn backed up by high-risk mortgages.

In yet another twist, Citigroup and other major banks also created "structured investment vehicles (SIVs)" which were ostensibly independent companies, whose only assets were CDOs. The banks would then sell off shares in and/or bonds against these SIVs, keeping their liabilities off their balance sheets. This was yet another layer in a complex web of finance that concealed the risk that was building in the financial structure.

There was one other noteworthy twist to the wave of speculative finance that laid the basis for the current crisis. This period saw an enormous proliferation of credit default swaps (CDSs). CDSs are effectively insurance against bond defaults that were issued by the major banks. They provided security to lenders against the risk of default on assets of questionable quality. The spread of CDSs allowed many smaller firms or state and local governments to sell their bonds more easily, since their credit would be backed by the banks issuing CDSs on their bonds. CDSs were also issued against mortgage backed securities and various derivative instruments, which facilitated the sale of MBSs of questionable quality.

While CDSs just came into existence in the late 90s, their use exploded during the peak years of the housing bubble. The Bank of International Settlements estimated the total notional value of CDSs at more than $45 trillion in June of 2007.[9] Furthermore, since their issuance was largely unregulated, banks leveraged themselves very heavily in issuing CDSs that had notional values that could be more than a hundred times their capital.

Underlying the logic of this whole set of developments was an incentive structure that placed an enormous premium on short-term profits, often at the expense of longer-term profits or even longer-term corporate survival. Executives in the financial sector are paid in large part in bonuses that are based on hitting profit targets or stock options, the value of which was hugely responsive to short-term profits. In both cases, there is an enormous incentive to show short-term profits. The same dynamic applies with hedge funds, where managers typically receive 20 percent of the gains. If the cost of the gains for a hedge fund in the current year are losses in future years, this poses little problem, since the managers do not share in the losses.

This structure of compensation gave managers little incentive to plan for the long-term health of their own companies and encouraged all forms of risky behavior. The biggest incomes flowed from generating large fees, even if there would be losses from the assets being sold. This was certainly the case with the issuance of highly questionable subprime and Alt-A mortgages and also with the selling of CDSs. In both cases, the underlying assets were

[9] Bank of International Settlements, "Triennial and semi-annual surveys on positions in global over-the-counter derivatives markets as of the end of June, 2007." Table A available at http://www.bis.org/publ/otc_hy0711.pdf?noframes=1].

often very risky and could lead to large losses, but the fees from issuing and bundling mortgages and from selling CDSs led to large short-term profits.

It's worth noting that many of the figures at the worst financial actors have made themselves enormously wealthy, even as they wrecked their companies. For example Angelo Mozila, the CEO of Countrywide Financial, one the nation's largest originators of subprime mortgages, earned several hundred million dollar in compensation over the last decade. His company is being taken over by Bank of America at a price that is a small fraction of its levels at the peak of the bubble.

Similarly, James E. Cayne, the boss who led Bear Stearns to bankruptcy, also pocketed hundreds of millions of dollars for his work. The same is undoubtedly true for many hedge fund managers who got 20 percent of large gains during the good years, but who are now watching their clients lose much of their investment during the down market.

The incentive structure, coupled with a weak regulatory system, gives executives enormous incentive to use financial engineering to gain quick profits regardless of long-term costs. In 1996, the financial sector accounted for less than 16 percent of corporate profits. By 2006, the sector accounted for more than 30 percent. Needless to say, much of what financial corporations booked as profits in 2006 was illusory. Their "profits" were fees on transactions that would eventually lead to large losses for their companies. But, these profits provided the basis for large rewards for the big actors in the sector.

The end of the bubble and the meltdown

The bubble began to unravel after house prices peaked and began to turn down in the middle of 2006. This led to rapid rises in default rates, especially in the subprime market. While the worst abuses in the mortgage market were in the subprime segment, the main reason that defaults were initially concentrated so heavily in this sector is that subprime homeowners were the most vulnerable segment of the population. They did not have retirement accounts that they could draw down or family from whom they could borrow, when they found that they could no longer meet their mortgage payments. As a result, when they no longer had equity in their home against which to borrow, many subprime homeowners had little choice but to default on their mortgage.

It is worth noting that many of the subprime loans that began going bad in 2006 and 2007 were not purchase mortgages but rather mortgages used to refinance homes. Subprime lenders aggressively, and often deceptively, marketed mortgages for refinancing to low and moderate income homeowners as a way of getting access to extra money to meet bills or pay for big purchases like a care or home remodeling. As a result of these new subprime loans, families who had been secure suddenly faced the loss of their home.

The spread of defaults in the subprime market led to a sharp reduction in the valuation of MBS that contained substantial quantities of subprime mortgages, as well as the various derivative instruments that were based in whole or in part on MBS with substantial subprime components. The fact that so many instruments and institutions were exposed to serious risk from the subprime market led to the series of credit squeezes that hit financial markets beginning in the winter of 2007. Investors could have little confidence in the security

of a wide-range of assets and institutions, since it was not generally possible to know the extent that they were exposed to bad mortgage debt.

This financial meltdown also has important feedback effects on the housing market. On the supply side, the flood of foreclosures ensures that a large supply of housing will be placed for sale, since banks are generally anxious to sell properties on which they have foreclosed. In many of the most affected markets the number of foreclosures was running at levels that were close to the number of sales in the fall of 2007 and winter of 2008.

On the demand side the growing stress in financial markets has helped to dampen demand, since banks are far more reluctant to make loans than had been the case two years ago. With banks recognizing that they had been overly lax, and that prices are now falling, they are now demanding much larger down payments (20 percent in some of the most rapidly deflating markets) and insisting of much fuller documentation of income and asset information. There are millions of people who had been eligible to receive loans in 2006 who would not be able to take out a loan under the current standards. As a result, the number of potential buyers has contracted substantially over the last two years.

The continued flow of houses for sale, coupled with the sharp cutback in demand, is leading to rapid declines in house prices in many markets. In the first quarter of 2008, house prices were falling at more than a 20 percent annual rate in the Case-Shiller 20 City Index. House prices were falling at more than a 30 percent annual rate in the most rapidly deflating markets like Las Vegas, Los Angeles, and Phoenix. There is little likelihood that prices will stop dropping in these markets in the near future, although at this rate of price decline, most of the bubble induced run-up should be eliminated by the end of the year.

While a quick end to the housing bubble would be desirable in many respects, it will almost certainly lead to more financial turbulence. Banks around the world have already written down losses of more than $200 billion in connection with the collapse of the housing market, the total figure for write-downs is likely to be closer to $1 trillion. The additional write-downs hitting the market will almost certainly cause more banks to become insolvent and will impose serious stress on Fannie Mae and Freddie Mac, the two government sponsored corporations that are the backbone of the secondary mortgage market. The weakness of the housing market and the financial institutions with heavy exposure to the sector will worsen the recession , which will in turn aggravate the problems in the financial sector.

The lack of regulation

While it is easy to tell this story with hindsight, most of the worst abuses in the issuing, securitization, and subsequent repackaging of MBS were evident at the time to anyone who cared to look. The explosion of the subprime market by itself should have been an alarm bell calling attention to the problems in the mortgage market. The subprime share of the mortgage market went from less than 9 percent in 2003 to more than 20 percent in 2005. This sort of jump, at a time when the economy was experiencing weak job growth and stagnant wages, should have provided sufficient concern to alert regulators to the fact that something was seriously wrong.

There were many other items that should have raised concern by the Fed and other regulators. The pressure on appraisers to issue over-valued appraisals was widely known at

the time. Similarly, the fact that the banks paid for the rating of their bonds by credit agencies also should have prompted more concern from regulators. This situation was a recipe for abuse. In the same vein, it is truly remarkable that the banks were allowed – in a post Enron era – to carry debt off balance sheet with SIVs.

There was a wide range of regulatory agencies at both the state and federal level that could have intervened to counteract some subset of these abuses. It doesn't speak well for these agencies that their efforts were at best limited and halting. However the Fed deserves the bulk of the blame for the abuses in the credit markets allowing for the housing bubble to grow unchecked.

The Fed had ample tools to place a stop on the worst abuses in the mortgage and credit market. Fed regulations on abusive mortgage practices would have had an enormous impact even on institutions that were not directly under its control. If the Fed had imposed sound issuance practices (similar, albeit strong to the ones it proposed in December), there would have been pressure for other regulators to apply similar regulations to institutions under their jurisdiction. More importantly, the Fed could have set a standard that alerted actors in the secondary market to the abusive practices of many lenders. This would have caused the most irresponsible lenders to have difficulty reselling their loans in the secondary market.

However, the Fed's biggest mistake was it failure to directly target the housing bubble itself. The bubble created the climate in which financial abuses could persist for years without being detected. As long as house prices continued to rise, none of the financial engineering of the bubble period posed any problems. It was only when prices began to fall that the over-leveraged credit of this period became problematic.

Through the run-up of both the stock bubble and the housing bubble, the Fed took the view that financial bubbles are natural events, like the weather, which cannot be prevented. In fact, financial bubbles can be contained and there is nothing more important that the Fed or any central banks can do then to ensure that they do not grow to such dangerous proportions. The U.S. and world economy is paying an enormous price for Greenspan's failure to do his job.

SUGGESTED CITATION:

Dean Baker, "The Housing Bubble and the Financial Crisis", *real-world economics review*, issue no. 46, 20 May 2008, pp. 73-81, http://www.paecon.net/PAEReview/issue46/Baker46.pdf

Global finance in crisis:

A provisional account of the "subprime" crisis and how we got into it[1]

Jacques Sapir[2] [Ecole des Hautes Etudes en Sciences Sociales, France]

The current financial crisis has become a major international event and can be compared to the 1997-1999 world financial crisis[3]. The current crisis has spread from the US mortgage market, where it exploded in the spring of 2007, to the global banking and financial system. It now, spring 2008, threatens a systemic collapse of the banking system. It has pulled the US economy into recession and already by late 2007 its consequences were being felt in the Euro-Zone. Most analysts now forecast a GDP fall of between 0.5% to 3.0% in the US economy and very slow growth in the Euro Zone. However, a major difference with the 1997-1999 crisis is that emerging markets look much less impacted than developed economies.

This crisis is far from over, and yet already it offers an outstanding example of how things can go wrong in a deregulated economic system. Like the 1997-1999 crash, today's crisis was predictable. The fact that it was not predicted and then its severity repeatedly under-estimated testifies to the ideological content of mainstream economics.

How and why the US mortgage-market went amok

The crisis began in the US mortgage-market when delinquencies and foreclosures on mortgaged loans began to multiply in the winter 2006-2007. The rate of delinquencies and foreclosures increased steadily during 2007 and then accelerated further in early 2008. Delinquency rates on subprime mortgage loans originated in 2005 and 2006 have exceeded the highest recorded rates of all previous vintages. Mortgages originated in 2007 are performing even worse. During the third quarter of 2007, 43% of foreclosures were on subprime Adjustable Rate Mortgages (ARM), 19% on prime ARM, 18% on prime fixed-rate, 12% on subprime fixed rate and 9% on mortgage loans with insurance protection from the Federal Housing Administration. Clearly, the Adjustable Rate Mortgage mechanism has been one of the major triggers of the crisis.

The value of Adjustable Rate Mortgages (ARM) contracts, which were reset at higher rates, was 400 billion USD in 2007 and 500 billion in 2008, of which only 250 billion were subprime contracts[4]. Although they comprised only a limited share of all outstanding mortgage contracts, s*ubprime* ARM contracts nonetheless seriously unbalanced the whole mortgage market. Their resetting could be extremely costly for homeowners. It has been

[1] This paper expands presentations made at the Russian-French Seminar co-organised by CEMI-EHESS and Institute of National Economy Forecasting, Russian Academy of Science at Vologda in December 2007, before the *Moskovskaya Shkola Ekonomiki's* faculty seminar and at the Troïka-Dialog organized RUSSIA-FORUM on January 31st, 2008. An earlier version has been published as a CEMI-EHESS working paper.

[2] Professor of economics at Ecole des Hautes Etudes en Sciences Sociales. Director CEMI-EHESS, Paris. Contact: sapir@msh-paris.fr.

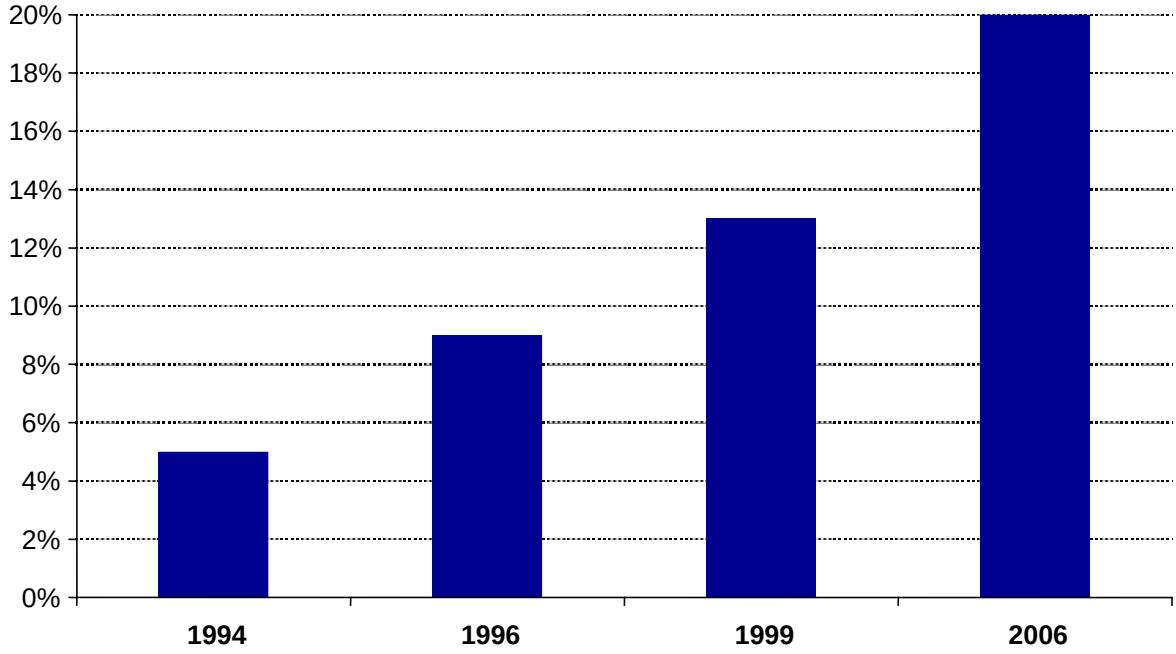
[3] J. Sapir, *le Nouveau XXIè Siécle*, Paris, Le Seuil, 2008.

[4] http://money.cnn.com/2007/10/16/real_estate/October_resets/index.htm

estimated that the resetting of ARM contracts in 2008 will result in a 31% increase in payments[5]. The more accommodating monetary policy recently implemented by the Federal Reserve System (FED) aims to ease but not eliminate the reset-shock on ARM contracts. Although subprime contracts have received the most attention, it would be a mistake to think that delinquencies are confined only to this catagory. The delinquency trend is perceptible also in the higher quality alt-A and non-agency sectors. In fact alt-A and Jumbo contracts could be the source of an even greater reset shock than subprime contacts in months to come[6].

Figure 1

Subprime share of all mortgaged loans originating in a given year



Sources

1994 : http://www.bankrate.com/brm/news/mortgages/20040615a2.asp
1996 http://www.npr.org/templates/story/story.php?storyId=12561184
1999 http://www.bankrate.com/brm/news/mortgages/20040615a2.asp
2006 http://www.npr.org/templates/story/story.php?storyId=12561184

This situation has resulted from a lending policy of inducing households to take on too much debt through ARM contracts and from the development of "special compartment" mortgages, *Subprime* and *alt-A*[7]. These compartments, which previously played only a marginal role in the mortgage industry, became increasingly significant after 2001(Figure 1). This was an important change in the nature of US mortgage industry.

[5] C. Cagan. *Mortgage Payment Reset: The Issue and the Impact*. Santa Ana, CA: First American Core-Logic, 2007 pp. 29-31, available at http://www.facorelogic.com/uploadedFiles/Newsroom/Studies and_Briefs/Studies/20070048MortgagePaymentResetStudy_FINAL.pdf

[6] IMF *Global Financial Stability Report*, April 2008, Washington DC, p. 5.

[7] *Subprime* are mortgages where the borrower debt/income ratio is over 55% or where the loan/house value ratio is over 85%. *Alt-As* are mortgages still qualify for an "A-rating" by Moody's and other rating firms but where references are incomplete. They are colloquially called "Liar's mortgages" as there is a strong incentive for the borrower to hide his/her own financial situation. There is a third "special" compartment called "Jumbo" for mortgage loans over USD 455,000.

Between 2001 and 2006 it was not just lower-income households which were enrolled in this system but also wealthier middle-class ones. These last used mortgage refinancing to raise money for other purposes (mostly to pay university fees). This created a credit bubble leading to a huge rise in real-estate prices. During its acceleration phase it had a cumulative effect of making it even easier to get mortgaged loans (and thereby leading to even higher real-estate prices) and inducing middle-class households into real speculative behaviour[8]. Subprime loans were over 1300 billion USD by March 2007[9], against 150 billion in 2001. By 2007 subprimes comprised as much as 14% of the mortgage market against 2.6% in 2001, with *alt-"A"* mortgages at a roughly similar level.

The ensuing "credit bubble" was induced not just mortgage market practices but also by the combination of specific social and institutional contexts that allowed some mortgage-market practices to be used in a purely speculative way.

The relevance of "special compartments" and the crisis of the US social model

In the US mortgage industry, "special compartments" traditionally played a minor and marginal role. What changed after 1998, and particularly after 2001, was the fast increase in subprime and alt-A shares in mortgages originations. This was, first and above all, a response to a change in the social situation: the weakening of the middle-class and the resurgence of a true Veblenian world dominated by the *leisure class*.

The change began with Reagan's conservative revolution of the early 80's. It was slowed down but not reversed under the Clinton's administration. The conservative fiscal and income policy implemented by the Bush administration dramatically curtailed "middle-class" income growth to the benefit of the wealthiest part of the US population. In 2007, 0.1% of the US population earned 7% of the national income (the equivalent figure is 2% in France and Germany).

Average per capita income increased by around 3% a year from 2001 to 2007, but *median* per-capita income did not increase at all. This shows that US economic growth was mostly captured by the very wealthiest part of the population (in France and Germany, where growth had been much lower, the *median* per-capita income increased by 2% in the same period). Income inequality in the USA, as shown in Figure 2, has now reached its level at the time of the 1929 Crash and the onset of the Great Depression[10].

Because of the relative impoverishment of America's middle class, expansion of credit was needed to sustain internal demand and economic growth from 2001 to 2007. This explains why subprime and *alt "A"* developed so rapidly from 2000 onwards. But as a result, total household outstanding debt jumped to 94% of US GDP during the same period, a clear departure from the long-term trend (Figure 3). The expansion of household indebtedness was central to George W Bush's "compassionate conservatism"; credit became a proxy for a more

[8] People were entering the ARM process in the hope they could re-sell the house before the planned rate hike and make a large profit. Households have been led to jump into the market not just for the need of a house but for the profit they hoped to make because of the upward movement of prices.

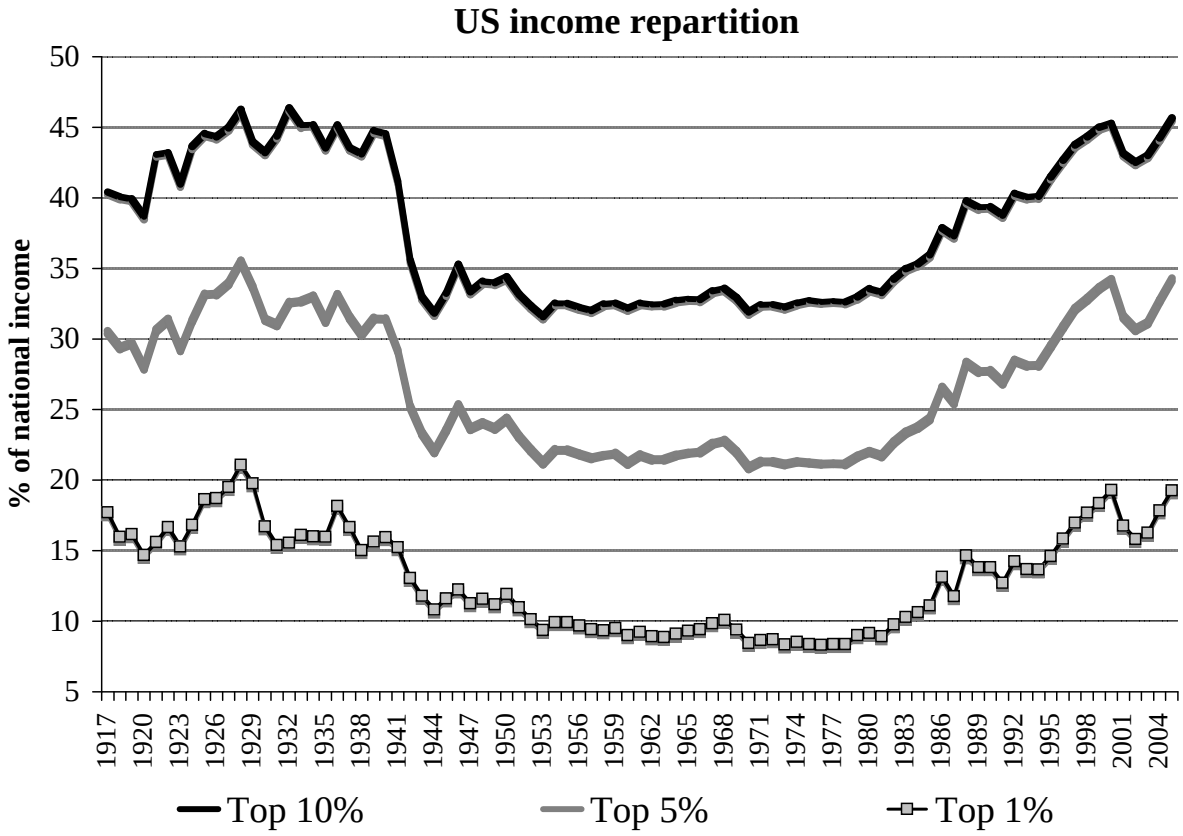
[9] Associated Press, March 13th, 2007.

[10] T. Piketty and E. Saez, "Income Inequality in the United States", *Quarterly Journal of Economics*, February 2003

balanced income policy. The device has been copied in Spain and Great Britain, two countries held up by conservative economists as European success stories. Household debt has reached 124% of GDP in Spain and 130% in GB.

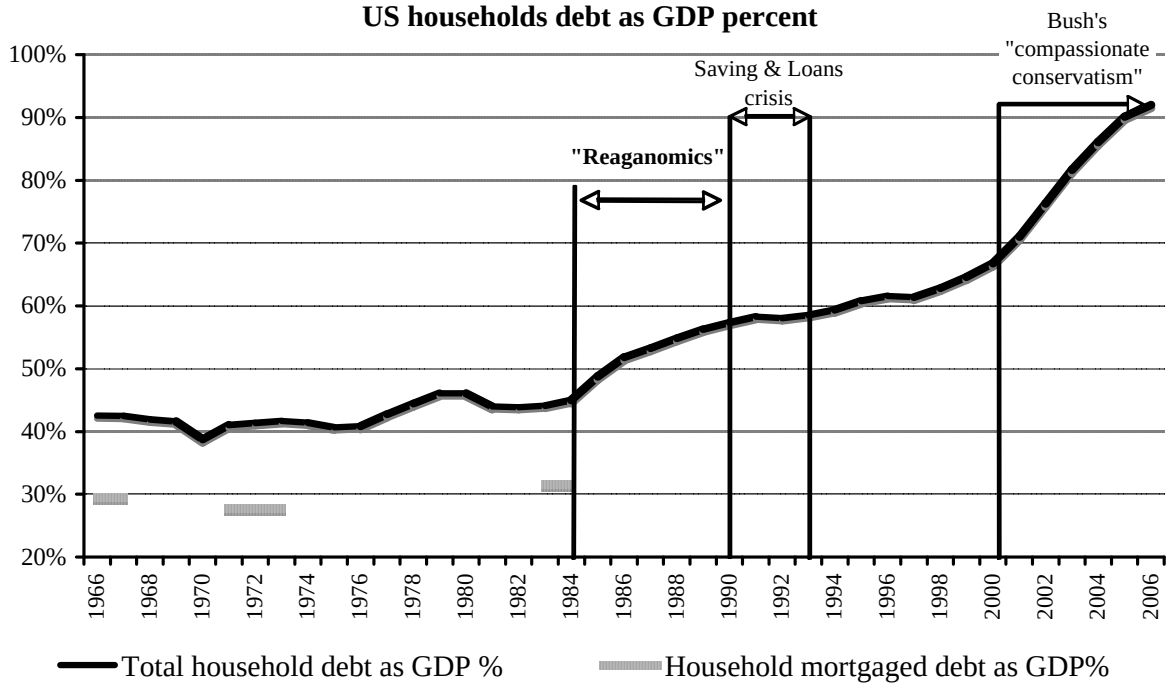
The credit-bubble that developed on the mortgage-market can be seen when the yearly growth of mortgaged debt is compared to yearly growth of GDP (Figure 4). From 1967 to 1996, both curves are clearly correlated. The mortgage market was a good proxy (with some amplification) of US economic trends and business cycles. However from 1996 on these growth dynamics diverged. In 2003 and 2004, the growth of mortgaged debt was close to that of the peak years of 1971, 1978 and 1985 but without a commensurate increase in GDP growth. This shows that the mortgage-market had become divorced from the general level of economic activity and was boosted purely by speculation.

Figure 2



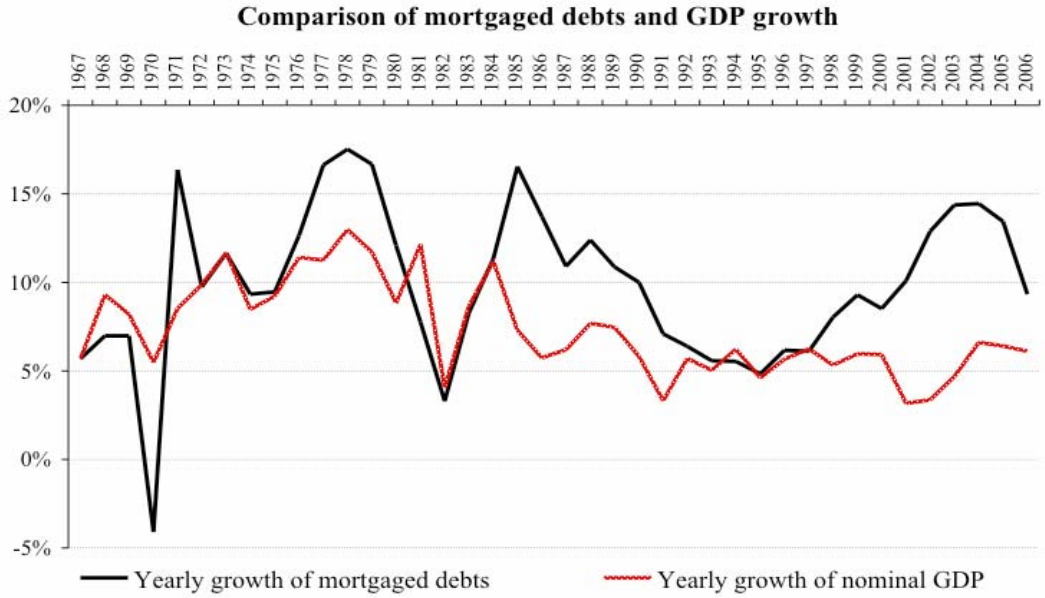
Source: T. Piketty and E. Saez, op.cit. Data updated by authors from IRS data.

Figure 3



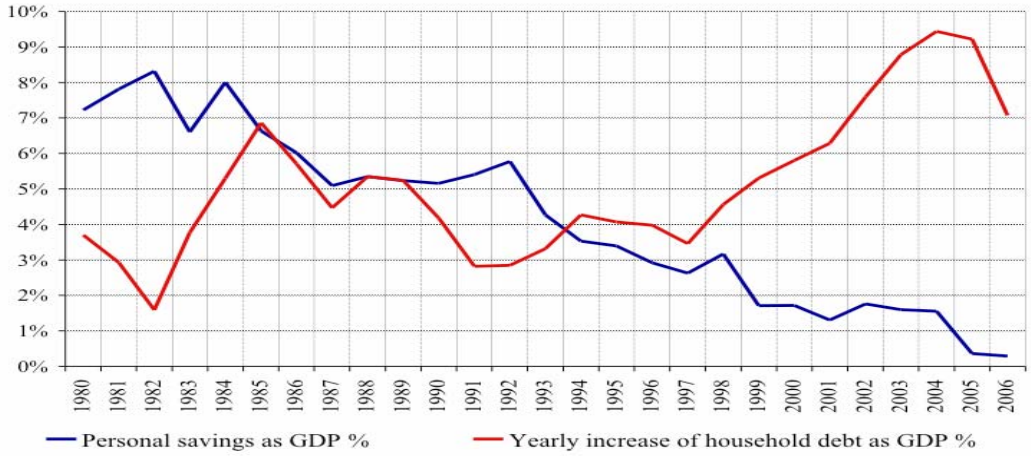
Source: US Bureau of Economic Analysis and US Joint Economic Committee.

