

# WHAT HAVE WE LEARNED?

Macroeconomic Policy after the Crisis

edited by

George Akerlof

Olivier Blanchard

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and Joseph Stiglitz



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## The Lessons of the North Atlantic Crisis for Economic Theory and Policy

Joseph E. Stiglitz

In analyzing the financial crisis that began in 2007 and led to the Great Recession, we should try to benefit from the misfortune of recent decades: The approximately 100 crises that have occurred during the last 30 years—as liberalization policies became dominant—have given us a wealth of experience and mountains of data. If we look over a 150-year period, we have an even richer data set.

With a century and a half of clear, detailed information on crisis after crisis, the burning question is not *How did this happen?* but *How did we ignore that long history, and think that we had solved the problems with the business cycle?* Believing that we had made big economic fluctuations a thing of the past took remarkable hubris.

### Markets Are Not Stable, Efficient, or Self-Correcting

The big lesson that this crisis forcibly brought home—one we should have long known—is that market economies, on their own, are not necessarily efficient, stable, or self-correcting. One of the reasons there were not only failures in preventing and forecasting the downturn but also in responding to it, was that many of the predominant models employed special assumptions, leading to views that markets were efficient, stable, and self-correcting. Because our models didn't adequately analyze the causes of the crisis, we could neither respond to the crisis in ways that would ensure a quick and strong recovery nor take appropriate actions to significantly reduce the likelihood of a recurrence. The result is that we continue to face a significant risk of another crisis in the future.<sup>1</sup>

That unfettered markets are not, in general, efficient whenever there are information imperfections and asymmetries, and/or when there is an

incomplete set of risk markets, and/or when capital markets are imperfect or incomplete has been well established for more than three decades. These “market imperfections” are important in *every* economy, even the most advanced; and yet many of our regulators and the advocates of deregulation ignored not only the lessons of history but also these advances in our understandings of the limitations of markets.

Moreover, predominant macroeconomic models *before the crisis* underestimated market instability. They had focused on *exogenous* shocks as the source of the perturbations giving rise to fluctuations, and yet it’s very clear that a very large fraction of the perturbations to our economy—including those giving rise to the worse downturns—are *endogenous*. The housing bubble and its bursting, like so many bubbles that preceded it, was a creation of the market itself. The models that focused on exogenous shocks simply misled us—the majority of the really big shocks come from within the economy. Moreover, some of the most important shocks are persistent and associated with long-run structural transformations—closely linked with the economy’s (endogenous) innovative activities.

Finally, economies are not self-correcting. Whether or not they are could not, of course, be addressed within models that assumed that the economy was in equilibrium. It is not just that the economy does not return to full employment quickly after a strong, adverse shock. There are economic forces that may, on their own, exacerbate the downturn. Unemployment leads to lower real wages; lower real wages lead to lower aggregate demand; and lower aggregate demand can lead to still more unemployment. The implication of this is that a quick recovery may require *strong* government intervention. It’s clear that we have yet to fully take on board this crucial lesson: it is obvious that the attempts to “fix” the economies of the United States and Europe in the aftermath of the crisis have failed to restore the economy to full employment. The loss in GDP between our potential and our actual output is in the trillions of dollars. Of course, some will say that it could have been done worse, and that’s true, even if it’s cold comfort.

The reason for this failure—in spite of the unprecedented loose monetary policy—is that fiscal policy was too tepid; the Keynesian policies were too small and not of long enough duration; and they were followed by contractionary policies, with far more austere policies in Europe than

in the United States, and far worse economic performance in Europe than in the United States. Of course, the fiscal policies could have been better designed. But poor design was not the main source of failure. Even with the imperfect design, the stimulative effects (the multipliers) were strong.

### More Than Deleveraging, More Than a Balance Sheet Crisis: The Need for Structural Transformation

We have roughly the same levels today of human resources, capital stock, and natural resources as we did before the crisis. But many countries have not regained their pre-crisis GDP levels, to say nothing of returning to the precrisis growth paths. It is clear that we are not using our resources well. In a very fundamental sense, the crisis is still not fully resolved—and there’s no good economic theory that explains why that should be the case.

