

## CRISES

Paul Krugman, January 2010

As this is formally billed on this program as the Nobel lecture, I suppose that I'm expected to focus on the work for which I was honored with the prize. And yet ... proud as I am of the work I and many others did on increasing-returns trade and economic geography, given what is happening in the world – and given what I've largely been working on these past dozen years – that work is not uppermost in my mind.

Fortunately, there's an out. The Nobel committee did cite another line of work that goes back to the first good paper I ever wrote: "A model of balance of payments crises", published in 1979 but originally written while I was still in grad school. When I'm in an expansive mood, I like to say that I invented currency crises – not the thing itself, which goes back to the invention of paper money, but the modern academic literature. And business has been good ever since.

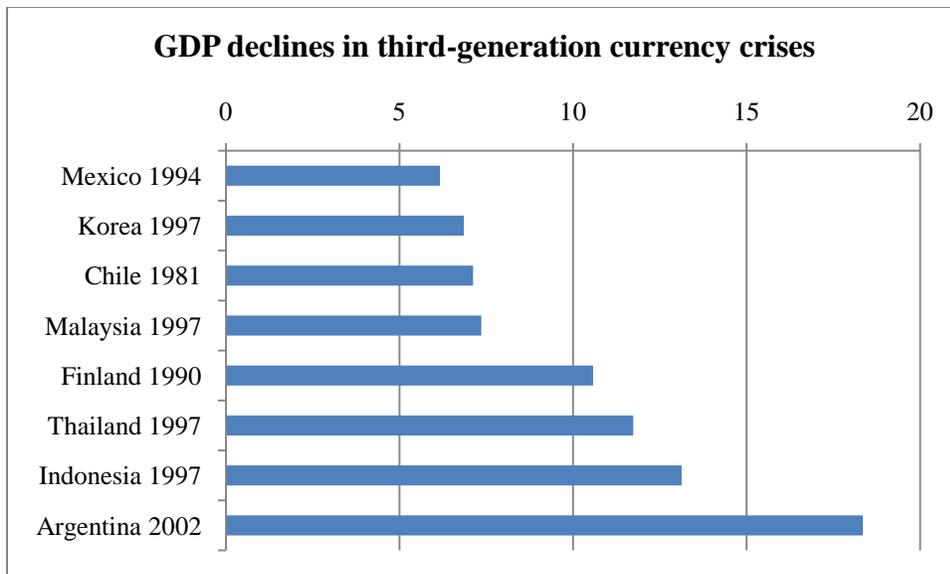
Now, most of what has gone wrong with the world these past two years has not taken the form of classic currency crises (though give it time – the Baltic nations, in particular, seem well positioned to follow in Argentina's footsteps). But there are strong parallels between the kinds of crises we actually have been experiencing and what those of us in the currency crisis biz call "third-generation" crises. Both the similarities and the differences are, I think, illuminating.

So without further ado, let me launch into a discussion of currency crises, their relationship to financial crises in general, and what all of that tells us about current prospects.

### *A history of violence*

The sudden implosion of world financial markets, trade, and industrial production in 2008 shocked many if not most economists. I think it's fair to say, however, that international macroeconomists were less startled. That's not to say that we predicted the crisis: speaking personally, I saw that we had a monstrous housing bubble and expected bad things as it deflated, but both the form and the scale of the collapse surprised me. What is true, however, is that international macroeconomists were aware, in a way those who focused mainly on domestic data were not, that the world economy has a history of violence. Drastic events – sudden speculative attacks that emerge out of a seemingly clear blue sky, abrupt economic implosions that slash real GDP by 5, 10, even 15 percent – are regular occurrences on the international scene.

Let me illustrate the point with the figure below, which shows peak-to-trough declines in real GDP during “third generation” currency crises (a term I'll explain in a little while). This list is close to, but not identical to, the Reinhart and Rogoff (2009) list of banking crises: as R&R point out, crises often combine elements of several of their ideal types. What I've done in this case – in a poor man's homage to Reinhart and Rogoff's awesome data-collection effort – is scan the Total Economy Database for all cases of sharp GDP declines in high-and middle-income countries since 1950, then do some cursory historical research to ask whether they fit the profile of a third-generation crisis.



A few observations: First of all, we’re talking huge declines here – Depression-level, in some cases. You can see why international macroeconomists were more attuned to the possibility of disaster than domestic macroeconomists: if you were looking only at US data, your idea of a really bad slump would be 1981-1982, when real GDP fell only 2.3 percent.

