

“The train wreck in the American home mortgage industry”

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The train wreck in the American home mortgage industry

Abstract

This article is an expanded version of a speech, intended for noneconomists and non-Americans, discussing how, over the past 15-odd years, mortgage securitization practices led the American mortgage industry to overlook moral hazard arising from possible borrower default. When borrowers did default in large numbers, the adverse consequences for commercial and investment banking triggered a major financial crisis and a worldwide recession, and the USA's worst postwar recession.

Keywords: subprime mortgage, financial crisis of 2008, mortgage securitization, credit crunch.

JEL Classification: G21, G01, E44.

Introduction

Let's begin with three metaphors for the ongoing worldwide economic mess:

- ◆ The world economy has taken to its bed and is running a high fever;
- ◆ The North Atlantic economy is like a car whose gears have locked up because the oil has been drained from the transmission;
- ◆ The USA home mortgage industry has experienced a vast "train wreck" (a phrase I have borrowed, with apology, from Liebowitz (2009)).

Think of credit as being like motor oil. How did the oil leak out of the economic engine? In short, how did we get into this mess? This article will flesh out this train wreck metaphor.

1970-2000, about 60% of American households lived in an owned home. Adult Americans who were homeowners were much less likely to be convicted of a crime, and more likely to vote for center-right politicians. Common sense suffices to explain this. Americans of color are more often renters than the Caucasian mainstream. Willfully taking a correlation as evidence of causation, the Clinton and Bush administrations set out to increase the proportion of homeowners by making it easier to qualify for a mortgage. Hence pushing homeownership came to be seen as politically correct. Those who argued that common sense should nevertheless prevail when deciding who should be eligible for a house purchase mortgage, were told to be quiet and sit down.

The wishful notion of a peaceful social revolution via homeownership reached cruising altitude under former President George W. Bush. Thus in 2006, 42% of first time homebuyers in the USA made no deposit whatsoever, and the median deposit was 2%. Such nonsense has since vanished from the UK, USA, and New Zealand. But the damage is a done

deal, and we will all have to live with the adverse consequences for a while¹.

Mortgages suffer from two disabilities that make them ill-suited as investments. First, mortgages are used to purchase real property, and every piece of real property is unique. Second, it is also hard to acquire information about borrowers who, unlike business borrowers, cannot be expected to issue audited financial statements. Hence mortgages are not readily bought and sold; they are *illiquid*. The solution is *securitization*, a process that transforms an illiquid financial asset into a liquid one. The leading roles in this melodrama are entities created to facilitate the securitization of USA mortgages².

Acronym Glossary. To understand the mortgage mess in the USA, one must get one's head around a number of institutions peculiar to the USA.

GSE = Government Sponsored Enterprise. An American public sector entity, akin to a New Zealand State Owned Enterprises (SOEs). We are only interested in those GSEs whose mission was to buy mortgages from mortgage bankers and to sell mortgage-backed securities (defined below):

- ◆ *Fannie Mae* (FNMA).
http://en.wikipedia.org/wiki/Fannie_Mae;
- ◆ *Freddie Mac* (FHLMC).
http://en.wikipedia.org/wiki/Freddie_Mac;
- ◆ *Ginnie Mae* (GNMA) is a US government department, and its activities in recent years are not controversial.
http://en.wikipedia.org/wiki/Ginnie_mae

¹ Bitner (2008) contains many anecdotes, taken from the author's experience as a subprime entrepreneur, and bearing on the erosion of mortgage lending standards over 1993-2007. Liebowitz (2009) speaks to the political pressures to facilitate homeownership.

² See McDonald and Thornton (2008) for an elementary overview of how USA mortgages are defined, valued, originated, serviced, and traded. They also discuss home equity loans. For a comparison of USA mortgage industry practices with those in other countries, see Green and Wachter (2005).

Fannie and Freddie were deemed GSEs even though both had share market listings. By law and regulation, the GSEs can only buy mortgages that satisfy certain criteria; such mortgages are called *prime* or *conforming*. Mortgages not meeting those standards are deemed *subprime*. In this article, this term will include what are known in the industry as “Alt-A” mortgages.

A key player in this melodrama is a USA invention, the mortgage backed security.

MBS = **M**ortgage **B**acked **S**ecurity. A bond issued by a unit trust investing in residential mortgages. A mortgage backing an MBS is said to be *securitized*. *Agency* MBS are issued by a GSE; *nonagency* MBS were issued by one of five private investment banks: Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley. The vast majority of nonagency MBSs are backed with subprime mortgages.

The main way an MBS differs from a share in an American mutual fund is that the latter is an equity while an MBS is a debt. Everybody understands that the value of a mutual fund share fluctuates, along with the market prices of the securities in which the fund invests. Because agency MBSs were seen as enjoying the unspoken protection of the USA government (which proved correct), few people expected a dramatic decline in the value of nonagency MBSs.