Real business cycle theory and modern-day descendants of those models suggest there was a negative productivity shock, a collective bout of amnesia that resulted in a reduced capacity to produce outputs from inputs. Putting aside the absurdity of such a position, the irony is that in this downturn, individual firms continued to increase productivity at a rapid rate. At the microeconomic level, there is no evidence of such amnesia.<sup>2</sup>

Some focus on the high level of debt (especially at the household level) as an impediment to recovery. But it is worth noting that in the standard models (on which policymakers relied so heavily in the years before the crisis, and which continue to be relied on in some circles) debt plays little role: it just changes claims on resources, transferring income from one individual to another. And in those models, such redistributions have no consequences. But even if such transfers lead to a lower level of aggregate demand (because creditors have a lower marginal propensity to consume than debtors), standard theory suggests that there is a change in prices that would restore the economy back to full employment. (Standard theory doesn’t have much to say about the dynamics of these price adjustments. Indeed, one strand simply assumes that wages and prices are rigid, when of course in the Great Depression they were changing at a very rapid rate. The problem, as I hinted above, is that the adjustments may themselves have been counterproductive.)

Much of the popular discussion sees no prospects of wage and price adjustments restoring the economy quickly to full employment. It has effectively abandoned the “standard” model. It is argued that if we could only deleverage—get rid of the excessive debt—we could return to some version of normality. In this view, the prolonged downturn is a result of the slow pace of deleveraging.

But even as the economy deleverages, there is every reason to believe that it will not return to full employment, even if it does lead to some increase in aggregate demand. We are not likely to return to the precrisis household savings rate of zero—nor would it be a good thing if we did.<sup>3</sup> Moreover, even if manufacturing has a slight recovery, most of the jobs that have been lost in that sector will not be regained. Nor will large numbers of construction workers in the United States that were employed at the peak of the housing bubble quickly regain their jobs.

Some, looking at past data, have suggested that we should resign ourselves to this unfortunate state of affairs. Economies that have had severe financial crises<sup>4</sup> typically recover slowly. But the fact that things have *often* gone badly in the aftermath of a financial crisis doesn’t mean they *must* go badly. To make matters go well, though, one has to understand why recoveries are often so slow.

In earlier work, Greenwald and I explained why recoveries from balance sheet recessions (where there were adverse shocks to firms’ equity) were so sluggish, and why this was especially so when banks’ balance sheets were badly hit.<sup>5</sup>

But this is more than just a balance sheet crisis. There is a deeper cause: the United States and Europe are going through a structural transformation. There is a structural transformation associated with the move from manufacturing to a service sector economy (just as earlier in the twentieth century there was a structural transformation from agriculture to manufacturing). Additionally, changing comparative advantages requires massive adjustments in the structure of the North Atlantic countries. Such transformations occur slowly. This is partly because the human and physical capital stock has to be restructured (workers have to be retrained, and often relocated).

Further, markets do not make such adjustments easily on their own, partly because those who have to shift do not themselves have the resources to finance the requisite investments, having lost much of their

human and other capital as a result of the underlying forces giving rise to the structural transformation; and there are natural imperfections in capital markets arising out of imperfect and asymmetric information.

Keynesian policies to stimulate the economy are not only able to increase GDP but can also facilitate restructuring. This is especially so if public expenditure is appropriately directed. Conversely, austerity measures, such as those that many countries are undertaking today, impede the restructuring that is now required. With austerity, some of the sectors that would naturally expand (as manufacturing contracts, along with its share of employment) are service sectors in which public financial support has traditionally played a key role, for understandable reasons.<sup>6</sup>

### Reforms That Are, at Best, Halfway Measures

As I have observed, markets by themselves do not in general lead to efficient, stable, and socially acceptable outcomes. This means we have to think a little bit more deeply about what kind of economic architectures will lead to growth, real stability, and a good distribution of income.

There is an ongoing debate about whether we simply need to tweak the existing economic architecture or whether we need to make more fundamental changes. I have two concerns. One I hinted at earlier: the reforms undertaken so far have only tinkered at the edges. The second is that some of the changes in our economic structure (both before and after the crisis) that were *supposed* to make the economy perform better may not have done so.

There are some reforms, for instance, that may enable the economy to better withstand small shocks but at the same time make it less able to absorb big shocks. This is true of many financial sector developments, which may have allowed the economy to absorb some of the smaller shocks but clearly made the economy less resilient to fatter-tail shocks. Many of the “improvements” in markets before the crisis actually increased countries’ exposure to risk. Whatever the benefits that might be derived from capital and financial market liberalization (and they are questionable), there have been severe costs in terms of increased exposure to risk. We ought to be rethinking attitudes toward these reforms—and the IMF should be commended for its rethinking in recent years. One of the objectives of capital account management, in all of its forms, can

be to reduce domestic volatility arising from a country's international engagements.