Figure 4



Source: US Bureau of Economic Analysis

Figure 4b



Source: US Bureau of Economic Analysis

Although the conservative policies implemented by the Bush administration aggravated the situation, the divorce initially came about through the economic regime change that took place between the notorious Long-Term Capital Management crash in 1998 and the explosion of the Internet bubble in 2000. Those years, sometimes described as a wake-up time for the US economy and lauded in the selling of the US economic "model" to Europe[11], are the ones when this "model" actually derailed. As in the "roaring twenties", the accumulation process was unsustainable.

Table 1
Characteristics of *Subprime* Home-Purchase Loans

	Share of ARM contracts	Debt Payments-to-Income Ratio (Solvency Ratio)	Average Loan-to-Value Ratio (Leverage Ratio)
2001	73.8%	39.7%	84.0%
2002	80.0%	40.1%	84.4%
2003	80.1%	40.5%	86.1%
2004	89.4%	41.2%	84.9%
2005	93.3%	41.8%	83.2%
2006	91.3%	42.4%	83.3%

Source: JEC, *The Subprime lending crisis – The economic impact on Wealth, Property Values and Tax Revenues, and How We Got There*, US Congress, Joint Economic Committee, Report and Recommendations by the Majority Staff of the Joint Economic Committee, US-GPO, October 2007 table 10, p.21.

[11] For example, in Nicolas Sarkozy's election campaign for President of France in 2007.

Credit leverage accelerated as subprime contracts encouraged minimal direct contributions from households.[12]. The use of adjustable rates in contracts also increased (see Table 1). Mortgage contracts qualifying as *Subprime* ARM comprised only 6.8% of loans outstanding, but accounted for 43% of foreclosures started during the third quarter of 2007.[13]

Deterioration in mortgage-contract underwriting standards: a case of adverse selection

Subprime contracts were not alone in undermining the mortgage industry. The development of the *alt-"A"* compartment facilitated fraudulent loan applications by borrowers who desperately needed loans because they were unable to face other and previous financial charges or because they wanted to be part of the ongoing real-estate boom. By definition the *alt-"A"* compartment allows for incomplete loan applications. When this compartment began to grow rapidly, mortgage-lenders in other compartments began to relax, at least informally, their controls on applications so as not to suffer too much from the competition coming from *alt-"A"* mortgage contracts. The total share of low or no documentation mortgages among subprime home-purchase loans rose from 28.5% in 2001 to 50.8% in 2006.

It is estimated that more than 3 million loan applications made between 1997 and 2006 were fraudulent, a large majority being made in 2005 and 2006. The US Department of Treasury reports that "suspicious activity" increased 14-fold between 1997 and 2005, with the largest increases coming in 2004 and 2005[14]. So long as real-estate prices steadily increased, the deterioration in underwriting standards could to some extent be ignored. But not so once the market levelled and then began to turn down. A recent Joint Economic Committee report explains what happened as follows:

The deterioration in underwriting standards in the subprime market as the market expanded is well documented. (…) Although underwriting standards in the subprime lending market began to decline after 2001, the effects of this decline were, until recently, mitigated by house price appreciation. If a borrower is struggling to make mortgage payments, but the value of his house has appreciated, he can solve his financial problems at least temporarily by refinancing the mortgage. Cash can be withdrawn from the increased equity in the house, and the new, higher mortgage can be sustained for a while. The house can also be sold, and the loan principal repaid. However, when house price appreciation does not create equity, borrowers' financial weakness cannot be disguised and default rates rise[15].

One important reason why "special compartments" developed so fast was the noticeable reduction in the risk-premium borrowers had to pay. In 2001 the difference between a subprime contract and one done in a "normal" compartment was 280 basis points

---

[12] By the last quarter of 2006, the average mortgaged-loan amount had reached 99% of the transaction amount .

[13] Home-purchase loans are not the only kind of loan burdening US households. The total payments-to-income ratio may be over 55% when credit card and car-purchase debts are included.

[14] http://www.fincen.gov/MortgageLoanFraud.pdf . See also Tyler Cowen in *New York Times*, January 13th, 2008, http://www.nytimes.com/2008/01/13/business/13view.html?_r=2&scp=1&sq=Tyler+Cowen&oref=login&oref=slogin

[15] US Congress, JEC, *The Subprime lending crisis – The economic impact on Wealth, Property Values and Tax Revenues, and How We Got There*, Report and Recommendations by the Majority Staff of the Joint Economic Committee, US-GPO, October 2007, p. 3.

(or 2.80%). The premium steadily decreased, reaching 130 basis points by early 2007. Meanwhile the subprime lenders were able to escape the escalating risk through "securitization", issuing mortgage-backed securities. Subprime lenders also introduced the adjustable-rate mechanism, which for the borrower had the effect of delaying the impact of monthly repayments. Interest rates during the first year were kept artificially low to induce new borrowers to enter into these contracts[16].

What happened here resembles a typical case of adverse-selection induced by increased competition. Financial deregulation implemented in the early 80's allowed economic actors to enter the mortgage market from the margins and destabilize the whole industry through their competitive impact. The greater risk of low or badly documented contracts would normally have deterred mortgage-brokers. But the intensity of competition generated by specialised high-risk mortgages brokers induced others to accept excessively high levels of risk so as not to lose market-share. The risk premium levied on subprime contracts did not keep borrowers from taking out loans that they actually could not afford. Adjustable Rate Mortgages and "payment option" mechanisms created the illusion of affordability at a time when middle and lower-middle-class incomes were constrained by the Bush administration policy. The credit bubble that emerged was largely the result of competition and market mechanisms in a weakly regulated environment. Although 41 states have laws regarding asset-based mortgages[17], their enforcement is uneven and frequently weak[18].

With adjustable rates, the interest rate burden began to be felt 20 to 27 months after the mortgage loans were issued. Prime delinquencies began to increase, with most ending in mortgage foreclosures and with people having to leave their houses which were then put on the market. Inevitably real-estate prices began to drop, which in turn undermined middle-class owners who had planned to sell their houses at a profit before the burden of the interest rate reset kicked in.

The combination of highly leveraged mortgages and high indebtedness in a time when middle-class household income was stagnant was a recipe for disaster. The neo-liberal deregulation of the banking and credit sector had enabled in the 1980s a merger between credit and market activities in the banking industry. This resulted in a deep institutional change whose consequences were greatly underestimated. Managing credit risk is not only a different job than managing financial market risk; it also requires a different business culture. The combination of weakened financial institutions and the increasingly unequal distribution of income soon led to dramatic consequences.

[16] The adjustable-rate mortgage is a system where home owners only have to pay the interest (not the principal) during an initial period of one to two years. Another type is a "payment option" loan, where the homeowner can pay a variable amount, but any interest not paid is added to the principal.

[17] R. Quercia et al., *The Impact of North Carolina's Anti-Predatory Lending Law: A Descriptive Assessment*. Center For Community Capitalism, University of North Carolina, Chapel Hill, 2003; E. Renuart, An Overview of the Predatory Mortgage Lending Process. in *Housing Policy Debate*, Volume 15, Issue 3/2004.

[18] W. Li and K. Ernst, *Do state predatory home lending laws work*? Center for Responsible Lending working paper, 2006; R. Bostic et al., *State and Local Anti-Predatory Lending Laws: The Effect of Legal Enforcement Mechanisms*, Center for Responsible Lending Working Paper, Aug. 7, 2007, http://ssrn.com/abstract+1005423.

The bubble bursts

Defaults increased steadily from early 2007 onwards, reaching 16% of the outstanding *subprime* loans by October 2007[19]. By late January 2008, 24% of subprime mortgages were delinquent or in foreclosure. By late September 2007 nearly 4% of all mortgages were delinquent or in foreclosure, meaning that for non-subprime compartments the average rate of delinquency was 2% against the traditional 0.5% rate. By late January 2008 the figure was 7.3% of all mortgaged loans, and 3.7% for all non-subprime compartments or seven times higher than the traditional rate. During 2007, nearly 1.3 million U.S. housing properties were subject to foreclosure, an increase of 79% over 2006[20].

Table 2

States where subprime foreclosures are expected to be above national average

	Total of *Subprime* contrats	Expected *Subprime* foreclosures 3Q07-4Q09	*Subprime* expected foreclosures as a percent of total *subprime* contracts
Ohio	293,566	82,197	28.0%
Michigan	275,931	65,607	23.8%
Minnesota	121,471	27,871	22.9%
Florida	708,195	157,341	22.2%
Arizona	250,799	53,372	21.3%
Nevada	134,528	28,390	21.1%
Illinois	286,246	59,328	20.7%
New Jersey	179,873	35,117	19.5%
Massachusetts	115,780	22,292	19.3%
California	1,030,920	191,144	18.5%
New York	364,433	67,386	18.5%
Total	3,761,742	790,045	21.0%
Percent of US total	**51,1%**	**59,7%**	**US average: 18.0%**

Source: JEC, *The Subprime lending crisis – The economic impact on Wealth, Property Values and Tax Revenues, and How We Got There*, op.cit., p.13.

In February 2008, the number of foreclosures was at the highest monthly level since the onset of the Great Depression in 1929. Nevada was the worst hit state with a monthly foreclosure ratio of 1 in 165 homes, followed by California (a 1 to 242 ratio), Florida, Texas, Michigan and Ohio[21]. The situation varied greatly between states. Eleven states are expected to account for over 70% of total US losses in home equity and property values, and

[19] B. Bernanke, "The Recent Financial Turmoil and its Economic and Policy Consequences", October 15th, 2007, http://www.federalreserve.gov/newsevents/speech/bernanke20071015a.htm

[20] http://www.realtytrac.com/ContentManagement/pressrelease.aspx?ChannelID=9&ItemID=3988&accnt=64847

[21] A. Veiga, *Foreclosure Activity Rises in February*, AP Business, Thursday March 13, 5:16 am ET.

of these, three states, California, Florida and New York, for over 40%.

Real estate prices fell by 8.9% in 2007, the largest decline In the *Case-Shiller* national home price index in at least 20 years. By the end February 2008, the C-S index was down by 10.2% compared to January 2007. This is just the beginning of a process which could see real estate prices falling on average by 20 to 25% and maybe up to 40% in some states. Here again the regional discrepancy in the mortgage crisis will be significant. Some US states will be hit much harder than others. Nonetheless, there is no doubt that the drop in house prices will have a widespread effect on US consumer behaviour.

The crisis goes global: from the mortgage crisis to the credit crunch.

The relevance of "special compartment" mortgages increased quickly because they were backed by a powerful string of financial derivatives, especially "collateralized debt obligations" (CDOs) and "collateralized loan obligations" (CLOs). It is the "collateralization" process, which spread the current crisis; about 75% of recent subprime loans have been securitized[22].

Securitization is basically a process where assets, be they receivables or financial instruments, are offered as collateral for third party investment, thereby transforming debts into investment instruments. Securitization of course spreads risks, but more important it makes it difficult for the buyers of the derivatives to determine what risks they have bought. This financial innovation transformed structured finance into a highly complex game, where derivatives of derivatives were commonly issued, CDOs re-packaging other CDOs. Also these asset pools became more and more heterogeneous, combining hugely different asset-types with hugely different risks[23].

From the mortgage crisis to the bank crisis.

Structured finance began to develop in the 70's, but until the late 90's its use was relatively limited in the mortgage industry. However, Mortgage-Backed Securities (MBS) developed rapidly fast from 1998 onwards and were in the forefront of "risky" credit expansion[24]. After reaching 1,500 billion USD in 2002, they reached 8,500 billion in 2004 and 45,500 billion in 2007[25]. 54% of *subprime* mortgages were securitized in 2001 and 75% by

[22] A. B. Ashcraft and T. Schuermann, "Understanding the Securitization of Subprime Mortgage Credit", *FIC Working Paper* n° 07-43, Wharton Financial Institutions Center, Philadelphia, Pa., 2007.

[23] Yu. Demyanyk and O. van Hemert, "Understanding the Subprime Mortgage Crisis", *Supervisory Policy Analysis Working paper*, n° 2007-05, Federal bank of Reserve of St. Louis, St. Louis, February 2008.

[24] J.P. Morgan Corporate Quantitative Research, "Credit Derivatives Handbook,", J.P. Morgan, New York, December 2006, p. 6.

[25] J.P. Morgan Credit Derivatives and Quantitative Research, « Credit Derivative : A Primer », J.P. Morgan, New York, Janvier 2005.

2006[26]. MBS became an important financial tool in a highly competitive context, where even small profit-rate gains could change the values of bank stocks.

The process of issuing "derivatives of derivatives" (the notorious CDO-squared) totally destroyed accountability and transparency of the mortgage industry. The development of Special Purpose Vehicles (SPVs) increased these problems. SPVs have progressively supplanted banks in the MBS trade. At the same time banks and insurance companies became willing to buy securities with a higher than average rate of return even if it was becoming more and more difficult to assess what was the precise composition of the collaterals. More importantly, the massive growth of basically unregulated structured finance allowed anyone to be transformed into an insurance company. Prudential behaviour fell victim to the strong competition between banks in global and largely deregulated markets. We have here a second typical case of "adverse selection" where high competition fosters unsustainable portfolio choices[27].

The fast developing MBS trade infected most Western and Asian banks, thereby spreading the US crisis all around the world. Since April 2007 several US banks have defaulted and one medium-sized British bank went bankrupt (Northern Rock). The British government then had no option but to nationalize the bank to avoid a major banking disaster and a 1929-type bank run. Since September 2007 there has been a stream of "surprise disclosures" of losses significantly higher than previously foretold and each adding to uncertainty. This impacted dramatically on the inter-bank monetary market. Elements of a generalized credit crunch began to appear by October 2007, forcing central banks (the FED and the ECB) to significantly increase their short-term liquidity supply. By 2 April 2008, 39 banks and insurance companies had announced write-off totalling 227.95 billion US dollars (Figure 5). Of these 39 institutions, the 11 worst account for more than two-thirds of disclosed losses and write-offs.

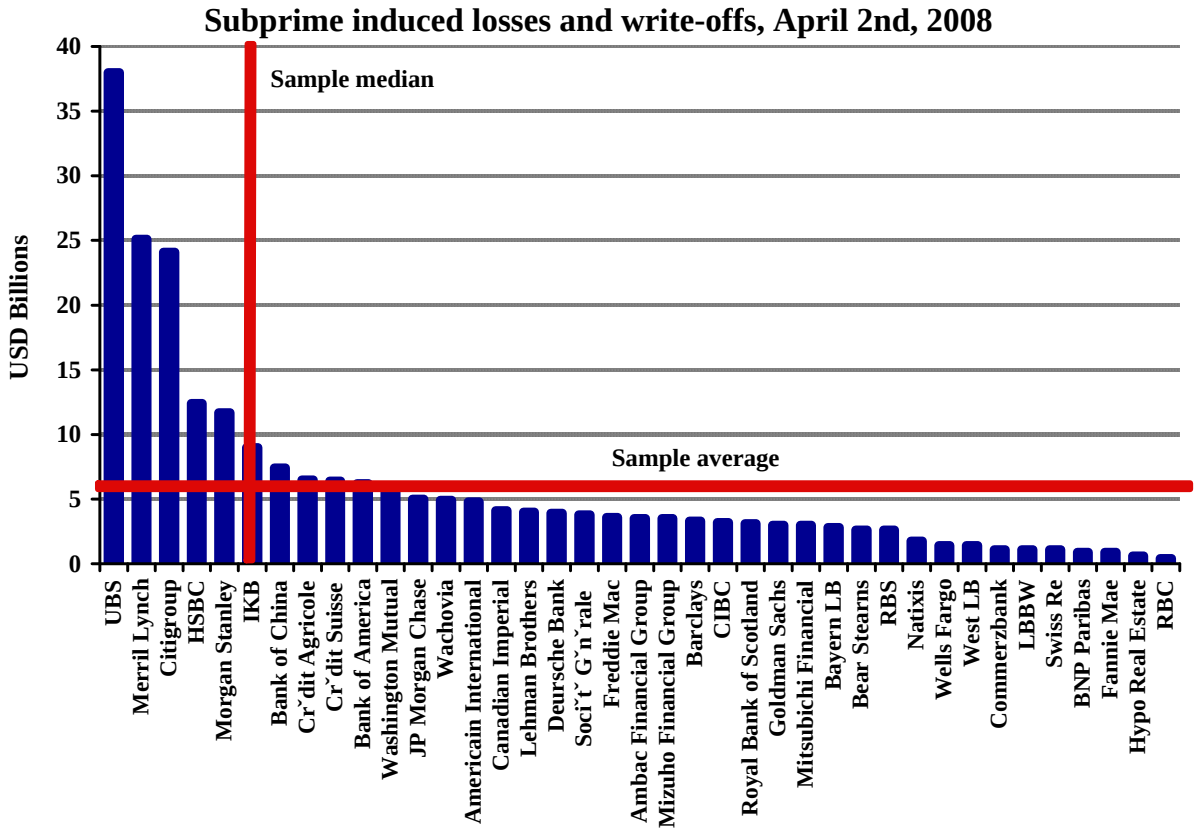
On 9 February 2008, the German Ministry of Finance warned that up to 400 billion USD may have been lost in the subprime crisis[28], of which between 50% to 55% would be by banks alone. By early April, the IMF stated that total losses could reach more than 950 billion USD. But because it is so difficult to determine losses suffered through SPV issued MBSs, nobody really knows. One can estimate at 450/500 billion USD the total bank sector loss by March 2008, with insurance companies and hedge funds making up the rest. Compared to total bank assets this is not so large. However, because the losses are still partly unaccounted for and because more could be in the coming, this is enough to boost "margin calls" and generate a worldwide credit crunch.

[26] Asset Securitization Comptroller's Handbook, http://www.dallasfed.org/news/ca/2005/05wallstreet_assets.pdf and http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1020396#PaperDownload

[27] M. Hellwig, "Some Recent Developments in the Theory of Competition in Markets with Adverse Selection" in *European Economic Review*, n°31, 1987, pp. 319-325.

[28] Reuters, February 9th, 2008.

Figure 5



Source: international press.

The collapse of Bear Stearns[29], a mortgage broker, which had to be bailed out by J.P. Morgan Chase and the FED, signals that otherl financial institutions could be in dire straits and that systemic risk is now a clear and present danger. By early April 2008 more financial institutions, like UBS and CitiGroup, have announced huge losses.

The credit crunch: the FED at bay?

By now, May 2008, we are still far away from seeing the end of this crisis, especially because mortgage defaults have yet to peak and household insolvencies will impact on the credit cards market. The US economy has clearly entered a credit-crunch situation, and it is now spreading to most Western economies[30].

Early in February 2008 it was announced that credit card companies were to write-off 5.4% of their prime card balances against 4.3% in January 2007[31]. More than 7.1% of loans related to personal vehicles and cars were in trouble against 6% by January 2007 and

[29] A. Barr, "Bear Stearns gets help from Fed, J.P. Morgan", *Market Watch*, March 14th, 2008, 11.24 a.m. EDT.

[30] C.J. Whalen, "The US Credit Crunch of 2007: A Minsky Moment", *Public Policy Brief*, The Levy Economics Institute of Bard College, n°92, 2007, Annandale-on-Hudson, NY.

[31] Moody's Economy.com

personal bankruptcy filings, which had significantly decreased after the 2005 federal law made it much harder for households to wipe out their debts, are again increasing significantly. Even more disturbing is the fact that auction-rate securities suffered a major blow on 13 February 2008 when closed-end funds had acute difficulties with their usual weekly issuing session and 80% of auctions failed[32]. The auction-rate securities market is a low-profile but important segment of US financial markets. Were it to completely dry up, then most municipal funds and financial insurers would soon be in deep trouble. This was another strong signal that a serious credit crunch was developing in the US economy.

Facing the prospect of a major bank crisis inducing a global systemic risk, the FED acted strongly and rightly, moving interest rates from 4.25% to 3.0% in 10 days in January 2008. For the time being this saved most US banks and insurance companies but did not solve the problem. The FED acted again on March 11th, announcing what amounted to a massive bail out of the US bank sector and received support from the Europe's ECB. However, markets stayed cheered for less than 2 days. By March 13th, with Carlyle Capital going bankrupt, markets fell again[33]. On March 14th, Bear Stearns, a mortgage broker, had to be bailed out by J.P. Morgan, with FED help. Bear Stearns was bought during the week-end (March 15-16) by J.P. Morgan, using a $30 billion FED loan[34]. This quite desperate move was needed to prevent a major bank crash on Monday March 17th. Carlyle Capital, formed in August 2006 by the powerful private-equity firm Carlyle Group, in the meantime, had filed for liquidation[35]. Carlyle Capital had used a highly leveraged strategy (32 to 1) to fund a $21.7 billion portfolio of mortgage-backed securities issued by Fannie Mae and Freddie Mac, which were supposed to be much safer than subprime and alt-"A". However, the value of these securities has fallen during the credit crisis as buyers for any kind of mortgage securities have pulled out of the market. Losses suffered by UBS and Credit Suisse were also linked part to alt-A and partly to "normal" commercial real estate credits.

The events in the period 13 to 17 March showed clearly that the massive combined FED-ECB move of March 11th had been unable to check the crisis. The FED board reacted strongly during the fateful March 15th-16th week-end[36]. The discount rate was lowered by 25 basis points to 3.25%. The FED board also approved the creation of a special lending facility through the New York Fed that would be available to members of its primary dealers list. This lending facility amounts to a kind of liquidity guarantee given to most of the vulnerable operators and represents a new and very large injection of liquidity aimed at preventing a

[32] Bank of America Securities, February 14th, 2008.

[33] "U.S. stock futures wilt on Carlyle fund, dollar woes", by Steve Goldstein , *MarketWatch*, March 13th, 2008, http://www.marketwatch.com/News/Story/Story.aspx?column=Indications

[34] "J.P. Morgan to buy Bear Stearns for $2 a share Fed to finance up to $30 bln of Bear's less-liquid assets, mostly mortgages " *By Alistair Barr &Greg Morcroft , MarketWatch March 17, 2008* http://www.marketwatch.com/News/Story/jp-morgan-buy-bear-stearns/story.aspx?guid=%7B9B6A846F%2DA585%2D4123%2DBB53%2DCB3E07A3CFCE%7D

[35] "Carlyle Capital to file to liquidate the firm. Lenders take the last of the fund's mortgage-backed securities"*By Robert Daniel , MarketWatch* EDT March 17, 2008 http://www.marketwatch.com/news/story/carlyle-capital-liquidate-lenders-take/story.aspx?guid=%7b644261EF-1080-4079-9CEE-AAC9C52AFF91%7d&print=true&dist=printTop

[36] "Fed acts Sunday to prevent global bank run Monday" *By Rex Nutting &Greg Robb , MarketWatch March 16, 2008 http://www.marketwatch.com/news/story/fed-acts-sunday-prevent-global/story.aspx?guid=%7b43265631-1656-4697-8377-55F05D859B76%7d&dist=TNMostRead&print=true&dist=printTop*

bank collapse. In the first three days of the operation of this facility, more than $50 billion were borrowed.

If institutional financial authorities were to lose their market credibility, then market agents could forecast "catastrophic events" (like a massive bank failure or a run against the USD) and begin to act accordingly. Even if only a limited number of market agents came to doubt the wisdom and ability of financial authorities to control the current crisis, their cumulative actions would be enough to create conditions making their own gloomy forecasts self-fulfilling.

The credit crunch began to be felt in Europe by January 2008 and is now clearly worsening. In Great Britain the inter-bank offered rate (LIBOR) rose to 6% by March 28th when the central bank was lowering its key rate. The situation is also tense in Germany and Spain, but somewhat less in France where the banking system looks a bit less exposed. Still there are no doubts that the crisis will cross the ocean.

The FED's March 16th dramatic move was certainly necessary, even if it has been criticized as not transparent enough and prone to generate a moral hazard syndrome in the US bank community. The systemic risk now hanging over Wall Street is much too serious not to be forcefully addressed. However, there clearly is a panic element in the FED reaction. This is an ominous signal for months to come.

What next?

The FED could again lower rates for federal funds (the primary interest rate) to 2.0% as well as the discount rates, as the assets held by banks and insurances companies suffer from downward turns in stock-markets and real-estate markets and from the Basel-II rules implementation (mark to market)[37]. Financial institutions are already downgrading the asset side of their balance sheets as markets go down, leading them to restrict even more than necessary their lending activities. By doing so they increase the severity of the credit crunch and push the real sector further into stagnation and recession. This could increase delinquencies not only on mortgage loans but also on credit cards and other consumption credits as well, leading to a new deterioration of the asset balances of financial institutions. The real and financial sectors may heavily interact with a clear snowballing possibility during summer 2008. The heterodox prediction that Basel-II rules will not foster financial stability may unfortunately be proved true[38]. If so, once again institutionalists, who hold that uncertainty is both systemic and endogenous in financial markets and that they therefore cannot be relied upon to determine the "fair value" of assets except for the most short-term ones, would be proved right and the mainstream wrong.

One can reasonably expect US prime rates to go down as low as 2.50% or even 2.00%. However, there now is a strong possibility that this still could not be enough. Paul

[37] Basel Committee on Banking Supervision, *Basel II: International Convergence of Capital Measurements and Capital Standards. A Revised Framework-Comprehensive Version*, Bank of International Settlements, Basel, June 2006.

[38] L. Randall Wray, "Can Basel II Enhance Financial Stability ?", *Public Policy Brief*, The Levy Economics Institute of Bard College, n°84, 2006, Annandale-on-Hudson, NY. This point had also been made by Mr. J.J. Bonnaud at the last French-Russian seminar in Vologda, on December 10th, 2007.

Krugman's gloomy vision before the FED's March 11 move seems to have been vindicated[39]. It is possible that the interest rate weapon has reached a point where it is no longer useful in fighting the oncoming disaster. If worries were to turn into a panic, even going down to 0.5% (as the Bank of Japan did some years ago) would not stop the calamity. A more radical path would have to be taken, with a probable government guarantee to some institutional lenders (Fanny Mae and Freddy Mac), possibly extended to banks. A government bailout of the banking (and probably insurance) sector is now clearly a possibility. But a consequence would be to increase the already rapidly growing US public debt[40], making it more difficult to keep interest rates low and increasing downward pressures on the USD..

All this needs to be put in the perspective of the Iraq War's budgetary burden. Nearly 251billion dollars were spent on the war between 2003 and the end of 2005. The direct cost could rise to $750 billion, and total economic cost could reach 1,026 billion if US forces are to stay until 2010. If a residual US military presence would be needed until 2015, the total economic cost could reach 2239 billion[41]. There is no way the US economy could face the current financial crisis and at the same time carry out military operations in Iraq at a level compatible with a strategic stabilisation.

All economic and political factors point toward a huge increase in the US public debt for 2008 and 2009. Against the overwhelming pressure to avoid raising interest rates, massive debt monetization and then inflation are likely to occur with consequences for the USD and the US economy to follow.

From the US recession to a world crisis?

Most analysts now expect the US economy to enter a recession, but will it be mild or severe and will it spread to Asia, Europe and Latin America and will "uncoupling" develop between the US economy and emergent ones like China, India and Russia?

Some Asian banks (mostly Chinese and Japanese) have suffered significant losses in the MBS trade. However foreign currency exchange reserves are so high in Asia-Pacific countries that the possibility of a major financial local crisis is quite remote. This is true also for Russia, whose banks have not been involved in the MBS trade. Russian FOREX reserves were over 509 billion USD by April 2008. The financial situation here is much better than in 1997/98, and both Asian and Russian Sovereign Funds are set to emerge from this crisis as major players.

Asian countries could be more affected by a strong recession in the USA. However, even if the US economy were to suffer a -3.5% recession (which would qualify as "severe") this would reduce current Chinese growth only from 11.5% to 8.0%. If the US economy undergoes only a "mild" recession (-0.5%), the Chinese growth would decrease from 11.5% to

[39] P. Kugman, "The face-slap theory", *The New York Times*, March 10th, 2008.

[40] Rex Nutting, *Budget deficit widens to record $175.6 billions*, Market Watch, March 12th, 2008.

[41] L. Bines and J. Stiglitz, *The Economic Cost of the Iraq War: An appraisal, three years after the beginning of the conflict*, NBER working paper 12054, February 2006, NBER, Cambridge, MA.

10.0%/9.5%[42]. The effect a US recession on Chinese growth is expected to be small because Chinese products are now widely exported to other markets. The development, even if too slow, of the Chinese internal market will also dampen the effect of any US recession. The same situation holds true for other East-Asian economies. China now imports form them more than the US economy does. This is why there is a strong possibility of an uncoupling between what is happening in the US economy and East-Asia. It has to be added that Asian emerging economies are accumulating a large share of world currency reserves. In such a situation Asian growth looks much more robust than in 1997.

Unfortunately the situation the EU faces is quite different. The Euro-Zone is already suffering low growth because of constrained household demand and an uncompetitive situation induced by too strong a Euro. This will exacerbate tensions in a zone where there is still no convergence of real sectors[43]. The combination of a lack of a "federal" budget at the Euro-Zone level and an ECB policy much too geared to fighting inflation could be a recipe for disaster when facing so strong a shock[44].

