

Steve Keen's DebtWatch No 29 December 2008

What's Really Going On? or... Why Did I See it Coming and "They" Didn't? Part 2: The Models

But this long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again. (Keynes, A Tract on Monetary Reform, 1924)

In last month's Debtwatch, I explained why the data side of why the "Financial Instability Hypothesis" enabled me to predict this crisis, long before conventional "neoclassical" economists had any idea it was approaching.

This month I explain why the models neoclassical economists build are hopelessly inadequate--as models of the economy in general, as guides to what is likely to happen in the future, and as sources of policy recommendations to end this crisis.

In particular, the Australian Treasury's prediction that Australia will avoid recession simply cannot be trusted.

Neoclassical Models: Crisis? What Crisis?

The focus of neoclassical economists on misleading indicators is compounded by the models they build, which--as well as omitting crucial data like the debt to GDP ratio--are congenitally incapable of identifying serious turning points in the economy.

This are several reasons for this, but first and foremost is their belief that the economy is fundamentally stable, and will always return to a long-run equilibrium growth path after any shock. The models they construct have this expectation of a return to long-term growth paths after any short term divergence from trend "hard wired" into their results.

An instance of this for the Australian Treasury's macroeconomic model (TRYM) is shown in Figure One, which shows the impact on business investment in the model of a simulated monetary shock in 2010. The shock initially pushes business investment above the long term trend, to which it then returns after eight years.

This is not a prediction by the model as such, but a product of its structure, which assumes that the economy will always return to a supply-side driven equilibrium in a relatively short time frame.

Figure One

TRYM's supply-side behaviour is determined simply by the assumption that, in the long run, the economy will return to an equilibrium rate of growth, given by the sum of assumed trends in population growth and labour productivity, at an assumed equilibrium rate of unemployment called "NAIRU" ("Non-Accelerating Inflation Rate of Unemployment"). As the Treasury's documentation of TRYM puts it (see <http://www.treasury.gov.au/contentitem.asp?NavId=016&ContentID=235>):

*The model could be described as broadly new Keynesian in its dynamic structure but with an equilibrating long run. Activity is demand determined in the short run but supply determined in the long run... **The model will eventually return to a supply determined equilibrium growth path in the absence of demand or other shocks.** (THE MACROECONOMICS OF THE TRYM MODEL OF THE AUSTRALIAN ECONOMY, p. 6; emphasis added)*

and

the aggregate supply curve is vertical in the long term at a level of employment and production consistent with the NAIRU. (Or more precisely the economy grows along a steady state growth path consistent with the NAIRU.) [AN INTRODUCTION TO THE TRYM MODEL APPLICATIONS AND LIMITATIONS p. 6]

Neoclassical models like TRYM are thus variable in the present--and have some capacity to predict the very short term, if their guesses about the size of any shock are reasonably accurate. But they are anchored to some point in the (not too distant) future when it is assumed that "equilibrium" will once again apply, and they are therefore useless as guides in the medium term.

They are also useless for long term prediction because the model's long run equilibrium is unaffected by the short term disturbance: if the figure assumed for the NAIRU in the model remains unchanged, along with the estimates for population and productivity growth, then the model will average the rate of growth those assumptions imply, regardless of how severe a shock the short-term disturbance causes.

In the case of the RBA's main model, this is a real growth rate of 3.25 percent per annum (see Tables 7 & 8 of RDP2005-11)--so the economy is assumed to converge to a tranquil future

path after any disturbance, with no residue from the shock itself (apart from a change in the price level for permanent increases in the money supply).

Ironically, this means that models like TRYM produce medium term predictions of an *acceleration* in growth after the impact of a shock like this financial crisis--otherwise the model could not get back to its "long run equilibrium growth path".

There was thus no prospect that Neoclassical models could predict the crisis, and their guidance on what will happen--with or without policy intervention--are irrelevant. Unlike these models, the actual economy does not have a point of balance in the future to which it is tethered. It is therefore no wonder that these models gave no warning of the impending crisis--indeed the wonder would be if they had done so!

This is why supposedly authoritative bodies like the OECD could claim "our central forecast remains indeed quite benign" just two months before all hell broke loose (as noted in my last Debtwatch). If economic data have been apparently tranquil, these models will predict tranquility ahead; if the data have been depressed, they will predict a bit of a downturn, followed by a return to equilibrium some years hence.

Neither prediction is worth a pinch of salt.

To have any hope of predicting the future using an economic model, it has to be one with genuine dynamics--not a model that simply assumes that "when the storm is long past the ocean is flat again", as Keynes satirically remarked. Such a model has to specify what it sees as the main causal factors in the economy, and then let those factors interact. The medium and long term outcomes are thus a product of the interaction of the causal variables in the model, just as the short term is.

Models of this nature are commonplace outside economics, and scientists, mathematicians and engineers have designed an impressive range and variety of computer simulation programs to support this genuinely dynamic approach to modelling.

I developed such a model of Minsky's Financial Instability Hypothesis in the early 1990s.

A Minsky Model: Finance and Economic Breakdown

The basic principles in Minsky's financial instability hypothesis are extremely simple. A capitalist economy is necessarily cyclical. During a boom, investors will take on debt to finance investment, but because the economy is cyclical, they will later find themselves in a recession when they have to repay that debt.

Therefore their repayments don't quite cancel all the extra debt, and debt levels tend to ratchet up over time. These debt cycles with an overall secular trend towards increasing debt can lead to an ultimate crisis where the debt overwhelms the economy--a Depression.

This is not an inevitable outcome of Minsky's theory, but he emphasises that since market economies have experienced Depressions in the past, to be valid a model of the economy must...

*"make great depressions one of the possible states in which our type of capitalist economy can find itself" (Minsky, 1982, **Inflation, Recession and Economic Policy**, p. xi)*

In the model I developed in 1993, under some circumstances, the economy could taper to equilibrium; but under others, a series of debt-driven financial cycles would lead to an eventual crisis where debt overwhelmed the economy. The following graphics set out the model in flowchart format. It can also be summarised in three very simple propositions:

1. Firms borrow to invest during booms;
2. Workers' capacity to secure wages rises is affected by the rate of employment; and
3. Banks lend money to finance investment; and four very simple "stylised facts":
1. Wages share of output will rise if wage rises exceed productivity;
2. The employment rate will rise if the rate of growth exceeds the sum of population and productivity growth;
3. The debt to GDP ratio will rise if investment exceeds profits; and
4. an increased rate of economic growth will reduce the debt to GDP ratio.

As a flowchart, the model is as shown in Figure Two (the blue boxes contain mathematical sub-systems).

The simulation below and in Figure Three are with no debt in the model--in which case the model generates simple cyclical growth.