More generally, the crisis has brought home the importance of financial regulation for macroeconomic stability. But as I assess what has happened since the crisis, I feel disappointed. With the mergers in the financial sector that have occurred in the aftermath of the crisis, the problem of too-big-to-fail banks has become even worse. But the problem is not just with too-big-to-fail banks. There are banks that are too intertwined to fail and banks that are too correlated to fail. We have done little about any of these issues.<sup>7</sup> There has, of course, been a huge amount of discussion about too big to fail. But being too correlated is a distinct issue. There is a strong need for a more diversified ecology of financial institutions that would reduce incentives to be excessively correlated and lead to greater stability.

Also, we haven't done enough to increase bank capital requirements. Missing in much of the discussion is an assessment of the costs versus benefits of higher capital requirements. We know the benefits: a lower risk of a government bailout and a recurrence of the kinds of events that marked 2007 and 2008. But on the cost side, we've paid too little attention to the fundamental insights of the Modigliani-Miller theorem, which explains the fallacies of arguments that increasing capital requirements will increase the cost of capital.<sup>8</sup>

### Deficiencies in Reforms and in Modeling

If we had begun our reform efforts with a focus on how to make our economy more efficient and more stable, there are other questions we would have naturally asked. Interestingly, there is some correspondence between these deficiencies in our reform efforts and the deficiencies in the models that we as economists often use in macroeconomics.

#### The Importance of Credit

We would, for instance, have asked what the fundamental roles of the financial sector are, and how we can get it to perform those roles better. Clearly, one of the key roles is the allocation of capital and the provision of credit, especially to small and medium-sized enterprises, a function it did not perform well before the crisis and arguably is still not fulfilling well.

This might seem obvious. But a focus on the provision of credit has not been at the center of policy discourse or of the standard macro models.

I believe we have to shift our focus from money to credit. In looking at a bank's balance sheet, the two sides are *usually* going to be highly correlated. But that is not always the case, particularly in the context of large economic perturbations. Especially in deep recessions, we ought to be focusing on the impediments to credit creation. I find remarkable the extent to which there has been an inadequate examination in standard macro models of the nature of the credit mechanism.<sup>9</sup>

But failing to analyze credit markets--and to manage credit creation--is not the only lacuna in "monetary" theory and policy. There is also a lack of understanding of different kinds of finance. A major area in the analysis of risk in financial markets is the difference between debt and equity. But in standard macroeconomics, this has barely been given any attention.

#### Stability

As I have already noted, in the conventional models (and in the conventional wisdom) market economies were stable. So it was perhaps not a surprise that fundamental questions about how to design *more* stable economic systems were seldom asked. We have already touched on several aspects of this: how to design economic systems that are less exposed to risk or that generate less volatility on their own.

One of the necessary reforms, though it is not emphasized enough, is the need for more automatic stabilizers and fewer automatic destabilizers, not only in the financial sector but also throughout the economy. For instance, the movement from defined benefit to defined contribution systems may have led to a less stable economy.

Elsewhere I have explained how risk-sharing arrangements (especially if poorly designed) can actually lead to more systemic risk: the precrisis conventional wisdom that diversification essentially eliminates risk is simply wrong.<sup>10</sup>

#### Distribution

Distribution matters as well—distribution among individuals, between households and firms, among households, and among firms. Traditionally,



macroeconomics focused on certain aggregates, such as the average ratio of leverage to GDP. But that and other average numbers often don't give a picture of the vulnerability of the economy. It was the fact that a large number of people at the bottom were at risk of being unable to make their debt payments that should have tipped us off that something was wrong.

Across the board, our models need to incorporate a greater understanding of heterogeneity and its implications for economic stability.

### Policy Frameworks

Flawed models lead not only to flawed policies but also to flawed policy frameworks.

#### Should Monetary Policy Focus Just on Short-Term Interest Rates?

In monetary policy, there is a tendency to think that the central bank should only intervene in setting the short-term interest rate. Adherents to this view believe "one intervention" is better than many. Since at least 80 years ago with the work of Ramsey,<sup>11</sup> we have known that focusing on a single instrument is not generally the best approach.