The US recession will probably lead to a European recession or stagnation. Growth will not exceed 1.1% in Germany for 2008, probably 1.3% in France, and will be under 0.5% in Italy. However, the main concern for Europe is the possibility of a mirror mortgage crisis in Great-Britain and Spain.

Mortgage based securities have increased in Spain from 25 to 200 billion euros between 2001 and 2006 and by the third quarter of 2007 had topped 247 billion. The solvency of Spanish households is now decreasing fast. The average weight of yearly loan payments (prime and capital) jumped to 45% of average yearly income in early 2007 and total Spanish household debt had reached 124% of GDP by the autumn of 2007[45]. Spain looks like the weakest link in Europe for 2008. As the ECB is less reactive than the FED, one cannot dismiss the possibility of a major crash in the Euro-Zone. One possible crisis transmission link to the EU could be through a mortgage and real-estate crash in Spain. German banks have invested heavily in the Spanish financial sector, which is clearly the most vulnerable to a real estate crisis (Figure 6).

[42] Different scenario are covered in Institute of International Finance, *Global Economic and Capital Market Forecasts*, Washington, January 2008, and by several East-Asian research institutes to which the writer had access late January 2008.

[43] C. de Lucia "Où en est la convergence des economies dans la Zone Euro?" in *Conjoncture*, BNP-Paribas, Paris, March 2008. C. Conrad et M. Karanasos, "Dual Long Memory in Inflation Dynamics across Countries of the Euro Area and the Link between InflationUncertainty and Macroeconomic Performance", in *Studies in Nonlinear Dynamics & Econometrics*, vol. 9, n°4, November 2005 (*The Berkeley Electronic Press*: http://www.bepress.com/snde.)

[44] J. Sapir, « La Crise de l'Euro : erreurs et impasses de l'Européisme » in *Perspectives Républicaines*, n°2, June2006, pp. 69-84.

[45] Data from the quarterly bulletin of the Spanish Central Bank.

Figure 6

Source: Central Bank of Spain.

If there is a financial sector collapse in Spain, then German banks, already weakened by losses they suffered on the US market, could face extremely serious difficulties. Already, several Spanish real estate developers have gone bankrupt. House building statistics are showing a major slow-down, moving from 800,000 houses a year to less than 375,000 for the last 12 months. The building rate could even collapse to under 100,000 a year by late 2008. The Spanish government delayed reacting until after general elections. The economic programme disclosed by prime-minister Zapatero on April 15th is probably a case of "too little, too late". Indeed, Spain could be for 2008 what Austria was for 1930, with its real estate sector playing the same fateful role as played by *CreditAnstalt*. Also a Spanish crash would have dramatic consequences not just in Europe but in Latin-America where Spanish banks have been extremely active.

Are we facing another 1929?

One of the most frequently asked questions today is whether the current crisis is roughly equivalent to 1929. Put this way, the answer is clearly no. But that is not to say that the crisis is a minor one.

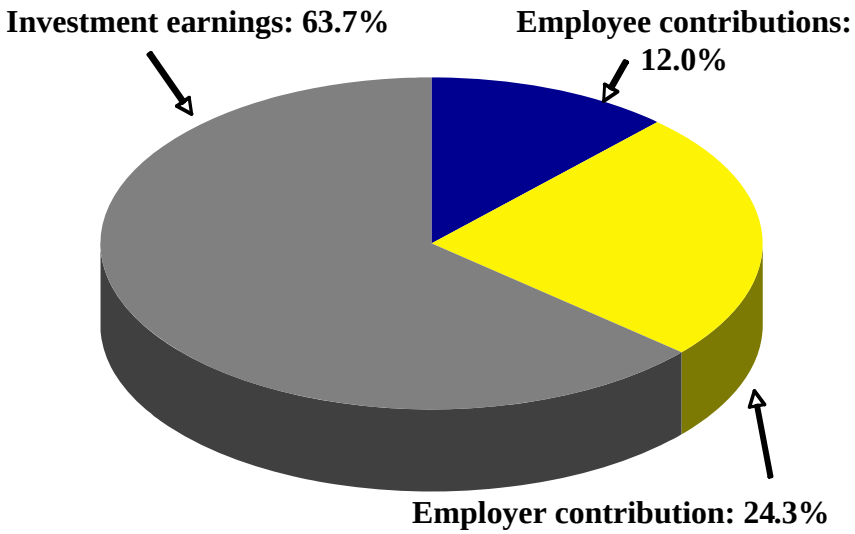
The current crisis will not turn out to be another 1929 for at least two reasons. First, central banks have learnt some lessons. The FED acted before the US banking sector could collapse. Preventing the so-called "systemic risk" certainly is a priority for central bankers. This is why some measures like the special FED lending facility have been created before and not after a major bank collapse. To a large extent the fact the policies have been guided by historical experience explains why so far the crisis has been a "slow-burn" one. But we need to remind ourselves that these polices are not enough to stop and even less to cure the current crisis.

Second, although the crisis will seriously damage the US and possibly some Western European economies, the emerging economies, particularly China, India and Russia, look quite strong. More than two-thirds of world FOREX reserves are held by emerging countries (including Russia). Real sector growth also looks solid with internal markets developing and "middle-class" consumer groups making their weight felt. Thus, emerging economics will dampen the effects of the crisis.

Nonetheless, there are reasons to compare the current situation with the 1929 one. First, the US income distribution is now quite similar to what it was in 1929. Generally speaking, neo-liberal policies have created such huge income inequality that a large share of productive investments made in the last ten years could be without a market if consumption credit collapses in Western economies. The very fact that social safety nets have been dismantled or are in the process of being dismantled in several countries makes consumption spending more vulnerable, as it was before the development of the "welfare-state" in the 1940's.

A second reason for comparing the current situation to 1929 is linked to the development of pension funds for retirement benefits. If financial markets remain depressed for a significant period of time, pension funds could run into serious trouble. On average, investment earnings account for more than 60% of pension funds revenues (Figure 7). If they decline sharply during the crisis, then pension funds will either have to reduce their payments, pulling down demand or increase employee and employer contributions, which would have the same effect. Already the deficit of UK-based pension funds reached £97.5 billion in February 2008. With US-based pension funds accounting for 45% of all pension funds, a revenue crunch induced by the financial markets crisis could have highly destabilizing consequences. The very fact that pension funds are becoming a matter of public concern creates enough uncertainty to push people to increase their savings at the expense of consumption in countries where pension funds are the dominant form of retirement benefits. Pension funds are a time-bomb inside the current crisis. They will contribute to the depression of demand and make the recession felt longer. Only countries where the "welfare-state" system has not been dismantled will escape this process.

Figure 7
Average Pension Funds revenue sources from 2001 to 2006.



Source: NASRA 2007

A third reason making a comparison with 1929 worthwhile is the dominance of neo-liberal ideology. What made the 1929 Crash so nasty was the fact that, except for a handful of dissenters, ideology blinded authorities and economists alike. In a technical sense corrective measures could have been taken quite early in that crisis, preventing it from spreading as it did. But this would have implied a major breach with the then dominant ideology. The current crisis is happening after more than twenty years of conservative revolution, which has brought about deregulation and a weakening of needed State economic functions. Even though there are now numerous voices asking for more *technical* regulations, the general fact that markets need to be regulated in a global and strategic sense has still not been acknowledged by economic and financial authorities.

A fourth reason making 1929 a possible benchmark for the current crisis in scope if not in historical path is the basic non-sustainability of global capital circulation as it developed after the 1998 crisis[46]. Following this crisis, global finance was restructured on the basis of a balance between extremely aggressive trade policies implemented by emerging countries (and bordering on predatory policies in the case of China) and their willingness to massively buy the US public and private debt. US indebtedness created the market needed by some East-Asian economies and allowed those countries to accumulate trade balance surpluses, which were transformed into USD denominated debts. In some ways this was not so different from the post-Versailles Treaty financial circulation organized by the Dawes Plan. So long as this two-sided arrangement worked, there was a natural alliance between USA and China to keep the system going.

However, four factors now point toward a breakdown of this arrangement. The first is that the size of the US debt has increased hugely because of the Iraq War. The second is that the compositional quality of Chinese exports is catching up with that of developed countries trade much faster than expected[47]. This is threatening first some Latin American countries (particularly Mexico) and even developed economies. The very fact that the massive USD devaluation since summer 2007 has not eased the US trade balance deficit is an important point to be kept in mind. The third factor is the already described fact that the US market is less and less relevant for China. The fourth factor is the rise of social tensions in China itself. The Chinese government could be forced to give a greater priority to the internal market. If so, keeping the USD afloat by buying every month a significant amount of USD denominated debts could, from China's point of view, become no longer necessary. Even a limited shift in the Chinese Central Bank reserves from the USD toward other currencies could now have devastating results.

So the underlying economic basis of the trade arrangements between the US and China is now seriously eroded. The collapse of those arrangements could be triggered either for political reasons or by simple mismanagement. Nothing significant, however, will happen before the close of Beijing's Olympic Games in August. But what will happen after is a huge question mark.

.

[46] J. Sapir, *Le Nouveau XXIè Siècle*, op.cit..

[47] P. K. Schott, "The relative sophistication of Chinese exports" in *Economic Policy* n°53, January 2008, pp. 5-47.

Conclusion

The current crisis is much more than the result of a limited mortgage-industry collapse poisoned by badly regulated derivatives. The 1997-1999 crisis grew out of the Washington Consensus policies imposed on emerging economies. The current crisis is the creation of the conservative revolutions of the 80's and 90's in the USA and some European countries. It is a crisis for and created by neo-liberal policies and thinking. It became global because of the world financial market deregulation[48]. However, the WTO-sponsored global free-trade environment contributed also, by allowing an unsustainable compromise to develop between emerging Asian economies and the US economy.

There are strong similarities with the 1997-1999 world financial crisis. The current one will result in a brutal and wide-ranging re-drawing of the economic and financial "correlation of forces", giving more and more weight to countries like China, India and Russia, which are underrepresented in international financial institutions. It also, already, is causing another massive "cognitive shock" to mainstream economics and highlighting the necessity for "realist" economic theory[49]. The post-autistic movement emerged in the wake of the 1998 crisis. The months to come could see a growing awareness of the need for heterodox or "realist" economists to come forward with a fully developed agenda for institutional and economic policy reform aimed at dismantling what the neo-liberal revolution created.

We must not underestimate what our responsibilities could be in the near future.

SUGGESTED CITATION:
Jacques Sapir, "Global finance in crisis", *real-world economics review*, issue no. 46, 20 May 2008, pp. 82-101,
http://www.paecon.net/PAEReview/issue46/Sapir46.pdf

[48] Paul B. Farrell ,*Derivatives the new 'ticking bomb' Buffett and Gross warn: $516 trillion bubble is a disaster waiting to happen*, Market Watch, March 10th, 2008
http://www.marketwatch.com/news/story/derivatives-new-ticking-time-bomb/story.aspx?guid=%7BB9E54A5D%2D4796%2D4D0D%2DAC9E%2DD9124B59D436%7D&dist=TNMostRead

[49] See J. Sapir, *Quelle Economie pour le XXIè Siècle*, Odile Jacob, Paris, 2005.

End-of-the-world trade[1]

Donald MacKenzie [University of Edinburgh, UK]

Last November, I spent several days in the skyscrapers of Canary Wharf, in banks' headquarters in the City and in the pale wood and glass of a hedge fund's St James's office trying to understand the credit crisis that had erupted over the previous four months. I became intrigued by an oddity that I came to think of as the end-of-the-world trade. The trade is the purchase of insurance against what would in effect be the failure of the modern capitalist system. It would take a cataclysm – around a third of the leading investment-grade corporations in Europe or half those in North America going bankrupt and defaulting on their debt – for the insurance to be paid out.

I asked one investment banker what might cause half of North America's top corporations to default. No ordinary economic recession or natural disaster short of an asteroid strike could do it: no hurricane, for example, and not even 'the big one', a catastrophic earthquake devastating California. All he could think of was 'a revolutionary Marxist government in Washington'. That's not a likely scenario, yet the cost of insuring against it had shot up ten-fold. Normally one can buy $10 million of end-of-the-world insurance for between two and three thousand dollars a year. By early last November, the prices quoted were between twenty and thirty thousand, and even then it was difficult to buy in quantity – at least, said the banker, 'not from anyone you trusted'.

Of course, the credit crisis has increased the risk of systemic economic failure. But the existence and rising price of the end-of-the-world trade indicate something beyond that. The crisis isn't just about the bursting of the US housing bubble and dodgy sub-prime lending. Nor is it merely a reflection of the perennial cycle in which greed trumps fear to create a euphoric disregard of risk, only for fear to reassert itself as the risk becomes too great. What is revealed by the end-of-the-world trade is that the current crisis concerns the collapse of public fact.

A price or an interest rate quoted by one person or firm to another and agreed between them is a private fact. That isn't good enough for many purposes. Even purely bilateral transactions are facilitated if there is a public fact, in this example a known and credible 'market price' or 'market interest rate', that can be consulted to check whether a quoted price or rate is fair. Trustworthy public estimates of borrowers' creditworthiness make debt markets far more liquid than they would be if borrowers' capacity to meet their obligations had to be investigated from scratch. Believable bank balance sheets encourage banks to lend to each other; it was the suspension of such lending that undid Northern Rock. As the American sociologists Bruce Carruthers and Arthur Stinchcombe pointed out in the journal Theory and Society in 1999, market liquidity – plentiful borrowing and lending, or buying and selling – 'is, among other things, an issue in the sociology of knowledge'. Believable market prices, valuations, credit ratings and balance sheets encourage lending, active trading, competition and keen pricing. If credibility is lost, then everyone becomes wary of lending, deals aren't done, and an increased proportion of sellers are the desperate, who have to accept fire-sale prices.

---

[1] This article originally appeared in the *London Review of Books* (http://www.lrb.co.uk) and appears here with the *Review*'s permission.

At the core of the current crisis is a set of mechanisms for the transfer of credit risk (the risk that borrowers default), in particular collateralised debt obligations (CDOs). The first CDOs were created in 1996-97 by banks that wished to pay others to take on the risks of the loans they had made. From 1999 onwards, CDOs were also pursued simply as money-making opportunities, and hedge funds as well as banks started to set them up.
CDOs come in many varieties, but one way for a bank or hedge fund to set one up is to create a separate legal entity known as a special purpose vehicle (typically registered in the Cayman Islands). The vehicle then buys assets such as corporate bonds, loans and bonds backed by mortgages, either from the parent bank – if, for example, the motive for the CDO is to reduce the risk of its loan portfolio – or on the open market.

To raise the money that's needed for these purchases and to create the opportunity for profit, the vehicle sells a hierarchically structured set of investments backed ('collateralised') by the pool of assets the CDO has bought. At the bottom of the hierarchy is the 'equity' tranche. Losses caused by default of the assets in the pool are absorbed in the first place by investors in this tranche, who in compensation receive the highest rates of return, often as high as 15-20 per cent. Next in the hierarchy is the mezzanine tranche or tranches, the investors in which incur a loss only if defaults are sufficiently bad to wipe out the equity tranche completely. Above the mezzanine is the senior tranche, and above that the super-senior. Because the buffer of the equity and mezzanine tranches stand between it and any losses, the senior tranche is usually regarded as very safe (equivalent to a corporate bond with the highest rating, AAA), and super-senior as even safer than that. Correspondingly, investors in these tranches have to accept rates of return substantially lower than those in the equity and mezzanine tranches.

For a structure as complicated as a CDO to be attractive to investors, facts about it need to be created: ratings, crucially, awarded to its tranches by firms such as Standard & Poor's, Moody's and Fitch. Traditionally, the core business of these rating agencies is to grade bonds issued by corporations. They divide these between 'investment-grade' and 'speculative' (colloquially, 'junk'), and there are multiple categories indicating how high in investment grade, or how low in speculative grade, a bond is. Standard & Poor's, for example, has ten categories of investment grade, ranging from AAA down to BBB–. Recently, however, a large part of what rating agencies have done is to grade CDO tranches. Many investment institutions are strongly guided by ratings, and some are allowed to invest only in investment-grade products. The success of CDOs has rested on the way they can be set so that the mezzanine and senior tranches can achieve investment-grade ratings while offering higher rates of return than equivalently rated corporate or government bonds.

To award a rating, or more generally to work out the value of a CDO, requires one to take three main things into account. First is the risk of default on each of the debt instruments in the asset pool. Past data are useful here – the rating agencies have kept records of corporate defaults for decades – and the market's current view of such risk can be worked out, either from the yield of the bond involved (a risky bond has to offer a higher yield before investors will buy it) or from the cost of credit default swaps. Like CDOs, these swaps are 'credit derivatives' – products built on the underlying market for bonds and loans – and they too have grown rapidly over the past decade. They are insurance, essentially, against the risk of an individual company defaulting. Under normal circumstances, credit default swaps are actively traded (far more often than a company's underlying bonds or loans), and thus have a credible market price.

A second issue is 'recovery rates': the amounts that creditors will get back when borrowers default. Though these rates vary, it's common in CDO valuation simply to assume a recovery rate of 40 per cent. Third, one needs to take into account the extent to which defaults by different borrowers are likely to cluster. Some defaults are the result of idiosyncratic problems causing the bankruptcy of a single corporation, but others reflect systemic factors such as poor conditions in the economy as a whole. If the latter, then one corporation's default is likely to be accompanied by others.

The extent to which default risks are linked is known in the world of credit derivatives as 'correlation'. If correlation is low, defaults aren't likely to cluster much, and only the equity tranche of a typical CDO would normally be thought of as carrying significant risk of loss. If, on the other hand, correlation is high and defaults tend to come in clumps, then the mezzanine and conceivably even the senior tranches can be hit.

Correlation is by far the trickiest issue in valuing a CDO. Indeed, it is difficult to be precise about what correlation actually means: in practice, its determination is a task of mathematical modelling. Over the past ten years, a model known as the 'single-factor Gaussian copula' has become standard. 'Single-factor' means that the degree of correlation is assumed to reflect the varying extent to which fortunes of each debt-issuer depend on a single underlying variable, which one can interpret as the health of the economy. 'Copula' indicates that the mathematical issue being addressed is the connectedness of default risks, and 'Gaussian' refers to the use of a multi-dimensional variant of the statistician's standard bell-shaped curve to model this connectedness.

The single-factor Gaussian copula is far from perfect: even before the crisis hit, I wasn't able to get a single insider to express complete confidence in it. Nevertheless, it became a market Esperanto, allowing people in different institutions to discuss CDO valuation in a mutually intelligible way. But having a standard model is only part of the task of understanding correlation. Historical data are much less useful here. Defaults are rare events, and producing a plausible statistical estimate of the extent of the correlation between, say, the risk of default by Ford and by General Motors is difficult or impossible. So as CDOs gained popularity in the late 1990s and early years of this decade, often the best one could do was simply to employ a uniform, standard figure such as 30 per cent correlation, or use the correlation between two corporations' stock prices as a proxy for their default correlations.

However imperfect the modelling of CDOs was, the results were regarded by the rating agencies as facts solid enough to allow them to grade CDO tranches. Indeed, the agencies made the models they used public knowledge in the credit markets: Standard & Poor's, for example, was prepared to supply participants with copies of its 'CDO Evaluator' software package. A bank or hedge fund setting up a standard CDO could therefore be confident of the ratings it would achieve. Creators of CDOs liked that it was then possible to offer attractive returns to investors – which are normally banks, hedge funds, insurance companies, pension funds and the like, not private individuals – while retaining enough of the cash-flow from the asset pool to make the effort worthwhile. As markets recovered from the bursting of the dotcom and telecom bubble in 2000-2, the returns from traditional assets – including the premium for holding risky assets – fell sharply. (The effectiveness of CDOs and other credit derivatives in allowing banks to shed credit risk meant that they generally survived the end of the bubble without significant financial distress.) By early 2007, market conditions had been benign for nearly five years, and central bankers were beginning to talk of the 'Great Stability'. In it, CDOs flourished.

Ratings aside, however, the world of CDOs remained primarily one of private facts. Each CDO is normally different from every other, and the prices at which tranches are sold to investors are not usually publicly known. So credible market prices did not exist. The problem was compounded by one of the repercussions of the Enron scandal. A trader who has done a derivatives deal wants to be able to 'book' the profits immediately, in other words have them recognised straightaway in his employer's accounts and thus in the bonus that he is awarded that year. Enron and its traders had been doing this on the basis of questionable assumptions, and accounting regulators and auditors – the latter mindful of the way in which the giant auditing firm Arthur Andersen collapsed having been prosecuted for its role in the Enron episode – began to clamp down, insisting on the use of facts (observable market values) rather than mere assumptions in 'booking' derivatives. That credit correlation was not observable thus became much more of a problem.

From 2003 to 2004, however, the leading dealers in the credit-derivatives market set up fact-generating mechanisms that alleviated these difficulties: credit indices. These resemble CDOs, but do not involve the purchase of assets and, crucially, are standard in their construction. For example, the European and the North American investment-grade indices (the iTraxx and CDX IG) cover set lists of 125 investment-grade corporations. In the terminology of the market, you can 'buy protection' or 'sell protection' on either an index as a whole or on standard tranches of it. A protection seller receives fees from the buyer, but has to pay out if one or more defaults hit the index or tranche in question.

The fluctuating price of protection on an index as a whole, which is publicly known, provides a snapshot of market perceptions of credit conditions, while the trading of index tranches made correlation into something apparently observable and even tradeable. The Gaussian copula or a similar model can be applied 'backwards' to work out the level of correlation implied by the cost of protection on a tranche, which again is publicly known. That helped to satisfy auditors and to facilitate the booking of profits. A new breed of 'correlation traders' emerged, who trade index tranches as a way of taking a position on shifts in credit correlation. Indices and other tranches quickly became a huge-volume, liquid market. They facilitated the creation not just of standard CDOs but of bespoke products such as CDO-like structures that consist only of mezzanine tranches (which offer combinations of returns and ratings that many investors found especially attractive). Products of this kind leave their creators heavily exposed to changes in credit-market conditions, but the index market permitted them to hedge (that is, offset) this exposure.

All this activity explains the attractiveness of the end-of-the-world trade. The trade is the buying and selling of protection on the safest, super-senior tranches of the investment-grade indices. No one buys protection on these tranches because they are looking for a big pay-out if capitalism crumbles: if nothing else, they have no reason to expect that the institution that sold them protection would survive the carnage and be able to make the pay-out. Instead, they are looking to hedge their exposure to movements in the credit market, especially in correlation. Traders need to demonstrate they've done this before they're allowed to book the profits on their deals, so from their viewpoint it's worth buying protection, for example from 'monolines' (bond insurers), even if the latter would almost certainly be insolvent well before any pay-out on the protection was due.

With problems such as the non-observability of correlation apparently adequately solved by the development of indices, the credit-derivatives market, which emerged little more

than a decade ago, had grown by June 2007 to an aggregate total of outstanding contracts of $51 trillion, the equivalent of $7,700 for every person on the planet. It is perhaps the most sophisticated sector of the global financial markets, and a fertile source of employment for mathematicians, whose skills are needed to develop models better than the single-factor Gaussian copula.

The credit market is also one of the most computationally intensive activities in the modern world. An investment bank with a big presence in the market will have thousands of positions in credit default swaps, CDOs, indices and similar products. The calculations needed to understand and hedge the exposure of this portfolio to market movements are run, often overnight, on grids of several hundred interconnected computers. The banks' modellers would love to add as many extra computers as possible to the grids, but often they can't do so because of the limits imposed by the capacity of air-conditioning systems to remove heat from computer rooms. In the City, the strain put on electricity-supply networks can also be a problem. Those who sell computer hardware to investment banks are now sharply aware that 'performance per watt' is part of what they have to deliver.

The boom in credit derivatives had wider effects, in particular increasing the appetite for low-grade debt. A typical CDO, if it is to offer an attractive enough return to investors, has either to purchase risky (and thus high-yielding) bonds or loans in significant quantity, or to sell protection on such bonds and loans via credit default swaps. This fuelled the growth in private equity groups, which buy companies by borrowing very heavily, often by issuing large quantities of bonds. Because of the riskiness of heavily-indebted enterprises these bonds can achieve only junk ratings, but were attractive nonetheless to the creators of CDOs.

Fatally, the demand for risky debt – which arose not just from CDOs, but from the sharply reduced returns available from safer assets more generally – also encompassed bonds based on sub-prime mortgages: home loans that are risky, usually because the borrower has a blemished credit record, but also because the loan-to-value or loan-to-income ratio is high, documentation is poor, or it's a buy-to-let purchase or second mortgage. It is now well known that problems in the US sub-prime sector caused the credit market to turn in summer 2007 from boom to crisis.

It is important, however, to keep a sense of scale. Last autumn, the Bank of England calculated that bonds backed by US sub-prime mortgages totalled $0.7 trillion. That's a lot of money, but it makes up only 2.5 per cent of the total value of non-governmental bonds and corporate loans outstanding worldwide. Sub-prime's $0.7 trillion is, for example, dwarfed by the $11 trillion corporate bond market, of which $10.2 trillion is investment grade. Indeed, what is perhaps most striking about the credit crisis is that corporations outside the financial sector have remained generally in robust economic health, with bankruptcies and thus default rates at historic lows. Not a single investment-grade corporation has defaulted recently, and there haven't even been any recent large-scale speculative-grade corporate defaults.

Problems spilled over from sub-prime to sectors that hadn't been experiencing financial distress in good part because of damage to the credit market's fact-generating mechanisms. The rating agencies had graded products underpinned by sub-prime mortgages on the basis of previous experience of default rates and of the proceeds of the sale of repossessed properties, but had failed to take into account the effects of the bubble in housing prices in the US, the way in which the growth of mechanisms for transferring credit risk and the increased appetite for risky debt had altered the US mortgage market. Predatory and irresponsible lending by commission-hungry brokers had been encouraged by the way in which even the riskiest mortgages could so easily be packaged and sold on, leaving the original mortgage-

lender free of losses in the event of default. Mortgage-backed products that the rating agencies had ranked as investment-grade started to incur major losses, and the agencies had to revise many ratings sharply downwards. To take an extreme but not wholly untypical case, Moody's downgraded the top tranche of one mortgage-backed CDO by 14 notches. When it was issued in April last year the tranche was rated Aaa, the top of investment grade; by November, it was rated B2, well down in junk.

The rating agencies are businesses, and the issuers of debt instruments pay the agencies to rate them. The potential conflict of interest has always been there, even in the days when the agencies mainly graded bonds, which generally they did quite sensibly. However, the way in which the crisis has thrust the conflict into the public eye has further threatened the credibility of ratings. 'In today's market, you really can't trust any ratings,' one money-market fund manager told Bloomberg Markets in October 2007. She was far from alone in that verdict, and the result was cognitive contagion. Most investors' 'knowledge' of the properties of CDOs and other structured products had been based chiefly on ratings, and the loss of confidence in them affected all such products, not just those based on sub-prime mortgages. Since last summer, it has been just about impossible to set up a new CDO.

Even more damagingly, the credit world's existing special purpose vehicles have found it harder and harder to obtain funds from the source that usually sustains them, the sale of 'commercial paper' (short-term debt). Consequently, some vehicles have had to sell assets – not just mortgage-backed securities, but corporate loans and corporate bonds – to raise cash.

The result of such forced selling, and the unwinding of positions in other sectors of the credit derivatives market, has been a sharply increased demand for protection, and much-diminished willingness to sell it. As a result, the cost of protection has soared across all sectors of the credit market. The safest instruments have been affected as well as the riskiest ones, paradoxically sometimes to an even greater degree. For example, the returns from holding safe assets or selling protection on the safest index tranches were in the recent past paltry, so it was common for hedge funds and other market participants to finance such positions by borrowing, or by multiplying returns (and also potential losses) in other ways; this is called 'leverage'. A popular product, for example, has been 'leveraged super-senior', investors in which sell end-of-the-world insurance, but with returns and risks multiplied by about ten.

If you're levered up, even relatively modest market movements can force you to liquidate your positions in a hurry to stop your losses becoming catastrophic. Leveraged super-senior and similar products, for example, typically have specified 'unwind points': thresholds, such as loss levels, at which the deal has to be unwound by buying protection equivalent to the protection one has sold. With what Jon Gregory of Barclays Capital estimates in Risk magazine to be around $100 billion of leveraged super-senior protection having been sold, even the fear of approaching unwind points can be deeply disturbing to the markets.

Processes of this kind – changes internal to the world of credit derivatives, not in the level of the risks being insured against – have meant that investment-grade indices sometimes move by up to 20 per cent in a single day. At times, the price of end-of-the-world insurance has corresponded to utterly implausible correlation levels in excess of 90 per cent:

meaning, in effect, that if one investment-grade corporation were to default, almost all of them would.

Why aren't such mispricings being corrected by savvy investors, eager to seize the opportunities for profit they create? Why, for example, have people not been selling end-of-the-world insurance when the returns from doing so have jumped ten-fold while the risk of having to pay out remains small? A crucial part of the answer is that, paradoxically, a fact-generating mechanism is blocking the restoration of fact. The mechanism is 'marking-to-market', the compulsory revaluation of portfolios as market prices fluctuate. Its motivation is entirely sensible: for example, when regulators insist that banks mark-to-market, it should force them to disclose losses to their investors and creditors.

Unfortunately, however, marking-to-market makes market participants extremely sensitive to short-term price fluctuations. To sell end-of-the-world insurance, for example, is almost certainly an excellent long-term bet, but traders don't do it because of the fear that in the short run its price may increase even further, causing a mark-to-market loss. Although it would be a paper loss, it would have real consequences, damaging your bank's balance sheet and profits, threatening your bonus, and typically forcing you to transfer valuable collateral to the custody of the buyer of the insurance.

