Introduction

Until three years ago we were living in the ‘Great Moderation’. Macroeconomic outcomes were good. And New Keynesian macroeconomics — the theoretical apparatus which underpinned macroeconomic policymaking — appeared to be in good shape. Olivier Blanchard, now Chief Economist at the International Monetary Fund, wrote that ‘the state of macro is good … The battles of yesteryear… are over, and there has been … a broad convergence of vision.’

Then things fell apart.

How did economists get it so wrong? Paul Krugman’s answer to this question is profoundly misleading (Krugman 2009). As ever with Krugman, it is also profoundly thought-provoking. But I have ended up with a quite different answer.

The Krugman story

Three steps

Firstly, Krugman laments the fact that, over the last 50 years,

… economists fell back in love with the old idealised vision of an economy [which was widely believed before the Great Depression] in which rational individuals interact in perfect markets … This influenced their view of policy … Lucas [a Nobel Prize winner of Chicago] says

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2 The ideas which follow are discussed in more detail in Adam and Vines (2009).
the Obama administration’s stimulus plans are ‘schlock economics,’ and his Chicago colleague John Cochrane says they’re based on discredited ‘fairy tales.’

Second, Krugman implies that economists fell back in love with this old idealised version because, like Keats, they mistook beauty for truth. Krugman is saying — although never quite explicitly — that only the ‘old idealised vision’ can be represented in the ‘all-encompassing, intellectually elegant’ kind of analysis that economists like to produce.

Third, Krugman suggests that ‘economists need to abandon the neat but wrong solution of assuming that everyone is rational and markets work perfectly’. As a result, economists will…[then] learn to live with messiness, will…acknowledge the importance of irrational and often unpredictable behaviour…[and will] face up to the often idiosyncratic imperfections of markets. … In practical terms this will translate into more cautious policy advice — and a reduced willingness to dismantle economic safeguards in the faith that markets will solve all problems.

Evaluation

I think that Krugman’s answer is actually too optimistic, and that things are worse than he suggests.

Most of us have never believed in the idealised vision which Krugman described. I myself studied economics at Melbourne University in the late 1960s because I thought — correctly — that economic policy is necessary to correct the many failings of the free market. And I have spent the rest of my life trying to teach my students what the necessary policy should look like.

And those who have led the subject in my generation have certainly never believed in a ‘perfect markets’ vision. Take Stan Fischer, perhaps the best macroeconomist of our time, once Head of the foremost Economics Department in the world (at MIT), then First Deputy Managing Director of the IMF (one level up from the post that Olivier Blanchard now holds), and currently Governor of the Central Bank of Israel. The great practical work of Fischer’s life was achieved during the Asian Financial Crisis of 1997–98. Fischer led a team at the IMF which laboured, using the best tools available, to avert a global financial meltdown.

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3 James Meade, my mentor when I was a young researcher at Cambridge, went to Oxford in the late 1920s to study Classics. But Meade gave this up because he saw unemployment everywhere around him and wanted to do something about it. As a result, he studied economics, and then went to Cambridge to work as a graduate student with Maynard Keynes. Many of us are still like Meade.
Now Olivier Blanchard has achieved the same thing in the present financial crisis. Neither Fischer nor Blanchard has been working with silly Panglossian theories. They have both made use of the best available analysis of what has gone wrong, and of what to do to fix it.

The trouble with all of us was that, even although we were fully aware that things could go wrong, we did not see this particular crisis coming. Our trouble was not that we believed that markets are perfect. Rather, we just did not understand how the financial system works. This might seem odd for macroeconomists, but it was true. Our problem was not one of ideological bias. It was one of poor understanding.

**Krugman on the future of macroeconomics**

At the end of his paper, Krugman suggests that economists ‘should recognise that Keynesian economics remains the best framework we have for making sense of recessions and depressions’.

What is Krugman’s ‘Keynesian framework’? To answer this, we need to remind ourselves of the key insights in Keynes’ *General Theory of Employment Interest and Money*. There are three.