Tax and regulatory environment. The American voter desires that American public policy strongly favor owner-occupancy. Thus the USA government wraps the USA housing finance industry in cotton wool, as follows. These facts go back to the 1940s and 50s; hence they are not primarily responsible for the current crisis:

- ◆ Interest on a loan secured by one’s primary residence, and rates paid on that residence, are deductible from taxable income. Since 1986, no other interest paid by households is tax deductible; this is why Americans invented the home equity loan.
- ◆ The first 500K of capital gains on the sale of one’s principle residence are excused from capital gains tax if the owner has resided in the house for at least 2 of the 5 years previous to the sale¹.
- ◆ The GSEs are creatures of statute. The USA government guarantees Ginnie Mae liabilities from default. Fannie Mae and Freddie Mac were

widely perceived to enjoy an unspoken guarantee of this nature. In September 2008, this perception proved correct when Fannie and Freddie were effectively taken over by the USA government².

- ◆ Despite the expansion of mortgage banking and brokering, it is still the case that most mortgages in the USA are originated by depository institutions:
 - ◆ chartered and regulated by the American government;
 - ◆ whose deposit accounts are insured by the American government up to 250K;
 - ◆ that can borrow on advantageous terms from the central bank of the USA and other American government entities.

In return, the American government expects cooperation from mortgage lenders on a number of politically sensitive issues, including lending to the truly disadvantaged and to those perceived as such.

1. Some empirics

In 2006, the USA had 116 million households. In 2004, 62% of households owned their residences. Homeownership increases with income, and is about 50% even in the bottom income quintile³. According to an article in a recent issue of *The Economist*, about 5 million mortgaged homes have begun foreclosure in the past 3 years, and an estimated 9 million more will follow suit over the next 4 years⁴. If this prediction proves correct, the ongoing crisis will result in nearly 1 in 8 American households experiencing one of the following:

- ◆ abandoning a residence they had owned;
- ◆ being required to vacate a rented property because the landlord defaulted on his mortgage;
- ◆ keeping their residences only thanks to financial assistance from the public sector or a private charity.

I now turn to some historical data on the evolution of the mortgage industry. These data are from the Flow of Funds Accounts of the USA. The Data Appendix says more about these Accounts, and includes some calculations in addition to those reported in this section. Figure 1 shows the evolution since WWII of the total dollar amount of mortgages secured by owner-occupied residences, divided by the estimated dollar value of such residences. This ratio rises when the mortgages owed grow faster

¹ http://en.wikipedia.org/wiki/Capital_gains_tax_in_the_United_States#Primary_residence Homeowners in California, where house prices were both high and rising rapidly until 2 years ago, had a tax incentive for changing house every few years.

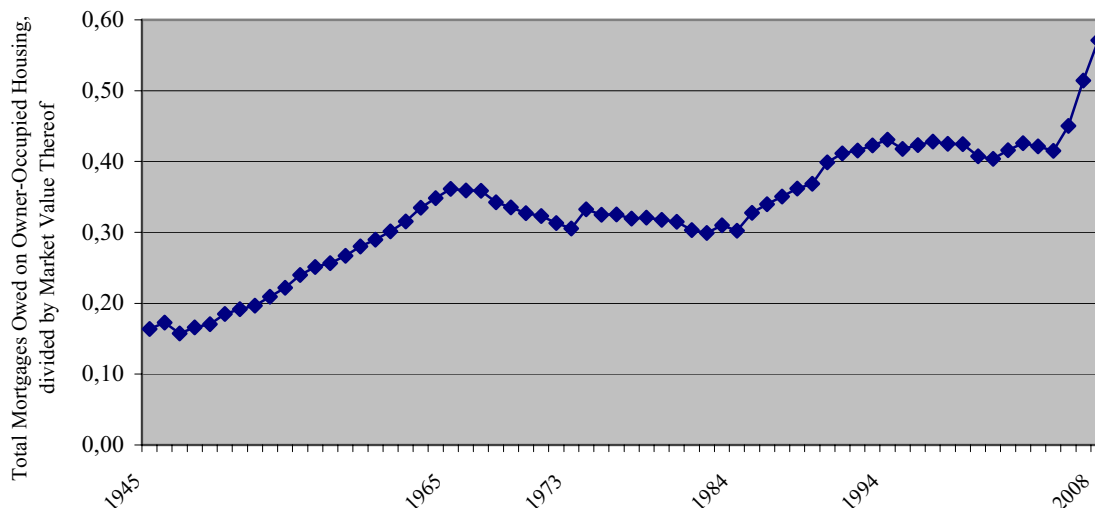
² http://en.wikipedia.org/wiki/Federal_takeover_of_Fannie_Mae_and_Freddie_Mac.