Figure Two

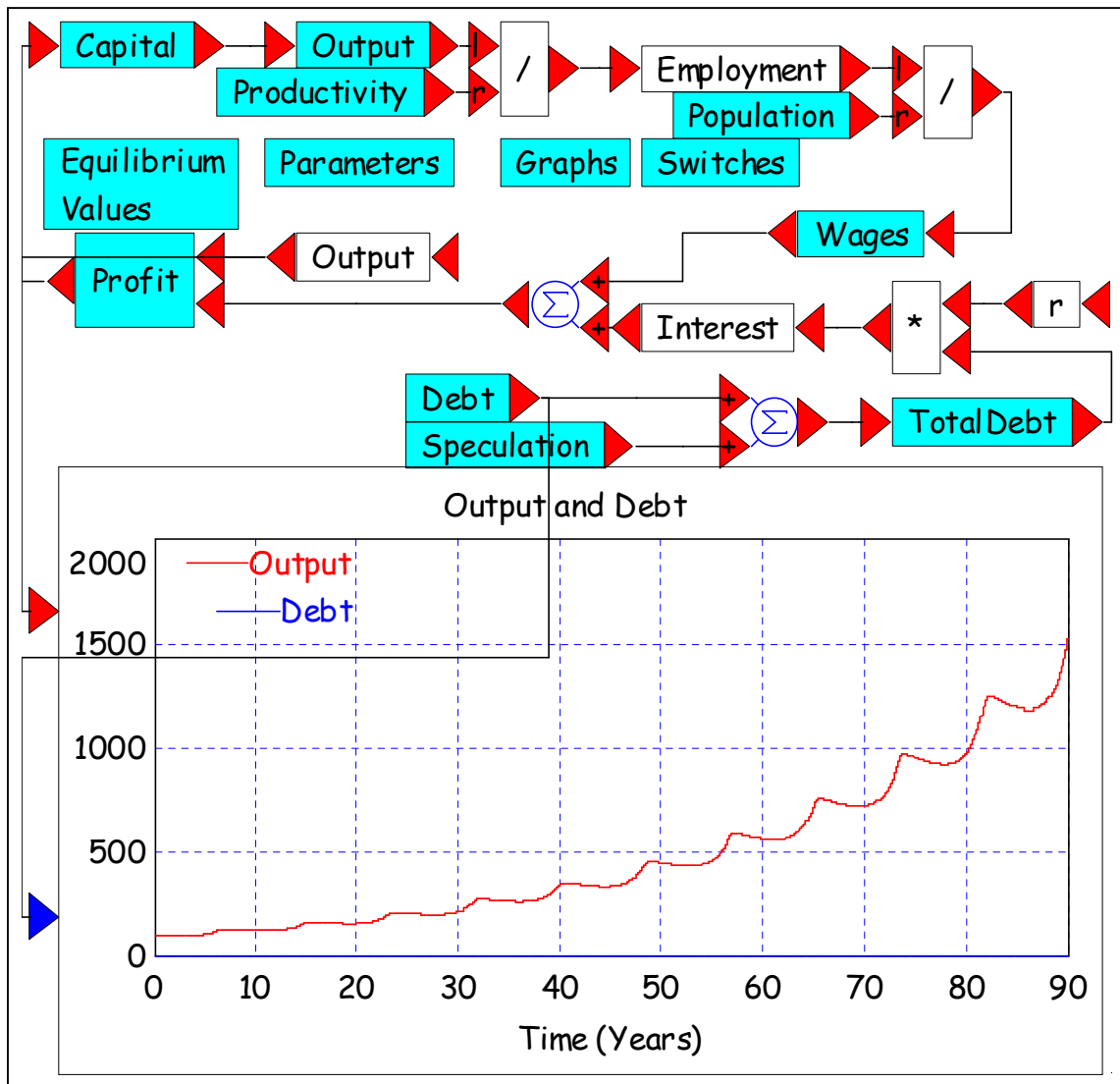
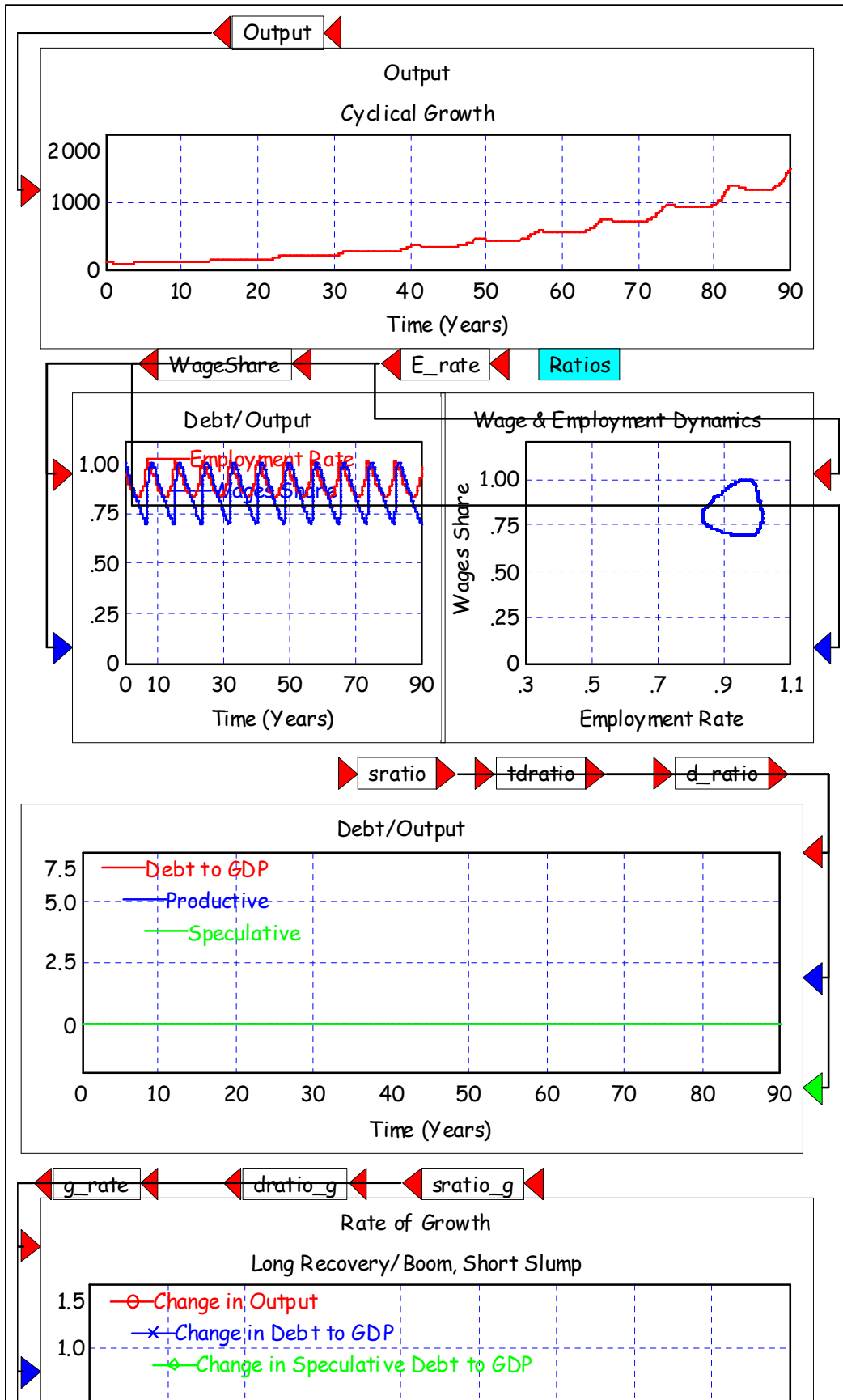


Figure Three explodes the "Graph" subsystem of the model. The same set of graphs is used in subsequent Figures to display the behaviour of the more complete models, where debt and Ponzi investing are added.