First, Keynes argued that the level of demand for goods can influence the position of the economy: an economy can end up producing less than what is possible. Second, Keynes maintained that serious falls in demand can be caused by shocks in the financial system. Third, he thought that economies might actually be unstable if they were not actively managed by fiscal policy and/or monetary policy. If there is a large negative shock to demand, and a recession, and prices start to fall, Keynes thought this combination of factors might cause ‘debt deflation’. As prices fall, what debtors owe becomes more and more onerous, leading to further reductions in what is spent. Consequently, the economy may never recover under its own steam. The much-neglected Chapter 19 of Keynes’ *General Theory* makes this point very clearly. All three of these points really matter.

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4 Actually many of us thought that we saw coming a crisis arising from a collapse of the dollar — which has not happened. Even Krugman made this mistake.

5 Modern textbooks abstract from this point — it is too inconvenient for them. And so, generations of students have been taught in macroeconomics courses that if only prices were somehow more flexible, then recessions could be quickly averted, reducing the need for active policy intervention. Keynes did not believe this.
What is missing from Keynesian economics

But Keynes’ *General Theory* does not contain a theory of financial crisis. While Keynes’s popular writing (for example, Keynes 1932) contain remarkable insights about the financial crash which happened during the Great Depression, it is not true that, lurking beneath the surface of the *General Theory*, there lies a theory of financial crisis, which economists have somehow stupidly forgotten. Yet somehow the myth of a hidden Keynesian solution has persisted.

Robert Skidelsky implies as much in his recent popular book about Keynes; even the title — *The Return of the Master* — suggests this idea. But the fact is that Keynes could not cut the mustard when it came to building a theory which is relevant to the present financial crisis.

In his discussion of finance in the *General Theory*, Keynes focused on the choice by investors between interest-bearing and non-interest-bearing money. He thought that the interest rate might be forced to rise if investors want more liquidity, and that the resulting rise in the interest rates might cause a fall in the demand for goods, and so might cause a recession. If the fall in demand was large enough, it might even — because of Keynes’ third point described above — cause an unstable collapse of the economy. That is clearly an issue.

But in the world in which we now live this issue has been comprehensively dealt with — partly as a result of what Keynes has taught us. In our modern economy the interest rate is set by the central bank, so as to make sure that inflation is under control, and to dampen down fluctuations in demand. In doing this the central bank ensures that our economy is not troubled by the kind of fluctuations in the demand for liquidity which concerned Keynes. If financial institutions want more liquidity, the central bank will provide it, without letting the short-term interest rate go up too much, if at all. Such central banks will also cut interest rates to offset the effects of any falls in demand. And if a recession does happen, the central bank will cut the interest rate enough to ensure that debt deflation does not occur. In fact, this modern approach to monetary policy deals with all three of Keynes’ points.

Until two years ago, we believed — in a self-congratulatory sort of way — that this kind of policy was all that was needed. And we were right — up to a point. Providing that the inflation-targeting approach worked all right, we thought, financial intermediation would work efficiently. As a result, the financial sector would provide no impediment to the functioning of the economy. A competitive financial system would drive risk premia on private debt down to low levels, so that — effectively — all short-term interest rates, including those on private debt, would mimic rates set by the central bank. And the prices of longer-dated assets would be set by efficient ‘inter-temporal arbitrage’. As a result, the return
on these assets would be governed by the interest rate which the central bank
would be expected to set in the future, as it successfully operated its inflation-
targeting policy. The central bank would thus effectively set those longer-term
interest rates too.

But such a theory was silent on how balance-sheet problems of financial
intermediaries might lead to very large increases in the risk premium attached
to holdings of longer-dated assets, to a collapse in the price of these assets, to
a rise in long-term interest rates, and to a difficulty for longer-term borrowing
and investing. This theory was therefore completely silent on how our financial
system led our whole economy to crisis.