Second, if you know a bit about the history, you get a very strong sense of just how wrong conventional wisdom can be. Reinhart and Rogoff emphasize the “this time is different” syndrome, the way people wave off clear parallels to earlier crises. I’d go a bit further and argue that there’s a strong “pride goeth before a fall” syndrome. In many if not all of these cases, the country in question was everybody’s darling just before the disaster. Chile was a showpiece for Chicago School policies in action. I remember personally the enormous optimism about Mexico on the eve of the tequila crisis; I was very unpopular at a 1993 meeting of investors where I raised some questions about prospects. Argentina’s currency board was lionized by the Cato Institute, the Wall Street Journal editorial page, and so forth. The countries caught up in the East Asian crisis were the subject of glowing reports, including a major World Bank study.

After the fact, of course, everybody saw many flaws in each afflicted country's economic model – just as everyone now sees the rottenness of the U.S. financial system, a system that was being praised just yesterday as one of the wonders of the world.

Finally, note that half my examples are from the late-90s East Asian crisis. That crisis had a profound effect on some of us. Nouriel Roubini was transformed from a mild-mannered macroeconomist into Doctor Doom. I lost my faith in the healing powers of central bankers, and wrote the original edition of *The Return of Depression Economics*. In essence, the East Asian crisis awakened us to the fact that there were more dangers in the world economy than were dreamt of in textbook macro.

But what were these dangers, anyway?

### *Generat(ion)ing crisis*

All crises are divided into three parts. OK, maybe not. But the currency crisis literature has evolved in three “generations”, successive accounts of what can cause sudden speculative attacks on currencies.

First-generation models began, at least in my mind, with wise words from the governor of the Bank of Portugal. Back in 1976, a group of MIT graduate students was working at the Bank, thanks to a personal connection between the governor and Dick Eckaus. Portugal at the time was

a bit of a crazy place, still suffering from the mild chaos that followed the overthrow of the dictatorship the year before. The economy had stabilized after an initial slump, but the currency was under pressure, with reserves rapidly dwindling. It turned out later that most of the reserve loss was due to foreign exchange hoarding by commercial banks – which was kind of funny, since at the time those banks were state –owned.

But in any case, the governor made a remark that intrigued me: “When I have six months of reserves,” he said, “I will have no reserves.” What he meant was that once reserves dropped below some critical level, there would be a run on the currency that would quickly exhaust whatever was left.

There were already economic models like this, albeit of very recent vintage – and not exactly about foreign exchange. Notably, Salant and Henderson (1978, but circulated as a working paper in 1976), in an analysis of gold prices, devoted part of their paper to attempts to stabilize gold prices with stockpiles. They showed that an unsustainable stabilization scheme would eventually collapse in a speculative run that quickly exhausted the remaining stock, which is more or less what happened in March 1968. I realized that this was in effect what Silva Lopes had been saying about the escudo.

Translating that insight into a fully-specified model was a bit tricky. Krugman (1979) was more complicated than it should have been; it took the work of Flood and Garber (1984) to get it in comprehensible form. But the result was a highly suggestive analysis of speculative attacks on fixed exchange rates.

But there were problems with that analysis. Some complained about the asymmetry between super smart speculators and super stupid governments. More compelling, in my view, was the fact that the story didn't seem to fit very well with what actually happened in many currency crises, especially in advanced countries. For example, neither the sterling crisis of 1931 nor that of 1992 seemed to be mainly about dwindling foreign exchange reserves. Instead, both seemed to be about governments who found that their commitment to a fixed exchange rate was interfering with attempts to achieve domestic objectives, especially full employment. When speculators began to bet on an abandonment of the currency peg to deal with pressing domestic concerns, spiking interest rates sharply increased the cost of defending that peg – hence, a crisis, with speculators in effect forcing the government's hand.

In an influential survey of evidence from the 1992-1993 European crisis, of which the fall of sterling was one component, Eichengreen, Rose, and Wyplosz (1995) coined the term “second-generation models” to describe models that tried to capture this quite different kind of crisis dynamics. The most influential modeling came from Obstfeld (1994), who showed that this kind of analysis strongly suggested the possibility of multiple equilibria: countries in a vulnerable state could experience a currency crisis whenever investors believed that such a crisis was imminent, or for that matter believed that other investors believed in a crisis.

But two generations of crisis theory, it turned out, were not enough. Second-generation crisis models suggested that succumbing to a speculative attack should be good for employment and GDP: no longer constrained by the exchange rate commitment, a government would be free to

expand demand. That is, in fact, what happened in the aftermath of the two sterling crises, 60 years apart: I used to joke that Britain should erect a statue of George Soros in Trafalgar Square, to thank him for getting the UK out of the ERM. But it's not what happened to Mexico after the tequila crisis, or the East Asian economies after the crises of 1997, or Argentina after the collapse of convertibility in 2002. In all these cases the collapse of a fixed rate under speculative attack was followed by a severe contraction in the real economy.