³ http://en.wikipedia.org/wiki/Household_income_in_the_United_States

⁴ “Can’t Pay or Won’t Pay”, *The Economist*, 21 February 2009. http://www.economist.com/world/unitedstates/displayStory.cfm?story_id=13145239&source=features_box_main.

than house prices (e.g., 1945-65), and declines when the inequality goes the other way (e.g., 1965-84). Rises tend to be permanent, so that the evolution of this ratio is subject to a ratchet effect. USA households have gone ever deeper into debt in order to buy their houses. The rise in this ratio over 1984-

94 is due, to some extent, to the rise of home equity loans as a form of general purpose consumer credit. Starting in 2006, after a decade of stability, the ratio experienced a dramatic and unprecedented rise, driven in good part by the unprecedented decline in house prices that began in that year.



Source: Board of Governors of the USA Federal Reserve System, release Z.1, Flow of Funds Accounts, Table B.100, Assets and Liabilities of the Household and Nonprofit sectors. The series graphed is “Mortgages owed on owner-occupied residences” (row 33) divided by the “Market value of owner-occupied residences (row 4).

1955 is the first year with a nonzero value for GSE holdings of home mortgages. At that time, Fannie Mae was the sole mortgage-related GSE, and it held 0.1% of mortgages by value. The first agency MBSs were issued in 1965. The first nonagency MBSs were issued in 1984; the first subprime MBSs were issued in 1995.

2003, this share grew by almost 0.02 per annum. Then between year end 2003 and midyear 2007, a mere 3.5 years, the share rose by almost 0.04 per annum. It has since declined a bit.

Table 1. Some historical facts about USA home mortgages

| Year end, unless otherwise stated | % of GDP | | | % of all mortgages | |
|-----------------------------------|---------------|-------------------------------|-----------|--------------------|-----------|
| | All mortgages | Mortgages held by MBS issuer: | | GSE | Nonagency |
| | | GSE | Nonagency | | |
| 1983 | 0.34 | 0.09 | 0 | 0.27 | 0 |
| 1989 | 0.44 | 0.18 | 0.01 | 0.40 | 0.02 |
| 1993 | 0.47 | 0.23 | 0.03 | 0.49 | 0.05 |
| 2003 | 0.66 | 0.34 | 0.06 | 0.52 | 0.09 |
| 30.6.2007 | 0.79 | 0.32 | 0.16 | 0.41 | 0.20 |
| 2008 | 0.77 | 0.37 | 0.13 | 0.48 | 0.17 |

Source: <http://www.federalreserve.gov/releases/z1/>. See Data appendix. Mortgage amounts are from the Flow of Funds Accounts, Table L.218: All (row 5); Held by GSEs (rows 17+18); Held by Nonagency (row 19). GDP: <http://research.stlouisfed.org/fred2/data/GDPA.txt>

The fraction of all mortgages outstanding owned by GSEs (Table 1, penultimate column) rose to 0.40 in 1989, was a bit over 0.50 in 1994-2003, declined to 0.41 by midyear 2007, then surged to 0.48 by yearend 2008, the most recent value. Hence all of the 1989-2007 growth in the fraction of mortgages that are securitized (Table 1, sum of the two columns on the right) was due to the rise of private securitization. At midyear 2007, agency and nonagency MBS issuers owned 61% of all outstanding mortgages. A curious fact is that the comparable number for year end 2003 was also 61%. The very rapid growth of the market share of nonagency MBSs, 2003-07, was entirely at the expense of the market share of agency MBSs. Was the Bush administration attempting to privatize the MBS industry by stealth?

The column “All mortgages” of Table 1 reveals that the dollar value of all home mortgages outstanding has grown substantially more than the overall economy. Between 1955 (not shown) and 1993, mortgages as a share of GDP rose by a little more than 0.007 per annum. Between 1993 and

Interpreting Table 2 requires the following assumptions:

- ◆ Row 1: I assume that nearly all nonagency MBS were backed by subprime mortgages (equivalently, I assume that the securitization of “jumbos,” i.e., mortgages too large for the GSEs to buy, was immaterial). “Subprime MBS” shall henceforth be nearly synonymous with “nonagency MBS”.

- ◆ Row 2: I assume that holdings of “corporate and foreign bonds” by “government sponsored enterprises” were entirely (or nearly so) accounted for by Fannie and Freddie holdings of subprime MBS. In particular, I assume that GNMA held no subprime MBS.
- ◆ Row 3: I assume that Fannie and Freddie account for all or nearly all of the data in this row. If this is incorrect, the amount in row (3) is greater than the net worth of Fannie and Freddie, which strengthens my argument.