**Getting Finance Properly into Macroeconomics:
‘the short-long choice’**

What the financial system does — at its heart — is to transform the maturity
of lending. Households make savings decisions and — through financial
institutions — lend their savings to others in the economy who invest them. The
savings decision is — at least in many cases — a short-term decision. That is,
savers need to be able to get their money out easily. Investment is, by contrast, a
long-term decision, since investment projects take time to bear fruit.

The important thing in analysing the financial system is to focus on what we
can call ‘the short-long choice’. How can we find enough people, or institutions,
who take short-term savings and make them available for long-term investment
projects? This will be risky. The interest rates charged on long-term loans —
or the returns on long term equity investment — have to be large enough to
compensate investors for the risk in going long. If the financial system becomes
less able to bear this risk, then the interest rate charged to investors will rise, and
the price that investors will get by issuing shares will fall (since fewer people
will be able to buy them). This is what brought down the world economy two
years ago.

What happened was this.

During the early 2000s, many investors engaged in a ‘search for yield’. They did
this because in this period interest rates on short-term lending were very low.
A good way for a financial institution to increase yield was to ‘leverage’; that is,
to borrow money and then to invest the borrowings alongside the firm’s own
capital. During the early 2000s, highly leveraged financial institutions (HLFIs)
took their own capital, or shareholders’ funds, and supplemented it with large
short-term borrowing from elsewhere at low interest rates, and then invested
these funds in longer-term assets paying a higher rate of return. This increased the expected return on their capital — which was good at a time when short-term interest rates were low — but, of course, it made that return much more risky.

An example of what can be achieved by leverage is the following simplified illustration. Imagine an investing institution with $100 in capital. Suppose that, if this was invested long term, it would earn $3, or 3 per cent. Suppose that, at the same time, the investing institution borrowed $900 short term, at a lower interest rate of, say, 2.5 per cent, and then invested the overall sum of $1000 in long-dated securities having a return of 3 per cent. Then the net earnings of the portfolio, after paying the interest due on the short-term borrowing, would rise from $3 to $0.03 \times 100 + (0.03 - 0.025) \times 900 = $7.50. Leverage would have raised the fund manager’s return from 3 per cent to 7.5 per cent.

And to see why leverage increases the risk faced by an investor at the same time as it increases prospective return, consider what happens to the above portfolio when the price of long-dated assets falls by 1 per cent. This would mean that the value of the investor’s portfolio would fall from $1000 to $990. But one part of the portfolio’s liability structure is unchanged — the value of the outstanding loans which the fund manager has incurred as a result of the borrowing used to finance the leverage. This borrowing remains unchanged, at $900. The other component of liabilities — the value of the portfolio to those who originally invested in it — must take up the slack, falling by $10 to $90. Thus a 1 per cent fall in the value of the long-term assets held by the portfolio will cause a 10 per cent fall in the balance-sheet value of the assets of the portfolio. A leverage ratio of 10 — that is, a ratio of assets-held-in-investment to own-capital of 10 — has increased the proportionate variation in the balance-sheet value of the portfolio by a factor of 10.

In the early 2000s the business model of HLFIs was very simple. Increase the leverage ratio as much as possible in order to increase returns. But only do as much of this as the risk managers in the firm will allow you to do. 6 Leverage ratios well above 10 — up to 30 or 40 — have been common over the past few years.

A ‘Financial Multiplier’

This business model of HLFIs led directly to the financial crisis, as follows.

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6 Shin (2009) describes how ‘value at risk’ calculations can be used to work out such a maximum leverage ratio.
Suppose — as imagined above — that the value of the HLFI’s portfolio falls by 1 per cent, from $1000 to $990. This initial effect will get magnified by a ‘financial multiplier’. Recall that the initial leverage ratio was 10 ($1000 in investments divided by the $100 of capital). We have already noted that a fall in the value of long-term assets from $1000 to $990 will cause the value of capital to fall from $100 to $90. But this means that the leverage ratio will have actually risen from 10 to 11. If we suppose — for now — that the initial leverage ratio of 10 really was the maximum that the firm’s risk managers would allow, then the HLFI will be required to contract its balance sheet by selling long-dated assets.