Figure Three

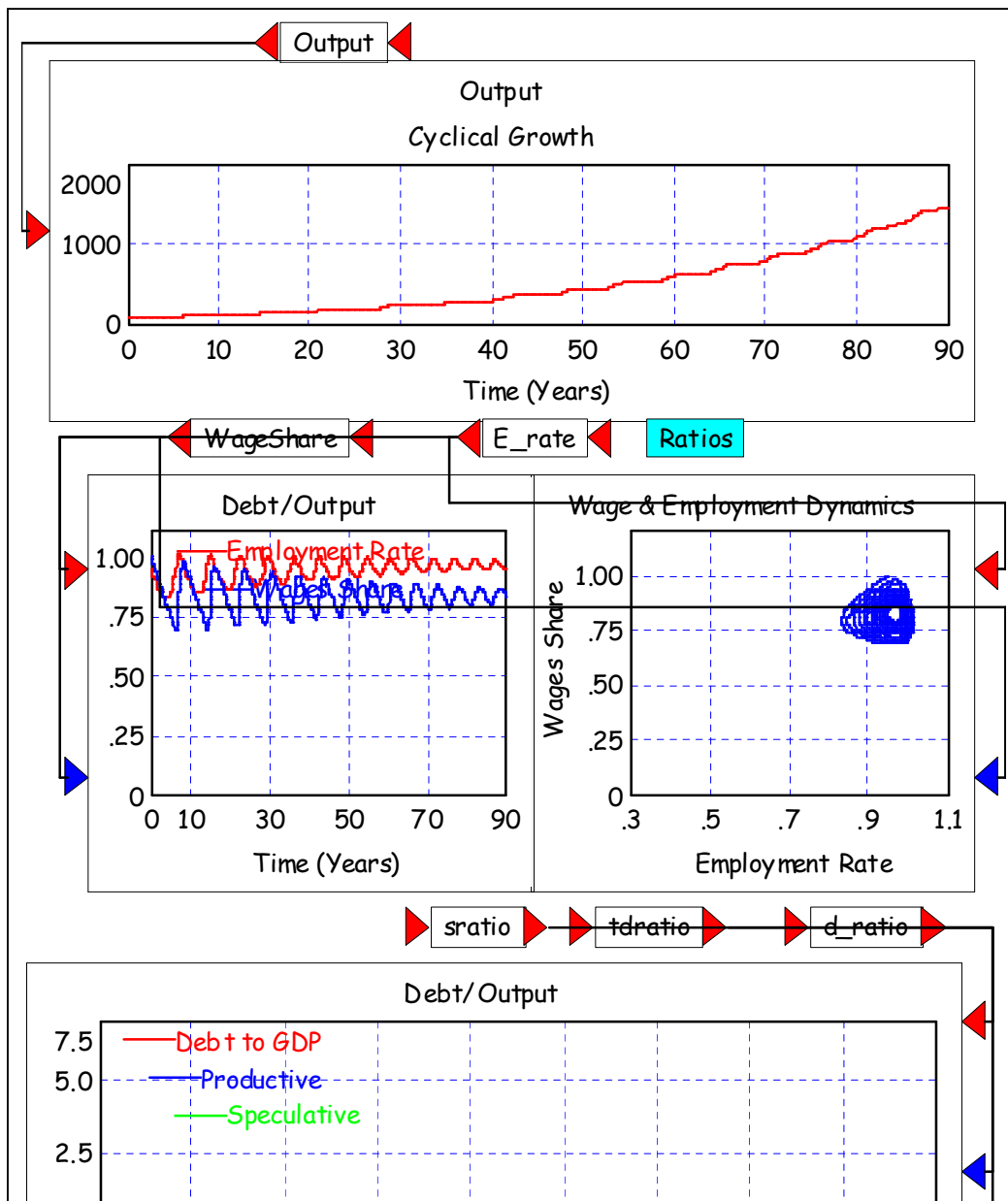


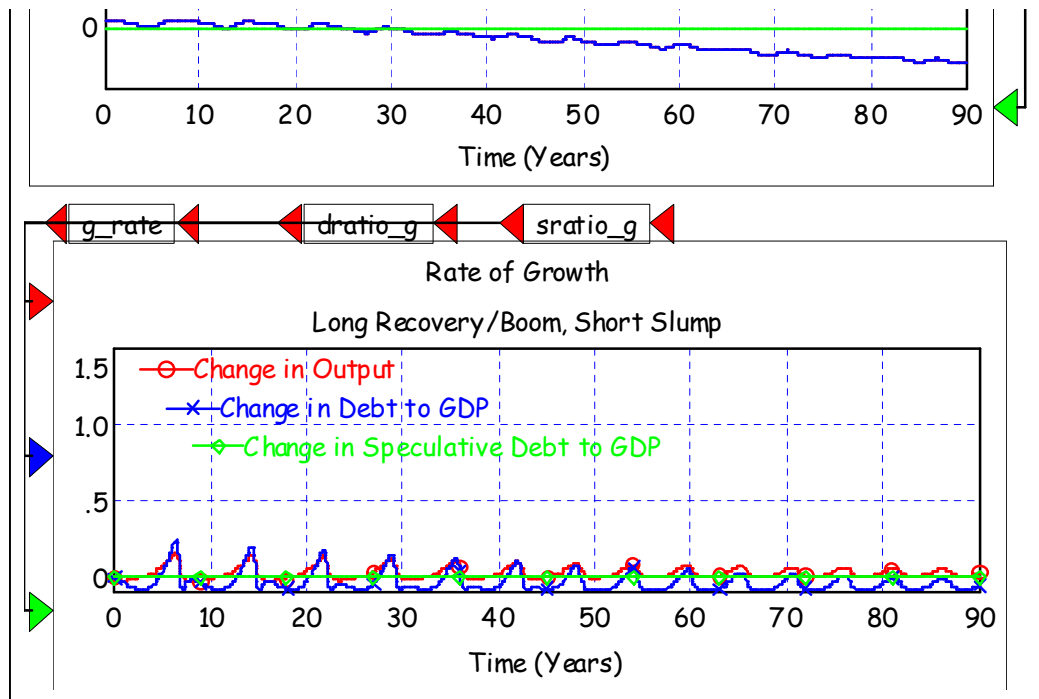


When the debt switch" is flicked to include borrowing to finance productive investment only--so all borrowed money leads to an increase in the capacity to produce output--then one of two situations will apply.

Figure Four shows the first such situation: when the model begins close to its equilibrium values, it continues to converge towards it. Employment and income distribution (proxied here by the wages share of output) taper to equilibrium values, as does the debt to output ratio (which is negative, implying positive net financial assets for firms).

Figure Four





However, if the system starts further away from equilibrium, then the system's behaviour is rather like that described by Fisher in his Debt Deflation Theory of Great Depressions:

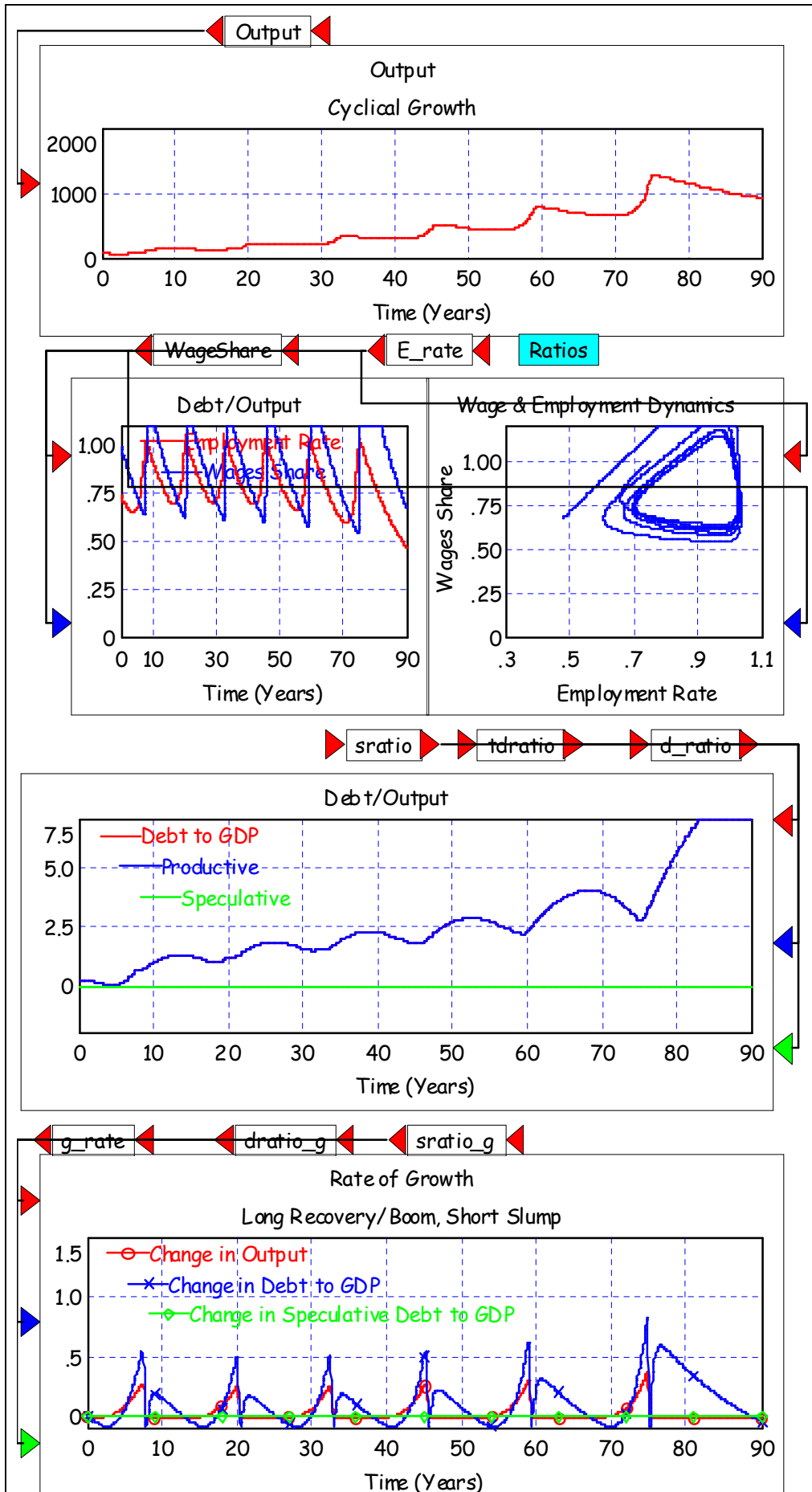
There may be equilibrium which, though stable, is so delicately poised that, after departure from it beyond certain limits, instability ensues, just as, at first, a stick may bend under strain, ready all the time to bend back, until a certain point is reached, when it breaks.

This simile probably applies when a debtor gets "broke," or when the breaking of many debtors constitutes a "crash," after which there is no coming back to the original equilibrium.

To take another simile, such a disaster is somewhat like the "capsizing" of a ship which, under ordinary conditions, is always near stable equilibrium but which, after being tipped beyond a certain angle, has no longer this tendency to return to equilibrium, but, instead, a tendency to depart further from it.

With this far from equilibrium starting point, the system goes through a series of cycles in which the debt to output ratio ratchets up, as Minsky surmised, until such time that the next boom leads to such an accumulation of debt that it cannot be repaid--debt service consumes all available revenues--and the economy falls into a permanent slump.

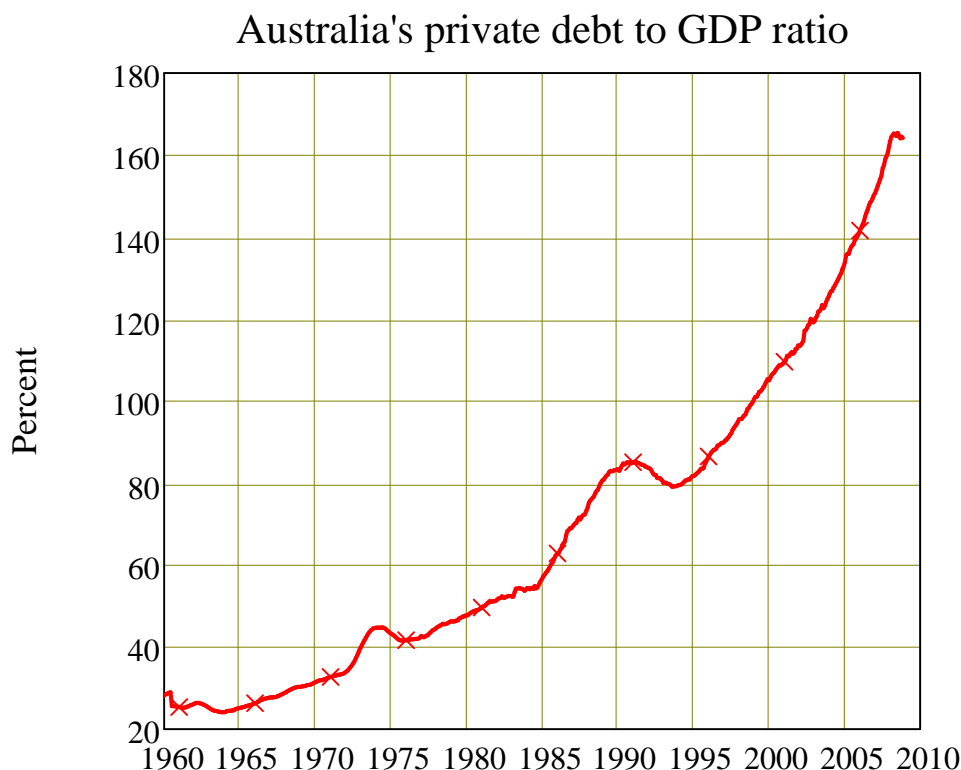
Figure Five



I have commented frequently that economists are prisoners of their models--rather than seeing the economy, they see their model of it. Though I differ from the neoclassical mainstream in the type of model I see, on this front I was not very different. I therefore expected to find a pattern like that shown for the debt to output ratio in Figure Five in the Australian data, when I prepared an expert witness case for the NSW Legal Aid in December 2005: a gradual hump-like increase in debt to output ratios.