Over recent months, banks have frequently been accused of hiding their credit losses. The truth is scarier: such losses are extremely hard to measure credibly. Marking-to-market requires that there be plausible market prices to use in valuing a portfolio. But the issuing of CDOs has effectively stopped, liquidity has dried up in large sectors of the credit default swap market, and the credibility of the cost of protection in the index market has been damaged by processes of the kind I've been discussing.

How, for example, can one value a portfolio of mortgage-backed securities when trading in those securities has ceased? It has become common to use a set of credit indices, the ABX-HE (Asset Backed, Home Equity), as a proxy for the underlying mortgage market, which is now too illiquid for prices in it to be credible. However, the ABX-HE is itself affected by the processes that have undermined the robustness of the apparent facts produced by other sectors of the index market; in particular, the large demand for protection and reduced supply of it may mean the indices have often painted too uniformly dire a picture of the prospects for mortgage-backed securities. One trader told the Financial Times in April that the liquidity of the indices had become very poor: 'Trading is mostly happening on interdealer screens between eight or ten guys, and this means that prices can move wildly on very light volume.' Yet because the level of the ABX-HE indices is used by banks' accountants and auditors to value their multi-billion dollar portfolios of mortgage-backed securities, this esoteric market has considerable effects, since low valuations weaken banks' balance sheets, curtailing their capacity to lend and thus damaging the wider economy.

Josef Ackermann, the head of Deutsche Bank, has caused a stir by admitting 'I no longer believe in the market's self-healing power.' The state has had to stand between the market and the abyss. Had the British government not rescued Northern Rock, bank runs would have brought down other institutions and destroyed confidence in the UK's financial system. Had the Federal Reserve not bailed out Bear Stearns, at least one other major Wall Street bank would most likely have failed, and chaos might have ensued. With private lending having dried up, government-sponsored lenders now provide 90 per cent of the funding of new mortgages in the US.

Modern central banking, backed ultimately by the tax payer, can almost certainly prevent financial catastrophe on the scale of 1929. Restoring normality, which requires repairing the cognitive state of modern finance, is quite a different matter. As Carruthers and Stinchcombe note, market liquidity depends on facts. However, today's financial facts depend on liquidity. The credit markets remain stuck in a vicious circle.

There are some signs that repair might be possible. Pension funds, which are under less immediate pressure to mark-to-market, have started to sell end-of-the-world insurance, and if they do so on a larger scale, liquidity and thus credible prices may return to that part of the index market. The rescue of Bear Stearns persuaded many traders that the Federal Reserve will not allow any major US bank to collapse, and a $19 billion write-down (a reduction in the balance-sheet valuation of its portfolio) by the Swiss Bank UBS in early April was widely seen as a nadir, the valuation now so low that it was unlikely to fall much further.

But there have been false dawns before. In early October 2007, as US banks first started to report large write-downs of their credit portfolios, their share prices surprisingly soared. 'It seems that the more money you lose,' one banker told the Financial Times, 'the more your shares go up.' It had begun to seem as if the banks had the measure of the crisis, and facts were on the way to being restored. However, that impression quickly evaporated as within weeks the estimates of losses jumped upwards. For example, by 20 October Merrill Lynch had increased its estimate of its losses from $4.5 billion to $7.9 billion. That's the problem with facts. Once they fall apart, they are very difficult to put back together again.

SUGGESTED CITATION:
Donald MacKenzie, "End-of-the-world trade", *real-world economics review*, issue no. 46, 20 May 2008, pp. 102-109,
http://www.paecon.net/PAEReview/issue46MacKenzie46.htm

An Overview of Climate Change:

What does it mean for our way of life? What is the best future we can hope for?

Neva Goodwin[1] [Tufts University, USA]

Abstract

This paper starts with the question of whether climate change will require a significant reduction of consumption among the richer people in the world, and ends with the most optimistic picture the author can conjure up, of the world in the year 2075. That hopeful picture is of a world in which inequalities – among and within nations – have been substantially reduced. The challenges and adjustments confronting humanity in the coming decades provide an opportunity that could be used to mitigate climate change in ways that can improve the circumstances of the poor. Ecological reasons to reduce throughput of energy and materials in economic systems urge the abandonment of high-consumption life-styles. The 21st century will be an era of many losses, but it is conceivable that societies will successfully make the transition from goals of economic growth, as understood in the 20th century, to goals of maintaining and increasing sustainable well-being.

1. Introduction

This paper addresses a question that is often in the back of people's minds when, in the wealthy countries, there is discussion about climate change. This question, which is more often dodged than addressed, is: **will we in the rich countries need to rearrange our lives so as to make do with significantly less consumption?** Put another way: will the reality of climate change require people in the rich nations to live in ways that greatly reduce the economy's throughput of energy and materials? That might mean less long-distance travel for ourselves, and for the things we buy; less meat; smaller houses; and a reduction in the quantities of things that fill most of our houses – sports equipment, toys for our children or grandchildren, gadgets, and so on. Is such a scenario possible – desirable – inevitable – or is it something we simply cannot contemplate?

I am currently writing a book – *Changing Climate, Changing Economy* – that will expand on these issues, and a number of others. This paper is a first attempt to sketch out the scope of the book. Here I will examine the questions posed above in relation to three types of action related to climate change. These are:

- **Mitigation** – efforts to prevent climate change;
- **Adaptation** – responses to climate-related disasters that are not prevented by mitigation efforts; and
- **Resilience** – the characteristic needed in individuals, communities, nations, and the world, to prepare for disasters, to reduce the suffering and loss they bring, and to rebound in positive ways.

The paper will be organized as follows: In section 2 I'll propose a conceptual starting point for understanding the challenge of climate change, and touch on a few facts about it. Section 3 will very briefly describe some encouraging possibilities for mitigation. Section 4 takes on issues relating to the unavoidable effects of climate change that will be faced, in

[1] I am extremely grateful to David Korten and Brian Roach for many thoughtful comments and suggestions on two drafts of this paper. I also thank Brian Roach and Pamela Velez-Vega for excellent research assistance. Jonathan Harris and Julie Nelson also helped to catch some errors. Remaining errors are the author's sole responsibility.

[2] Global Development and Environment Institute, www.gdae.org

coming decades, by humans around the world. Specifically, this section connects the concepts of climate change adaptation and resilience to existing global inequalities. (An earlier, but similar, version of section 4 appeared in "Economic Vitality in a Transition to Sustainability," my booklet in the series, *Growing the Economy through Global Warming Solutions;* published by the Civil Society Institute, 2007, and available on www.GDAE.org.)

Section 5 outlines a plan for allocating the costs of mitigation in ways that can reduce global inequalities. Section 6 considers what kinds of assistance will be needed for those most affected – and how, and whether, such assistance might be elicited. Section 7 outlines a "carbon cap and trade" system. Recognizing the economic growth possibilities in the technological response to climate mitigation, this version of cap and trade emphasizes transfers of technology to, and economic development in, the poorer countries.

Section 8 broadens the discussion, from climate change to consideration of two other major issues that are likely to affect the U.S. and the world economy in coming decades: demographic shifts, and recessionary pressures. Section 9 then sums up my answers to date on the question posed at the outset – whether climate change will force people in the rich nations to reduce the amounts of energy and materials flowing through their lives. Section 10 cites some conclusions from the field of hedonic psychology to suggest that these changes do not need to make our lives less happy. Section 11 then jumps ahead to the year 2075, to try to imagine what the world could look like at that time.

2. Climate change: some of what we know, and some ways to think about it

> For the last 10,000 years we have been living in a remarkably stable climate that has allowed the whole of human development to take place. In all that time, through the mediaeval warming and the Little Ice Age, there was only a variation of 1°C. Now we see the potential for sudden changes of between 2°C and 6°C. We just don't know what the world is like at those temperatures. We are climbing rapidly out of mankind's safe zone into new territory, and we have no idea if we can live in it. (Robert Corell, Arctic scientist and IPCC member; *The Guardian* 5 October 2007.)

A useful starting point for understanding the economy in its ecological context (and also, in fact, in its social context) is an idea that has not received much attention until recently: the idea of common wealth. It now appears that an important part of the common wealth of all humanity is *the global atmospheric capacity to absorb greenhouse gasses without disastrous climate effects*. Until the industrial revolution this capacity was never noticed, as it was in a balance in which greenhouse gasses emitted as methane, by the release of CO_2 in the decay or burning of trees and plants, and by other natural causes, were offset, principally by new plant growth and by the carbon uptake of the oceans.

This balance has been seriously disturbed by various types of human activity which are rapidly degrading the atmosphere's capacity to absorb greenhouse gasses without disastrous climate effects. Human beings in effect used up this atmospheric capacity decades ago, creating a situation in which some amount of climate change is inevitable, and additional emissions of greenhouse gasses make it more severe.

What are these greenhouse gasses? Methane produced from livestock and paddy rice farming, as well as vented septic systems and landfills, accounts for about 15% of the

anthropogenic effects that are tipping the planet's climate toward warming. (Stern Report, chapter 1.) In a feedback effect, if global warming causes the melting of the permafrost and frozen peat bogs, the release of methane could rise substantially. Nitrous oxide, mostly from fertilizers, accounts for another 6% or so[3]. The largest and best-known cause, at present accounting for nearly three-quarters of climate change, is the release of CO_2 into the atmosphere.

The major source of CO_2 emissions is, as is well known, the combustion of fossil fuels, while deforestation also releases (and reduces the capture of) CO_2, accounting for 15-20% of the climate change that has occurred to date. (Stern, 2007) Of particular concern is the massive destruction of rain forests in tropical countries, which not only releases carbon that had been stored in living trees – it also reduces the uptake of carbon from the forest biota, both above ground and in the soils. While part of the reason for this destruction can be traced to population growth, with growing demand for land on which to grow food, a larger amount relates to development and trading patterns in which tropical forests are cut down to sell the wood abroad, or to grow crops such as soybeans or cattle (the latter most notably in the Amazon), to earn the foreign currency on which these countries are increasingly dependent.

3. Mitigating climate change – and preserving economic growth?

When people think about what to do about climate change, the first concern, appropriately, is how to prevent it from happening, to the extent possible. Mitigation activities can be divided into two parts: one is conservation; the other is the development and deployment of alternative energy sources. Each of these, again, has two principal components: technology, and behavior change.

Technology is increasingly being seen as a source of economic growth – maybe the start of a new kind of growth that doesn't have negative environmental impacts. The growth model of the past two and a half centuries was one that kept increasing the amount of fossil-fuel-based energy available to people. The new model – one that is not yet fully realized – emphasizes the amounts of energy **services** available to people. Better home design, for example, can increase the energy services of heat and light, while reducing the amount of energy used to produce these services. In the home of Amory Lovins, in Colorado's high mountains, banana trees grow in the enclosed courtyard in the center of a house with no furnace. Lovins, who has minimized energy waste from the sources he taps into, reports that "building such a heat-tight home actually decreased construction costs by $1,100. Reinvesting that sum, plus an additional $6,000, saved 99 percent of water-heating costs and 90 percent of household electricity plus 50 percent of water use, repaying the extra expense in 10 months."[4]

The behavioral aspects of conservation are not only a matter of **how** you do what you do (e.g., whether the winter thermostat is set at 78 or 63 degrees Fahrenheit); it will also include some changes in **what** is done.

---

[3] Global Warming Fact Sheet, at http://www.ypte.org.uk/docs/factsheets/env_facts/glob_warm.html

[4] "How to Fuel the Country While Saving the World." *Newsweek* 2007 downloaded Feb 9 2008 at http://www.newsweek.com/id/80938/page/1

-- For individuals the decisions could include choices between shopping near-by versus going to a distant mall; or decisions on how many square feet of living space one requires.
-- Builders need to decide whether to put in a furnace, or to follow Lovins' lead and use the saved money to build houses that don't require furnaces.
-- Governments face decisions on what kinds of transportation systems to support – more highways vs. more public transit? – as well as decisions on how to allocate the budget, in the famous choice between "guns and butter;" or what kinds of agriculture to subsidize.
-- Corporations may face hard choices about their basic business: should ExxonMobil continue to define itself as a petroleum producer, or should it follow BP and others into calling itself an energy company? How many companies can follow the model of Ray Anderson, who founded a company that sells the **service** of floor covering, not the floor covering itself – which is designed to be taken back and recycled?

It is encouraging that there are known conservation measures that can provide the same energy services with a half or a quarter of the energy. The task ahead is, first, to implement existing conservation technologies; second to develop additional conservation and clean-fuel technologies; and third to speed up the transition to clean fuels. Huge numbers of jobs are already being created in industries that seek to mitigate climate change by energy conservation or the development of energy alternatives, along with related technological innovations. Investment funds are pouring into these industries; some of that money will be lost, but there appear to be good prospects for strong positive returns, on average. I mention this, because it adds to the rosy picture of economic growth continuing, even with an energy transition. Economic growth, measured in money value (corrected for inflation), can increase even if many of the things we are used to having become more expensive, so that we can't have as much of them. I'll return later to this more sobering issue.

4. "Adapting" to climate change

Now, however, I want to address another, less talked-about, aspect of what climate change will require. This aspect is generally referred to as **adaptation**; that means coping with those climate change effects that we cannot, or will not, prevent. The greatest need is to help vulnerable communities and individuals (in both rich and poor countries) to increase their ability to cope with climate-related catastrophes. Two social characteristics, in particular, are increasingly being perceived as essential for adaptation.

One is *resilience*, which means, among other things, that the least advantaged groups in society must be strengthened, and supportive institutions developed, so that in the face of catastrophes they can adapt instead of being crushed. The disaster of New Orleans, so ill-prepared to respond to Hurricane Katrina, is a dramatic reminder of the importance of resilience.

The other requirement for successful adaptation – and a prerequisite for resilience – is *social cohesion*, which means that people identify with larger social goals than their own immediate interest. Among the things that are most damaging to social cohesion are wide inequalities. At the time of this writing, income and wealth inequality in the United States are at about their high-water mark for the last hundred years; inequality is also exceptionally high, by recent standards, in many other parts of the world. Most mainstream economic theorists have had little to say about the growth in inequality – in part, no doubt, because the policies supported by their theories have been important in increasing inequality in the last quarter of

the 20th century.[5]

Adaptation will be much more difficult for poor, developing countries, which are likely to suffer from droughts and food deficits beyond anything experienced in the last century. The April, 2007 report from the Intergovernmental Panel on Climate Change describes many ways in which poverty, especially in the tropics, spells disastrously low resilience against the likely effects of climate change. The international community will face myriad regional conflicts over increasingly scarce resources of fresh water or arable land. The concept of "environmental refugees," familiar now to only a few people, will become part of the common language.[6]

Fourteen years ago I wrote a paper describing a "nightmare scenario" in which I imagined that

> redistribution does not occur; ecological collapse hits the poor soonest and hardest, causing Third World famine and disease on a scale surpassing anything ever experienced by our species; and the wealthy countries learn enough from that to reform their ways – not in terms of helping the poor, but in reducing their own throughput. (Goodwin, 1994)

What I left out of this nightmare scenario was the "gated community" aspect that is already appearing within countries, and on their borders, as individuals, communities and nations consciously or unconsciously lay the groundwork for the use of violence by the rich to repel a possibly violent influx of the desperate.

Equality is a requirement for resilience on the global as well as local level. As people in poor nations become increasingly unable to feed themselves, to preserve their homes, or to maintain their livelihoods, the rich nations and people of the world face a stark choice: to give the assistance required to increase resilience among the poor – or to let them die, or shoot them when they arrive at the gates. If morality is not sufficient to make the choice obvious, there is also the consideration of how unpleasant it would be – even for the rich – to live in such a world.

5. Convergence toward a low level of fossil fuel use, as a step toward global equity

Do we have any alternative? We will not find one in business-as-usual, supported by economic theory. When I was in graduate school a teacher introduced a class by saying, "Economics is supposed to be about equity and efficiency. We've never figured out how to deal with equity, so for the rest of the class we'll focus on efficiency." That focus, and that

[5] These policies have included "trickle-down economics," "supply-side economics," and "the Washington consensus." Regarding the last of these – a set of principles imposed by the World Bank and the IMF on poor countries – it is interesting to note which of its prescriptions have been adopted in the U.S.: privatization of public services, tax reduction, welcoming foreign investment, and secure property rights – vs. which prescriptions the U.S. has ignored, while urging them on other countries: fiscal discipline and reduction of government borrowing, and dismantling trade barriers and trade subsidies.

[6] According to the report, "An Uncertain Future: Law Enforcement, National Security and Climate Change," it is "almost certain" that, by 2050, droughts, food shortages and flooding caused by climate change would lead to the mass movement of up to 200 million environmental refugees. (The Environmental and Energy Study Institute, www.eesi.org; February 2, 2008.)

omission, was in force for the rest of my formal education as an economist. However the ideology that allowed this choice, and this division, is increasingly called into question by the results of the policies it has driven. As noted by an especially effective critic of recent decades' economic development orthodoxy, "Neoclassical free-trade free-market policy claims to sacrifice equity for growth, but in fact it achieves neither; growth has slowed down in the past two and a half decades when markets were freed and borders opened." (Chang, 2007, p. 17) This point about the effectiveness of a growth-rather-than equity approach applies to rich countries as well as to poor ones (as laid out in the book just cited). As is trenchantly stated by the author of *Collapse: How Societies Choose to Fail or Succeed*:

> If the whole developing world were suddenly to catch up [with the consumption rate of the U.S. and Western Europe] world rates would increase eleven fold. It would be as if the world population ballooned to 72 billion people (retaining present consumption rates).
>
> Some optimists claim that we could support a world with nine billion people. But I haven't met anyone crazy enough to claim that we could support 72 billion. Yet we often promise developing countries that if only they will adopt good policies – for example, institute honest government and a free-market economy – they, too, will be able to enjoy a first-world lifestyle. This promise is impossible, a cruel hoax: we are having difficulty supporting a first-world lifestyle even now for only one billion people. (Jared Diamond, "What's Your Consumption Factor?" *New York Times* op ed, Jan 2, 2008, p. A19)

A United Nations Development Programme report notes, regarding per capita income differentials, that if high income countries were "to stop growing today and Latin America and Sub-Saharan Africa to continue on their current growth trajectories, it would take Latin America until 2177 and Africa until 2236 to catch up." (UNDP 2006, p. 37) Even this projection, in which the world must wait more than two centuries for Africa to attain a Western standard of living, sets aside three realities. One is that if the path of economic development continues to encourage all nations to strive for the U.S. level of consumption, as Diamond points out in the passage just quoted, the life support system of the planet will collapse long before the goal is reached. A second is that the economic impacts of natural disasters are more severe in poor countries, with likely negative impacts on their economic growth. Thirdly, the West has not yet shown any disposition to stand still while the rest catch up. But that last, in some form, is what I am going to propose.

Discussions about mitigating climate change, even in Washington D.C., are beginning to accept, at least in the abstract, a requirement to reduce fossil fuel use by 80% below 1990 levels by the year 2050. It is increasingly hard to dispute that this is the minimum necessary to prevent the global temperature from rising to more than two degrees centigrade above where it was at the beginning of the 20th century – and that more than a 2 degree increase will have horrible consequences. This 80% reduction must be a world-wide requirement. However, if the rich countries achieve this, and no more, then the poor countries must do the same, reducing their fossil fuel use by 80%, even from a much lower starting point.

An 80% reduction fossil fuel use in the United States would bring us down to about the per capita level of fossil fuel use now prevailing in China, Djibouti, Suriname, and Macedonia.[7] Is it acceptable that those countries must also reduce their use of the currently most convenient fuels, so that they reach a level, 40 years from now, that is still just one-fifth

[7] Comparative figures from the US Energy Information, Energy Review Annual 2005.

of the U.S.? What about the 115 countries whose per capita level of fossil fuel use is **less** than 20% of the US – including 66 countries, starting with India, who achieve only 5% or less of our per/capita fossil fuel energy use – should that differential also persist into the future? If technology for alternative energy is developed rapidly enough, and is introduced immediately into these countries, so that all can ramp down carbon emissions at the same rate without seriously harming their chances at development, that would be fine. However, this may be seriously unrealistic – even more unrealistic than what I am about to suggest in its place.

A number of thinkers are starting to propose that the only morally conceivable alternative is that the rich countries need to plan that by the year 2050 they will have reduced their CO_2 emissions by **90%**, so as to leave room for the developing countries to slide down a somewhat slower path of CO_2 emissions. The best report I've seen on this – the Global Development Rights Framework, which can be found at www.ecoequity.org – proposes that the developing countries continue a slow increase in fossil fuel use for as much as ten years, while gearing up – with considerable help from the rich countries – for a massive energy transition. They would then reduce their emissions by about 6% a year, while in the rich world's "90% by 2050" scenario (which, by the way, is also Gore's trajectory) the rate of emissions reductions would reach 6.7% annually by 2025. That doesn't look like a great difference – 6% a year in the poor countries vs. 6.7% a year in the rich – but in fact it would lead in the direction of convergence, especially if the rich countries begin to implement their emissions reductions 8 or 9 years earlier, by 2010 or 2011. If this plan were followed, by 2050 the per capita fossil fuel consumption in the rich world, as a whole, would be no more than twice the level of the developing world – a much lower differential than at present.
There are many questions, here, about what is realistic – politically, most of all, but also technologically. On the technological side, it is increasingly asserted that conservation can close something like half of the gap between the current rate of fossil fuel use and the reduction in CO_2 emissions required in the next 40 years. While conservation is doing its share, the evidence I've seen suggests that there is a reasonable chance of accomplishing the rest with renewables like wind, solar, geothermal, sensible biofuels that don't compete with food production and that actually deliver more energy than is used to produce them, and perhaps some technologies yet to be discovered. Nuclear power plants take a long time to bring on line; given their dangers, we're better off using that same lead time in a Marshall-plan-like program to develop the other, safer alternatives.[8] There is also an obvious need for a massive technology transfer, to ensure that the economic development that takes place in poor countries is based on the most efficient and sustainable energy forms. This last seems both economically and politically feasible.

On the political side, it's plausible that the poor countries would accept the proposal just outlined, in which the rich countries undertake a faster, steeper decline in their CO_2 emissions – and it is vanishingly unlikely that they would take on what this scheme asks of them if the rich countries do **not** accept their part of such a deal. In other words, the best chance of bringing developing countries on board for a new international climate change

[8] "Micropower"—the cheap and efficient "cogeneration" of electricity and useful heat together in industry and buildings, plus making energy from renewable sources like the wind, the sun, the earth and small hydropower—emits little or no carbon and is sweeping the market. Micropower, mostly from private power providers but also many utilities, now produces a sixth of the world's total electricity (just beating nuclear power) and a third of the world's annual increase in electricity. In 2005, micropower added four times the global electricity and 11 times the capacity that nuclear added…. New nuclear plants would worsen the climate problem by saving two to 10 times less carbon per dollar, more slowly, than micropower and megawatts."
"How to Fuel the Country While Saving the World." *Newsweek* 2007 downloaded Feb 9 2008 at http://www.newsweek.com/id/80938/page/1

treaty is to lay out a clear path towards per-capita convergence in emissions and/or energy use. The reasons to do it this way are so compelling; this scheme might also have a chance of being accepted in the richer countries, to the extent that they can turn into policy some natural human concerns about the well-being of future generations – and even of our own well-being.

6. Steps toward increasing resilience among the most vulnerable

I have suggested that mitigation activities, by themselves, can be a source of economic growth, of a new kind – I'll return later to the question of whether this kind of growth can be achieved without a reduction in the flows of real goods and services enjoyed by "The 15 percent of the world's population that live in the roughly 40 high-income countries, who use about half the world's energy, produce about half the world's CO_2, and consume about half the world's goods and services." (Baer et all 2007, p. 11) First I want to look a little more into what it will take to adapt to climate change, and to prepare for its dangers.
Activities that will make individuals, communities and societies more resilient must include a great deal of education. Even before that, they need to start with the health and nutrition interventions that will allow people to attain their potential, without being stunted by illness or malnutrition.

In 1978 the World Health Organization mounted an oral rehydration campaign to treat children suffering from previously fatal diarrhea that commonly resulted from contaminated water in poor areas, or in the aftermath of wars and natural disasters. By 1990 oral rehydration packets distributed by UNICEF were saving the lives of a million children a year. This outstanding success is an encouraging reason to believe in the promise of a new initiative, in which Doctors Without Borders is working to introduce, for children at risk from malnutrition, an equally simple, cheap, easily distributed and administered formula (known as Plumpy'nut or Plumpy'doz). Since early childhood malnutrition runs a high risk of stunting an individual's continuing physical and mental development, a major reduction in this scourge would be of great significance. This is the kind of step that is needed – but only one, early-phase step – to make vulnerable people more resilient to catastrophes.

If we could imagine such initiatives being successfully undertaken to address each of the UN's Millennium Development goals, the world would have made a good start on increasing resilience among some of the world's poorest people. At the same time large areas of the world would be well on the way to achieving the human capital that is necessary to achieve the kind of economic development (better named, by the UNDP, "human development") that can support the satisfaction of basic needs in low income countries. But that rosy, long-range view needs to be counterbalanced. There are no signs of the wealthy OECD nations being willing to contribute the less than one-half of one percent of GNP that the World Bank estimated as necessary to underwrite the rest of the Millennium Development goals.

If we stretch our minds to something more ambitious than the very modest Millennium Development Goals, we see that, in addition to the need for nutrition, health and education inputs, and affordable sources of inanimate energy to allow people in developing countries to participate in global communications and education systems, they also need transportation systems – infrastructure as well as energy – that will enable farmers and other producers to

get their goods to markets. And they need huge investments in urban housing and infrastructure, to convert the exploding slums into healthy dwellings.[9]

Those are just a few of the urgent needs that will require financial capital, as well as other inputs. The current system of global capital is one in which the wealthy owners of capital deploy it where they can expect the highest returns, and then use those returns for more wealth creation and consumption – usually not in the poorer countries where they had invested. This system can help in the development and deployment of new energy technologies, but the contribution to other development imperatives that can be expected from only the standard investment approach is much too slow. Nor can we be optimistic about these needs being achieved through government or private aid, given the record of foreign assistance, with so many sorry tales of development aid being wasted or stolen.

However, vigorous climate mitigation programs could improve the lot of the poor if they include really effective sharing of new technologies. If, as seems reasonably likely, mitigation efforts produce continued, significant reduction in the cost of turning sunlight into energy readily usable by people, then tropical areas, which have labored under many disadvantages, generally including scant access to fossil fuels, could benefit from their plentiful supplies of sunlight. We could imagine a post-carbon world, starting by the middle of this century or sooner, in which the rich world uses its wealth to maintain fairly high per capita access to the full range of energy services, with declining fossil fuel use offset by increased renewable sources, along with energy conservation. At the same time, large parts of the developing world would offset their lesser reliance on fossil fuels by rapidly growing capture of renewables, especially solar energy.

This is one way in which mitigation activities in the Third World can provide a grounding for other development achievements. The next section will suggest additional ways in which it is possible to build Third World economic progress into an effective response to the climate challenge.

7. Creating the economic incentives for energy conservation and sustainable technology development

Technology alone will not be enough to get us to the post-carbon world in time. Without very strong incentives neither the technological nor the behavioral changes will come about at nearly the speed that is essential to halt global warming at 2 degrees Celsius. In addition to moral imperatives associated with concern for the future of our children and grandchildren there is a need for price incentives.

The ideal system would be one that imposes costs – **negative incentives** – on rich producers of greenhouse gasses, while providing **positive incentives** that would simultaneously encourage the poor to stop contributing to the problem, while also helping

[9] "Some 1.1 billion people lack access to safe drinking water, 2.4 billion are affected by inadequate sanitation, and 1.4 billion have no power." (Footnote 1 in chapter 6 of World Bank, 2004.) Another commentator notes that

> In Sub-Saharan Africa infrastructure investment and operations and maintenance needs are at least 12 cents a day per person, or $44 a year—a lot given that more than half of the region lives on less than $1 a day….
>
> Needs for infrastructure investment are estimated to range from as much as 9 percent of GDP for low-income countries to 5.5 percent for middle-income countries, with an average of about 7.1 percent for all developing countries. (Estache, 2004, p. 7)

them to rise out of poverty. The breakdown of CO_2 production into two major areas – fossil fuel combustion and forest destruction – provides a convenient, though quite approximate, way of looking toward this. We would make a good start on the combined goals of mitigation of climate change, on the one hand, and healthy economic development, on the other, if we could find a way to raise the cost of burning fossil fuels, while also making it profitable, as well as safe and possible, for people living in and near tropical forests – some of the poorest people in the world – to protect and preserve their ecosystems. These two achievements wouldn't cover all the rich or all the poor, and there is undoubtedly a danger of hurting poor people who are in various ways dependent on fossil fuel combustion – but let's forge on and see where we can get from this start.

The two ideas economists most often raise for using prices to curb fossil fuel use are taxes and carbon trading. Taxes are readily understood: governments can simply add to what consumers pay when they fill up their cars, and electric bills can be enlarged depending on the carbon content of the energy mix that was used to generate the electricity. Carbon trading is more complicated. It is also less politically scary, since politicians have become so fearful of the word T-A-X. And, I believe, it has better potential to accomplish the two goals, of poverty alleviation and climate mitigation, that must be addressed simultaneously.