Over the 1993-2003 decade, nonagency MBS (Table 2, row 1) grew at 13.8% p.a. But over the 3.5 years from year end 2003 to midyear 2007, the growth rate was 35.2% p.a. In 1993, Fannie and Freddie began buying nonagency MBSs and by yearend acquired 7% of the amount outstanding (Table 2, row 4). A subprime mortgage is, by definition, one that Fannie and Freddie cannot buy. But the law and in-house rules were silent about whether Fannie and Freddie could buy subprime MBS, and they began doing so in 1995. In every year since 1998, the GSEs have owned at least 20% of nonagency MBSs outstanding. At year end 2002 and 2003, this percentage was as high as 42%. By midyear 2007, the GSEs held \$501 billion of nonagency MBSs, 22% of the outstanding amount. Moreover, GSE holdings of nonagency MBS have exceeded GSE net worth (Table 2, row 3) in every year since 1995. By midyear 2007, these holdings amounted to 5.4 times GSE net worth. By year end 2008, this multiple had risen to 7.4, meaning that a 14% decline in the value of these holdings would suffice to wipe out the net worth of the GSEs. When the “market prices” of the subprime MBS went into free fall, 2007-08, the insolvency of Fannie and Freddie was inevitable.

Table 2. MBS and GSEs: a closer look

| | | Year end 1993 | Year end 2003 | 30.6.2007 | Year end 2008 |
|---|---|------------------|------------------|-----------|------------------|
| 1 | Nonagency MBS (L.218.19) | 168 | 666 | 2287 | 1839 |
| 2 | “Corporate bonds” held by GSEs (L.124.10) | 11 | 277 | 501 | 376 |
| 3 | GSE net worth (L.124.1–L.124.21) | 19 | 47 | 93 | 51 |
| 4 | 2÷1 | 0.07 | 0.42 | 0.22 | 0.20 |
| 5 | 2÷3 | 0.6 | 5.9 | 5.4 | 7.4 |
| 6 | MBS issued by GSEs (L.218.18) | 1334 | 3211 | 3943 | 4811 |
| 7 | 1÷(1+6) | 0.11 | 0.17 | 0.37 | 0.28 |

Note: Data in rows 1, 2, 3 and 6 are in billions of US\$.

Source: <http://www.federalreserve.gov/releases/z1/>. See Data appendix.

2. The gathering storm

The volume of nonagency MBS increased dramatically over 2003-07 because both the supply of, and demand for, such securities were stoked. Turning first to supply, in 2004 the American government repealed a regulation requiring investment banks to have so many cents of capital for every dollar of debt they issued. Is it a coincidence that between year end 2003 and midyear 2007, the value of mortgages backing nonagency MBS rose from US\$0.7 to US\$2.3 trillion (Table 2, row 1)? All issuers of nonagency MBS were listed on the New York Stock Exchange, but how much equity they had over this period is not easily determined.

The investment banks stoked the demand for subprime MBSs by grossly understating the risk that the underlying mortgages would default. Let us say, by way of example, that an investment bank acquired 100,000 subprime mortgages. Each mortgage came with data on the value and location of the property, on the income of the borrower, on the deposit as a fraction of the purchase price, etc. Based on these data, a computer assigned these mortgages to several broad risk classes. A given MBS issue was backed by mortgages from a given risk class, called a “tranche” (a French word meaning “bread slice”). The investment bank then insured MBS investors against default in the underlying mortgages, by engaging in a poorly understood financial transaction called a “credit default swap” (CDS). The counterparty to a CDS was an insurance company, the main one being AIG. Each tranche was then rated by one of the two main USA bond rating agencies, Standard & Poor’s and Moody’s, which gave the best tranche of each subprime MBS issue the coveted AAA rating. The problem was that this premium tranche was too large by design, typically amounting to about 80% of the total pool. Once 20% of the mortgages in a pool were in default, further defaults were at the expense of the AAA tranche¹.

These practices made it very easy for USA investment banks to sell vast quantities of subprime MBSs around the world. Salespeople only needed to say “Look, it’s a no-brainer. It’s rated AAA, the default risk is insured, and Fannie and Freddie have bought hundreds of billions of the stuff”. By heavily investing in subprime MBSs, the GSEs sent a clear but misleading message to Wall Street and to investors around the world: the securitization of subprime mortgages enjoyed the favour of the

¹ Bitner (2008: 107-09) discusses many of the institutional details mentioned in this paragraph.

American Powers that Be. This is the sense in which the American government gave the green light to the whole sordid business, and Wall Street was encouraged to delude itself that unsound mortgages were sound. But this signal carried the seeds of its own destruction, because it put the entire net worth of the GSEs at risk.