Instead what I saw was the pattern shown in Figure Six.

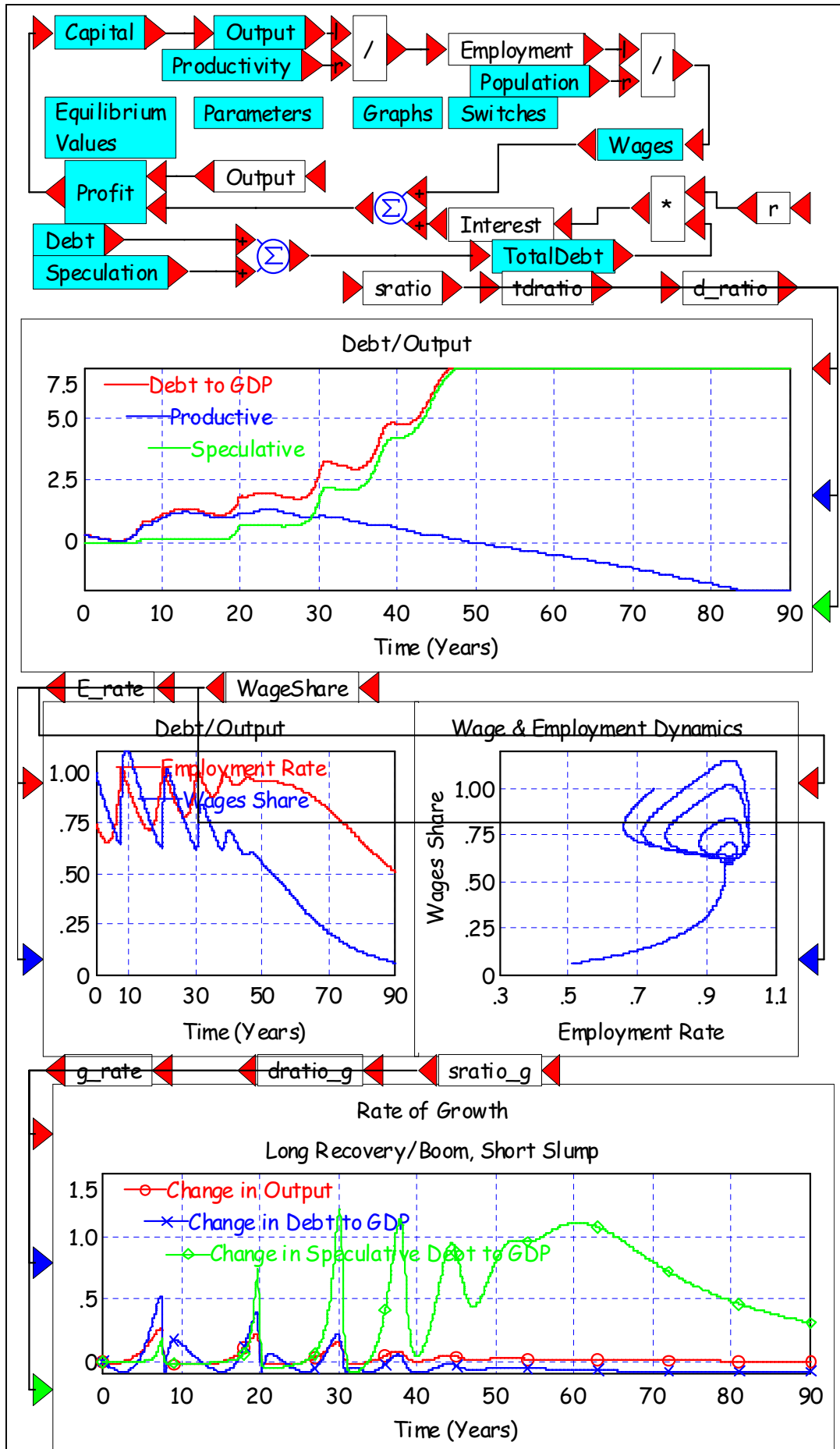
Figure Six



That was an almost purely exponential increase in the debt to GDP ratio over time--disturbed only by the growth and bursting of two obvious super-bubbles (one in the early 1970s that was associated with the demise of the Whitlam government, and the other that drove Keating's "recession we had to have" in the early 1990s).

It was obvious that a key aspect of Minsky's theory that my model omitted had to be introduced: Ponzi investing, in which individuals take out debt to speculate on asset prices, but don't actually build any assets in the process. I introduced this into the model by adding a speculative debt component, where borrowing for speculation rose whenever the rate of growth exceeded a minimum level. With that modification, the pattern shown in Figure Seven resulted.

Figure Seven



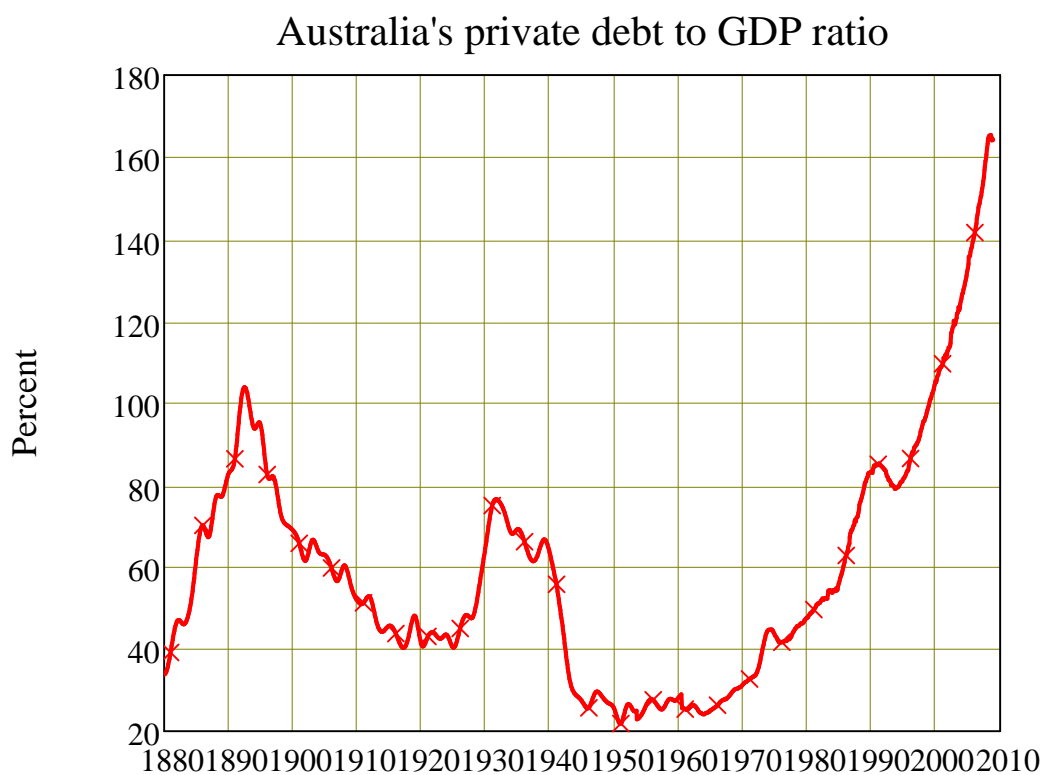
This model generates a generally exponential increase in debt levels, with super-bubbles in speculative borrowing occurring regularly, and borrowing to finance speculation gradually accelerates to ultimately dwarf borrowing for productive investment.

At some point the debt burden becomes too great for the economy to finance, and debt accumulates faster than it is repaid, leading to a secular crisis and not merely a financial cycle. Guided both by Minsky's hypothesis and my mathematical models, I felt that we were at such a secular turning point in the real world when I saw the data in Figure Six (three years ago, in December 2005).

I feared that Australia--and probably the rest of the world--was in for a serious debt-induced downturn. Knowing that there was little if any likelihood that this danger would be perceived by the neoclassically-trained economists who dominate Treasuries and Central Banks (and University Economics Departments) around the world. I decided to go public with my analysis

This was more than confirmed when RBA Deputy Governor Ric Battellino published a graph showing Australia's long term debt to GDP ratio during a speech in September 2007 (see Figure 8, which is augmented to include estimates of non-bank credit prior to 1953).

Figure Eight



The model I've outlined above is extremely simple, and would need to be substantially embellished to capture the main dynamics of a market economy. But it is already streets ahead of neoclassical models by not making an artificial distinction between the short and long term. To paraphrase Keynes, "in the long run we are still in the short run".

Avoiding Recession?