The advocates of the "single intervention" approach argue that it is best because it least distorts the economy. Of course, the reason we have monetary policy in the first place—the reason why government acts to intervene in the economy—is that we don't believe that markets on their own will set the right short-term interest rate. If we did, we would just let free markets determine that interest rate. The odd thing is that while just about every central banker would agree we should intervene in the determination of that price, not everyone is so convinced that we should strategically intervene in others, even though we know from the general theory of taxation and the general theory of market intervention that intervening in just one price is not optimal.

Once we shift the focus of our analysis to credit, and explicitly introduce risk into the analysis, we become aware that we need to use multiple instruments. Indeed, in general, we want to use all the instruments at our disposal. Monetary economists often draw a division between macroprudential, microprudential, and conventional monetary policy instruments. In our book, *Toward a New Paradigm in Monetary Economics*, Bruce Greenwald and I argue that this distinction is artificial. The government

needs to draw on all of these instruments, *in a coordinated way*. (I'll return to this point shortly.)

Of course, we cannot "correct" every market failure. The very large ones, however—the macroeconomic failures—will always require our intervention. Bruce Greenwald and I have pointed out that markets are never Pareto efficient if information is imperfect, if there are asymmetries of information, or if risk markets are imperfect. And since these conditions are *always* satisfied, markets are never Pareto efficient.<sup>12</sup> Recent research has highlighted the importance of these and other related constraints for macroeconomics—though again, the insights of this important work have yet to be adequately integrated into either mainstream macroeconomic models or policy discussions. For instance, privately profitable contracts (e.g., credit default swaps) may, as we noted earlier, enhance systemic risk. The reason we have financial and banking regulation is precisely because profit maximization on the part of private agents does not, in general, lead to socially optimal outcomes. There are large externalities, for instance, associated with the actions taken by certain agents which they naturally don't take into account: the bankers did not take into account the costs that their excessive risk taking would impose on the rest of society.

#### Price versus Quantitative Interventions

These theoretical insights also help us to understand the erroneousness of the old presumption among some economists that price interventions are preferable to quantity interventions. There are many circumstances in which quantity interventions lead to better economic performance.<sup>13</sup>

#### Rethinking Tinbergen's Analysis of Targets and Instruments

A policy framework that has become popular in some circles argues that so long as there are as many instruments as there are objectives, the economic system is controllable, and the best way of managing the economy in such circumstances is to have an institution responsible for one target and one instrument. (In this view, central banks have one instrument, the interest rate, and one objective, inflation.<sup>14</sup> We have already explained why limiting monetary policy to one instrument is wrong.)

Drawing such a division may have advantages from an agency or bureaucratic perspective, but from the point of view of managing macroeconomic policy—focusing on employment, growth, stability and



distribution, in a world of uncertainty—it makes no sense. There has to be coordination among all the instruments at our disposal, taking into account the impacts on all societal objectives.<sup>15</sup> The equilibrium that arises when different people control different instruments and focus on different objectives is, in general, not optimal in achieving overall societal objectives. In particular, there needs to be close coordination between monetary and fiscal policy. Better coordination—and the use of more instruments—can, for instance, enhance economic stability.

### Take This Chance to Revolutionize Flawed Models

It should be clear that we could have done much more to prevent the crisis that began in 2007 and to mitigate its effects. It should be clear too that we can do much more to prevent the next one. Still, we are at least beginning to identify the really big market failures, the big macroeconomic externalities, and the best policy interventions for achieving high growth, greater stability, and a better distribution of income.

To succeed, we must constantly remind ourselves that markets on their own are not going to solve these problems, and neither will a single intervention such as changing short-term interest rates. That this is so has been proved time and again over the last century and a half. We should not let ourselves be deceived again by overly simplistic models that suggest otherwise.

And as daunting as the economic problems we now face are, acknowledging this will allow us to take advantage of the one big opportunity that this period of economic trauma has afforded: the chance to revolutionize our flawed models, and perhaps even exit from an interminable cycle of crises.

### Notes

This chapter, an extended version of a discussion presented April 17, 2013, at the IMF Conference “Rethinking Macro Policy II: First Steps and Early Lessons,” is based on joint work with a number of my colleagues, cited below. I especially want to thank my long term coauthor Bruce Greenwald. Research assistance from Laurence Wilse-Samson and Eamon Kircher-Allen is also gratefully acknowledged. I also wish to acknowledge financial assistance from the Institute for New Economic Thinking, and to acknowledge its agenda to reexamine the foundations of macroeconomics in the light of the crisis.