Hence the development of third-generation models. These models – e.g. Krugman (1999), Aghion et al (2001), Chang and Velasco (1999) – emphasized private-sector balance sheets, especially firms or banks with foreign-currency debt. The key argument was that a currency depreciation set off by speculative attack would sharply worsen balance sheets, as the domestic-currency value of foreign-currency debt rose. This in turn would damage the economy, e.g. by depressing investment, which would feed back into further currency depreciation, and so on. Some models stressed the possibility of multiple equilibria, but even without such multiplicity there was the clear possibility of disproportionate depreciation and output decline from an adverse shock, including the end of a bubble financed by foreign capital.

Or to put it a different way, what happens in a third-generation currency crisis is a vicious circle of deleveraging. Hence the severe cost to the real economy.

One question you might ask is whether this diagnosis is all ex-post rationalization. Did the theory of third-generation currency crises actually succeed in predicting any crises? The answer is yes: Argentina, which, alas, played out exactly as expected.

Before I proceed to the relationship between currency crises and the financial crises that have afflicted all of us recently, let me briefly highlight two policy issues that arise in the context of third-generation crises.

First, does this analysis argue that troubled economies with large foreign-currency debt should avoid currency depreciation? This is a highly relevant question right now for the Baltics, which, as I've already mentioned, are currently in a situation highly reminiscent of Argentina's position just before the collapse. It might seem, given the account I've just provided, that Latvia or Estonia should do anything possible to avoid devaluation.

But that's not right. Suppose that the underlying problem is a level of prices and wages that makes your production uncompetitive – typically the consequence of an earlier period of excessive capital inflows. Then what must happen, sooner or later, is a decline in prices and wages relative to those in your trading partners – a real depreciation. This can happen through nominal currency depreciation – but this has the unpleasant consequence that the real value of foreign currency debt will rise, creating a deleveraging crisis.

Unfortunately, the alternative is worse. Real depreciation without nominal depreciation must take place through deflation. And this means that the real value of *all* debt, not just foreign-currency debt, rises. So the deleveraging crisis will be even worse if you don't depreciate.

A second issue concerns the role of capital mobility. Clearly, substantial capital mobility is a prerequisite for third-generation crises, which can't happen unless you've already run up a large foreign-currency debt. And in the crisis, it's capital flight that leads to the large depreciation that in turn worsens balance sheets. So there is a clear case for temporary capital controls – a sort of curfew on capital flight – in the heat of a third-generation currency crisis.

But what does all this have to do with the current problems of the United States and other advanced countries?

*Deleveraging crises: similarities and differences*

In the movie *The Longest Day* there's a scene involving a German general who is first shown preparing for a war game in which he will play the American commander. He tells his aide that he plans to surprise everyone by landing, not at Calais, but in Normandy – but not to worry, the Americans would never do that. Then, when the invasion begins, he mutters, “Normandy! How stupid of me!”

Now you know how some of us felt as the current crisis unfolded.

By 2006, huge U.S. current account deficits suggested that the dollar would have to fall eventually, and the fact that U.S. real interest rates weren't significantly higher than rates in other major economies suggested that markets weren't taking that fact into account. So there was reason to expect a Wile E. Coyote moment – a moment of sudden realization – leading to a

sudden dollar fall. But U.S. external debt, although large, is overwhelmingly dollar-denominated. So America didn't seem vulnerable to a third-generation currency crisis. No worries, then, right?

Yet the logic of the models should have suggested that there were, in fact, reasons to worry. After all, a vicious circle of deleveraging could arise as easily on the asset side as on the liability side, as noted in Krugman (2002). It should have been easy to put the evidence of a mammoth housing bubble together with the concepts of third-generation crisis theory to see how a nasty deleveraging cycle could occur without the "original sin" of dependence on foreign-currency debt.

Sadly, almost nobody – certainly not yours truly – put the pieces together. Even those of us who diagnosed that housing bubble correctly failed to foresee the financial implosion that would follow. Normandy! How stupid of me!

But now it has happened. How does the crisis we have actually stumbled into compare with a currency crisis, both in terms of outlook and in terms of the policy response?

One difference one might have expected to be important is the role of monetary policy. The normal front line of defense against recession involves cutting interest rates. For a country facing a currency crisis, however, that defense is of ambiguous value: cutting rates may help domestic demand, but it may also weaken the currency, intensifying the vicious circle. For a country facing an asset-side deleveraging spiral, however, interest rate reductions are all good: in