The Australian Government is almost unique amongst OECD nations in predicting positive growth during 2009. Indeed, only ten countries are holding out for positive real growth next year in

the OECD's recent Economic Outlook are Australia (1.7%), the Czech Republic (2.7%), Greece (1.9%), Korea (2.7%), Mexico (0.4%), Norway (1.3%), Poland (3%), the Slovak Republic (4%), Sweden (0%), and Turkey (1.6%) (see Figure Nine, taken from the OECD Economic Outlook No. 84 for November 2008, p. 82). The other nineteen countries all expect to record negative growth.

These "predictions" should be seen for what they are--not so much predictions as assumptions of a class of economic models that has little connection with the real world. The scale of the downturn "predicted" for 2009 largely reflects the judgments of national Treasuries--including Australia's--as to how severe a shock the financial crisis represents.

On that scale, the only country giving this financial crisis serious weight is Iceland, which is estimating its damage as equivalent to about 14% of GDP--represented by the change between the growth rate recorded for 2007 and that expected for 2009. Australia's Treasury has apparently persuaded the OECD that this crisis will knock only a couple of percent off growth.

Figure Nine

Real GDP
Percentage changes from previous year

	2003	2004	2005	2006	2007	2008	2009	2010
Australia	3.4	3.2	3.2	2.5	4.4	2.5	1.7	2.7
Austria	0.8	2.5	3.3	3.3	3.0	1.9	-0.1	1.2
Belgium	1.0	2.8	2.2	3.0	2.6	1.5	-0.1	1.3
Canada	1.9	3.1	2.9	3.1	2.7	0.5	-0.5	2.1
Czech Republic	3.6	4.5	6.3	6.8	6.6	4.4	2.5	4.4
Denmark	0.4	2.3	2.5	3.9	1.7	0.2	-0.5	0.9
Finland	1.9	3.8	2.9	4.8	4.4	2.1	0.6	1.8
France	1.1	2.2	1.9	2.4	2.1	0.9	-0.4	1.5
Germany	-0.2	0.7	0.9	3.2	2.6	1.4	-0.8	1.2
Greece	5.0	4.6	3.8	4.2	4.0	3.2	1.9	2.5
Hungary	4.2	4.8	4.0	4.1	1.1	1.4	-0.5	1.0
Iceland	2.4	7.7	7.5	4.4	4.9	1.5	-9.3	-0.7
Ireland	4.5	4.7	6.4	5.7	6.0	-1.8	-1.7	2.6
Italy	0.0	1.4	0.7	1.9	1.4	-0.4	-1.0	0.8
Japan	1.4	2.7	1.9	2.4	2.1	0.5	-0.1	0.6
Korea	3.1	4.7	4.2	5.1	5.0	4.2	2.7	4.2
Luxembourg	1.6	4.5	5.2	6.5	5.2	2.4	-0.5	1.9
Mexico	1.4	4.0	3.1	4.9	3.2	1.9	0.4	1.8
Netherlands	0.3	2.2	2.0	3.4	3.5	2.2	-0.2	0.8
New Zealand	4.4	4.3	2.7	2.5	3.0	-0.5	-0.4	1.9
Norway	1.0	3.9	2.7	2.5	3.7	2.7	1.3	1.6
Poland	3.9	5.3	3.6	6.2	6.7	5.4	3.0	3.5
Portugal	-0.8	1.5	0.9	1.4	1.9	0.5	-0.2	0.6
Slovak Republic	4.8	5.2	6.6	8.5	10.4	7.3	4.0	5.6
Spain	3.1	3.3	3.6	3.9	3.7	1.3	-0.9	0.8
Sweden	2.1	3.5	3.3	4.4	2.9	0.8	0.0	2.2
Switzerland	-0.2	2.5	2.5	3.4	3.3	1.9	-0.2	1.6
Turkey	5.3	9.4	8.4	6.9	4.6	3.3	1.6	4.2
United Kingdom	2.8	2.8	2.1	2.8	3.0	0.8	-1.1	0.9
United States	2.5	3.6	2.9	2.8	2.0	1.4	-0.9	1.6
Euro area	0.8	1.9	1.8	3.0	2.6	1.0	-0.6	1.2
Total OECD	1.9	3.2	2.7	3.1	2.6	1.4	-0.4	1.5

Notice also that the OECD expects growth to dramatically improve in 2010--even Iceland is expected to almost return to positive growth for the calendar year as a whole, while in the 4th quarter it is expected to record positive growth at an annual rate of 2.6% (see Figure Ten). Australia is expected to rebound to 3.1% annualised growth by the last quarter of calendar year 2010.

Why? Because by that stage into the future, the "long run" in the OECD's neoclassical model of the economy starts to reassert itself, and every economy is predicted to boom away, to erase the impact of the "temporary" shock of the 2008 financial crisis.

I'd love to see the OECD's predictions for Iceland for 2011 and 2012--they should show massive growth to overcome the impact of the -9.3% figure for next year, and return to the long run equilibrium assumption the model makes for Iceland--which is probably above 5% p.a. Australia is also likely to be shown to enjoy a rosy 4% or above rate of growth.

These predictions, and those of any other neoclassical model--including the Treasury's TRYM model, and the RBA's small model--are no more than a statement of faith in the long run stability of a market economy.

I expect that faith will be sorely tested in the coming years.

Figure Ten

Real GDP				
Percentage changes from previous year				
	Fourth quarter			
	2007	2008	2009	2010
Australia	4.5	1.6	2.0	3.1
Austria	2.7	0.9	-0.1	2.0
Belgium	2.3	0.8	-0.2	2.2
Canada	2.8	-0.5	0.2	2.9
Czech Republic	6.3	3.4	2.6	5.2
Denmark	1.5	0.1	-0.7	1.6
Finland	4.2	1.1	0.8	2.4
France	2.2	-0.1	0.1	2.3
Germany	1.7	0.2	-0.1	1.8
Greece	3.5	2.9	1.8	3.0
Hungary	0.4	1.8	-1.5	2.6
Iceland	6.4	-3.2	-7.9	2.6
Ireland	5.6	-3.1	0.3	4.0
Italy	0.1	-0.7	-0.5	1.5
Japan	1.5	-0.4	0.3	0.9
Korea	5.9	2.5	3.4	4.5
Luxembourg
Mexico	4.2	0.7	0.3	2.6
Netherlands	4.1	0.5	-0.1	1.5
New Zealand	2.4	-1.8	0.6	2.4
Norway	4.7	1.8	0.9	1.9
Poland	6.6	4.2	2.8	3.8
Portugal	1.9	-0.1	0.0	1.0
Slovak Republic	9.9	5.7	4.2	6.0
Spain	3.2	0.0	-0.6	1.5
Sweden	2.4	-0.1	0.5	3.1

Switzerland	3.7	0.6	0.1	2.2
Turkey
United Kingdom	2.9	-0.7	-0.5	1.7
United States	2.3	0.1	-0.3	2.3
Euro area	2.1	0.0	-0.1	1.9
Total OECD	2.6	0.2	0.2	2.2

END OF COMMENTARY

Comments on the Data

It appears that Australia's debt to GDP ratio has peaked at 165% of GDP, and it is now starting to fall. It could still turn up once again if deflation takes hold, but for the meantime, this seems to be the top of the bubble.

Now as debt levels start to fall--firstly relatively to GDP and then, ultimately, in absolute terms as well--the macroeconomic effect of the bubble's bursting will be felt. This trend appears in the next two graphs, which show the annual rate of change of debt and GDP, and the contribution that change in debt makes to aggregate demand (which I define as the sum of GDP and the change in debt).

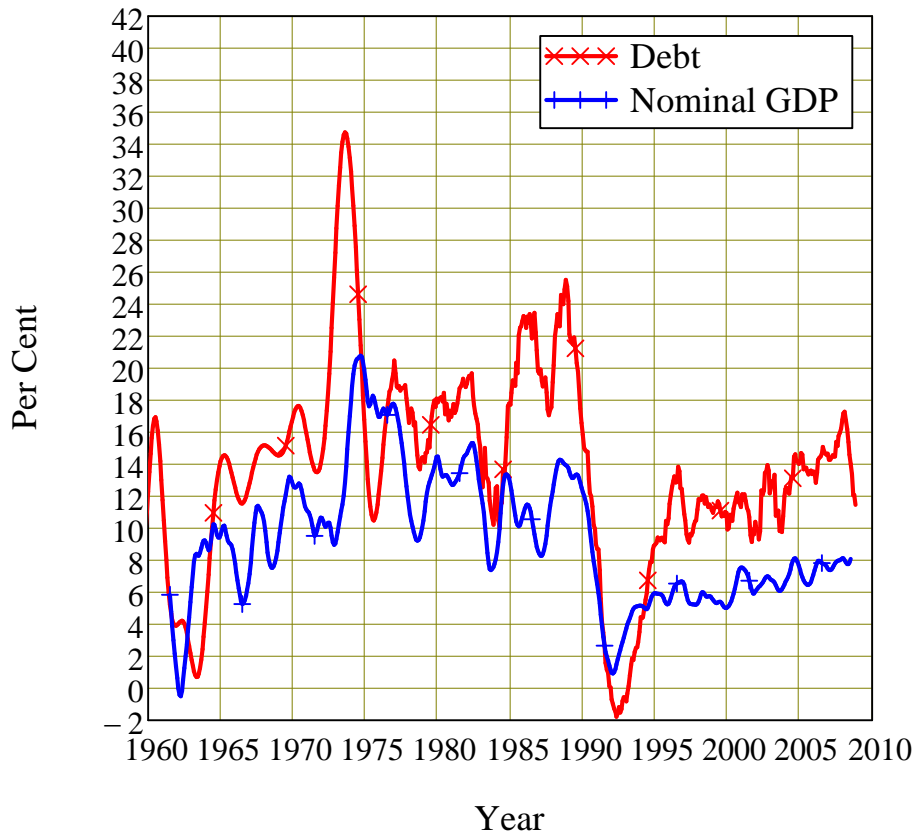
One intriguing aspect of the next two charts is the fact that the rate of growth of debt has fallen over time--from a peak of over 34% year on year for the 1973 bubble, to 25% for the 1989 bubble, and 17% for the bubble that has now peaked in 2008--but the contribution that rising debt makes to demand has risen--from just over 10% in 1973, to 14% in 1989 and 19.5% in 2008.