Without trying to describe in detail the kind of carbon permit trading scheme that could achieve this most effectively, a critical point to remember, in terms of bills now being discussed in Congress, is that carbon permits should not be **given**, gratis, to polluters; permits should be auctioned, and in general they should only be good for a finite period, such as one year. In each successive period, based on a well-publicized, predictable schedule, a lesser number of permits should be sold; as the supply shrinks, prices will rise, and everyone in the economy will be motivated to reduce their use of CO_2 emitting fuels.

A second critical point is that the sale of these permits will generate enormous amounts of revenue. These funds should be used to help those who will suffer most from higher energy costs. Extrapolating from a good analysis,[10] such sales in the U.S. could easily generate enough for an annual rebate of $600-700 for everyone in the bottom three-fifths of this country's income distribution, to compensate for the higher energy costs they will face. That would still leave large amounts available to invest in significant technology development in the U.S., as well as technology transfers to other countries.

Third, in addition to the carbon credits that are bought and sold among firms, nationally and internationally, firms could also receive credit for financing carefully monitored and verified **carbon retention** efforts in their own or other countries. Systems would be established to allow forest dwellers in Africa, or woodlot owners in Arkansas, to sell certificates of sustainable land-use practices. These are practices that do not reduce the amount of carbon stored in the area for which they are responsible; in the most favorable situations, they increase carbon storage. Or a U.S. firm could get credit for installing efficient electric generating equipment in China, replacing highly polluting coal plants.

[10] Boyce and Riddle, 2008, forthcoming. For an analysis of the tax alternative, see a recent paper by Gib Metcalf: http://pdf.wri.org/Brookings-WRI_GreenTaxSwap.pdf. This scheme is on the conservative side: it would not raise enough funds to cover the other critical uses for income received from raising carbon costs, i.e., assistance to low income countries, and support for technology to make the transition to the post-carbon economy. The Boyce and Riddle analysis shares some of these deficiencies; in proposing a more politically acceptable solution, in which virtually all revenues from the sale of carbon taxes would be distributed on an equal per capita basis throughout the United States, it leaves little room for the other critical uses just mentioned.

The fourth critical element in an international carbon trading scheme has to do with the question of into whose hands the receipts would flow when permits, or credits, are purchased from developing nations. To understand this it is important to recognize that the proposed scheme includes two flows of money. One is the flow into the hands of the agency (presumably government) that would sell each year's emission permits. This is what would create the huge hoard of funds mentioned above. Then, however, there is also a second wave of funds changing hands, as some firms find that they need more permits than they were allowed to purchase under the initial allotment, and seek "carbon offsets," or credits, to make up for their shortfall.

As suggested earlier, during the first decade of a "carbon cap and trade" scheme developing nations could receive permits at or slightly above their initial level of fossil fuel use, but by 2020 should be aiming for 6% annual reductions. Developing nations that participate in a scheme which allots them relatively generous quantities of permits in the early years would be able sell some of their permits to firms in industrialized nations. At the same time, rising costs of carbon-based fuels, and assistance in developing alternatives, would make it attractive to move quickly to a non-carbon path for their energy development. In this way there could be two source of funds flowing from the richer countries to the poorer: one could be firm-to-firm trade in carbon permits; the other could be the sale of credits for carbon retention (e.g., in standing forests). The second flow would in some cases go directly to the people who are living closest to the ecology-protecting resource. These funds could support the development of sustainable energy alternatives while also investing in people, institutions and infrastructure to increase their resilience.

8. Two other major considerations for the United States and the world in the 21st century

The preceding sections have focused on specific kinds of policy responses to two critical areas that must be addressed together: development needs and the climate challenge. Now, before returning to the original question, of what climate change will mean for how we live, I will widen the lens to take in two other aspects of the social/economic environment within which people of the 21st century – especially in the United States – will be facing this era of dangerous challenge.

A prevalent image of population growth which has stayed with us from the 20th century now needs to be revised. Close to 50% of the people in the world are now living in countries where birth rates are at or below replacement (Wilson and Pison, 2004). This is the new fact that has not been taken into account in popular, and many academic, analyses. Even without any of the possible mortality effects of climate chaos, there are good reasons to accept the UN's low estimate for global population, which projects that it will peak at 7.7 billion around 2050, and will decline thereafter. (The UN's median estimate projects a 9.2 billion population by 2050.)[11] Even with the lower estimate, it will be difficult to provide food, energy,

[11] Overall, the UN projections have proven close to reality as long as growth was high, but have been slow in recognizing declining birth rates, and resistant to consider the possibility of a demographic "fifth stage" of population decline. In the early 1990s David Seckler discovered that when UN statisticians noted a fertility rate below replacement level they nevertheless based their projections on a "normalized" fertility rate of 2.1% – "because lower rates are not sustainable." (Reported by Seckler in a conversation with Neva Goodwin, 1993.) He circulated several of his papers on this subject, contending that the UN should abandon this practice and that the UN low variant was the best estimate. Recognition of the

education, and productive work for a billion more people than are now on Earth; many environmental groups estimate that we have already surpassed the Earth's carrying capacity. That belief is certainly valid if we imagine a world of 7-10 billion people living according to American standards of consumption. (Cf. the quotation from Diamond in section 5, above.)

It is, as far as I know, coincidental that the present century, in which we reap the whirlwind of 250 years of fossil fuel use, is also the century in which 250-year long demographic trends will be reversed. In the largest view, this coincidence is probably very fortunate. It will, however, pose some additional challenges to economic functioning as well as to social and cultural developments.

Around the world medical, sanitary, and dietary improvements, as well as reduced physical wear and tear from arduous physical labor and exposure to weather extremes, has caused a dramatic rise in longevity over the last two centuries. This, combined with lower birth rates, results in a rising proportion of older people. By 2030 "nearly half of Western Europe's population will be over age 50, with a life expectancy at 50 of another 40 years."[12] Such projections assume, of course, that the advances in overall health that have occurred over the last two centuries will not be rolled back. If life expectancies continue to rise, or are at least do not follow Russia's lead into decline, while birth rates increasingly fall below the replacement level, these projections will be at least roughly accurate.[13] Where development economists and policy makers formerly focused on the economic strains caused by the high youth dependency ratio in countries with a population bulge at the young end, the new concern is for the old-age dependency ratio. (This is normally defined as the number of people age 65 and over for each 100 people age 15-64.)

The aging of the world's population is not only a phenomenon of the West, or of wealthy countries. Because of its one-child policy, China's old-age dependency ratio will be larger than that of the U.S. by about 20 years from now. Pensions and medical and other support for the elderly are looming as possibly China's leading social crisis. By mid-century Italy and Japan, the two countries that now have the highest median age populations (and whose populations, along with that of Germany, have actually started declining in absolute terms), are expected to have about 70 people age 65 and over for every 100 people in the work force. The fastest-growing segment of the population is the number of people age 80

---

possibility of continuing below-replacement rates finally prevailed, and those watching population projections observed a sudden, dramatic drop in UN projections for future world population levels. They continue, however, to project "low, median and high" variants wherein only the low projections fully accept the reality that nation after nation is following the trend to birthrates below the level necessary to replace the current population.

See also Wilson and Pison 2004: "Les Nations unies et les autres institutions élaborant des projections de population font l'hypothèse que la fécondité remontera dans ces pays pour y atteindre à terme le niveau de remplacement ou un niveau légèrement inférieur . Mais dans toutes les projections qu'elles ontpubliées depuis un demi-siècle, les Nations unies n'ont cessé de sous-estimer l'ampleur de la baisse de la fécondité." (p 2).

[12] Harper, 2006, p. 20 Cf. also Aaron, 2006, p. 10.: "In no European nation did as much as 5 percent of the population reach age 65 until the middle of the nineteenth century; in none did 10 percent of the population reach age 65 until after 1930. Now, projections indicate that by the year 2050 more than 20 percent of the population will exceed age 65 in most developed nations, and in several the proportion will approach or exceed 30 percent."

[13] We cannot rule out reversals in longevity which might result from new pandemics, drug-resistant diseases multiplying faster than new drugs, continued increases in obesity and diabetes, or a reversal of the conditions of life (sanitation, diet, work conditions, etc.) that have improved human health. For now, in any case, the trend is strongly toward older populations, and this is the trend I will assume as I attempt, in the last section of this paper, to imagine life in 2075.

and over. In 1950 those older than 80 were a negligible portion of the population in all nations, but by 2050 this cohort is expected to make up to 9.6% of the population in Europe, 7.8% in North America, 4.5% in Asia and 5.2% in Latin America.[14]

On the positive side, the convergence in life expectancies has been one of the most outstanding features of modernity, with the age gap closing faster than the wealth gap over the last half-century. (Wilson, 2006, p. 6) On the negative side, in less developed countries old age is especially likely to be a time of poverty and hardship. Here again the need arises for institutional advances – as well as for economic development among those now suffering from material insufficiency. Public pension systems such as those in the OECD countries are hardly to be found in most of Latin America, where fewer than 20% of older people have pensions, or in Southeast Asia (under 10%) or sub-Saharan Africa (under 5%). (World Bank, 1994)

What does an aging population mean for the economic prospects of any country, rich or poor? For one thing, it seems likely to emphasize the trend toward increasing the expansion of the service sector (e.g., health and social services vs. primary production and industry), which is in any case occurring rapidly in most economies. That might seem like a good thing, given the increasingly evident reasons to reduce consumption of raw materials. However services are not as "dematerialised" as is sometimes imagined: consider the amount of materials that are used and thrown out in a single visit to a doctor's office.

A second implication has to do with the output of an economy in relation to its total population. Over time, it is to be expected that technological innovation will continue to raise labor productivity; nevertheless, the composition of demand, supply and output will inevitably shift as a shrinking workforce produces less output than it would otherwise, while more of a society's resources are directed to the needs of the elderly.

The issue of declining population is relevant for most of the world, but may come last, or not at all, to the United States, as long as it remains a magnet for migrants, whose first and second generations retain high enough birth rates at least to maintain replacement fertility in this country. However, the U.S. population is aging, if not declining. This will add urgency to another set of issue that is especially relevant to the United States.

For some time environmentalists have been talking about the problem of affluent societies "living beyond their means," for example in terms of an "ecological footprint analysis" which compares the actual geographical area that we inhabit to our dependence on crop lands, forest lands, pasture lands, marine and inland fisheries, built space, and lands producing energy. "[W]ealthier nations tend to run negative ecological balances, largely because of the high degree of correlation between affluence (expenditures) and fossil fuel consumption. In regions with more modest energy consumption, on the other hand, a higher percentage of their footprint is associated with food."[15]

[14] United Nations Population Division, 2006; Population Ageing; Table 2, page 6.

[15] Redefining Progresss, p. 9 This paper continues:
"The five nations with the largest per capita ecological deficits (negative ecological balances) are the United Arab Emirates (-213), Kuwait (-146), the United States (-89), Belgium & Luxembourg (-62) and Netherlands (-56). Nations with the largest per capita ecological surpluses (positive ecological balances) are Mongolia (163), Nambia (97), Gabon (96), Mauritania (68) and Papua New Guinea (65)."

We are not only living beyond our means in terms of what our natural environment can produce; the United States, as a nation, is also consuming more than its economic system actually produces. This shows up in three important kinds of deficits: the nation's trade deficit, the U.S. government budget deficit, and excessive spending by U.S. households.

The United States spends an amount equal to 17 percent of GDP on imports, but earns from its exports an amount equal to a bit less than 11 percent of GDP. Thus imports are about 55 percent larger than exports. This trade deficit makes up the lion's share of what is called the current account deficit.[16] As of 2006 the U.S. current account deficit is running at an annual rate of $811 billion, or about 6% percent of GDP. This

> represents well over 1 percent of global GDP and absorbs close to two-thirds of the cumulative current account surpluses of all the world's surplus countries. All of these figures are without precedent. The United States has never run such large current account deficits and no single nation's deficit has ever bulked nearly as large relative to the global economy. At a minimum, such a unique imbalance deserves careful scrutiny. (Summers, 2004, p. 3)

We finance the current account deficit in, essentially, two ways: borrowing from other countries, and selling them our assets. In years to come this deficit will be further magnified by the fact that foreign parties have purchased U.S. bonds as well as ownership shares in firms located in the U.S., since interest and profits paid to the foreign holders of these assets become further outflows of funds from the U.S. current account.
In addition to the trade deficit, another deficit is that run by the U.S. federal government. This deficit has grown in recent years, largely due to huge military expenditures.[17] Annual deficits lead to increases in the amount of debt outstanding, which in turn also increases the draw on the treasury to meet interest payments. The cost of the wars that the country is now pursuing, along with other present obligations, is thus increasingly being left for future generations to pay.

An economic unit runs a deficit whenever its expenditures exceed its income. Besides current account deficits and government deficits, household deficits are a serious concern. A government can, theoretically, maintain a growing debt forever as long as it is not growing larger in proportion to GDP. However, U.S. GDP is increasingly dependent on consumer spending, which has swelled to over 70 percent of the total economy (up from 63% in 1980, according to Economy.com). During this same period the share of the average household's income dedicated to servicing household or personal debt increased from 11 percent to more than 14 percent (Goodman, 2008). Consumer spending grew .5% faster than income for at least the two decades up to 2007. (Levy Economics Institute, 2007, p. 17) U.S. consumers have been borrowing to support a national habit of consumption greater than its production.

---

[16] Much smaller elements in the current account deficit include income paid to foreigners who work in the U.S., and transfers abroad, such as monies paid out in government foreign aid programs.

[17] According to Joseph Stiglitz, "Because the administration actually cut taxes as we went to war, when we were already running huge deficits, this war has, effectively, been entirely financed by deficits. The national debt has increased by some $2.5 trillion since the beginning of the war, and of this, almost $1 trillion is due directly to the war itself… By 2017, we estimate that the national debt will have increased, just because of the war, by some $2 trillion." (quoted by Bob Herbert in a *New York Times* op ed, "The $2 Trillion Nightmare," March 4, 2008, p. A25). This estimate includes the medical costs for returning veterans.

Unlike governments, individuals cannot indefinitely spend more than they have; this fact has been painfully experienced in the sub-prime housing finance crisis of 2007-8. Returning to the patterns of borrowing that were sustained over the last decade is no solution – but that appears to be the goal of those who propose responding to the current recession by a variety of domestic fiscal stimulus packages (e.g., tax rebates, lowering the Federal interest rate). Stephen B. Roach, chairman of Morgan Stanley, Asia, has commented on such proposals by noting that

> Government aid is being aimed, mistakenly, at maintaining unsustainably high rates of personal consumption. Yet that's precisely what got the United States into this mess in the first place – pushing down the savings rate, fostering a huge trade deficit and stretching consumers to take on an untenable amount of debt. ("Double Bubble Trouble," op ed in *The New York Times,* March 5, 2008; p. A23)

The aging of the population, as noted above, is one reason to question whether future generations will be – as economists so often assume – better off than the present. To be sure, the U.S. is "special," because our debts are denominated in our own currency – the dollar – and this may hold off the day of reckoning much longer than would be the case for any other country. Nevertheless, in the half-century-long view of this paper, it seems obvious that, at minimum, foreign lenders will become increasingly reluctant to hold ever-expanding amounts of dollar-denominated investments.

If Americans accept a requirement to live within their means in ecological terms, and at the same time come up against barriers to increasing, or maintaining, their dangerous triple deficits – foreign, governmental, and household – aggregate U.S. consumption (household and government) will have to decline. (For ecological reasons, the decline in consumption – and production – should emphasize resource-intensive output.) The shock waves from such a transition may well so shake the economy as to cause an absolute reduction in overall GDP. This will require considerable readjustment in a world that has come to rely on the U.S. as the "consumer of last resort." These concerns need to be integrated into the question of whether climate change will force people in the rich nations to rearrange their lives so as to make do with significantly less consumption – and whether, at the same time, it will be possible for international equity to be increased by rising levels of material needs satisfaction among the world's poor.

9. What does climate change mean for how we live?

> The renewable economy is more labor-intensive, less capital-intensive; therefore, there should be a net increase in jobs….
> It's going to be a tough century. I think we're in for something of a hard landing, some socioeconomic and ecological shocks. That can bring out the best or the worst in the country. We've already seen, with Katrina, both. We've got to start talking now and creating action that brings us closer together, across these racial lines, across these class lines, so that if things do get rougher, there's a bit more social connectivity and a bit more of a spirit of cooperation. That will create the shock absorbers we're going to need. ("A Van With a Plan: An interview with Van Jones, advocate for social justice and shared green prosperity" by David Roberts, 20 Mar 2007, in the on-line magazine, *Grist*.)

Returning to the implications of climate change, specifically, for material life-styles in the richer regions of the world, I will address the initial question of this paper with reference, again, to mitigation, adaptation, and resilience.

Climate change mitigation will, I believe, require significant life-style changes; the largest question is who will be most affected by these changes. Until the energy transition is complete – maybe as long as 50 years (though some optimistically predict a much shorter time, of 10-20 years) – energy costs will be higher. That will increase the prices for those goods and services that are energy-intensive in their production or transportation. At the same time a more general recognition of ecological limits will bring about other changes in relative prices. A host of natural resources are rapidly becoming scarce in relation to the size and appetite of the human population: these include wood, fresh water, fertile farm land, and many animal and vegetable species. In addition to paying more for a variety of goods, whether as individuals or as tax-payers we will also need to support the cost of gearing up for both conservation and new technology. This can create very large numbers of jobs, but it means that more of the nation's wealth will be allocated to these purposes.

Ambitious mitigation activities may actually increase economic growth, but even if this is not the case the benefits of mitigation are expected to significantly outweigh the costs (Stern, 2006). Mitigation will also cause dramatic shifts in where the economy puts its resources of money and human effort, as well as of materials and energy. These shifts will certainly entail some changes in the allocation of society's product – "who gets what." As will be suggested below, this is an opportunity to move toward a less unequal distribution. If this opportunity is lost, the life-style changes will largely come in terms of reductions in well-being among the poorest members of society.

Adaptation to climate disasters, after the fact, is required when a town or a city is flooded, or crops destroyed, or new diseases roar through a population of humans or domesticated animals. This represents a net loss in wealth, wherever it occurs – though the loss can be spread very unequally, with the poor usually suffering the most. The increase in medical payments, or construction work, that will show up in the national income accounts doesn't make up for the losses in lives, in income, in dwellings, and in livelihoods that follow natural disasters – or that come in the wake of the wars and conflicts that occur when too many people are in competition for too few resources. In the U.S. as well as elsewhere losses from climate disasters will continue to grow, piling further trillions of dollars onto the amounts that climate change has already cost through increased weather instability and extremes (including droughts and wildfires as well as tornadoes, hurricanes and floods[18]). The bottom line here is simply that disasters affecting a whole society make that society poorer.

What about when climate change emergencies occur in poorer countries? It is not so clear that the rich are immediately forced to share their losses. Our response is sometimes an outpouring of charitable dollars, and sometimes we fail dismally in our response, depending on how "charismatic" the disaster is, and how well reported. Either way,

[18] Average yearly hurricane losses in the U.S. have been estimated at $1.6 billion during the period 1950-1989, rising to $6.2 billion a year from 1989-1995. This is compared to losses of $63 billion in the single year 2004 and $165 billion in 2005. "Future losses from catastrophic U.S. hurricanes could rise 70-75% above current losses." (Allianz Group and the World Wildlife Fund, 2006. p. 24) Hurricanes are, of course, only one of the damaging manifestations of climate change; and the U.S. is one of the countries that would have been expected to have been best equipped with such catastrophes.

climate change has already been imposing severe losses on people throughout the world. For example, the World Health Organization estimates that climate change is already causing an additional 150,000 deaths per year and the United Nations indicates that climate change is hampering progress towards the Millennium Development Goals. (WHO, 2008; UNDP, 2008) The impacts of future climate change will fall disproportionately on developing countries as a result of geography, a heavy reliance on agriculture, and limited resources for adaptation (Stern, 2006). The rich countries may pay a little to soften these losses, after disaster has struck, but we also face as yet unknown or unimagined costs, of many kinds, from the possibility that the nightmare scenario, described earlier, could come about.

The creation of greater resilience among the vulnerable can be understood as "pre-adaptation." This is another way of describing economic development. If it were done effectively, with this goal in mind, it would be more successful than most past development efforts. Truly effective development assistance, committed immediately and designed to go as directly as possible to the recipients, would be a good trade-off for the costs of emergency relief that will otherwise be needed later, and for the humanitarian crises, stretching across all political borders, from which it will be difficult or impossible for the rich to insulate themselves. In the short run a program for global resilience will cost money, most of which will need to come from the wealthy OECD countries. The Millennium Development goals are a very modest start on what is required, if people in poor countries are to achieve a minimally decent level of wellbeing. Those goals do not include the technologies and markedly improved education that are needed both for well-being and to mitigate and prepare for, climate change, or the huge requirements for urban and transportation infrastructure,[19]

The depressing fact that such an effort seems hardly more likely now than it has been in past decades is somewhat offset by one encouraging possibility. Namely, that a tradable permit system, established on a global basis, could funnel large amounts of money directly into the hands of people in the Third World in the course of their transition to renewable energy sources, and also to those who are preserving natural resources related to climate change. Some of the individuals directly receiving these funds will be wealthy; others will be poor. Much progress could be achieved toward poverty alleviation and increased resilience if these funds stay in the countries that earn them, with the poor spending their income (from, e.g., forest stewardship and watershed management) on locally grown or produced products, and the wealthier energy entrepreneurs investing in the infrastructure and buildings that will be increasingly profitable to build as more of the population moves out of poverty.

To sum up where we are so far: When we experience extreme weather events, as well as pests and diseases migrating into where we live, and commercially or aesthetically important species migrating out or becoming extinct, then our lives will be poorer regardless of the appropriateness of our after-the-fact response. We will also, for the foreseeable future, be paying scarcity prices for a variety of natural resources that used to be regarded as plentiful.

[19] Right now official development aid from the OECD countries is averaging around 0.3% of GDP (the UN target is 0.7% and the U.S. contribution is only 0.2%). The existing aid is clearly far too little to achieve any of the goals just cited. As a thought experiment, if the wealthy countries were actually to contribute 10% of their GDP to the poor countries this would be equivalent to raising the per-capita income in the latter from $509 (using 2006 World Bank data) to $1,737. This is nearly the per-capita income level in the "middle income" countries ($2,314) such as Columbia, Peru, or Thailand. It is interesting, though perhaps a purely academic point, to note that a shift of 10% of GDP from rich to poor could, theoretically, raise the entire world to a "middle income" standard of living.

It is often noted that GDP can rise because of increasing "defensive expenses," such as rising costs of illness, or responding to climate-related land and property destruction with dikes, or rebuilding, etc., at the same time as relative prices shift. The shift I have been anticipating, as a necessary part of any rational response to climate change, is one in which, at least for a transition period of some decades, energy and materials will become more expensive, relative to wages. The same amount of money might flow through the economy (i.e., no reduction in GDP), but with respect to many consumer goods it would represent less purchasing power. The cost of services, unlike material goods, would rise less, to the extent that a larger portion of their cost goes to paying wages. Education might become a bargain; doctors' visits, concerts, and massages, as well as land restoration and housing insulation, would be relatively easier to pay for than food – especially meat – or snow-mobiles or refrigerators.

The topic of inequality has appeared in this paper mostly with reference to international differences in standards of living. I have suggested a somewhat hopeful image of the future in which post-carbon economic development is encouraged in the poorer nations, while the rich countries devote significant portions of their resources to energy conservation and energy transformation at home, and also assist with adaptation and resilience both at home and (to some extent) abroad.

Within-country inequalities are also of great importance, partly because of their destructive effect on the social cohesion that is important for resilience in the face of disaster; partly for the issues of psychological well-being that will be noted in the next section; and also because hard times are hardest for those who had the least to begin with. A more even distribution of a society's assets reduces that excessive hardship. Goodman (op cit) notes that "Some Americans have so much wealth that they can spend enough to fuel much of the economy. The top fifth of American earners generates half of all consumer spending." If, as I am suggesting, climate change will require a reduction in overall consumption, it seems obvious that the largest reductions should come from this segment, where there is the largest proportion of marginally (or not at all) well-being-enhancing luxuries, as compared to basic necessities and meaningful comforts.

The point just made is a partial answer to the tripartite debate that is now heating up. Various Chambers of Commerce and other conservative economic commentators in the U.S. say that nothing should be done about climate change, for fear of reducing economic growth. Some environmentalists and communitarians say that we should, in fact, embrace a reduction in economic growth, aiming for a simpler life-style in recognition of the finite world in which we live. A third, and growing, body of opinion, recognizing that the economic costs of climate change will greatly outweigh the economic costs of mitigation, has emphasized that mitigation is, in any case, not just about costs; it also represents a program, comparable to preparation for war, that can stimulate the economy. Indeed, as we head into a severe recession in the U.S., some of the best hopes for reducing its pain are to be found in the numerous city and state initiatives that are hiring people in "green" jobs such as building retrofits for energy conservation, green infrastructure, and renewable energy projects.

As in the case of the blind men and the elephant, each of these positions starts from some piece of reality. An inequality lens makes it easier to see that the conservative position is one that looks fearfully at reductions in economic growth which are likely to affect some major areas for traditional investing – a significant source of income for the top 20% of earners to whom Goodman referred. Environmentalists and communitarians embrace such

change as a possible path toward lives that focus on the pleasures of relationships and a reversal of humanity's assaults on nature. The pro-mitigation economists and policy makers see a possibility for better work options for the people who are now losing jobs in auto manufacturing and other rust belt industries. These seismic shifts can create opportunities for broader changes toward a more equal society.

I have suggested ways in which the rich countries might choose to support economic development and energy transition in the poorer nations, but these intentional acts are not, as far as I can see, what will make the most difference to the possibilities we face in our own lives. Any amounts of money we may choose to give in foreign aid or personal charity will, I believe, be dwarfed by a changing cost structure in our own economy, as energy and natural resources become more expensive. Energy will become more expensive, as it has done over the past few years, just because the global demand for oil and other fossil fuels is rising faster than the supply. If nothing intentional is done about this trend, it will simply continue until the world's economies collapse because of climate chaos wiping out cities, causing massive starvation, death by disease, and, very likely, fueling the havoc of war and terrorism. That is not the scenario I have assumed in this paper. Rather I have assumed that some appropriate steps will be taken to raise the price of fossil fuel energy more steeply that will occur through market mechanisms alone. These steps can, and should, be taken in ways that will reduce spending power, especially among the more affluent in wealthy countries, while fostering economic development elsewhere.

When such a scenario is in place, an individual who has found it necessary to spend more of her money on energy conservation measures, including perhaps decreasing the space she inhabits, eating less meat, and traveling less, may find herself asking, "where has the rest of my money gone? Why is everything so much more expensive, in relation to my income?" The answers will include the following:

-- Some of your money is paying wages to people working in energy conservation and green energy businesses. (Of course, if you are one of these, you may be a net beneficiary.)

-- Some of the diminished purchasing power results from inflation; it is being absorbed in higher prices to energy producers or sellers, who (in the fast-approaching carbon-constrained world) must use part of your purchase price to purchase carbon permits. Energy producers and/or sellers also send part of what they get from you to firms or individuals, in this country or abroad, who have credits to sell because they are ahead of the curve in conserving energy and in preventing the release of additional greenhouse gases.

-- The biggest impact, however, is that many things are more expensive because energy is a component of so much that we buy. As long as energy prices remain high – until the energy transition is complete – the relation between wages and other things will continue to go in the opposite direction from what we have experienced over the last 250 years, when human labor kept commanding a higher price (wage) relative to everything else, because progressively cheaper energy made virtually everything else cheaper.

You may or may not take some comfort from the fact that the scenario I've outlined – which is the most hopeful one I could imagine – includes some degree of convergence between the rich and poor countries of the world. It has included a partial convergence in per capita use of fossil fuel energy, so that by 2050 the much decreased per capita fossil fuel use in rich countries is only twice that in poor countries. The use of all energy sources might

converge as well, if the tropical countries can benefit from their great amount of solar energy income. I've also suggested that the rich will feel squeezed by the rise in energy and other resource costs, while I have hoped that there will be enough benefit to the poor (in wealthy countries as well as around the world) from an appropriately designed carbon trading system that they will be able to build human, social and institutional capital to help protect them against climate disasters. Convergence, thus, means that the material standards of the rich will be declining in absolute terms, while the conditions for the poorest people of the world – especially, the 40% of the human population who now subsist on less than $2.00 a day – will be rising.

I conclude that the reality of climate change, along with the increased proportion of elderly persons in virtually all countries, and the special problem for the United States of its triple deficit, will require down-shifting by the rich, one way or the other. This will be either as part of an intentional scheme that, as a side-effect, gives the poor nations some chance to catch up, or as the consequence of continuing business as usual until our choices have been very severely restricted. To suggest a positive view on how the "down-shifting by the rich" scenario might be a good thing for the rich as well as for the poor, I will offer some comments on the possibility that well-being can grow even while we buy less stuff.