It will need to do this to enable its investments to fall in line with the fall in the value of its capital. To do this in such a way as to bring its leverage ratio back to 10 requires the HLFI to sell $90 of assets.

If such a process happens to any one HLFI on its own — facing a fixed price of financial assets — then the outcome would not be remarkable. But if this process is macroeconomic — that is to say if the position of our representative HLFI is symptomatic of what is happening in the economy as a whole — then the problem is serious. That is because the sale of $90 in long-dated assets will force the price of these assets to fall further, beyond the initial fall in price. But that will cause a further contraction in the value of the HLFI’s balance sheet, requiring it to make further sales of assets, causing further falls in asset prices, etc, etc — a true fire sale. In other words, a ‘financial multiplier’ process will come into play. Clearly, because the leverage ratio is much larger than unity — 10, in our example — there is a risk that this multiplier process causes the price of long-dated financial assets to implode, leading to a collapse of the whole financial system.

**How bad can the Crash get?**

Whether the process outlined above happens clearly depends on whether there is anyone else to take up the supply of long-dated assets. The question is: how much will this asset sale drive down the price? That depends on the price elasticity of demand of the other holders of long-dated securities. If the general public will absorb a large quantity of risky assets without much fall in price — that is, if there are many final investors like Warren Buffett — then asset prices will not fall much in the face of the shock which we have described.  

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7 It will also try to reduce its own borrowing. To analyse the effects of this would complicate our story. But it does not change the overall picture.
8 My understanding of how a financial multiplier can create large fluctuations in asset prices owes much to a paper by none other than Paul Krugman himself (see Krugman 2008). But in this paper Krugman assumes that there are lots of people like Warren Buffett.
But if there are no others besides HLFIs who might hold these assets, then the price will fall a lot, because each fall in price will cause HLFIs to dump more and more securities on the market so as to maintain their preferred leverage ratio. In reality, in the past two years, the crisis revealed that the holdings of securitized assets, which (to ensure diversification of risk) were supposed to be distributed widely beyond the banking system, had in fact largely remained either within the banking system, or in off-balance-sheet financial vehicles which were still ultimately part of the banking system (Bean 2009; Frexias 2010). This suggests that the demand by the non-HLFI public for long-dated financial assets may have been quite inelastic.  

In the limiting case in which the HLFIs are the only holders of long-dated securities, the outcome depends on how far the price of these long-dated securities has to fall, to ensure that the supply of leverage increases enough (that is, the leverage ratio increases enough) to create a floor under the price of these assets. To continue with our example from above, let us suppose that the initial fall in the value of long-dated assets from $1000 to $990 represents the true long-run fall in the value of these assets. As HLFIs offload these assets to prevent their leverage ratio from rising above its desired level, the value of these assets will go on falling way below their true value: $990, $980, $970, $960…. But as this happens, there will be an increase in the prospective returns to holders of these assets, assuming that the value of these assets will, eventually, return to the true long-run level of $990. This will lead HLFIs to increase their desired leverage ratio. The further the price falls, the more this desired leverage ratio will go on rising, because the larger is the fall in price, the larger are the prospective capital gains which the purchasers of these assets expect to make after they have bought them. Consider what happens in our example when the value of long-dated assets falls to $950. At this point the value of invested capital will have fallen to $50 ($950 – $900 = $50), and the leverage ratio will have risen to 950/50; that is, all the way to 19. Let us suppose that, at this point, the capital gain which the HLFIs expect to earn, as the assets rise in value back to their long-run value of $990, is large enough to induce them to increase their desired leverage ratio to 19. At that point the value of the long-dated securities will stop falling, because investors will be prepared to hold them.  

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9 One reason for this may have been that many of the securitised assets were very complex. The seller has superior information about the assets than the buyer, and they have an incentive to sell the lowest-quality assets to the buyer, as in the classic lemon case, which, of course, makes these assets less attractive to the non-HLFI general public. The current law case against Goldman Sachs has revealed just how much this was going on.