This apparent paradox is the result of the increasing scale of debt compared to GDP. Back in 1972, when the first debt super-bubble began, debt was equivalent to only 33% of GDP--and therefore a 1/3rd increase in debt, while dramatic, only increased the ultimate debt to GDP ratio by 11%. In mid-1984, when the second superbubble took off, debt was already 54% of GDP, and therefore the slower rate of growth of debt resulted in the debt to GDP ratio rising to 57% by the time the bubble burst.

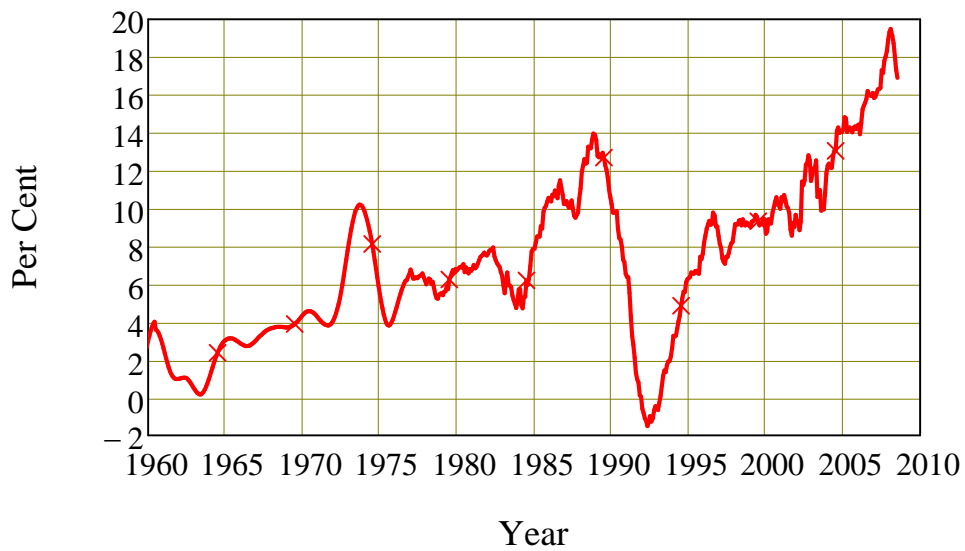
This time round, though debt grew by a maximum of only 17% in one year, the debt superbubble which began in mid 1993 increased the debt to GDP ratio by a staggering 109%, from 79% at its commencement to 165.43% by its peak.



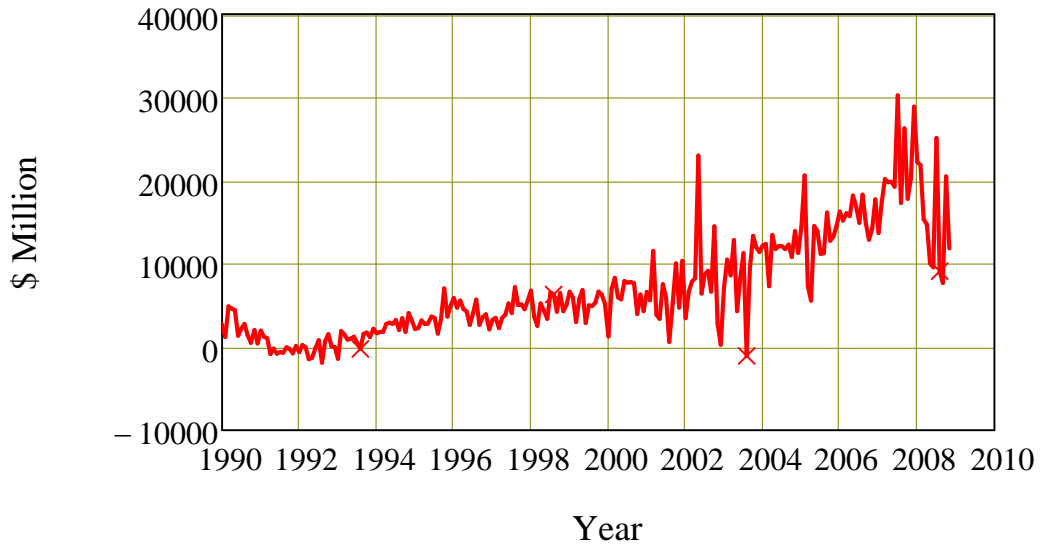
Growth of Debt & GDP



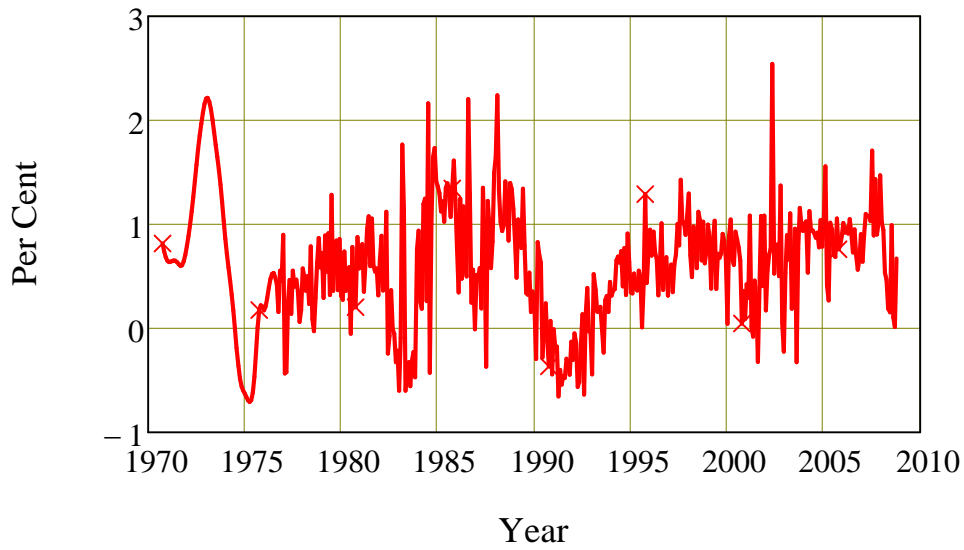
Contribution of Change in Debt to Demand