1. I have elaborated at greater length on some of the lessons to be drawn from the crisis for macroeconomics in “The Financial Crisis of 2007–2008 and Its Macroeconomic Consequences,” in *Time for a Visible Hand: Lessons from the 2008 World Financial Crisis*, ed. S. Griffith-Jones, J. A. Ocampo, and J. E. Stiglitz, Initiative for Policy Dialogue Series (Oxford: Oxford University Press, 2010), 19–49; “Rethinking Macroeconomics: What Failed and How to Repair It,” *Journal of the European Economic Association* 9, no. 4 (2011): 591–645; “Rethinking Macroeconomics: What Went Wrong and How to Fix It,” *Journal of Global Policy* 2, no. 2 (2011): 165–175; “Stable Growth in an Era of Crises: Learning from Economic Theory and History,” *Economi-tek* 2, no. 1 (2013): 1–39; and “Macroeconomics, Monetary Policy, and the Crisis,” in *In the Wake of the Crisis*, ed. O. Blanchard, D. Romer, M. Spence, and J. Stiglitz (Cambridge, MA: MIT Press, 2012).
2. Economic downturns can lead to the destruction of organization and informational capital, as Bruce Greenwald and I have emphasized. See our *Towards a New Paradigm in Monetary Economics* (Cambridge: Cambridge University Press, 2003).
3. It is important to distinguish between arguments concerning the restoration of growth and those focusing on the restoration of the economy to full employment. It is conceivable that the economy could return to normal growth—creating new jobs in tandem with new entrants to the labor force—but that the level of unemployment remains elevated. Hence, it is possible that once the economy has deleveraged, growth might be restored. Here we are asking, would aggregate demand be sufficient to return the economy to full employment?
4. We note too that the fact that downturns that are associated with deep financial crises are longlasting tells us very little: if there are deeper fundamental causes to crises (as suggested in the next paragraph), then these deep and longlasting crises will result in financial crises; the financial crises are the consequence, not the (underlying) cause. If that is the case, then the statement that “deep financial crises are longlasting” says nothing more than “deep crises are longlasting,” a statement that, while true, is not very informative.
5. B. Greenwald and J. E. Stiglitz, “Financial Market Imperfections and Business Cycles,” *Quarterly Journal of Economics* 108, no. 1 (1993): 77–114; and Greenwald and Stiglitz, *Towards a New Paradigm in Monetary Economics*.
6. The ideas in this paragraph are elaborated in D. Delli Gatti, M. Gallegati, B. Greenwald, A. Russo, and J. E. Stiglitz, “Mobility Constraints, Productivity Trends, and Extended Crises,” *Journal of Economic Behavior & Organization* 83, no. 3 (2012): 375–393; and idem, “Sectoral Imbalances and Long Run Crises,” in *The Global Macro Economy and Finance*, ed. F. Allen, M. Aoki, J.-P. Fitoussi, N. Kiyotaki, R. Gordon, and J. E. Stiglitz, IEA Conference Volume 150-III (Houndmills, UK, and New York: Palgrave, 2012), 61–97.
7. See Joseph E. Stiglitz, “Witness Testimony of Joseph E. Stiglitz, Congressional Oversight Panel,” Hearing on Impact of the TARP on Financial Stability, March 4, 2011, <http://cybercemeterly.unt.edu/archive/cop/20110401230935/http://cop.senate.gov/documents/testimony-030411-stiglitz.pdf#transcript> (accessed September 30, 2013) and “Too Big to Fail or Too Big to Save? Examining the Systemic Threats

of Large Financial Institutions,” testimony at a hearing of the United States Congress’s Joint Economic Committee, April 21, 2009, [http://www.jec.senate.gov/public/?a=Files.Serve&File\\_id=6b50b609-89fa-4ddf-a799-2963b31d6f86](http://www.jec.senate.gov/public/?a=Files.Serve&File_id=6b50b609-89fa-4ddf-a799-2963b31d6f86) (accessed September 30, 2013).