10 My understanding of how there can be very large fluctuations in financial asset prices when there are not lots of people like Warren Buffett, owes much to the tradition of work on the ‘financial accelerator’ started by Bernanke, Gertler and Gilchrist (1999). In particular, a recent paper by Gertler and Keradi (2009) is very important in this area.

11 In our simple arithmetic example we are not actually letting the value of these assets fall very much before people are supposed to start buying them. This is because if the value of the assets fell by too much
How will recovery get under way — and will it be sustained?

After such a collapse in asset prices, how can an economy ever recover? What does our new way of looking at the financial system tell us about this?

What our story suggests is that the HLFIs will need to build up their capital again, to make up for the capital that was lost when the value of their long-dated assets fell. When the value of our HLFI’s assets has returned to $990, the value of its capital will have returned to $90. Suppose that, when assets have stopped rising in price, the leverage ratio desired by our HLFI will also return to 10. To support asset holdings of $990 with a leverage ratio of 10, the HLFI will have need to have built up its capital, back to $99. It thus needs to find an extra $9 in capital. To obtain that will require that there be a period of time during which there is a large gap between the return on long-dated assets and the short-term interest rate, so that our HLFI can generate large profits and build up its capital again.

All this suggests that, in the real world, HLFIs now need to make big profits, to rebuild their capital! Only when they have done this will they be able to start lending again at sensible low-interest rates. Such high profits are exactly what banks are now earning right around the world. And this has caused much annoyance. It is right that people should be annoyed. This is an outcome which seems very wrong indeed, since it was the behaviour of the HLFIs which caused the crisis in the first place.

But can this be avoided? One way would be for new banks to raise new capital and to enter the industry with it, stimulating the ability of the industry to provide loans. That does not seem likely at present. Another way would be to increase the public ownership of banks — at least for a time. Governments would inject more capital into existing banks, in exchange for extra shares that would be owned by the state. This would dilute the ownership of those who already own the bank — something which has already happened in the US and, especially, in the UK, where two of the three major banks are now more than half-owned by the state. Of course a further move would be wildly unpopular amongst the existing bank shareholders. And it would also be difficult at present, given the fiscal crisis of the state in so many countries. So — at least in the US and the UK — we may be stuck with an extended period during which there is a slow recovery, but during which banks earn high profits.

then all of the capital of the HLFI would be wiped out and it would go bankrupt. That will happen in our example if the fall in the value of the long-dated assets is 10 per cent. Of course, such bankruptcies actually happened in 2008 — think of Lehman Brothers. But we do not want to make our simple story too complicated by including that possibility.
Of course, in the longer term, we will need to regulate the financial sector to prevent this happening all over again. But that is another story.

**How did economists get it so wrong?**

To conclude, let us return to Paul Krugman’s question. Why did economists not see this coming?

In this article I have argued that the prices of financial assets can overshoot wildly in an economy with a highly leveraged financial sector. Economists missed this. Everybody — well, almost everybody 12 — thought that financial institutions could diversify away their risks by holding a mixture of assets. Few economists understood the way in which a sale of assets by some institutions could mean that all institutions end up having to sell assets, leading to a generalised fire sale, and causing crisis. In addition, there was little understanding of other factors which made the crisis worse — matters which I have not had the space to discuss here. 13 These include an understanding of how short-term inter-bank lending might dry up — which it did — or of how domino effects could operate within the banking system, so that the failure of one bank could bring down other banks — which happened.

In sum, it was not a case of mistaking beauty for truth. It was just that economists did not understand what truth looks like.

**References**


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12 William White, at the Bank for International Settlements in Basle, and Nouriel Roubini, at Roubini Global Economics, were spectacular exceptions.

13 See Haldane (2009); May, Levin and Sugihara (2007); and May (2010) for valuable discussions of these questions.