10. The dissonance between growing consumption and increasing well-being; corporations as producers of the one, but not the other

> Evidence from the human happiness literature strongly suggests that our current expenditures fail to take full advantage of the opportunities available to us. Roughly speaking, the problem is that we work too many hours, save too little, and spend too much of our income on goods that confer little additional satisfaction when all have more of them. (Frank, 2007, p. 103)

The fascinating, fairly new field which calls itself hedonic psychology (also known as happiness studies) has established strong evidence for a set of propositions that to some may sound like simple common sense, but that are directly opposed to some basic assumptions in standard economics. These propositions[20] include the following:

- People who have insecure access to the basic requirements for survival suffer reduced well-being, by any standard. However, for the people who live securely above poverty, the influence of wealth or consumption on their happiness is largely a relative matter. To the extent that their comparison group is their neighbors, only some people can derive their happiness from superior wealth, while others must suffer from having, relatively speaking, less. On the global level, as more of the human population takes wealthy Americans as their comparison group (through, for example, TV shows), there is reason for ever-growing dissatisfaction throughout the world. However a reduction in global inequality would reduce such comparison-based dissatisfaction. (See note 20, below.)
- Individual increases in material wealth do not raise the happiness of the whole society; indeed, hedonic psychology research has produced evidence from Japan and the U.S., where the standard of living has risen greatly since the 1950s,

[20] See, for example Kahneman et al, 1999; Lane, 1991 and 2005; Diener et al, 1995 and 2000; and Veenhoven, 1993

showing no increase – if anything a decline – in the happiness of the population as a whole.[21]

- Wealth very much beyond basic needs, when it belongs to and is spent on behalf of individuals, operates within a zero-sum game wherein success by a few creates, among the rest, hopeless wishes for emulation, and overall well-being is not increased. By contrast, wealth that belongs to, and is spent on behalf of, a whole society can be used to promote public goods such as environmental protection and restoration, to protect the well-being of future generations. For a given level of resources, more equal societies are psychologically and practically better able to cope with emergencies; moreover, if a cultural norm of equality promotes the more use of resources for public goods, less for private status consumption, they will be happier. (See Frank, 1999, 2007.)

Human well-being – the ultimate purpose of any economy – is not only tied to what people *have*, but also to how they feel about it, and what they do with it. Leisure to enjoy the riches that advanced economies have accumulated in the last century is becoming one of the most significant scarce resources; for many, well-being will be better served by more *time* than by more *products*. This gives credibility to a scenario in which some systems of production and consumption could be modified to produce less output (thereby mitigating climate change) but more well-being. As David Korten points out,

> We can reallocate from military expenditures to health care and environmental rejuvenation. From investing in suburban sprawl to investing in compact communities and reclaiming forest and agricultural land. From advertising to education. And from financial speculation to local entrepreneurship. . . There is potential to conserve or free up enormous social and environmental resources with sensible policies — all with the potential to improve the quality of our lives. A significant reduction in per capita energy consumption in rich countries … would mean less commuting time, better insulated homes that require less maintenance, more organic, healthier, tastier, locally grown food, etc.
> (Personal communication, Feb. 6, 2008)

As we go forward in the trials and transitions of the coming decades, a major challenge will be to devise systems that can encourage production of those goods and services that do most to enhance well-being, while taking cuts in types of production that are, from this perspective, less important. Markets have not yet shown much ability to discriminate between more and less well-being-promoting outputs. Markets, today, are

[21] Diener, et all, 1995. In contrast, recent findings by the Gallup Poll do find a continued rise in reported satisfaction as national wealth increases. Andrew Deaton interprets these findings thus:

> …when asked to imagine the best and worst possible lives for themselves, points 10 and 0 on the scale, people use a *global* standard. Danes understand how bad life is in Togo and other poor places, and the Togolese, through television and newspapers, understand how good life is in Denmark or other high-income countries.
>
> Such an interpretation is also consistent with Easterlin's conclusion that the "best possible life for you" is a shifting standard that will move upward with rising living standards. Thus, we might expect the Danes to continue to maintain an average rating of 8 as national income rises, provided they stay in the same position in the global income rankings. If this interpretation is correct, it would be an indication of how much the globalization of information has affected the perceptions of populations worldwide – because the consistently high correlation between income and satisfaction could not have existed in its absence. (Deaton, 2008)

The differences between the Gallup findings and others may result from the different questions asked. Gallup asked people to imagine kinds of lives they might aspire to, while the usual question in hedonic psychology inquires about the individual's satisfaction with his or her life.

dominated by corporations. A major question will be whether the corporate form, with its motives all lined up toward short-term profitability, can be revised or redesigned so that well-being is incorporated within its goals.

Corporations are examples of the many institutions that will need to be re-thought, or invented, from the most local to the fully global level. For the next half century or so, until the energy transition away from fossil fuels is complete, much attention will need to be given to creating, monitoring, and improving institutions to handle the recycling of monies from carbon emitters to the owners of the atmospheric commons who are most harmed by these emissions. A time will come when that potential source of wealth transfer will have dried up – a time much to be hoped for, because it will mean that the energy transition has been achieved.

Compared to this institutional challenge, right now redesign of the institution of the corporation may not seem so critical. However the long term success of the human race will be much endangered if corporations continue to be, as they are now, the world's most powerful group of institutions, and if their motivations continue to drive them to strive short-sightedly for economic growth as it was defined in the 20th century. That model has motivated corporations to act vigorously to blind consumers to the realities of what makes for a good life – e.g., drenching the culture with messages suggesting that all troubles can be solved by going shopping, and elevating money-dependent status to the highest cultural goal. If we want to imagine how the human race may emerge from the present time of looming crisis and danger to a more hopeful future, a critical part of this imagining will need to be a way of instilling in the most powerful institutions a clear orientation to immediate and long-term human well-being. Conversely, institutions that lack such an orientation should not retain the ability to shape human desires and the resulting culture.

11. The world of our grand- and great-grand-children

This paper has talked about a period of transition – a long period, probably 50 years or more. It is reasonable, in concluding, to pose the question: what is this a transition *to* – where does the human race come out? I will take a long leap in imagination, to the year 2075, to suggest how the world might look at that time – supposing that both the projections and the prescriptions laced through this paper turn out to be pretty close to what happens. (2075 is not, of course, the end of change; but it is as far as I can stretch.)

I will start by saying that this is going to be a very optimistic view – but will then hasten, in the next three paragraphs, to get through a partial list of the losses and tragedies that humankind and the Earth will have sustained.

Many species of other creatures will have become extinct; probably the best we can hope for (a very sad best) is that the diversity of flora and fauna will be reduced by no more than a quarter or a third. Many ecosystems will have been severely disturbed, through changing temperature, weather patterns, and the accompanying movement as well as loss of species. The 20th century saw unwelcome invasions of many transplanted species – including new parasites and diseases – into both natural areas (such as lakes, meadows, forests) and areas of human habitation. By 2075 it may be possible to feel that the human race is catching up with, and learning to protect itself from, the unwelcome new arrivals, while

adjusting to the losses. Ecological change will not have ceased, but it will no longer be so shocking, and will perhaps not be so rapid.

Another category of loss will be lands and structures. A modest projection sees about a foot of sea-level rise by this time, with more on the way, because this is a process that seems likely to unfold over centuries.[22] (The other possibility, which I will not try to encompass here, is that it will be much more abrupt, with much more sea level rise having already occurred by 2075). Shore properties, including many airports and other portions of cities, as well as the most vulnerable islands, and significant portions of some nations, will either have been lost to the ocean, or will be precariously protected by ever rising dikes, dams and levees. Assuming that the sciences have been strengthened, not weakened, by the catastrophes they tried to predict and prevent, by 2075 virtually everyone on Earth will have access to good projections of what more to expect in sea level rise, and how soon to expect it. Individuals, governments, and institutions (such as insurance) will be interacting with coastal areas based on a much more precise understanding of this kind of risk (among many other climate risks).

The kind of loss that is hardest to write about is what the people of 2075 will see when they look back at the deaths caused directly by extreme weather events, and indirectly by disease, war and other human violence, by hunger, and by the perils of long-distance migration. There will be a record of human misery in the middle half of the 21st century that I will not try to write of here. It will linger on as a trauma of the human species, likely even greater than the traumas of the holocaust of the 1940s and the genocidal violence that exists today.

It is too painful to try to extrapolate directly from the above about the size of the human population in 2075. However, as noted in section 8 above, there are a variety of reasons to believe that the population will not be above the UN's mid-range estimate of 9.2 billion, and may be well below that, and on the decrease.

The picture painted so far shows 2075 as a time of recovery from economic, social and psychological traumas, including a vivid awareness, on the part of all people, of the destruction that flowed from the behaviors that were based on the materialistic, commercial goals and values, and the ecological ignorance, of the 20th century. It will also be a time for adapting to changed and changing age profiles, as well as the roller-coaster changes in relative prices that began in the early part of the century, where we are now living. These realities will strongly affect human goals, values and behaviors.

A sustainable socio-economic system will be a critical goal for the people of 2075. A good example of how that must work can be suggested in an image of the system that will

---

[22] The loss in summer of all eight million square kilometres of Arctic sea-ice now seems inevitable, and may occur as early as 2010, a century ahead of the Intergovernmental Panel on Climate Change projections. There is already enough carbon dioxide in the Earth's atmosphere to initiate ice sheet disintegration in West Antarctica and Greenland and to ensure that sea levels will rise metres in coming decades. (Greenleap and Carbon Equity, 2008.)

The Allianz Group and the World Wildlife Fund (op cit.) make the more moderate (but not necessarily more correct) projection of global sea level rise increasing "by a minimum average of 0.28 m in this century". They add that

> Even small amounts of sea level rise contribute to increasingly dangerous storm surge and more vulnerable levee systems as was seen in New Orleans in 2005. Over the next five centuries, catastrophic sea level rise of up to 6 m could inundate many U.S. coastal cities, and large portions of coastal states.

provide food from the land for the people of that time. Sustainably managed farms will replace some of the physical inputs of agribusiness (chemical weed and pest killers, heavy machinery) with human inputs of time, intelligence and technology (appropriately selected seeds; carefully timed, just-enough applications of water and organic fertilizer; hand-eradication of pests; excellent information on weather predictions as well as on demand conditions for various crops, etc.). The people who do such farm work will require more education than has been assumed for farm laborers of the past. For educated people the choice of farming as a profession competes with other possibilities; it will not be chosen if, as has been true during most of human history, it is a back-breaking, no-leisure-time, low-paid activity. This suggests that farm workers will be relatively better paid than they are today. Food will then become relatively more expensive, requiring considerably more than the 13% of household income that is normal in the U.S. today (but that is very low by the standards of the rest of the world).

In the most hopeful scenario I can imagine for 2075, the goal of sustainability will be accompanied by goals of equity and equality. Earlier I had mentioned the two centuries it would take for African GDP per capita to catch up with Western averages, supposing the latter did not grow. The more important point, in talking about convergence, is not a question of GDP, but is rather a matter of the throughput for which each person is responsible, as well as the amount of ecological damage attached to that throughput. Solar energy, in itself, can represent a benign form of energy throughput. Imagine solar energy being used to pump sea-water into holding areas for desalinization, which is also accomplished with solar energy. If the fresh water produced thereby is used in a sustainable agriculture system; if the plant and animal (including human) wastes resulting from growing and eating food are returned to the soil, without introducing toxic chemicals or other elements; and if the land and water area used for all the elements of this production cycle do not remove or damage habitats needed to preserve an acceptable balance[23] of humans and other species – then this describes a set of basic economic activities whose throughput has little or no negative ecological impact.

Contrast any economic activity that removes carbon-sequestering plant material without replacing it; or otherwise generates greenhouse gases; or releases toxins to diffuse in soil, water, or air; or establishes land use patterns that degrade the land's overall value to people and other creatures. These are patterns of activity that can only be replicated up to a point without tipping the ecological balance in a way that will, in the short or the long run, reduce human well-being. These are unsustainable activities. The rich populations of the world have been living lives based on patterns of economic activity that would be totally unsustainable if replicated by all the people on Earth – that are, indeed, unsustainable even within the populations now living this way.

To bring this discussion back to the year 2075: drawing on all the foregoing, my best hope for the people of that future time is that, even while they look back on a terrible period of loss and adjustment, they will be making good use of the following possibilities:

- The human population, which probably surpassed the Earth's carrying capacity sometime in the 20th century, is now declining in numbers, while its age

[23] Defining such an "acceptable balance" is one of the hardest of all tasks; I will not attempt it here, but leave the words as a place marker for a consideration that must not be ignored.

profile is heavily weighted toward the elderly.[24] For some time yet individuals will feel that the human population is still above a sustainable level, and will respond as they have in Russia,[25] Japan, Italy, and many other countries where fertility rates below the level necessary to replace the existing population have emerged out of individual decisions, and often in spite of government efforts to the contrary.[26]

- The destructive impacts of climate change will have hit hardest in tropical areas, small island nations, and other areas where poverty has made adaptation most difficult. At the same time, the energy transition may have been accompanied by substantial flows of resources and technology from the rich to the poor world. This, combined with humanitarian impulses and some self-interest, may have worked to reduce the world's worst inequalities in material well-being; as the rich world reduced its throughput, and its materialist aspirations, the developing countries may have found ways to improve the health, education, and material well-being of their people.

- The energy transition will have occurred quite successfully by 2075, so that energy for most uses is no longer expensive, and virtually all of the people of the world have access to energy from inanimate sources in amounts that are not much less – and may even be more – than the amounts of energy used today by people in the wealthy countries. Those who have lived through the previous period will have experienced a number of shifts in relative prices – first making energy and many material goods very expensive relative to the income people could expect to earn, then lowering the price of energy, allowing the world's many belt-tighteners to draw a deep breath. However the products of the natural world – the food, fuel, minerals, etc. whose prices, as "commodities," plummeted throughout the 20th century – will be re-valued at levels representing the full, long-range cost of their extraction, processing and re-insertion into nature, or else their re-cycling within the production process.

- With wide recognition of the dangers of resource overuse, cheap energy will not tempt people and societies back to the profligate resource use of the 20th century. Much of the low-hanging fruit in energy and materials conservation will already have been plucked by 2050. While human ingenuity will continue to find ways to "do more with less" (to quote the 20th century visionary, Buckminster Fuller), the bottom line will be that everyone will need to accept life-styles that require reduced throughput of materials, probably of energy, and also of human labor (given population aging).

[24] If or when the populations stabilize at some level, and if life expectancy is consistently high, demographers would expect population profiles, after a few generations, to settle down in a "rectangular" pattern, in which all age cohorts are of roughly the same size.

[25] The Russian Federation, suffering from the special conditions of a poorly managed transition from socialism to a market economy, has a population in rapid decline; from a high of 148 million in 1990, it has fallen to 143 million today, with projections showing it sinking to 112 million by 2050 – a decline of nearly 25% in 60 years. The sharp decline in births in Russia since 1990 creates a shrunken cohort of children and youth who will find it virtually impossible – no matter what incentives the government offers – to replace in one or two generations the much larger cohort of Russians now in the workforce, as the latter retire and die. While this is a nearly unique record since the start of the demographic transition in the 18th century (the only comparison that can be made is to Ireland during the potato famine of 1845-6), we may see similar patterns, for different reasons, in other countries in the 21st century.

[26] Economists have long assumed that the reason for declining birthrates in some parts of the world was economic development, especially when it results in urbanization and education and job opportunities for women. These are clearly relevant, but in cases like Russia, or in many still very poor countries that are rapidly reducing their birthrates, the larger cause may be the sense of angst that comes with a conscious or unconscious awareness of the misfit between human beings and their environment.

Aspirations to live in the style of Americans at the beginning of the 21st century are off the table for virtually everyone – including Americans.

- The previous 50 years will have been times of tremendous institutional experimentation and reform. Some institutions for global governance will have been created. If corporations have not managed to redesign themselves to orient toward the promotion of human well-being, then the corporate form will have been replaced with other modes of production: co-operatives, local trusts and other not-for-profit organizations, and perhaps other forms not yet discovered.

These realities will inject into cultures of the year 2075 a number of critical lessons:

- To stop poisoning the oceans with run-offs from agriculture and other land uses.
- To use fresh water sparingly and wisely, so that stores of fresh water can begin to recharge, and are not polluted by human agency.
- To cherish and protect land and water ecosystems, looking forward to a gradual reversal of the process by which more and more of the surface of our planet has been taken over, and made over, for human uses.
- To value food, and the growing of it, so that, while food production will be more labor-intensive than the factory farms of the United States today (where less than 1% of the labor force is enough to feed our entire population), farm workers will be relatively better paid than they are today.
- To value the integrity of language, culture, and arts, and to resist their pollution by advertisers whose goal of selling more goods or services is not well aligned with the healthy development of human beings as individuals or as members of society.
- To revise expectations, behaviors, policies, and theories, to assist declining populations to adapt to a changing age profile. One important challenge is to discover how the elderly population can be more of an economic and cultural resource than a drain; this is desirable from an economic point of view, and also in terms of the psychological well-being (sense of meaning and purpose in life) of the elderly.
- To express the value of leisure by making it easy for those who want it to have a shorter work week, recognizing that this is a trade-off. High status will not automatically go to those who make the other choice – of less leisure and more stuff.

In section 10 of this paper I summarized some reasons to believe that we could preserve or improve levels of real well-being even while making changes in consumption patterns, with greatly reduced throughput of energy and materials flowing through the chain from extraction to production to packaging, transportation, sale, consumption, and finally to disposal. The throw-away society that developed in the 20th century externalized huge costs onto the environment and onto the people of the future. The people of 2075 will still be picking up those costs – will perhaps, less figuratively, still be picking up our trash. Not using plastics, because they end up in the oceans, ground into non-biodegradable fragments; using wood sparingly, to allow forests to regenerate; using less chemical fertilizer and more intelligence – all of these choices will come with a different kind of cost. These costs sum up to a sizeable shift in relative prices, in which many materials become more expensive. The

era of expensive energy may be past or passing by 2075, but the lessons of frugality, and of how to live a better life with less work, less income, and less stuff will, I hope, remain.

Neva Goodwin is co-director of the Global Development and Environment Institute, www.gdae.org.
She holds a Ph.D. in economics from Boston University. Inquiries can be directed to Neva.Goodwin@tufts.edu

References

Aaron, Henry J. 2006. "Longer life spans: boon or burden?" *Daedalus*, Winter issue.

Allianz Group and the World Wildlife Fund, October 2006, "Climate Change and Insurance: An Agenda for Action in the United States".

Baer, P., T, Athanasiou, S. Kartha, 2007, 'The Right to Development in a Climate Constrained World: The Greenhouse Development Rights Framework.' At www.ecoequity.org.

Barnes, Peter (2006) *Capitalism 3.0: A guide to Reclaiming the Commons.* San Francisco, CA: Barrett-Koehler Publishers, Inc.

Boyce, James K., and Matthew Riddle, 2008, "Cap and Rebate: How to Curb Global Warming While Protecting the Incomes of American Families," in Jonathan Harris and Neva Goodwin, eds., *Twenty-first Century Macroeconomics: responding to the Climate Challenge.* Edward Elgar, forthcoming.

Chang, Ha-Joon 2007, *Bad Samaritans: The Myth of Free Trade and the Secret History of Capitalism.* Great Britain: Random House Business Books.

Cobb, Clifford, Ted Halstead and Jonathan Rowe, 1995, "If the GDP is up why is America down?" *The Atlantic Monthly*, Oct. vol. 276(4):p. 59.

Deaton, Angus, 2008, "Worldwide, Residents of Richer Nations More Satisfied" February 27, http://www.gallup.com/poll/104608/Worldwide-Residents-Richer-Nations-More-Satisfied.aspx

Diener, Ed, Marissa Diener and Carol Diener,1995, "Factors Predicting the Subjective Well-being of Nations," *Journal of Personality and Social Psychology*, 69: 851-864.

Diener, Ed and Shigehiro Oishi, 2000, "Money and Happiness: Income and Subjective Well-being Across Nations" in Diener and E.M. Suh, eds., *Subjective Well-being Across Cultures*. Cambridge, MA: MIT Press.

The Environmental and Energy Study Institute, February 2, 2008, "An Uncertain Future: Law Enforcement, National Security and Climate Change," at www.eesi.org.

Estache, Antonio, 2004. "Emerging Infrastructure Policy Issues in Developing Countries: A Survey of the Recent Economic Literature." Background Paper for the October 2004 Berlin meeting of the POVNET Infrastructure Working Group.

Frank, Robert, 1999, *Luxury Fever: Money and Happiness in an Era of Excess*. Princeton, NJ: Princeton University Press.

Frank, Robert, 2007, *Falling Behind: How Rising Inequality Harms the Middle Class*. Berkeley, CA: University of California Press.

Goodwin, Neva, 1994, "Commentary: A Range of Predictions for the Future" in *Ecological Economics*, May; pp 15-20.

Peter S. Goodman, "Economy Fitful, Americans Start to Pay as They Go," *New York Times*, Feb 5, 2008, p. A21.

Greenleap and Carbon Equity, "Climate Code Red," summary, downloaded from http://www.climatecodered.net/ Feb. 17 2008.

Harper, Sarah, 2006, "Mature societies: planning for our future selves." *Daedalus*, Winter issue.

Homer-Dixon, Thomas, 1994, "Environmental Scarcities and Violent Conflict: Evidence from Cases." *International Security*, vol. 19, no. 1 (Summer) pp. 5 - 40.

Homer-Dixon, Thomas, 2001. *Environment, Scarcity, and Violence*, Princeton, NJ: Princeton University Press.

Intergovernmental Panel on Climate Change (IPCC), April 2007, "Summary for Policymakers" in: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, by M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge, UK: Cambridge University Press, 7-22.

Kahneman, Daniel, Ed Diener and Norbert Schwarz, eds., 1999, *Well-being: The Foundations of Hedonic Psychology*. New York, NY: Russell Sage Foundation.

Kitzes, Justin, Mathis Wackernagel, Jonathan Loh, Audrey Peller, Steven Goldfinger, Deborah Cheng and Kallin Tea: "Shrink and Share: Humanity's Present and Future Ecological Footprint" forthcoming in *Philosophical Transactions of the Royal Society.*

Lane Robert E., 2005, *After the End of History: The Curious Fate of American Materialism*, Ann Arbor, MI: Michigan Press.

Lane, Robert E., 1991, *The Market Experience*; Cambridge University Press.

Redefining Progress, *Footprint of Nations, 2005 Update*, at www.RedefiningProgress.org

Stern, Sir Nicholas, 2007, "Climate Change, ethics and the economics of the global deal" 30 November, at VoxEU.org

Stern, Sir Nicholas, 2006, *The Stern Review Report on the Economics of Global Climate Change* ,http://www.hm-treasury.gov.uk/Independent_Reviews/stern_review_economics_climate_change/sternreview_index.cfm.

Summers, Larry, 2004, "The U.S. Current Account Deficit and the Global Economy;" Per Jacobsson Foundation lecture; at http://www.perjacobsson.org/2004/100304.pdf

United Nations Development Program, 2007, *Human Development Report 2007/2008, Fighting Climate Change: Human Solidarity in a Divided World.* UNDP, New York.

United Nations Development Programme 2006, *Human Development Report 2005: International Cooperation at a Crossroads*. UNDP, New York

United Nations Population Division, DESA; *World Population Prospects: The 2006 Revision*

Veenhoven, Ruut (1993) "Happiness in Nations: Subjective Appreciation of Life in 56 Nations 1946-1992". Rotterdam: Erasmus University, RISBO Press.

Wilson, Chris, 2006, "The century ahead." *Daedalus*, Winter issue.

Wilson, Chris and Gilles Pison, 2004. “La majorité de l’humanité vit dans un pays où la fécondité est basse” *Population & Sociétés*, No. 305, October.

World Bank, 2004 *Global Development Finance.*

World Bank, 1994, “Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth,” World Bank Policy Research Report. Oxford: Oxford University Press, 1994.

World Health Organization, 2008. Health and Environment Linkages Initiative, Policy Brief, http://www.who.int/heli/risks/climate/climatechange/en/index.html

.

SUGGESTED CITATION:
Neva Goodwin, “An Overview of Climate Change”, *real-world economics review*, issue no. 46, 20 May 2008, pp. 110-135, http://www.paecon.net/PAEReview/issue46/Goodwin46.pdf

The unhappy thing about happiness economics

Helen Johns and Paul Ormerod [Volterra Consulting, UK]

Introduction

Happiness economics has generated an entire new academic industry. Over 10,000 articles have now been published on the concept of happiness, or subjective well-being (the two terms are used interchangeably).

Surveys on the levels of happiness reported by individuals have been carried out over a few decades in most Western countries. The recorded levels of happiness fluctuate from year to year, but in general there is no trend, either up or down. Over the same period, average material standards of living, measured by real gross national product (GNP) per head, have shown a very clear upward trend.

This finding is repeated endlessly and appears to have made an impression on many people. We see the level of happiness over time rumbling along showing no trend. In contrast, there is GNP per head bounding ahead, soaring into the stratosphere. Surely this proves that economic growth is not making us happier?

Time series data show that nations do not get happier over time as they get richer. In contrast, happiness is positively correlated with individual income within a given country at any point in time; the rich generally report greater happiness than the poor. This, the so-called Easterlin paradox, named after the doyen of happiness studies, Richard Easterlin, is also discussed at length in the happiness literature. An implication which is widely drawn is that if we do not get happier as we get richer, this effect must be due to the pernicious psychological effects of inequality.

In conjunction, these findings have been used as the basis for wide reaching policy recommendations. For example, taxation should be more progressive, and indicators of self-reported happiness should be used in formal government policy appraisal, to supplement or even replace economic indicators.

The fact that measured happiness has not increased over decades is viewed by some commentators as indicating a flaw in our society which must be corrected through government intervention. As increasing happiness is a self-evident good, who but the most irredeemable misanthrope could object to such an end?

But scepticism about the use of happiness evidence in policy-making does not mean that the holder of this view is automatically a fanatical believer that economic agents always behave rationally, or that maximising GNP is all that matters. Or, for that matter, that inequality is an irrelevance and we should revive Victorian workhouses for the poor. Neither of us believes any of these things. The question for us is the scientific validity of happiness research, most specifically any findings based on time series.

There are at least two alternative interpretations to the mainstream view that happiness has remained flat over decades because economic growth does not make us happier. First, we could conclude from this flat trend that attempting to improve the human lot

through any policy – not just through pursuing economic growth - is entirely futile. Second, and alternatively, that happiness data over time shows little movement because it is an extremely insensitive measure of welfare.

We argue that the evidence points to the latter. This can be demonstrated both from empirical reasoning and by examining the mathematical properties of the measure itself.

Above all, we argue that average happiness time series are, by construction, incapable of conveying useful information on the level of overall social wellbeing, and their use should therefore be rejected by policy-makers and social scientists.

Why time series data on happiness tells us nothing

First of all, the lack of correlation over time between measured happiness and the size of the economy, so widely mentioned, is a wholly misleading argument. This lack of correlation extends to a wide range of variables, a fact which attracts far less publicity.

.

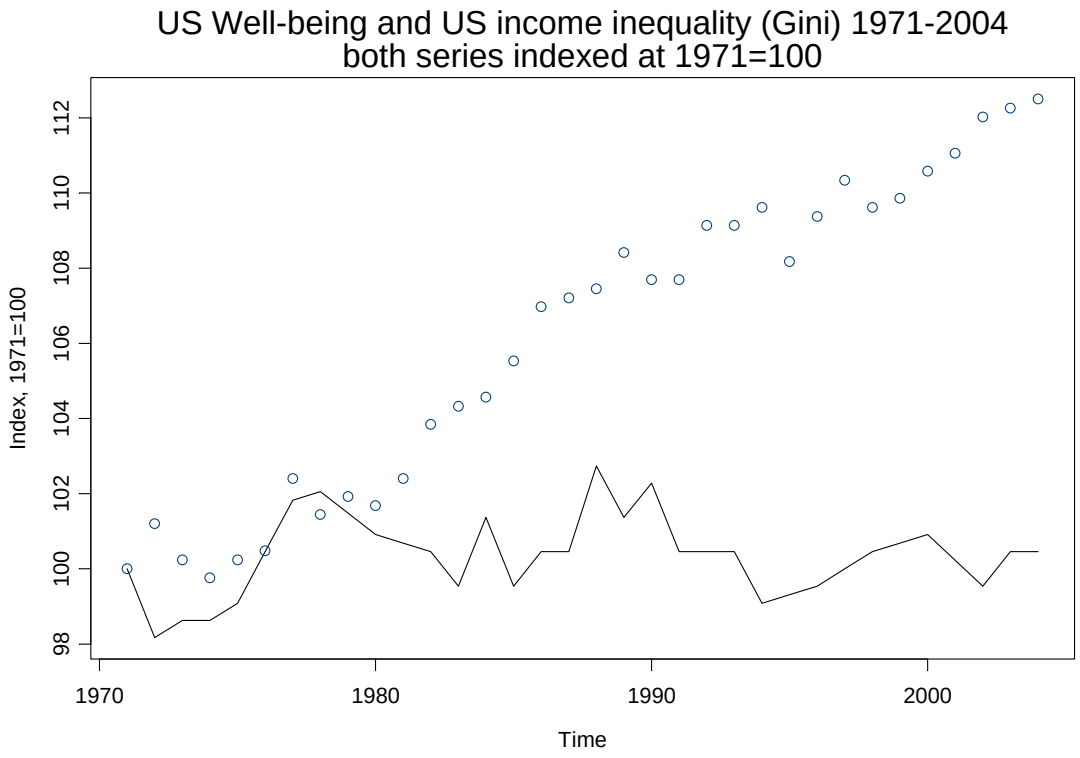


Figure 1: *US well-being and Gini coefficient 1971-2004, both indexed at 1971=100. Solid line is well-being, dotted line is the Gini coefficient*

For example, using UK data from 1973 onwards, there is no correlation between self-reported life satisfaction and either real current public expenditure or lower hours of work. In the US, life expectancy for whites rose from 72.0 years in 1972 to 78.0 in 2003. For blacks, the increase was even higher, from 64.6 to 72.7, representing not merely an absolute rise, but a narrowing of the gap with whites. Gender inequality as measured by the median earnings

of women compared to men has fallen sharply. In 1972, women earned 58 per cent of men, rising to 75 per cent in 2003. Yet there was no correlation between happiness and any of these improvements.