All looked well while USA house prices rose. Defaults were rare because one could always get out of an onerous mortgage by selling the house. But house prices began to fall in mid-2006, and in 2007 American mortgage lending practices began backtracking to sanity. Borrowers who had taken out a mortgage this decade and paid little or no deposit, discovered that their houses were often worth less than the balance owed on their mortgages, a situation termed “negative equity”. The total amount of negative equity in the USA may equal or exceed US\$500 billion. It has also been estimated that during the past 3 years, about 20% of households with negative equity have ended up in foreclosure¹.

Negative equity would not matter too much, were it not that American business law regulating the borrower-lender relation, as well as the day-to-day practices of American lenders, probably tilts more strongly towards borrowers than is the case in any other OECD economy. If a USA borrower surrenders his house to the bank, the only real penalty he will experience is that during the 7 years subsequent to the default, he will be unable to obtain a mortgage and his family will have to live in rented housing. But at the end of 7 years, the default is erased from the computer databases lenders use to verify the credit histories of those who apply for loans. In recent years, the variety of rental housing has risen and its cost has fallen, in part because many homeowners have preferred to rent out their houses rather than to sell them in a declining market. Hence the supply of rental housing has risen along with the demand.

A further complication is that many USA mortgages issued during the middle of this decade featured an initial low interest rate that would rise (“reset”) to the market interest rate after 1-3 years. Many lenders approved mortgages purely on the borrower’s ability to meet the artificially low monthly payments of the initial period.

2.1. Gaming the system. I will now describe a clever way certain large home builders could work the system and in effect pay the deposits of subprime borrowers, leaving them with little or no equity in

their houses. A builder opting to go down this path would first create a charitable foundation whose mission was to make grants to households of modest means, covering all or part of the deposit they needed to qualify for a mortgage. All donations to such foundations are tax-deductible up front, including donations made by the builder himself. The builder would price his new houses so as to recoup the after-tax cost of his donations to his foundation. He then steered to the foundation prospective buyers of his houses who were likely to qualify for a grant.

A worked example follows. Assume that a builder can build a house for 400K, an amount including his “normal” profit. Further assume that an application for a subprime mortgage was normally successful if the deposit amounted to 5% or more of the selling price of the house. The builder builds a house and prices it at 421K, a sufficiently small markup over its 400K cost that an appraiser working for the lender was unlikely to flag it in a rising market. The builder then makes a donation to his foundation equal to 5% of 421K, or 21.1K, thereby reducing his company tax liability by that amount times the company tax rate, 35%, or 7.4K. When a willing but impecunious buyer materializes, the builder steers him to the foundation, which advances the prospective buyer the 21.1K he needs to qualify for a mortgage. The builder realizes 421K from the sale of the house + 7.4K of tax benefits – 21.1K donation to the foundation, or 407.3K on net. Hence his costs are more than covered.

The main problem is that the borrower is left holding no equity. Also, the notional loan-to-value ratio exceeds the effective loan-to-value ratio. By taking out a mortgage amounting to 95% of the 421K selling price, the effective loan-to-value ratio is 100% of the 400K market value. Once the borrower realizes that his house is worth only 400K, and not the 421K he “paid” for it, he has little incentive to not default should house prices decline. And if he does default, neither the builder nor his foundation suffers a loss. A builder who declines to play this game will build a comparable house, price it at 400K, and do nothing to facilitate its sale to a subprime borrower. The eventual buyer will pay a deposit of, say, 10% or 40K, and borrow the 360K balance at a lower interest rate.

If subprime borrowers are required to pay a deposit greater than the 5% assumed above, the builder would have to raise the asking prices of the house, discouraging potential buyers and raising the risk that the appraiser retained by the lender would balk at the higher price. Specifically, if the builder’s objective is to net 400K, a deposit rate of

¹ See fn P. 80, fn 4..

5%/10%/20% would require a selling price of 413.4K/428K/460K. Also, the resulting *effective* loan-to-value ratio of 98.2%/96.3%/92% would be considerably higher than the *notional* ratio equal to 100% minus the deposit rate. For example, if the deposit rate were 20%, so that the notional ratio is 80%, a mere 8% decline in the price of the house would suffice to wipe out the borrower's equity.

2.2. The banking industry hits a wall. Over the course of 2006-07, house prices began to decline and mortgages began to default in appreciable numbers. Those who had issued CDSs were called on to honor their end of the bargain. As a result, AIG soon became insolvent. In 2008, after 12-18 months of rising defaults, Bear Sterns had to be bailed out by the taxpayer, Lehman Brothers was allowed to fail, and Merrill Lynch was merged into the Bank of America (itself very badly stressed). Goldman Sachs and Morgan Stanley appear to have weathered the crisis, but distanced themselves from the debacle by reincorporating as trading banks, thereby placing themselves under much stricter regulation.