8. See J. E. Stiglitz, “On the Need for Increased Capital Requirements for Banks and Further Actions to Improve the Safety and Soundness of America’s Banking System,” testimony before the Senate Banking Committee, August 3, 2011, [http://www.banking.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore\\_id=97cec3e1-2d1d-44fa-acd9-a0a1bc640bc4](http://www.banking.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=97cec3e1-2d1d-44fa-acd9-a0a1bc640bc4) (accessed September 30, 2013); A. Admati, P. M. De Marzo, M. F. Hellwig, and P. Pfleiderer, “Debt Overhang and Capital Regulation,” Stanford Working Paper, 2012, <http://www.gsb.stanford.edu/news/packages/PDF/AdmatiDebt032612.pdf> (accessed July 16, 2013); and Anat Admati and Martin Hellwig, *The Bankers’ New Clothes: What’s Wrong with Banking and What to Do about It* (Princeton, NJ: Princeton University Press, 2013), and the references cited there. There are numerous other regulatory issues (e.g., dealing with the transparency of derivatives and having them trade over well-capitalized exchanges). Even a brief exploration of these would take me well beyond the confines of this short note. I simply observe that in virtually each of these arenas, the regulatory reforms have fallen short of what is desired or needed.

9. Doing so was the objective of my book with Bruce Greenwald, *Towards a New Paradigm in Monetary Economics*. There is, of course, a large microeconomic literature on banking and credit, but for the most part, the insights of this literature have not been taken on board in standard macro models.

10. See J. E. Stiglitz, “Contagion, Liberalization, and the Optimal Structure of Globalization,” *Journal of Globalization and Development* 1, no. 2 (2010), art. 2; idem, “Risk and Global Economic Architecture: Why Full Financial Integration May be Undesirable,” *American Economic Review* 100, no. 2 (2010): 388–392; and S. Battiston, D. Delli Gatti, M. Gallegati, B. Greenwald, and J. E. Stiglitz, “Liaisons Dangereuses: Increasing Connectivity, Risk Sharing, and Systemic Risk,” *Journal of Economic Dynamics and Control* 36 (2012): 1121–1141.

The intuition behind these results is simple: when we identify a group of individuals with a contagious disease, we don’t “diversify”—sending them to all quarters of the earth. We quarantine them. Economists have intuitively recognized that economic crises can spread like a contagious disease, but that happens because of one form of interdependence or another. High levels of interdependence enable a disturbance in one part of the system to be transmitted elsewhere. Well-designed “architectures” balance the advantages of interdependence with the disadvantages, and attempt to introduce design features (“circuit breakers,” capital controls) that mitigate the risks of adverse contagion. In the standard models, the risks of contagion were ignored (at least before crises occurred, which they did with increasing frequency), and thus no attention was paid to policies that might reduce these risks—and indeed, capital controls were adamantly opposed.

11. F. P. Ramsey, “A Contribution to the Theory of Taxation,” *Economic Journal*, 1927, 47–61.

12. See J. E. Stiglitz and B. Greenwald, “Externalities in Economies with Imperfect Information and Incomplete Markets,” *Quarterly Journal of Economics* 101, no. 2 (1986): 229–264.

13. The classic reference is Weitzman (M. L. Weitzman, “Prices vs. Quantities,” *Review of Economic Studies* 41, no. 4 [1974]: 477–491). Since then, there has been a wealth of literature in different contexts showing that quantity interventions may be preferable; for example, quotas may be preferable to tariffs (P. Dasgupta and J. E. Stiglitz, “Tariffs Versus Quotas As Revenue Raising Devices Under Uncertainty,” *American Economic Review* 67, no. 5 [1977]: 975–981), or quantity interventions in capital account management may be preferable to price interventions (J. E. Stiglitz, José Antonio Ocampo, Shari Spiegel, Ricardo French-Davis, and Deepak Nayyar, *Stability with Growth: Macroeconomics, Liberalization, and Development*, The Initiative for Policy Dialogue Series [Oxford: Oxford University Press, 2006]).

14. A fortiori, simple rules, like inflation targeting, that call for an increase in the interest rate when the inflation rate exceeds the targeted level are even more misguided. Such rules do not take into account the source of the disturbance to the economy or the most efficient way of restoring the economy to the desired “equilibrium” after a perturbation. The obvious illustration was provided by inflation in developing countries arising out of the global food and oil price rises of 2007. The increase in the interest rate in a small country obviously would have a negligible effect on these global prices; if the average rate of inflation were to be brought down to the desired level, it would require such large constrictions in the nontraded sectors that the cure would be worse than the disease. Fortunately, most governments have recognized this, and even those that have retained an inflation-targeting framework have adopted “flexible” frameworks.

15. Jan Tinbergen’s analysis was, of course, based on a very simple model, with very stringent assumptions. Evidently, those relying on his insights did not appreciate just how critical these assumptions were, and that the results were not even approximately correct in more general contexts.