In fact, dramatic rises in inequality in both the United States and UK had no impact on happiness, as shown for the US in Figure 1

This chart seems to rather undermine the emphasis which many happiness advocates place on the adverse effects of inequality on happiness. Most emphatically, this is not to say that inequality cannot possibly have adverse effects on individuals; there are much more soundly based scientific findings which show this in areas such as health, for example. But this is a clear case where the concept of well-being confuses rather than clarifies the issue.

Wide publicity has been given in the UK to the apparent large rise in the number of depressed people in the population. Indeed, the government has taken note and is investing large sums to try to deal with this problem. However, the UK happiness data show no signs of reflecting the claimed increase in depression. This is surely something which, if it is correct, must show up in the happiness data.

So there is no correlation in time series data between reported happiness levels and a whole series of factors which might reasonably be thought to affect well-being: income, public spending, longevity, gender equality, income inequality – even the incidence of depression in a population.

Indeed, if we were to attach any import to this evidence, we would be forced to conclude that measured happiness shows that sixty years' economic and political labours of all descriptions since World War Two have made no difference to the welfare of the citizens of the Western world.

However, in examining the reasons why average happiness is flat it is important to examine the way in which happiness is measured. People are asked to register their level of happiness on a scale of *n* categories (e.g. 1 = ‘not happy’, 2 = ‘fairly happy’ or 3 = ‘very happy’). These numbers are then averaged over the population to gain an overall happiness score. Discrete categories mean that people have to undergo large discrete change in their happiness in order for this to be registered by the indicator; and once they have reached the top category they officially can’t experience any further increase in their happiness. As a consequence, noticeable changes in average happiness can only come about through substantial numbers of people moving category.

As a general rule, if the happiness of 1% of the population (net) increases enough for them to place themselves in the next category, the average happiness score increases by 0.01. For example, happiness surveys on a 3-category scale in the US typically yield an average happiness of about 2.2. In order for the measure to undergo a 10% increase, 22% of the population would have to undergo a substantial enough increase in their happiness for them to shunted up to the next category.

It is very difficult to think of a set of circumstances in which 22% of the population would find themselves moving from, say, ‘fairly’ to ‘very’ happy over the space of a few years, particularly as genes and formative experiences play a large role in determining someone’s

happiness. It is therefore not surprising that we observe average happiness to be sluggish compared to other social or economic indicators such as GNP.

Furthermore, *by construction*, the happiness data can exhibit no indefinite trend. As individuals answer a survey in which they are asked to state their own level of happiness on an n-point scale, the data is therefore bounded between one and n. Over any particular short period of time, an apparent trend either up or down might exist, but by definition it cannot persist. In contrast, at least as it is presently defined, real GNP can exhibit no upper bound. Indeed, for the past 200 years it has shown a persistent trend increase.

This means that we have to exercise extreme caution in drawing any inferences from the correlation, or rather the lack of it, between time series data on well being and real GNP. From a statistical perspective, *any* calculation of a correlation between a variable which exhibits a trend and one which does not is fraught with inherent problems. (In technical terms, by definition time series happiness data is integrated of order zero, and GDP is integrated of order one).

The difficulties due to the inherent properties of the time-series happiness data would make it problematic were it to be used in policy. If a time series measure of well-being were to become used as a basis for policy, governments would succumb to an irresistible urge to try to influence its level. In such circumstances, it would be essential that the data should contain real information. Unfortunately, this is not the case.

Time series happiness data is in general indistinguishable from a purely random series. The autocorrelation function is flat and has no statistically significant individual values. In turn, this implies that it not possible to carry out systematically accurate forecasts of this variable[1].

Furthermore, we do not know what variables have influenced in a systematic way the movements in well being over the past. Note that even if we did, this would still not imply that the series could be successfully predicted. The variables which exercised a systematic influence would themselves have to be capable of being predicted.

So what causes variation in the happiness time series? One of the present authors, Helen Johns, has carried out original analysis which shows that the variations which we observe in measured happiness are completely consistent with the view that they are simply fluctuations based on sampling error. Her short mathematical paper is available on request (general.hj@googlemail.com), and here we try to give a flavour of the analysis. The particular difficulty in explaining the results is that the happiness index is based on discrete categories (0, 1,…, n), so the sampling error probability distribution associated with it is also discrete. This makes the analysis mathematically complicated.

The time series happiness data is based on surveys. For, example , the American survey is based on a survey of around 1,500 people. This is a sufficiently large sample to be reasonably representative of the population as whole. But by the very fact of being a sample, it is not, except by the purest of coincidences, exactly the same as the population as a whole.

[1] If the series exhibited long memory, this would not necessarily be the case. But *many* more data points are required before it could be established whether the data exhibit long memory.

So we will observe fluctuations from survey to survey which arise simply because of sampling error. How big are these compared to the fluctuations which we actually observe?

A way of conveying the algebraic results is to examine numerical results for the sampling error distribution associated with the kinds of sample sizes and population characteristics which are typical of happiness surveys.

The standard US survey, for example, asks people to place themselves in one of three categories (1 = not very happy, 2 = fairly happy, 3 = very happy). As already noted, this is usually conducted over a sample of about 1500 people. The results of US surveys seem to indicate that the proportions of the population in each category are roughly 12%, 55% and 33% respectively. The actual happiness score which would pertain in the absence of sampling error under these conditions is 2.21.

The probability distribution of the happiness value for a sample of 1500 drawn from a population with these 12%, 55%, 33% probabilities of being in each category is shown in Figure 2.

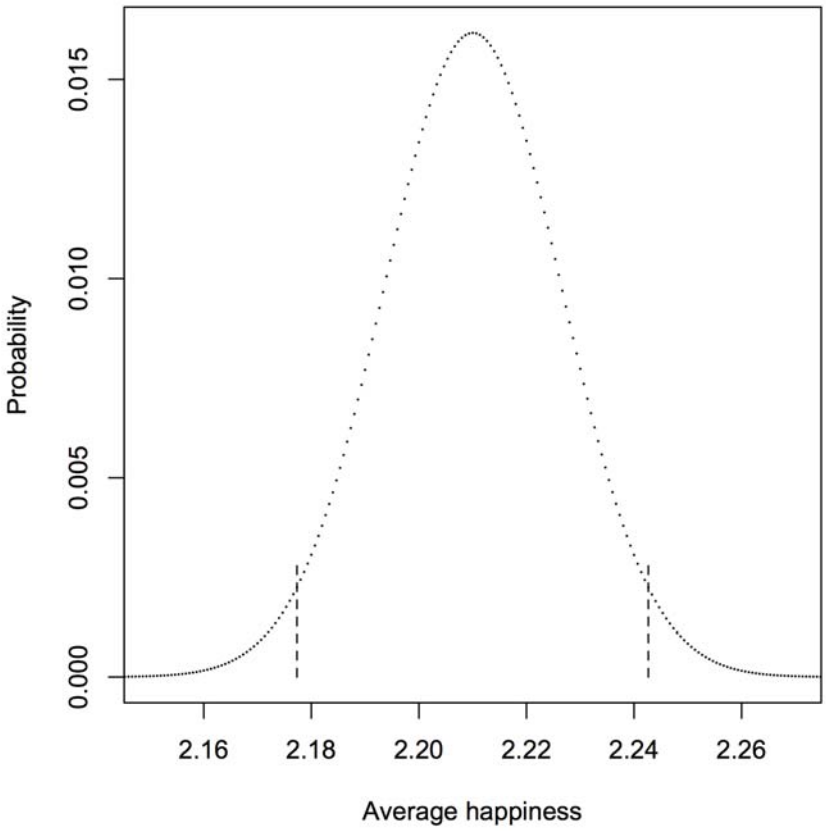


Figure 2: *The probability of obtaining each average happiness value given a sample of 1500 respondents and a probability of being in category 1 of 0.12, in category 2 of 0.55, and category 3 of 0.33. The dashed lines show the 95% confidence limits.*

In other words, Figure 2 shows the following:

- If the measured happiness score across the US populations as a whole really were 2.21, what the probability is of observing not just this but other values in a survey of 1500 people

We can see that 95 per cent of the time the survey will give a happiness level in a range of just under 2.18 to just over 2.24. Now, most of the actually recorded levels of happiness in the US are within this range. In other words, most of the annual movements in recorded happiness which we observe could arise simply from sampling error. And by definition such movements convey no true information.

Another way of looking at the lack of true information in the data is to imagine that something truly wondrous were to happen and that the sum total of human happiness was indeed augmented. A wise and perspicacious policy was implemented which caused a whole 6 million people in the USA (roughly 2% of the population) to undergo such a dramatic change in their personal happiness that they started to describe themselves as "fairly" rather than "not very happy". The average happiness of the population would now be 2.23 rather than 2.21. The resulting probability distribution is shown in Figure 3, superimposed on that before the change.

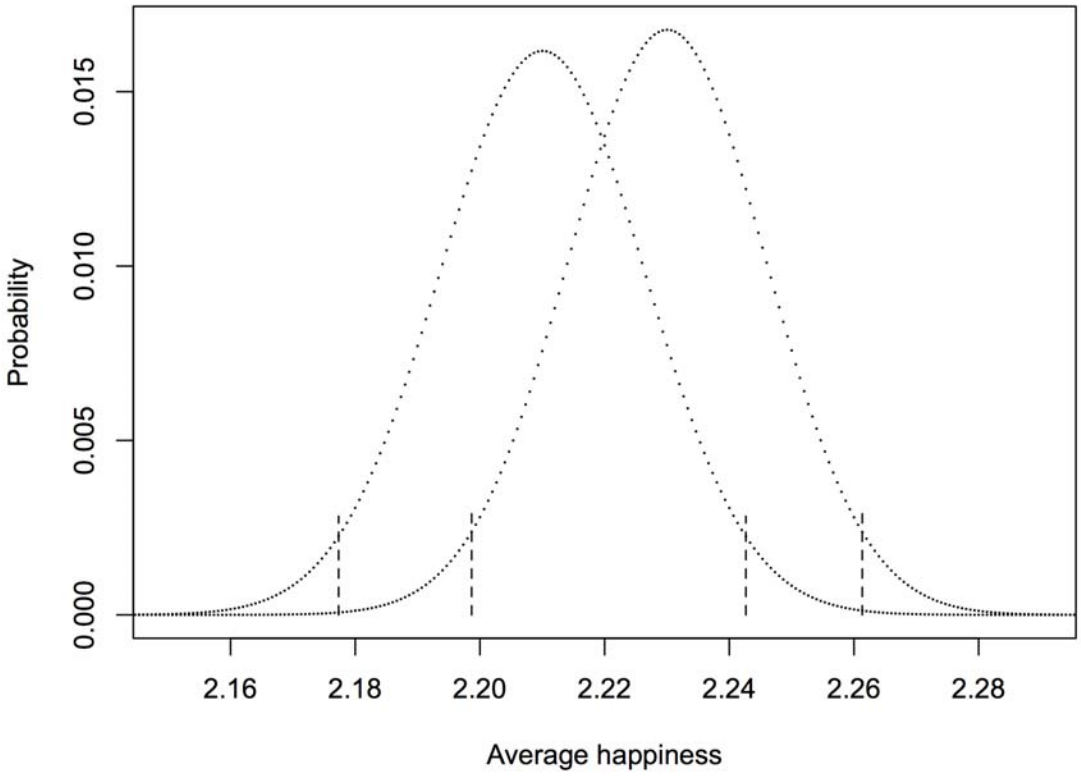


Figure 3: *The probability of obtaining each average happiness value given a sample of 1500 respondents and: (left) a probability of being in category 1 of 0.12, in category 2 of 0.55, and category 3 of 0.33; (right) a probability of being in category 1 of 0.10, in category 2 of 0.57, and category 3 of 0.33. The dashed lines show the 95% confidence limits.*

There is a substantial overlap between the two curves. In fact, if we observed two points next to each other in a US happiness time series with the values 2.21 and 2.23 we

could not be particularly confident that they were in fact different and there had been any actual change in the happiness of the population.

The large uncertainty which exists even if millions of people *were* to experience a genuine large increase in their happiness indicates the inherent insensitivity of this measure.

The resultant effect on the happiness time series of any real change could easily be drowned out by statistical noise. Any happiness-increasing policy effect would have to be of long duration, not be offset by countervailing trends in society, and be produced by kind of benefit which is not quickly adapted to, in order for it to be perceptible in the time series.

It is in fact easy to show, as Helen Johns' technical paper does, that the happiness data contains about as much information on the level of overall social well-being as a series of random numbers drawn from an appropriate probability distribution.

This startling finding raises serious questions over the validity of happiness time series and their ability to contribute useful evidence to social science.

Policy implications and concluding remarks

The originators of GNP never insisted that this was the *only* way of measuring an economy. In his Nobel lecture[2], for example, Kuznets specifically discussed the social implications of growth and argued that: 'Many of these are of particular interest, because they are not reflected in the current measures of economic growth; and the increasing realization of this shortcoming of the measures has stimulated lively discussion of the limits and limitations of economic measurement of economic growth'.

Politicians of all parties in all democratic countries already take into account a broad range of factors when they are making decisions. They are not simple GNP maximisers and they do not need an additional measure of 'well-being' to force them to consider policy objectives other than the purely economic.

Indeed, the official British government guidelines on policy appraisal, the Treasury's *Green Book*[3], clearly states that: "wider social and environmental costs and benefits for which there is no market price also need to be brought into any [policy] assessment" and that the inclusion of "non-market impacts is a challenging but important element of appraisal, and should be attempted wherever feasible". The extent to which formal policy processes are weighted towards maximizing GNP have been exaggerated.

Even if this were not so, wellbeing evidence is currently not robust enough to guide policy-making. The British government recently commissioned a group of academics led by Paul Dolan of Imperial College, London, himself a distinguished well-being researcher, to

[2] S. Kuznets, (1971), 'Modern Economic Growth: Findings and Reflections', Nobel Prize Lecture available at: www.nobelprize.org/nobel_prizes/economics/laureates/1971/kuznets-lecture.html

[3] Her Majesty's Treasury (2003), *Green Book: Appraisal and Valuation in Central Government*, available on the Treasury website

survey the literature. The results are published in the February 2008 *Journal of Economic Psychology*[4]. Here is what they concluded:

"One very firm conclusion that can be drawn from our review is that the existing evidence base [for well-being] is not quite as strong as some people may have suggested….This, in addition to lack of clear evidence on causality, makes it difficult to make clear policy recommendations at this stage."

This message will be very disappointing to many, but the point about causality is a very useful one; some of the conclusions which have been drawn from time series data have relied too heavily on assumptions about the direction of causation. In addition, the more credible results from happiness research seem to come from treating happiness scores as **ordinal** - i.e. using ordered models on the probability of an individual placing him or herself in particular category - rather than as cardinal numbers which can be averaged over entire populations.

Such analysis does produce intuitively sensible results, such as stable family life, being married and good health, contributing to happiness, while chronic pain, divorce and bereavement detract from happiness. These results, while consistent with everyday experience, don't however really tell us anything we didn't know already.

Our inexorable conclusion is therefore that society-wide happiness time series should be abandoned as they don't tell the social scientist anything useful; in addition, the flatness of happiness time series most certainly cannot be pinned on the economic system, and neither do they point to some kind of social aberration in need of government correction.

Average happiness has shown demonstrably stubborn flatness despite vastly differing government styles and levels of inequality, and it is seriously misleading to argue that, armed with the 'insights' of time-series happiness research, government intervention is going to make society measurably happier.

SUGGESTED CITATION:
Helen Johns and Paul Ormerod, "The unhappy thing about happiness studies", *real-world economics review*, issue no. 46, 20 May 2008, pp. 139-146, http://www.paecon.net/PAEReview/issue46/JohnsOrmerod46.pdf

[4] P Dolan, T Peasgood and M White (2008), 'Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being', *Journal of Economic Psychology*, 29, 94-122

Economics, conflict and war

Fanny Coulomb and J. Paul Dunne [Uni. Pierre Mendes, France; Uni. of the West of England, UK]

Introduction

With the end of the Cold War the international security environment changed fundamentally. The removal of the superpower conflict saw an initial wave of hope and cuts in military spending, but it quickly became clear that the world was still a dangerous place, and war and conflict remained endemic in many parts of the world. Conflicts had changed; in general they were intra rather than interstate, and there was a resurgence of interest in the role of economic forces in civil wars. In fact the discipline of economics has always included the study of conflict and war. At first its theories were global, focusing upon the role of inter-state war in economic development and then later became more focussed, offering partial analyses of conflicts. This partly reflected the changing nature of international relations over time, as modern nations were formed in an environment of international conflict. But it also reflected a change in the nature of the dominant paradigm, a move from political economy to neoclassical economics.

Early mercantilist theories explained war as predation, allowing enrichment and ensuring the supply of raw materials by conquest and imperialism. Later, in the 19th century after the Napoleonic Wars, the development of trade was characterized by relatively peaceful international relations; and a liberal perspective, which saw war as a fetter on the development of trade, had more influence. The growth of industrialisation created social conflicts that became the focus of economists' research, particularly Marx who gave little time to the study of international issues. But when the survival of capitalism was threatened by competing systems (notably Communism), the volume of economic studies focussing on issues of militarism and conflict increased enormously. This was true of Marxists, but also Institutionalist and Keynesian economists, who in some cases integrated war into their general perspective on the functioning of the capitalist system.

The development of nuclear weapons radically changed the international order, with a new balance of power (the balance of terror) and the limitation of international conflicts to peripheral zones. New economic analyses of conflict have then been developed to explain these changes, favoured by the progress in economic techniques. These studies were much focused on strategic concerns, economic issues taking only second place. Therefore, the economic discourse on conflict became depoliticized, except for a few heterodox works, in particular Marxist ones.

Today economic analysis has to deal with a renewal of economic problems in current conflicts, whether internal or international. The supply of raw materials, internal inequalities generating new demands, changes in the world economic hierarchy, development of asymmetrical conflicts… To deal with these new aspects of international relations, current economic theory presents partial and very sophisticated analyzes, in contrast to the global character of former economic theories. Furthermore, liberal orthodoxy dominates most studies devoted to defence economics. This has not decreased the importance of the issues or the debate, but it has moved them from the arena of economics into the more general arena of the social sciences, particularly international relations, politics, international political economy and development studies.

This paper provides a brief overview of how the understanding of conflict and war has changed over the years. Section I looks at the global perspectives that developed from liberal, mercantilist and Marxist schools of thought. Section II then examines the less general analysis of international conflict, in the form of arms races and the development of the theory of civil conflicts. Finally, Section III draws some conclusions

I - Global analyses of military conflict

The history of economic thought reveals three main economic explanations of international conflicts: one, that they are the result of State failure; two, that they are the result of the quest for power and wealth; and, three, that they are a result of the nature of capitalism. There are, however, few works in economics that have been entirely devoted to the war and peace issues.

I.1. Conflicts as State failure: the liberal creed

Kant (1795) argued that the progress of civilization tended to bring peace at the global level. He described wars as morally reprehensible, but also as a way to reach an ideal state of civilization, a world federation characterized by a universal and lasting peace. Fukuyama (1993) provides a recent example of this belief, arguing that the political changes of the late 1980's and the spread of democracy and liberalism, meant that war would become less and less probable. Many 'liberal' economists were also ready to announce the end of international conflicts thanks to the spread of civilization and, in particular, the spreading of free market economies. To them the costs of war are clear, namely the destruction of resources, the interruption of trade and the burden of debt when war is financed by loans. Thus, wars are considered to be counterproductive and cannot be justified by the benefits of predation and territorial expansion, since the surest way to increase the national economic growth is through the development of trade with prosperous neighbours. This leads to a denial the legitimacy of wars, which are seen as resulting from a perversion of the political process, with the State undertaking military actions to serve particular interests.

This analysis was already developed in the work of Adam Smith (1776), where the State is a place of conflicts and the decision to make war, or peace, depended on political processes, on the balance of power between the different social classes. The merchant class was seen as responsible for involving the country in useless colonial conquests and other military conflicts that were beneficial to them as a group. The founder of the British Classical School was inspired by the utilitarianism of Locke, according to whom universal peace was part of a law of nature. Man is naturally social and so war results from imperfections in human nature, in particular of ambition, and as such it can be only a temporary phenomenon. This theory directly inspired the liberal economic theories, which see the economy as governed by an "invisible hand", a natural order in which the State should not intervene (Coulomb, 1998).

Other economic analyzes of militarism and wars are even more hard-hitting. Pareto (1897) violently criticized the rise in military expenditure of his time, denouncing it as a regressive government policy that was leading to growing state economic control. For Pareto wars were of no economic use for contemporary civilized societies and could only be explained as resulting from the megalomania of leaders and the use by governments of

external threats to ensure social cohesion and to cover up corruption in executive circles[1]. He also denounced military expenditures because they led to tax increases. This concern with vested interests continued, with the term "military industrial complex" being used by US President Eisenhower in 1961, to warn against the potential threats of the coalition of interests between defence industries, military and all those who benefited from increased military spending and, as a result, conflicts. This was taken up by J.K. Galbraith (1992) to explain why the rise of the American military budget was not subject to democratic control. The existence of an external threat and the continuation of international conflicts reinforced the military sector's power and guaranteed the perpetuation of advantageous contracts for many companies, engineers, scientists, academics and other researchers. This type of analysis has been used beyond the liberal perspective, most notably in the contemporary Marxist analysis of militarism (Dunne, 1990).

I.2. Conflicts necessary for power: the mercantilist perspective

During the 17th century, while the Physiocrat theory defended the concept of a "natural order" in the economic sphere, political theory developed in the opposite direction. In the *Leviathan*, Hobbes (1651) presented international relations as anarchic, with a nation's survival depending on its management of a permanent state of war. Peace was then the absence of war and as such perceived in a negative way, as an artificial temporary state. Such ideas have influenced the "realist" school of thought in international relations and politics and some economics have also echoed these ideas. Prior to capitalism, the dominant mercantilist perspective considered the nation state as needing to produce wealth in the form of gold and this required running trade surpluses – encouraging exports and discouraging imports in a world in which trade volumes were considered fixed. This was one of the first instances of significant government intervention in the economy and it encouraged wars in Europe and imperialism beyond, as the powers fought over available markets. It meant that creating wealth required military strength which in turn required economic strength. In such a system economic openness would need hegemony to provide the collective goods of security and stability.

In the 19th century, the Historical School (notably as developed in Germany and the UK) saw the maintenance of strong national defence as an important component of economic prosperity and rejected the idea of disarmament. Wars and military values were considered useful for the government, as they developed the population's will to participate in the reinforcement of the national power. Thus strong interventionist policies were needed to promote national economic development. F. List (1841) went even further in emphasising the importance of economic patriotism and justifying wars as reinforcing national power on the world scene.

More recently a 'neo mercantilist' perspective has linked the realist and mercantilist theories, seeing countries and states as being motivated primarily by the desire for military and economic power, rather than ideals or ethics. War is seen as an irreducible human trait in earlier works but a curable one in more modern ones, and conflict is inevitable unless there is some dominant hegemonic force –Pax Britannica, or more recently the US.

[1] In fact such ideas were not new. In the 16th century, Machiavelli presented militarism as a remedy for civil war or internal disputes.

I.3. Militarism and the survival of the capitalist system

Another economic approach to conflict is based on a global explanation of the functioning of capitalism, as evidenced by the Institutionalist and Marxist approaches. Indeed, Schumpeter (1942) argued that capitalism would probably disappear because of middle-class disinterest in foreign policy and of the lack of charismatic political leaders able to gain national adhesion, while Veblen (1915) distinguished various types of capitalism, the Anglo-Saxon one being more peaceful than the Dynastic one. This distinction was used in the 1980's to explain Japanese and German commercial success as due to the specific nature of their societies, which were argued to be more prone to economic patriotism.

The Marxist approach saw international conflict as a consequence of class war. In the capitalist mode of production, internal contradictions related to overproduction and the resulting fall in the profit rate are temporarily solved by exports and imperialism. Some Russian pre-revolution theories, such as Lenin's (1916), predicted an increase in military conflicts between capitalist countries at the stage of imperialism, because of their competing ambitions on the world market. This did not occur, however, and later Marxist analyses focussed on explaining capitalism's post World War II survival and prosperity by its high level of militarism, which as wasteful expenditure provided a solution to endemic overproduction (Howard and King, 1992). Military Keynesianism also presented military expenditure as a way to solve the economic crisis, but in this case it was just like other public expenditures (Smith, 1977).

II. Economic models of conflict

Advances in econometrics and modelling since the second world war have been applied to the economic study of strategic issues, such as arms race, international alliances, or the economic consequences of military expenditure. The growing sophistication of the mathematical and statistical techniques has opened the way to many improvements on the basic models. Intriligator (1982) listed 64 possible combinations between the 8 existing types of possible analytical approaches (differential equations, decision theory, control theory, game theory, bargaining theory, uncertainty and stability theory, action-reaction models, and organization theory) and 8 subjects of studies. This list is much larger today, as mathematical techniques applied to economics have become even more numerous and sophisticated, for example the application of chaos theory. This section considers how the economic analyses of international conflicts and civil conflicts have developed.

II.1. Economic analysis of international conflicts

In the 1960's, arms race models became a popular way to explain governmental strategic decisions in the field of defence. The founding model from Richardson (1960) was based on three equations representing political, strategic and economic factors. The model accounts for the armaments of two rival countries through an action-reaction process, with capability, m_1 and m_2, related at time t by the equations:

$$\frac{dm_1(t)}{dt} = a_1 + b_1 m_2(t) - c_1 m_1(t)$$
$$\frac{dm_2(t)}{dt} = a_2 + b_2 m_1(t) - c_2 m_2(t)$$

Where a_i are exogenous 'grievance' terms, b_i are 'reaction' terms, whereby each country responds to the military capability of the other, and c_i are 'fatigue' terms, usually representing some internal limitations on a country's military spending/capability. Interestingly, this approach was not welcomed by the US government in the Cold War environment as it implied that arms races had no 'good' and 'bad' guy but were simply the result of one reacting to the other.

During the US-Soviet arms race, numerous arms race models were developed and improved to simulate the strategic interactions between the superpowers (Brito & Intriligator, 1995). These included the explicit modelling of rational economic decision-making, different dynamic specifications, game theory approaches, and empirically with the use of approaches such as co-integration. The search for clear empirical evidence of 'arms races' has, however, met with rather limited success, with even the apparently obvious example of the Cold War superpower arms race proving ambiguous and very much dependent on model specification[2]. Certainly, these models were more strategic than economic, as they did not integrate the economic characteristics of the countries. And yet, the political collapse of the Soviet Union and the end of the cold war was at least partly due to the burden of military expenditure on the Soviet block during the cold war's revival in the 1980's.

Since the end off the cold war the popularity of arms races has waned. Their focus on strategic comparable competition between two powers, had seemed less relevant as asymmetric conflicts between countries with high technology weapons and those without became much more likely. Several examples, like African conflicts or the attacks of September 11, show that technological superiority does not guarantee safety nor victory in the event of war. Asymmetric arms race models have to specify not only the protagonists and their strategic objective but also their cost constraint and the internal decision-making process (Dunne et al, 2006).

Recent work has considered arms races, but in a more general perspective. Dunne and Perlo-Freeman (2003a and 2003b) and Collier and Hoeffler (2004), sought to generalise the concept of an arms race by looking at the demand for military expenditure across a large group of countries, using either cross-section or panel data, incorporating a range of economic, political and security variables, and including variables for the aggregate military expenditure of neighbours and rivals. These models have typically shown that a country's military expenditure is significantly and positively influenced by that of those around them[3].

[2] India and Pakistan provides one of the few examples where researchers have been able to provide consistent evidence of a Richardsonian arms race. But even here, Oren (1994) has offered an alternative approach, based on hostility levels between the two countries, under which the apparent arms race disappears. Numerous attempts have been made to estimate arms races for Turkey and Greece, using a variety of theoretical and econometric models, without clear evidence of an arms race emerging. (E.g. Dunne, Nikolaidou and Smith (2003))

[3] Dunne and Perlo-Freeman (2003a) develop an attempt by Rosh (1988) to deal with general strategic effects by using the concept of a security web, instead of dyadic relationships between neighbours and other countries (such as regional powers). Rosh calculates the degree of militarisation of a nation's

Dunne and Perlo-Freeman (2003b) break this down, finding that the significant positive influence comes through the military spending of 'Potential Enemies'. They suggest that this indicates, if not an arms race as such, then at least arms race-like effects, or spillover effects, where there is some tendency towards an action-reaction pattern of military spending between hostile nations (Murdoch and Sandler, 2004; Dunne and Smith, 2007).