Defaults have risen among prime mortgages as well. By midyear 2008, when the current recession looked a lot milder than it does now, more than 9% of American mortgages were at least 3 months in arrears.

We now turn to the effect of these defaults on the world banking system. In the 1980s, the advanced economies agreed to require that their trading banks would:

- ◆ classify their assets into several broad risk classes;
- ◆ hold so many cents of capital per dollar of assets in each risk class.

These agreements are known as the Basel Accords, because they were drawn up, and have been subsequently policed, by the Bank for International Settlements in Basel, Switzerland¹. These accords force a bank to reduce its lending or raise more capital when its capital declines.

There is no point to the debt securitization game unless there is a secondary market setting a daily price on the MBS. MBS debt issued by Fannie and Freddie has been actively traded for decades; hence there has been an active secondary market for prime MBS. But subprime MBS have traded only in an over-the-counter market, one that became thinner as the credit crisis emerged and deepened. The word on the Street has been that "no one knows what a subprime MBS is truly worth".

¹ http://en.wikipedia.org/wiki/Basel_Accords.

The regulatory standard around the North Atlantic (presumably following on the Basel Accords) was to require no more than 5 or 10 cents of capital for every dollar invested in MBS, on the assumption that MBS were investment grade (AAA) securities, insured by CDS, and believed to enjoy the tacit backing of the USA government. Many buyers of subprime MBS would not have bought them if these securities had received a less than investment grade rating, if only because they lacked the required capital. In any event, the capital that was set aside proved grossly inadequate given that subprime MBS are trading for as little as 25 cents on the dollar. This fall in MBS prices reduced bank capital, and hence the capacity of banks to lend. Thus the credit crunch began in 2007.

This American mess became a worldwide crisis because debt issued by the American government finds willing buyers in many countries. During the first half of this decade, interest rates on direct obligations of the US government were abnormally low. Not only did subprime MBS pay a higher rate of interest than US Treasury obligations, they were mostly rated AAA and were also perceived as enjoying the tacit support of the US government. Hence subprime MBSs found willing buyers among financial institutions around the world, so that when the prices of these MBSs fell, bank balance sheets were damaged all around the world. This is the primary way by which purely domestic American business and regulatory errors planted the seeds of a world crisis. The operative metaphor here, "financial toxic waste", is an apt one.

It should be granted that overoptimistic lending practices and the resulting house price surge were not confined to the USA. The British and Irish enthusiastically imitated American practice; Australasia also did so, at least in a more subdued fashion. Canada to its credit mostly stayed aloof from this madness. The problem was worse in cities:

- ◆ that were popular destinations for moneyed immigrants;
- ◆ where population growth was substantial;
- ◆ where geography or politics limited building new housing to accommodate the rising demand.

3. Post mortem

I now briefly recapitulate the events that are the subject of this article:

- ◆ Borrowers agreed to pay too much to buy houses, by taking out mortgages whose monthly payments they could not afford, if not at the outset then later when the adjustable rate rose.
- ◆ In most urban areas in the six advanced English-speaking OECD countries, the interior of North America excepted, the median price of a single

family detached house rose to 6-12 times average household income. When this ratio exceeds, say, 4, first time home buyers have to endure financial stress or buy modest starter houses. For more on this ratio, see *Housing Affordability* in the Data Appendix, and Cox and Pavletich (2009).

- ◆ Mortgage bankers cheerfully issued mortgages, pocketed fees, on sold the dubious mortgages to Wall Street, then headed for the golf course.
- ◆ Wall Street, with the tacit blessing of the American mortgage GSEs, repackaged the mortgages into MBSs and sold them for a handsome profit.
- ◆ The MBAs and lawyers at the top of the American mortgage banking and investment banking industries anesthetized their consciences with compensation packages on the order of, say, \$2M of straight pay plus \$10M annual bonuses. Compensation of that magnitude makes *après moi le deluge* a viable stance: simply invest 70% of your take-home pay in investment grade bonds. (N.B. Investors in bonds that are *not* subprime MBSs are weathering this crisis rather well.) When Jericho falls, you lose your job, of course, but your nest egg is large enough to enable you to retire at age 50-55 in a beach condo in Florida.

These events have had the following multifarious consequences, which can be seen as the casualty list resulting from the “train wreck”:

- ◆ Fannie and Freddie are in receivership. In April 2009, the acting CFO of Freddie, appointed by the receivers, was found dead, an apparent suicide.
- ◆ The construction industry throughout the OECD has largely shut down, except for the occasional government project.
- ◆ There are neighbourhoods in California where 25%+ of the houses have been abandoned because their owners who could not meet their mortgage payments.
- ◆ The ultimate owners of the subprime MBS carried them at cost as long as accounting rules let them get away with that. When the dam broke, the value of these MBSs was written down 40-75%, which has wiped out most or all of the capital of quite a few financial firms.
- ◆ During the first half of 2009, there was some talk that the two largest USA banks, Citicorp and Bank of America, would have to be nationalized. Such talk appears to have ceased, however.
- ◆ British banking is badly damaged. The Royal Bank of Scotland (the 2nd largest bank in the UK

by virtue of having merged with NatWest in 2000) reported a £28 billion loss for 2008, and has been effectively nationalised¹.