Monthly Change in Debt



CPI Deflated Monthly Change in Debt



END OF COMMENTARY

Chart One

The Debt Bubble

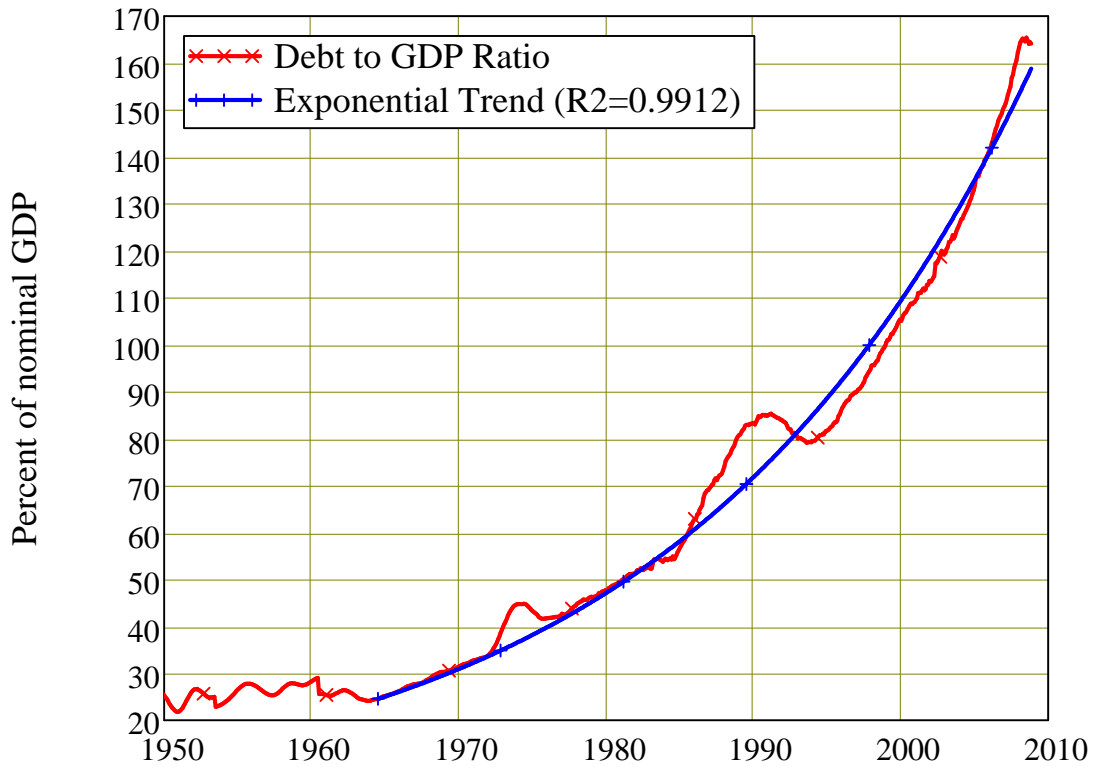


Chart Two

Long Term

Debt to GDP: The Long Term View

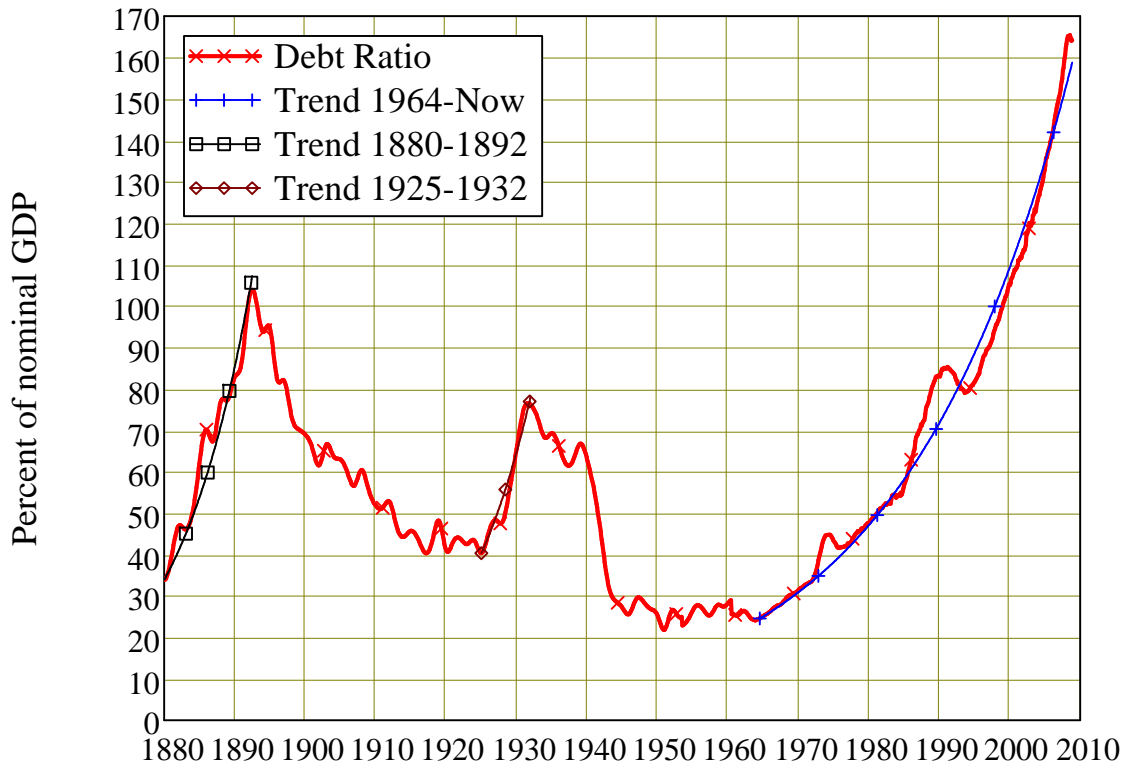


Table One: Aggregated Debt Summary

Table One

	0	1	2
0	"Summary"	"Total Private Debt"	"Nominal GDP"
1	"Date (levels)"	2008.83	2008.5
2	"Levels (\$m)"	1916097	1128551
3	"Change Month \$m"	11846	9546.08
4	"Change Month %"	0.62	0.85
5	"Change Year \$m"	196908	84447
6	"Change Year %"	11.45	8.09
7	"Since 1990"	8.9	5.49
8	"Since 1980"	12.01	7.88
9	"Since 1964"	13.46	9.35
10	"Date (% GDP)"	2008.83	"N/A"
11	"As % of GDP"	164.16	100
12	"Change Month"	-0.19	"N/A"
13	"Change Year"	2.23	"N/A"
14	"Since 1990"	3.1	"N/A"
15	"Since 1980"	4.15	"N/A"
16	"Since 1964"	4.2	"N/A"

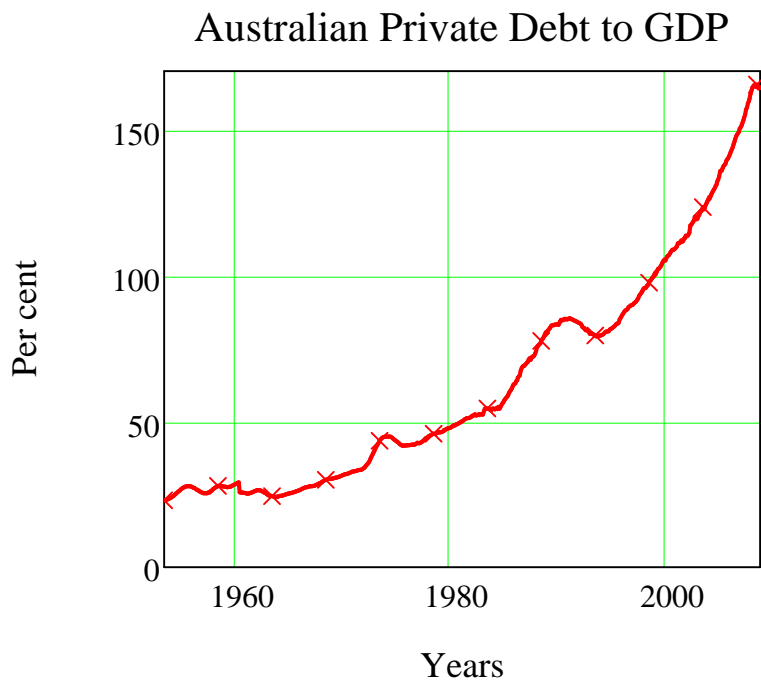
Table Two: Disaggregated Debt Summary

Table Two

	0	1	2	3
0	"Detail"	"Business"	"Mortgage"	"Personal"
1	"Levels (\$m)"	785569	987742	148417
2	"Change Mth \$m"	15242	4920	-2245
3	"Change Mth %"	1.98	0.5	-1.49
4	"Change Yr \$m"	112125	87233.95	-1155
5	"Change Yr %"	16.65	9.69	-0.77
$D_2 =$ 6	"Since 1990"	5.51	14.82	5.78
7	"Since 1980"	10.71	13.98	10.42
8	"Since 1976"	11.21	14.25	11.18
9	"As % of GDP"	67.02	84.27	12.66
10	"Change month"	1.03	-0.44	-2.41
11	"Change year"	6.56	0.2	-9.36
12	"Since 1990"	-0.44	9.28	-0.17
13	"Since 1980"	3.04	6.05	2.62
14	"Since 1976"	3.11	5.84	2.99

Debt to Income Ratios

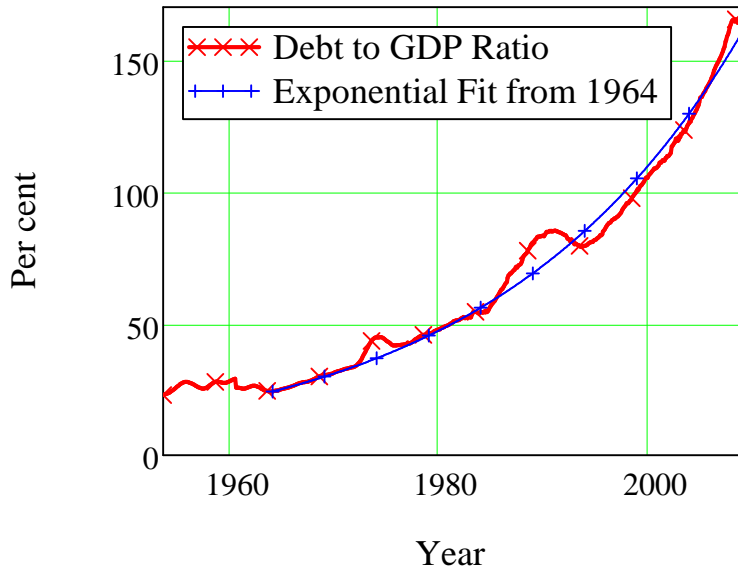
▣ Debt to GDP (D02 & G12)