Beside arms race models, another economic theory of conflicts has been developed during the 1990's, the Conflict Success Function (CSF). In these models, the inputs are the investments in fighting efforts of the two sides and the outputs are their relative degree of success in the conflict: either the probability of winning or the share of the pie that goes to each side[4]. While there is a vast military literature on success in battle, there is relatively little econometric work on conflict success functions[5]. One problem with this type of analysis is that it either treats aggregate military strength as a single aggregate, or distinguishes only between labour and capital, members of the armed forces and their equipment. In fact determining the optimal force structure involves four main choices for both labour and capital. The first choice is the number of varieties of types of forces: army, navy, air force, each made up of specialised types of soldiers, sailors and airmen, each with distinct roles and associated equipment. There is some substitution between these; a target may be destroyed by a tank shell, a bomb dropped from an aircraft or a cruise missile launched from a submarine. The second choice is the quality of those forces, determined by R&D for equipment and training for labour. The third choice is the quantity of each. The final choice is whether they are obtained domestically or from abroad. This choice is primarily important for equipment, where security of supply for spares in case of conflict is often important, but does also occur for labour for those countries that use foreign soldiers (Dunne et al, 2006).

More generally, economic models such as CSF are in the tradition of ultra-liberal economists (Gary Becker), which associate all human activities, including criminal ones, with an economic calculation. The relevance of such cost-benefit analyses can be questioned, however, particularly when the conflict is atypical, as it is in the case of terrorism. Indeed, rationality has limited value in explaining terrorism, as for example it is difficult to see what the economic rationality of suicide attacks is, particularly to the individual bomber. There have in fact been relatively few economic analyses of terrorism, with the work of Todd Sandler the best known. In Enders and Sandler (2002) a model is developed to highlight cycles of transnational terrorism (with periods of weak activity alternating with periods of strong activity) to deduce some recommendations for the political authorities at various periods of the cycle. But such conclusions may appear less than straightforward, given the sophistication of statistical method used.

II.2. The theory of civil conflicts

While the end of the Cold War, with its proxy wars and superpower involvement in local conflicts, may have reduced the intensity of conflict, it certainly did not reduce the

---

Security Web by averaging the military burdens of those countries in the web, finding it to have a significant positive effect on a country's military burden.

[4] There are two main functional forms used in which success depends either on the ratio of the forces or the difference of the forces. Hirschleifer (2000) provides a discussion of CSF, with many military and non-military examples, which captures the spirit of the literature.

[5] An exception is Rotte and Schmidt (2003), who use a data set of 625 battles 1600-1973 to estimate an equation to explain victory by the attacker in battle: a zero to one dependent variable.

number. Civil or intra state wars became prevalent and the 'new' wars were considered by Kaldor (1999) to be very different to the 'old' and only understandable within the context of political, economic and military globalisation. Although local, the wars tended to have a transnational connection, often through diaspora, and there was a blurred distinction between war and organised crime. There were few real military battles, with skirmishes more likely, and a tendency for militias to target civilians. New war economies were seemingly based upon plunder and black-marketeering, sometimes supported by aid, and sustained through continued violence. This was not helped by the tendency of the 'international community' to work with the protagonists to broker peace deals rather than the civil society that existed outside of the conflict (Kaldor, 2006). A harder look at the endemic and continuing conflicts in Africa was particularly challenging, and it started to become clear that the continuing struggles needed some source of income, that this was often natural resources and that it was possible that the resources' control had become the object of the struggle overtaking any previous goals. It was not a breakdown of the system but a way of creating a new system of income and profit and power (Cramer, 2006).

While these new characteristics of conflicts were being taken on board by areas in social science other than economics, often using realist state-centred theory, economists have generally ignored them. Instead economists developed models which formalized the liberal idea, based on methodological individualism, that public action results from the balance of power between various interest groups. Non-cooperative game theory was then used to build explanatory models of governmental decisions, which when combined with macroeconomic factors, provided a better understanding of internal factors determining the State propensity to conflict or militarism. Thus, economic analyzes developed during the 1990's rejected ethnic rivalry as the main explanation of civil wars, and emphasised the role of the economic and of internal political determinants. One of the pioneer contributions was Grossman (1991), who presents the choice of the level of military expenditure by a government as determined by the probability of an insurrection. This study gave rise to many analyzes of internal political conflicts likely to lead to civil wars, using Conflict Success Functions (Skarpedas 1992; Hirschleifer 1995). These analyzes have since been subject to many improvements, in particular aiming at showing that the nature of the political regime and of its economic policy can influence the outbreak and the nature of an insurrection (Azam, 2001).

Whereas Hirschleifer (2000) assimilates rebellion and search for profit (greed), implying that the only motivation of rebels is their personal enrichment, Collier & Hoeffler (2004) have more recently moved to a more nuanced approach that sees civil wars as arising from a complex arbitration between greed and grievance. Denying the importance of the ethnic factor in civil wars, Collier underlines the role of economic and institutional determinants. His models and econometric applications aim at explaining the various actors' rationality and the outbreak of civil wars. Africa especially is studied. In Collier's theory, any rebel movement needs to have a business activity to ensure sufficient resources to go into war and these resources come from the exploitation and sale of raw materials. Thereafter, the rebels' motivation for ending a conflict may be diminished by the fact that the war economy works well for them and provides a good living. According to Collier, this situation explains the importance in the number of civil wars in the poorest countries and the existence of "conflict traps" (Collier, 2007).

Collier's works have been much criticized, notably on technical issues: problems of data sample, of periodic divisions, etc. But a more fundamental criticism of this approach is

that under the guise of being apolitical it inevitably presents rebel groups in a negative way. It means believing that any government, however corrupt, must be maintained in power rather than allowing a civil war to start. With this approach, the worst predation which can be exerted on the population is that rising from the military burden; the legal predation (notably by the tax system) by a corrupted government is preferable to a state of civil war. Collier's analysis shows the difficulty that social scientists face in remaining objective. Although economic rationality does not explain all conflicts, by reinstating the economic dimension in the analysis of civil wars, Collier's theory contributes to a better understanding of these phenomena[6].

III Conclusion: The triumph of liberal neoconservatism?

Although as this paper has shown, economics has always included the study of conflict and war, it has tended to remain a diversion from the discipline's main focus. Nevertheless, an impressive literature has been developed that has influenced research in other subject areas, such as international relations and political science. The early theories were global, focusing upon the role of inter state war in economic development, but more recently they have become much more focussed and have reached an unprecedented level of technical sophistication. While this has led to important insights, it is still possible to question whether significant progress has been made in improving our understanding of conflicts, international or civil. The models are somewhat partial and abstract and one really needs to ask whether the modelling of Conflict Success Function provides a means of understanding international conflict, even if economic factors are central. It certainly begs a number of important questions, such as how the fact that a State's bellicosity may be motivated by a will to reinforce its internal control or to support the military industrial complex contrary to the general interest, may be introduced, or how the influence of long-term political changes at world level, such as described by political analysts, for example with the "power transition" theory, may be taken into account.

Certainly the analyses of conflict that use microeconomic methods remain partial, when compared with global explanations developed in the 19th and 20th centuries by the Marxist, Institutional, Keynesian, or even Classical economists. The rise of scientificity in social sciences fundamentally altered the analysis of conflict, and the search for a rationalization of the causes and consequences of war led to an apparent depoliticisation of economics discourse. Yet these theories are not politically neutral. The theory of the "diffusion of the democracy" is an example of imposition of neoconservative dogmas under scientific cover of neutrality. It is the theory of democratic peace with globalisation added to it, suggesting a role for multi layered governance structures to deal with weak states with anti-capitalist and anti-liberal attitudes which were reinforcing their backwardness in a globalising world. But more recently this has been replaced by the US hegemony pursuing democracy within states and protecting democracy from external aggression.

This new orthodoxy brings together neoclassical analysis of conflict and the general neoliberal perspective of the new realists in international relations. This sees war as a result of pre or anti-capitalist sentiments and groups, sees the solution to conflict as a global neo-liberal system and accepts that military action might be needed in the shorter run to create the

[6] It is also interesting that it provides an instance where neoclassical rather than Marxist economics introduces a materialist interpretation of a phenomena..

right conditions (dealing with rogue states and terrorists). As a result the need to maintain the basis to produce the means of destruction through high military spending can be justified as can the hegemonic role of the US. Such a world view is certainly not what was expected at the end of the Cold War and is certainly not uncontested[7]. It represents a limited view of the world that is being brought into question with the continuing problems in Iraq and Afghanistan. The challenge for economics is to develop an alternative to the new orthodoxy that will support initiatives that strive for peace and security, a challenge that has been taken up by the creation of Economists for Peace and Security[8].

References:

Anderton C.H. (2003), 'Economic Theorising of Conflict: Historical Contributions, Future Possibilities', *Defence and Peace Economics*, 14 (3), 209-222.

Azam J.P. (2001), 'Capacité d'engagement de l'Etat, redistribution et croissance', *Revue Economique*, 3(52), 506-517

Brito, D. and Intriligator, Mr. (1995), 'Arms races and proliferation', in Hartley, K. and Sandler, T. (eds.), *Handbook of defense economics*, Elsevier.

Collier, P., Hoeffler A. (2004), "Greed and grievance in civil wars". *Oxford Economic Papers* 56: 563-595.

Collier P. (2007), "The Bottom Billion", Oxford University Press.

Coulomb F. (1998), 'Adam Smith: A Defence Economist', *Defence and Peace Economics*, 9 (3), 299-316.

Coulomb F. (2004), *Economic Theories of Peace and War*, Routledge, London & New York.

Coulomb F., Fontanel J. (2001), 'War, peace and economists', in Galbraith J.K., Brauer J., Webster L.L. (eds.), Economics of peace and security, *Encyclopedia of Life Support Systems*, www.eolss.net.

Cramer C. (2006) *Civil War is not a Stupid Thing*, Hurst & Company, London.

Cramer C. (2002) 'Homo Economicus Goes to War: Methodological individualism, Rational Choice and the Political Economy of War', *World Development*, 30 (11), 1845-1864.

Duffield M. (2001), *Global Governance and the New Wars*, Zed books.

Dunne P. (1990), 'The Political Economy of Military Expenditure: An Introduction', *Cambridge Journal of Economics*, 14 (4), 395-404.

Dunne, JP and F Coulomb (2008) "Peace, War and International Security: Economic Theories", Chapter in Jacques Fontanel and Manas Chatterji (eds) (forthcoming) *Peace, War and International Security* (provisional title). Elsevier: Holland. With Fanny Coulomb. Version available at http://carecon.org.uk/DPs/0803.pdf

Dunne J.P. Nikolaidou E., Smith R. (2005). 'Is there an Arms Race between Greece and Turkey?', *Peace Economics, Peace Science and Public Policy*, 11 (2), Article 1.

Dunne J.P., Smith R. (2007) 'The Econometrics of Arms Races', Forthcoming 2007 in Hartley, K and T Sandler (eds) *Handbook of Defence Economics* Vol 2. Elsevier.

Dunne, J.P., Perlo-Freeman S. (2003a), 'The Demand for Military Spending in Developing Countries', *International Review of Applied Economics*, 17 (1), 23-48.

[7] It was not demilitarisation that followed the cold war but remilitarisation with closer integration of the civil and the military, through homeland security and the privatisation of defence functions (Wulf, 2005).

[8] See www.epsusa.org for more information.

Dunne, J.P., Perlo-Freeman S. (2003b), "The Demand for Military Spending in Developing Countries: A Dynamic Panel Analysis". *Defence and Peace Economics,* Vol 14, No. 6, 2003, pp. 461-474.

Dunne J.P. , Garcia-Alonso M., Levine P., Smith R.. (2006) 'Managing Asymmetric Conflict' *Oxford Economic Papers*, Vol. 58, 183-208.

Enders, W. & Sandler, T. (2002), Patterns off transnational terrorism, 1970-1999: alternative time-series estimates, *International Studies Quarterly*, 46, pp. 145-165.

Engels F. (1987 [1878]) *Anti-Duhring*, Progress Publishers, Moscow.

Fukuyama F. (1993), *The end of history and the last man*, Penguin, London.

Galbraith J.K. (1992), *The culture of contentment*, Boston, Houghton Mifflin Company.

Grossman, H.I. (1991), 'A General Equilibrium Model of Insurrections', *American Economic Review*, 81(4), 912-921.

Heckscher, Eli F (1955), *Mercantilism, Volume II*, Revised second edition, Allen and Ulwin, London and Macmillan, New York.)

Hirshleifer, J. (1995), 'Anarchy and its Breakdown', *Journal of Political Economy*, 103(1): 27-52.

Hirshleifer J. (2000), 'The Macrotechnology of Conflict', *Journal of Conflict Resolution*, 44 (6) p773-792.

Hobbes T. (1651), Leviathan, http://www.uoregon.edu/~rbear/hobbes/leviathan.html

Howard M.C., King J.E. (1992), *A History of Marxian Economics: Volume II*, 1929-1990, Macmillan: Basingstoke

Intriligator M. (1982), 'Research on Conflict Theory', *Journal of Conflict Resolution*, 26 (2), 307-327.

Kaldor M. (1999, 2006), *New and Old Wars: Organised Violence in a Global Era*, Polity Press.

Kant, I. (1991 [1795]) "Toward Perpetual Peace: A Philosophical Sketch." In Reiss H. (ed.), *Kant's Political Writings*, Cambridge University Press, 93-130.

Lenin V. (1916), Imperialism, the highest stage of capitalism, http://www.marxists.org/archive/lenin/works/1916/imp-hsc/

List F. (1909 [1841]), *The National System of Political Economy*, Longmans, Green, and Co. London.

Lovering J. (2003), 'Introduction: The New Orthodoxy', Paper presented to the Association for Heterodox Economists Conference, NTU, July.

Murdoch, J.C., Sandler, T (2004), 'Civil Wars and Economic Growth: Spatial Dispersion', *American Journal of Political Science* 48(1), 138-151.

Pareto V. (1992 [1897]), 'L'état actuel de l'Italie', in Libre Echangisme, Protectionnisme et socialisme, Recueil d'articles, Librairie Droz, Genève, 277-295.

Richardson, L. F. (1960), *Arms and insecurity - A mathematical study of the causes and origins of war*, The Boxwood Press, Pittsburgh and Quadrangle Books, Inc., Chicago.

Rosh, R. M. (1988), 'Third World Militarisation: Security Webs and the States they Ensnare', *Journal of Conflict Resolution* 32 (4), pp 671-698.

Rotte, R. and Schmidt C.M. (2003), 'On the Production of Victory: Empirical Determinants of Battlefield Success in Modern War', *Defence and Peace Economics*, 14 (3), 175-193.

Sandler, T. (2000), 'Economic Analysis of Conflict', *Journal of Conflict Resolution*, 44 (6), 723-729.

Schumpeter J.A. (1950 [1942]), *Capitalism, socialism and democracy*, New York, Harper.

Skarpedas S. (1992), 'Cooperation, Conflict, and Power in the Absence of Property Rights', *American Economic Review*. 82, 720-39.

Smith, A (1970 [1776]) *The Wealth of Nations*", Penguin Books, Harmondsworth.

Smith R. (1977), 'Military Expenditure and Capitalism', *Cambridge Journal of Economics*, Vol 1, 61-76.

Veblen T. (1964 [1915]), *Imperial Germany and the industrial revolution*, Augustus . Kelley, New York.

Wulf H. (2005), *Internationalizing and privatizing war and peace*, Palgrave Macmillan.

SUGGESTED CITATION:
Fanny Coulomb and J. Paul Dunne, "Economics, conflict and war", *real-world economics review*, issue no. 46, 20 May 2008, pp 147-157, http://www.paecon.net/PAEReview/issue46/CoulombDunne46.pdf

Milton Friedman and Trofim Lysenko

David A. Bainbridge (Alliant International University, USA)

The growing concern over home foreclosures, equities and derivative values is largely epistemological, but it is related to the growing awareness of more serious problems of resource availability ($100+ barrel oil) and global and local ecosystem stability. It is becoming increasingly clear that these financial and environmental problems may affect our prospects for quality of life in the future. Both are the result of profound ignorance, hubris, and flawed economic policies. The harsh reality is soon to be revealed when the economic game players, confront ecological reality. A $3.7 billion dollar income for a year of hedge fund trading is likely to insulate a person from hunger, but it can't get you to another planet.

Although all of us depend on natural systems for the air we breathe, the food we eat, the water we drink and the materials we use to build our homes, we have lost touch with this connection. Water now comes from the faucet or in a bottle; food comes packaged, prepared and free of dirt; energy flows from the wall socket from distant power plants; and wastes are simply flushed away. But these conveniences mask the critical connections we have to the natural and managed ecosystems that provide us with the requirements for life. Every one of us has an impact on our planet, and the wealthier we are the greater the impact. These impacts are exposing us to potentially catastrophic change.

Who is to blame? Both crises are the result of fundamental flaws in our economic system, and both can be attributed in large part to the ignorance of economists like Milton Friedman (1912-2006) and his many disciples, including Alan Greenspan and other key players in the U.S. government and global financial markets. They have long neglected the value of community and Nature's Services and Natural Capital. Friedman, a classical flat earth economist, represents the peak of economic folly with his statement that, *"A company's only responsibility is to increase profits for stockholders*." This view of economics neglects all the costs the current market does not include, including a wide range of environmental and social costs associated with company operations. This nonsense is still taught in universities and colleges around the world.

This view is as foolish and flawed in its own way as the evolutionary theory championed by Trofim Lysenko (1898-1976). Lysenko was Stalin's director of biology and promoted views that ignored fundamental research in genetics by Mendel and many others. At the peak of his powers he had dissent outlawed. When his theories didn't improve yields he gradually fell from favor and science returned. Many people suffered and starved in support of his failed beliefs.

Milton Friedman's failed beliefs are much more dangerous and have harmed far more people, now and in future generations. Worse yet, his disciples are still in power and favor with the ruling elite. If you ignore reality, reality may bite. The flat earth view of the earth has failed; and by any measure we are taking too much and disposing of our wastes improperly, leading to Global Warming, severe health problems, societal crises, and ecosystem destruction.

The average American now requires almost 24 acres to support his or her current lifestyle, and we would need at least five more planets if everyone on Earth were to demand

as much, while still leaving some room for Nature. Only a handful of countries are living within their ecological means, and trends are not encouraging, with the ecological footprint of the world expected to increase 50% by 2015. The flat earth economists ignore these problems, arguing that infinite substitutability and technological fixes will cure all ailments.

Sustainability is not simply about the environment either. To be sustainable a community must have a healthy economy and programs, policies and traditions that provide support for community, safety, cohesion, cooperation, education, health and equity. These can be as elusive as ecological sustainability, and will not happen without more careful consideration of the impact of the policies, regulations, and incentives that determine market forces.

The first step is discrediting the flat earth economists. Decisions need to be made that will favor economics that consider the triple bottom line (social, economic, environmental) while respecting the 3Ps, People, Prosperity, Planet. Triple bottom line accounting and reporting can help avoid ponzi schemes and speculation. Correctly and directly linking value to price is essential. It is almost inconceivable to learn that JP Morgan Chase had $70 trillion dollars in notational derivatives before they were forced to take over Bear Stearns. This is more than twice the GPD of the U.S., U.K. Japan, China, Germany, and Japan combined. The collapse of the derivatives frenzy, like the tulip bulbs of Holland, the dot.coms, and the burgeoning sub-prime equity collapse, will give us the chance to start over with a more realistic view of what the game of economics is about and how it should be played. It is time to cast out the Friedmanites and bring in a new younger generation of economists who understand the problem and can offer solutions that value the future. Time to relegate the flat earth economists to the junk heap of time.

SUGGESTED CITATION:
David A. Bainbridge, “Milton Friedman and Trofim Lysenko”, *real-world economics review*, issue no. 46, 20 May 2008, pp. 158-59, http://www.paecon.net/PAEReview/issue46/Bainbridge46.pdf

The IMF's historic transition: Is less better?

Mark Weisbrot [Center for Economic and Policy Research, USA]

'The IMF is back," declared the International Monetary Fund's managing director, Dominique Strauss-Kahn, at its annual spring meeting earlier this month in Washington. And not a moment too soon either. To hear the organization's economists tell it (as they mingled in five-star hotels, long black limos and posh restaurants with bankers, businessmen and finance ministers from around the globe), they've arrived on the scene just in time to help solve the world's financial crisis.

But despite the bravado, the reality is that today's IMF is not what it once was. These days, the world's most famous deficit police force is running a whopping small-country-size $400-million annual deficit of its own and is being forced into some of the same kinds of "structural adjustments" it used to impose on indebted Third World nations. In just the last four years, the IMF's total loan portfolio has shrunk from $105 billion to less than $10 billion; over half of the current portfolio consists of loans to Turkey and Pakistan. To cut costs, the agency is reducing staff and closing offices.

The IMF's loss of influence is probably the most important change in the international financial system in more than half a century. Until just a few years ago, the IMF -- originally created at the Bretton Woods conference on international economic cooperation in 1944 -- was one of the most powerful financial institutions in the world and the major avenue of influence for the United States in developing countries.

This wasn't so much a result of the money that it lent -- the World Bank loans much more -- but because of its position at the top of a hierarchy of official creditors. Until a few years ago, a developing-country government that did not meet IMF conditions risked being economically strangled. The World Bank, regional banks such as the Inter-American Development Bank, rich lender governments and sometimes even the private sector would withhold lending until the government reached agreement with the IMF.

At the top of this powerful creditors cartel sat the U.S. Treasury Department, which holds a formal veto over many of the IMF's decisions and is an informal power within the organization that marginalizes even the other rich countries. Developing countries -- the ones that have historically borne the brunt of IMF decisions -- have little or no effective voice in the decision-making of the organization, where the majority of votes of the 185 member nations are assigned to the rich members.

But the IMF lost credibility after presiding over a series of economic disasters. Latin America, for example, suffered its worst long-term growth failure in modern history under the IMF's tutelage since 1980. The IMF's "shock therapy" program in Russia vastly underestimated the time it would take to transition from a planned to a capitalist economy in the early '90s. The result was a lot of shock and no therapy, and tens of millions were pushed into poverty as the economy collapsed.

The Asian financial crisis in the late 1990s was a tipping point. The IMF and the U.S. Treasury helped cause the crisis by pushing for the removal of important regulations on foreign capital flows. Then they made it worse with their policy recommendations, prompting

economist Jeffrey Sachs -- now head of Columbia University's Earth Institute -- to say that "the IMF has become the Typhoid Mary of emerging markets, spreading recessions in country after country."

Some of these mistakes were because of incompetence; others were driven by ideological or special interests. But the result was that developing countries began voting with their feet, piling up international reserves so that they would never have to borrow again from the IMF cartel.

The IMF-supervised Argentine disaster from 1998 to 2002, which pushed the majority of Argentines below the official poverty line in a country that was previously one of the richest in the region, further sullied the fund's reputation. Argentina then defied the IMF, refused its conditions, got no international help and rapidly transformed itself into the fastest-growing economy in the hemisphere. This too was noticed.

The collapse of the IMF creditors cartel has been a huge blow to U.S. influence. It was most pronounced in Latin America, where most of a region that used to be referred to as the United States' "backyard" is now governed by states that are more independent of Washington than Europe is.

The problem is that poorer developing countries, especially in Africa, remain dependent on foreign aid from the IMF (and the World Bank and other sources) to fund their basic budget and import needs. This can be harmful to their development and their people. In recent years, the IMF -- insisting that such measures are necessary to hold down inflation -- has imposed conditions that limit their public spending and, according to the fund's own internal evaluation, have prevented these countries from spending aid money on urgent needs, such as healthcare and education.

These countries need to join the rest of the developing world in breaking free of the IMF's policy conditions. The U.S. Congress may consider legislation that would pressure the IMF to use some of its huge gold reserves for debt cancellation and to limit the IMF's control over policy in poor countries. These would be important steps forward for the world's poor.

SUGGESTED CITATION:
Mark Weisbrot, “The IMF's historic transition: Is less better?”, *real-world economics review*, issue no. 46, 20 May 2008, pp. 160-61, http://www.paecon.net/PAEReview/issue46/Weisbrot46.pdf

The great unravelling

Jayati Ghosh [Jawaharlal Nehru University, India]

It is now clear that the prolonged party for international finance capital is over, at least for now. The US financial structure is crumbling, possibly even collapsing. The collapse of the major Wall Street bank Bear Stearns and the interest rate sops and enormous bailouts that are being offered to financial institutions in the US by the US Federal Reserve are only symptomatic of the wider crisis.

This crisis was created by the unravelling of the real estate boom, which was itself based on dodgy lending practices. Everyone knows that what has already come out is only the tip of the iceberg. The financial crisis has already spread quite dramatically: from "sub-prime" borrowers to "prime" borrowers; from bad mortgage debt to bad credit card debt; and from banks to hedge funds to insurance companies.

There is no doubt that there is much more bad news to come within US markets. And most certainly, given the sheer size of the US system and the complex forms of financial pyramiding and entanglement with other financial structures in different countries, the global financial system will feel the impact.

But meanwhile, the actions of the Federal Reserve – the US central bank – have at one level declared the end of the recent era of freewheeling and deregulated finance. The financial liberalisation of the past two decades across the world was based on two mistaken notions. First is the "efficient markets" hypothesis beloved of some economists and many more financial players, which asserts that financial markets are informationally efficient, in that prices on traded financial assets reflect all known information and therefore are unbiased in the sense that they reflect the collective beliefs of all investors about future prospects. Second is the notion that financial institutions, especially large and established ones, are capable of and good at self-regulation, since it is in their own best interests to do so. And therefore external regulation by the state is both unnecessary and inefficient.

Both of these presumptions are now in tatters, completely destroyed by the waves of bad news that keeps coming from the financial markets, and by the growing evidence of foolish and irresponsible behaviour that was clearly indulged in by large and respectable financial players. It has emerged that unreliable behaviours is not the preserve of a few relatively small fly-by-night operators, but is endemic even among the largest private players in the financial system.

It is also increasingly clear that deregulated financial markets today are characterised by huge conflicts of interest: between the different functions that investment banks have taken on in recent times, between investment banks and regulators, between financial interests and the media, and so on. Financial deregulation allowed financial institutions to take on different activities that were earlier clearly segregated. Thus banks could take on non-bank financial services, and vice versa. It is clear that in terms of the activities of the banks, the integration of broking and underwriting, of proprietary and customer trading, of market research and investment advice, all give rise to huge conflicts of interest within the leviathan investment banks, and these conflicts are seldom or inadequately regulated. As a result, banks can carry

on with problematic practices because they make their profits on commissions and fees rather than on actual repayment by borrowers.

Such a situation was obviously not sustainable, and all these undesirable financial practices have now led to an enormous mess in the very heart of capitalism, Wall Street. And this has already required large public resources being made available to save fragile financial institutions, with more spending likely.

So finance capital, which has so far systematically tried to undermine the state and demanded autonomy for all its actions, is now calling to that same state to save finance from itself. But can this occur without the state at least trying to reassert some control over finance?

Not likely, if recent commentators are to be believed. Several American economists, including Joseph Stiglitz and Paul Krugman, have already called for more controls on finance, most of all the separation of different types of financial activity of banks and others. Now the normally free-market-oriented columnist of the Financial Times, Martin Wolf, has comes out even more strongly. In a recent article (March 25, 2008) he states: "Remember Friday March 14 2008: it was the day the dream of global free-market capitalism died. For three decades we have moved towards market-driven financial systems. By its decision to rescue Bear Stearns, the Federal Reserve, chief protagonist of free-market capitalism, declared this era over. Deregulation has reached its limits."

This has significance beyond just the United States. All over the world, the Anglo-American style of financial system and its pattern of financial deregulation has been sold as the definitive model to follow. It already led to financial crisis in Japan and a large number of developing emerging markets but all of these were blamed on internal problems of those countries, such as "crony capitalism". Now, with the implosion of the US financial market, such arguments are no longer possible.

Martin Wolf also recognises this: "If the US itself has passed the high water mark of financial deregulation, this will have wide global implications. Until recently, it was possible to tell the Chinese, the Indians or those who suffered significant financial crises in the past two decades that there existed a financial system both free and robust. That is the case no longer. It will be hard, indeed, to persuade such countries that the market failures revealed in the US and other high-income countries are not a dire warning. If the US, with its vast experience and resources, was unable to avoid these traps, why, they will ask, should we expect to do better?"

In every crisis, the Chinese ideogram states, there is also an opportunity. So in this current US financial crisis there is a tremendous opportunity not only for the US but even more for the rest of the world, to bring back the financial regulation that has turned out to be so essential.

SUGGESTED CITATION:
Jayati Ghosh, “The great unravelling”, *real-world economics review*, issue no. 46, 20 May 2008, pp. 163-163,
http://www.paecon.net/PAEReview/issue46/Ghosh46.pdf

ISSN 1755-9472

Articles, comments on and proposals for should be sent to the editor at
pae_news@btinternet.com

Subscriptions to this email journal are free.

Back issues of this journal and other material related to the PAE movement are available at www.paecon.net.

To subscribe to this journal go **here** (http://www.feedblitz.com/f/f.fbz?Sub=332386)

To unsubscribe to this journal go to
http://www.feedblitz.com/f/f.fbz?EmailRemove=_NDUzNDkzMHwzMzIzODZ8cGFlX25ld3NAYnRpbnRlcm5ldC5jb218MTA5OTU4_