- ◆ The reputations of the American rating agencies, Standard & Poors and Moody's, are in tatters. “If the financial over-engineering of the first decade of the 21st century was a crime, rating agencies were the getaway drivers”².
- ◆ The American financial innovation called debt securitization has now acquired a poisonous reputation. Securitizing debt can substantially reduce risk by diversification. It can also transform illiquid bank assets, whose value can only be estimated, into marketable financial instruments with an active secondary market. But the ongoing crisis reveals the worm in the apple: lenders face a constant temptation to issue loans to bad credit risks, pocket an origination fee, sell the loan to a 3rd party by concealing the credit risk, and let the 3rd party suffer the consequences of any eventual default.
- ◆ The central bank of the USA has become the largest financial institution in the USA, having purchased US\$800B of private debts during the last 4 months of 2008³. One consequence has been that the monetary base of the USA (= US\$ currency outstanding *plus* the value of reserve accounts at the central bank of the USA) rose from US\$875 billion on 10 September 2008, to \$1728 billion as of yearend 2008. A monetary policy intervention of this magnitude is without precedent in world economic history. The monetary base was \$1787 billion as of 9 September 2009⁴.
- ◆ Quarterly data for the USA released in late August 2009 reveal that real GDP per capita declined 5.1% over 2008 and the first half of 2009¹. Hence the ongoing recession in the USA is now the deepest since the quarterly data began in 1947, and the USA is experiencing its worst economic

¹ http://en.wikipedia.org/wiki/Royal_Bank_of_Scotland_Group#2008-2009Financial_Crisis.

² *The Economist*, 25 July 2009, p. 68.

³ As of 16 September 2009, Federal Reserve Credit was US\$2125 billion, of which \$872 billion was invested in the following private or quasi-private sector liabilities: \$685 billion in agency MBSs, \$61 billion in liabilities owed by Maiden Lane LLC I-III (http://en.wikipedia.org/wiki/Maiden_Lane_LLC), entities created to assume some of the “toxic assets” of Bear Stearns and AIG, \$43 billion in commercial paper, \$44 billion in other asset-backed securities, and \$39 billion lent to AIG. *Source*: Fed release H.4.1. <http://www.federalreserve.gov/releases/h41/Current/>.

⁴ Monetary base adjusted by the St. Louis Fed for changes in reserve requirements, computed biweekly and not seasonally adjusted. *Source*: St. Louis Fed, FRED database. <http://research.stlouisfed.org/fred2/data/BASENS.txt>.

downturn since the Great Depression and the unwinding of WWII. If this decline persists during the second half of 2009, this recession will also be the longest one in the quarterly data.

From a historic peak sometime during 2006 or 2007, to the subsequent trough in 2008 or 2009, the typical sharemarket, including that of the USA, declined at least 50%. But the subsequent data tell a much happier story. From year end 2008 to 9 September 2009 (the cutoff date for all facts in this paragraph), the American S&P 500 has risen 14.4%. This figure conceals a much more dramatic fact: since its 9 March 2009 low, about equal to its year end 1997 level, the S&P 500 has risen by more than 50%. An immediate consequence is that American pension funds have made a dramatic return to solvency. Corporate earnings, however, have not kept pace, so that the price-earnings ratio of the S&P 500 is now about 25. Sharemarkets outside the USA have performed even better. Among the 40-odd national sharemarkets followed by *The Economist*, the only ones that have not performed as well as the USA since year end 2008 are the UK and Switzerland. The only non-G7 sharemarkets not to have risen by at least 20% over the same period are those of Saudi Arabia, South Africa, and Switzerland².

Closing thoughts

American mortgage lending was widely believed to be “too sacred to fail”, and by virtue of that fact, was assumed to enjoy the protection of the American government. Mortgage industry officials tacitly assumed that the government would either bail out their employers or, if these were to fail, hasten the creation of new firms issuing mortgages. Given such beliefs, nobody believed that the mortgage industry practices described here would lead to a substantial personal cost, unless the perpetrators were indicted for fraud. It is the case that some financial executives are under indictment in both the USA and the UK.