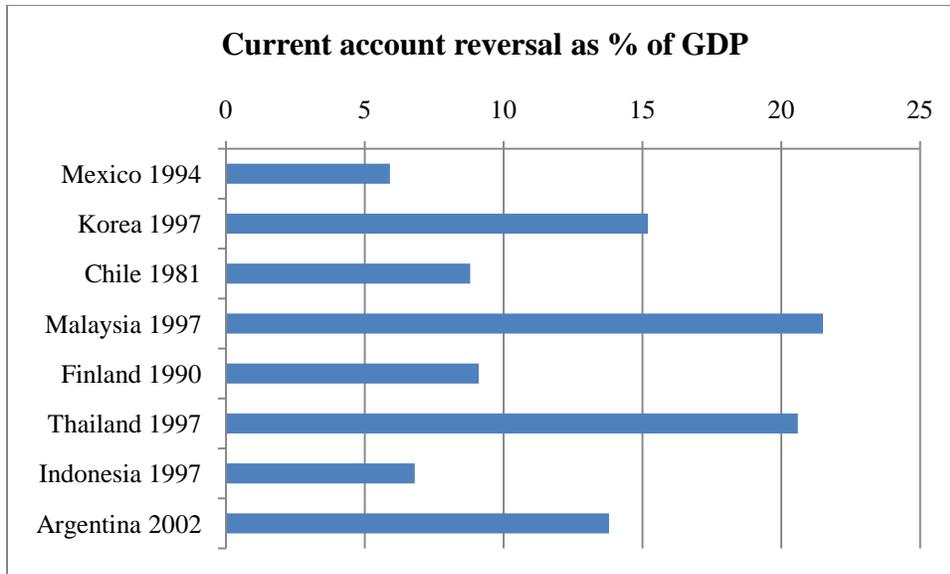
addition to their usual effects, they support asset prices and help balance sheets. So you might have expected central banks to be very effective in fighting asset-price-driven deleveraging.

In reality, however, the monetary line of defense was quickly overrun: reductions in policy rates quickly ran up against the zero lower bound, and that was that, at least as far as conventional monetary policy was concerned. We should have seen this coming: Krugman (2002) laid it all out, but nobody – the author included – took the message to heart.

Meanwhile, there's another difference between currency crises and asset-side crises that makes the latter look worse: namely, the fact that asset-price deflation, unlike currency depreciation, has no indirect stimulative effect on the economy.

As Calvo et al (2006) have stressed, financial crises in emerging markets are often followed by “phoenix-like” recoveries, with the downturn giving way to very rapid growth. Key to these recoveries is the fact that a severely depreciated currency makes exports extremely competitive, leading to a large positive swing in the trade balance.

As with the output declines associated with third-generation crises, the violence of these turnarounds is startling to economists accustomed to the tameness of U.S. data. The figure below shows the “current account reversal” for each of the cases shown at the beginning of this paper – that is, the extent of the swing from current account deficit on the eve of the crisis to the maximum current account surplus following the crisis.



These are awesomely large swings. In part, no doubt, they were due to the import-compressing effect of recession. But mostly they represent a gain in competitiveness due to plunging currencies. Plunging prices of houses and CDOs, unfortunately, don't produce any corresponding macroeconomic silver lining.

This suggests that we're unlikely to see a phoenix-like recovery from the current slump. How long should recovery be expected to take?

Well, there aren't many useful historical models. But the example that comes closest to the situation facing the United States today is that of Japan after its late-80s bubble burst, leaving serious debt problems behind. And a maximum-likelihood estimate of how long it will take to recover, based on the Japanese example, is ... forever. OK, strictly speaking it's 18 years, since that's how long it has been since the Japanese bubble burst, and Japan has never really escaped from its deflationary trap.

This line of thought explains why I'm skeptical about the optimism that's widespread right now about recovery prospects. The main argument behind this optimism seems to be that in the past, big downturns in the world's major economies have been followed by fast recoveries. But past downturns had very different causes, and there's no good reason to regard them as good precedents.

### *Living in a crisis-ridden world*

Looking back at U.S. commentary on past currency crises, what's striking is the combination of moralizing and complacency. Other countries had crises because they did it wrong; we weren't going to have one because we do it right.

As I've stressed, however, crises often – perhaps usually – happen to countries with great press. They're only reclassified as sinners and deadbeats after things go wrong. And so it has proved for us, too.

And despite the praise being handed out to those who helped us avoid the worst, we are not handling the crisis well: fiscal stimulus has been inadequate, financial support has contained the damage but not restored a healthy banking system. All indications are that we're going to have seriously depressed output for years to come. It's what I feared/predicted in that 2001 paper: “[I]ntellectually consistent solutions to a domestic financial crisis of this type, like solutions to a third-generation currency crisis, are likely to seem too radical to be implemented in practice. And partial measures are likely to fail.”

Maybe policymakers will become wiser in the future. Maybe financial reform will reduce the occurrence of crises: major financial crises were much rarer between the end of World War II and the rise of financial deregulation after 1980 than they were before or since. Meanwhile, however, the fact is that the economic world is a surprisingly dangerous place.

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