Figure 1

▣ Debt to GDP Regression

Figure 2

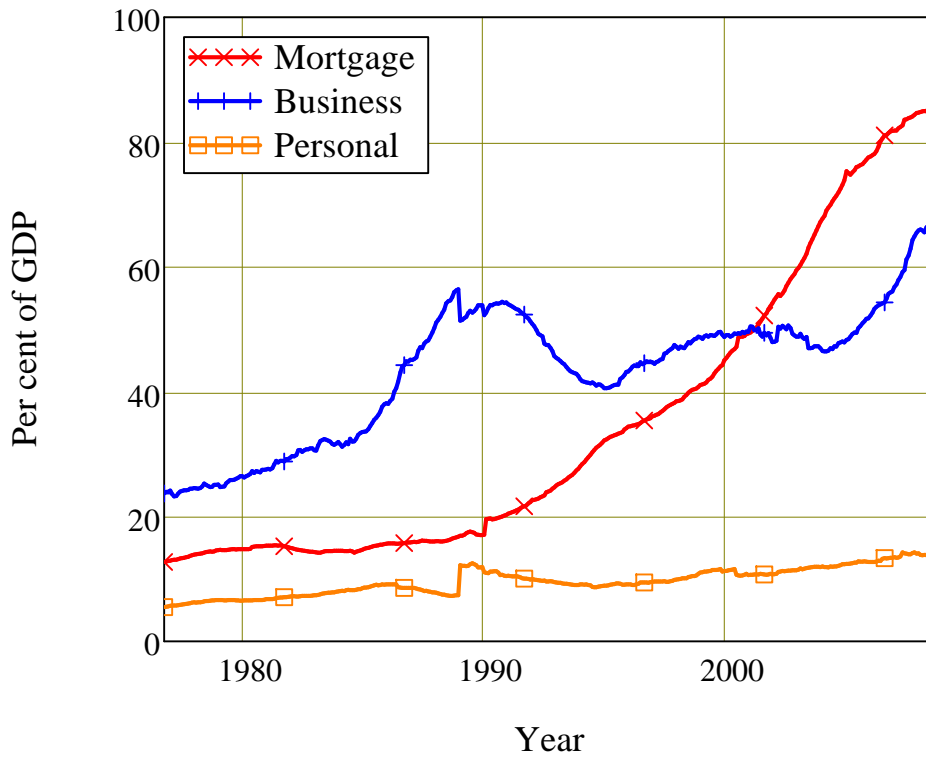
Australian Private Debt to GDP



▣ Debt Components to GDP

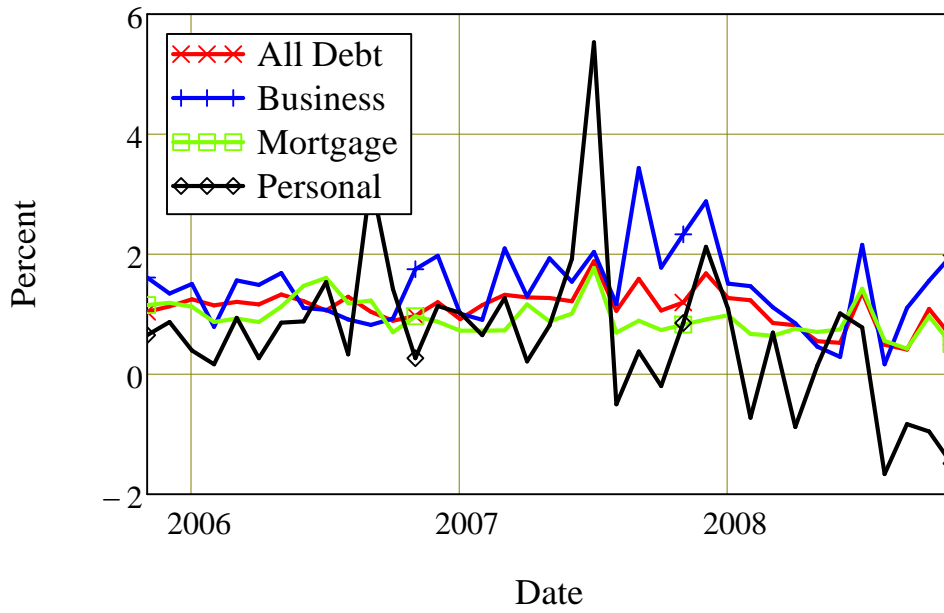
Figure 3

Components of Australian Debt



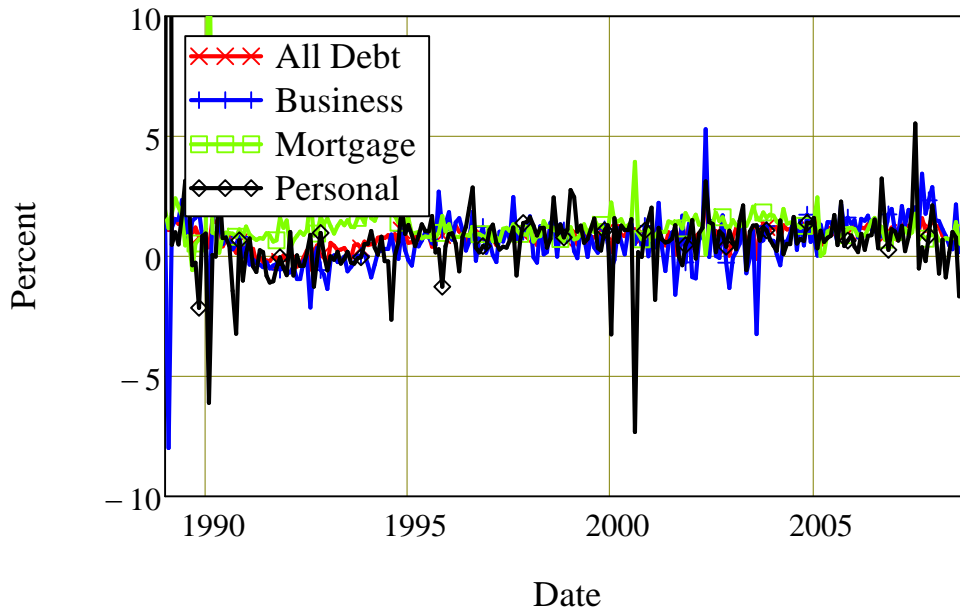
▣ Monthly Growth Rates

Debt Monthly Growth Rates--Last 3 Years



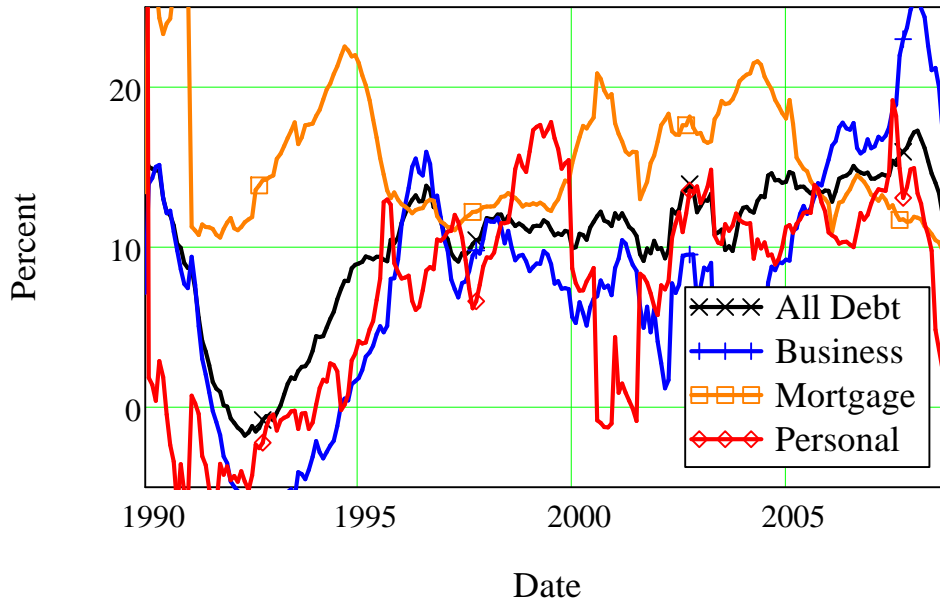
▶ Monthly Growth Rates

Debt Monthly Growth Rates



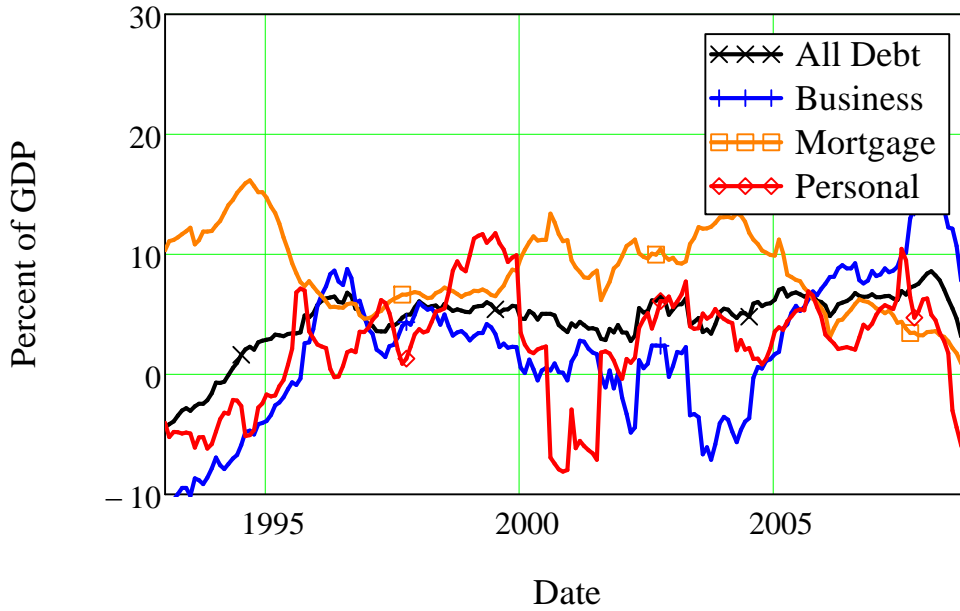
▶ Yearly Growth Rates

Debt Yearly Growth Rates



▢ Ratios Yearly Growth Rates

Debt Ratios Yearly Growth Rates



▢ Debt to Household Disposable Income

Figure 4