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The smaller the deposit as a fraction of the purchase price, the more likely the borrower will default should the market head south. This bald fact suggests a simple policy measure to prevent the recurrence of a crisis of this nature: requiring house buyers to pay in cash at least 20% of the buying price for a house. This has been the norm for decades in countries (e.g., Italy, Malta)³ that have weathered this banking storm relatively well. Central banks should also have standby discretionary authority to increase that percentage at any time, as a pin with which to prick property market bubbles. This authority should be seen as an essential part of effective and efficient financial regulation.

Business education needs a major rethink. Even 30 years ago, I noticed a creeping amorality among American MBA students I knew, some of whom struck me as thinking as follows: “If doing X is handsomely rewarded, and the employer's stock price rises, don't ask too many questions.” MBAs must be taught that a banker's fiduciary duty to his depositors and shareholders comes before his duty to make an immediate profit.

Very recently, an editorial in *The Economist* deemed “boosterism” the “original sin of business schools,” and called for an increased emphasis on financial history and financial crises, and called on business schools to foster the “twin virtues of scepticism and cynicism.” The editorial concluded with the following paragraph:

“Business schools need to make more room for people who are willing to bite the hand that feeds them: to prick business bubbles, expose management fads, and generally rough up the most feted managers. Kings once employed jesters to bring them down to earth. It's time for business schools to do likewise”⁴ .

¹ Bureau of Economic Analysis, National Income and Product Accounts, Table 7.1, row 10. <http://www.bea.gov/national/nipaweb/TableView.asp?SelectedTable=264&Freq=Qtr&FirstYear=1947&LastYear=2009> .

² *The Economist*, 12 September 2009, p. 90.

³ I thank the referee for informing me of this fact.

⁴ “Schumpeter,” “The pedagogy of the privileged,” *The Economist*, 26 September 2009, p. 72. http://www.economist.com/research/articlesBySubject/displaystory.cfm?subjectid=14391731&story_id=14493183&mode=comment&intent=postTop .

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Data appendix

The Flow of Funds Accounts (hereinafter "Accounts") are prepared by Federal Reserve Bank of the USA, and are updated quarterly in its release Z.1 (<http://www.federalreserve.gov/releases/z1/>). The Accounts include a set of mutually consistent balance sheets for the American economy. Annual data begin year end 1945; quarterly data, the first quarter of 1952. Each balance sheet is presented in a numbered table. *L.table.row*, where *table* and *row* are numbers, designates the row *row* in the table *L.table*. B.100 denotes the balance sheet for the combined household and nonprofit sector.

Each table either sets out the assets and liabilities of a sector of the USA economy, or how much of a given class of financial assets is owned or owed by the various sectors of the USA economy. The Accounts include holdings of foreign assets by Americans, and foreign holdings of American assets. Although a few tables include the replacement value of physical assets owned by a sector, as estimated by the Bureau of Economic Analysis, the Accounts focus on financial assets and liabilities.

Residential mortgages make up one of these classes of financial assets in the Accounts. Hence the Accounts include data on the overall American mortgage market, and on the relative importance of GSEs and MBSs among mortgage holders over time. The Accounts value debt at par, not market, and I assume that this is true of MBSs. Hence the data for 2008 on nonagency MBS do not reflect the drastic decline in the value of subprime MBSs.

Before 1965, GSEs held at most 1% of outstanding mortgages by value. By yearend 2001 (2008), that percentage had risen to 53% (48%). *Source*: L.218.17+18 ÷ L.218.5. As of year end 2008, agency (nonagency) MBS amounted to US\$4.8 (\$1.8) trillion. *Source*: L.125.2 (L.126.6). Nonagency MBSs were first issued in 1984; the underlying mortgages were not subprime but "jumbos", i.e., mortgages too large for the GSEs to buy. In 1992/2002/2006/2008, nonagency MBS accounted for 10%/15%/36%/28% of the total value of MBSs. *Source*: Table L.214.19 ÷ L.214.18+19. As recently as year end 2003, nonagency MBSs held only 9% of the value of outstanding mortgages. This percentage was 20% (17%) at year end 2006 (2008). *Source*: L.218.19 ÷ L.218.5.

Housing affordability.

Cox and Pavletich (2009) calculate each quarter, for each of 265 cities in the 6 English speaking countries, including the 8 largest New Zealand cities, the median price of a house that changed hands that quarter (routinely reported by national trade associations of property agents), divided by average household income for that quarter, as reported by the Bureau of Economic Analysis or its foreign equivalent. Cox and Pavletich call this quotient the *affordability index*. Its value ranges from 2 to 13; the lower the value, the greater the affordability. Their work reveals that the interior of North America is the most affordable part of the English speaking world, and that California is the least. The median values of the index, computed across all urban areas in a nation, are Australia (6), Canada (3.5), Ireland (5.4), New Zealand (5.7), UK (5.2), USA (3.2). Cox is a principal with Demographia, an American research firm. Pavletich is a New Zealand property developer.