



# Learning From The Crisis: A Talk in Honor of Lucas Papademos

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May, 2010

**LEARNING FROM THE CRISIS**

**A Talk in Honor of Lucas Papademos\***

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President Trichet, members of the Bank's Executive Board, governors of the other central banks represented here this evening, fellow students of central banking, and above all dear Lucas and Shanna:

I am privileged to take part this evening in honoring our colleague and friend, Lucas Papademos. Lucas has been a kind, and generous, and intellectually stimulating friend to me over the better part of four decades. I confess, however, to being here as a stand-in. The person who should be speaking about Lucas tonight is Franco Modigliani. Franco was Lucas's advisor at MIT. He was Lucas's frequent collaborator and co-author. And he was, I think it is fair to say, Lucas's mentor far more generally in matters of monetary economics and monetary policy. As Serena Modigliani put it, after Franco's death, she and Franco regarded Lucas and Shanna as their children. Alas, Franco is no longer with us, nor is Serena. Standing in his place tonight, and humbled to be doing so, I will try to think of how Franco would have addressed the subject

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of this splendid colloquium in Lucas's honor: What we can learn from the astonishing experience through which we have just lived?

The years of Lucas's service as vice president of the European Central Bank have encompassed one of the most significant sequences of economic dislocations since World War II. In many countries the real economic costs – costs in terms of reduced production, lost jobs, shrunken investment, and foregone incomes and profits – exceeded those of any prior post-war decline. It is in the financial sector, however, that this latest episode primarily stands out. The collapse of major financial firms, the decline in asset values and consequent destruction of paper wealth, the interruption of credit flows, the loss of confidence both in firms and in credit market instruments, the fear of default by counter-parties, and above all the intervention by central banks and other governmental institutions, have been extraordinary.

Large-scale and unusual events often present occasions for introspection and learning, especially when they bring unwanted consequences. Even if no one is at fault for causing some event in the first place (an earthquake, for example), it is only natural to ask what might be done to mitigate the consequences should a similar catastrophe recur. When what went wrong was the result of human action, the question at issue is not merely containment but prevention.

The harder question is to what extent the lessons from such unusual events are applicable in more normal times. No one expects the massive traffic jams typical when residents evacuate a coastal city in advance of a hurricane to occur at other times. Learning to manage such evacuations is helpful for occasions when they occur, but the knowledge has limited relevance for controlling ordinary traffic patterns. As economists and policymakers sort out the wreckage

from the recent financial crisis and the economic downturn that it triggered, these distinctions should be central to any normative lines of inquiry.

One lesson of this experience that certainly would not have surprised Franco Modigliani is that what matters for such purposes is not money but credit. Indeed, I think he would have argued, the economics profession's half-century-long fixation on money – how to measure it, how to control it, why households and firms hold it – appears today in retrospect as mostly a distraction. The causes of this crisis and downturn, in most countries, lay elsewhere – specifically, in restricted credit flows and depressed asset prices. The series of papers that Franco and Lucas co-authored in the 1980s often had the word “money,” or even the phrase “money supply,” in their titles. But they were really about the economy's dependence on credit, and how the central bank's influence over the volume of banks' liabilities gives it an influence as well over the asset side of lenders' balance sheets. Viewed from today's perspective, it is the Modigliani-Papademos line of thinking that has stood the test of time. What matters for economic activity is credit: its volume, its price and its availability.

By contrast, a second lesson would, I think, have surprised Franco. Contrary to the standard textbook model, which in this case Franco accepted – indeed, which Franco helped create – most central banks today do not normally set interest rates by open market operations increasing or decreasing the volume of reserves that they provide to their banking systems.

The traditional understanding of how a central bank sets a (presumably short-term) interest rate involves its varying the supply of bank reserves, or some other subset of its own liabilities, in the context of an interest-elastic demand for those liabilities on the part of the private banking system and perhaps other holders as well (including the nonbank public if the

measure of central bank liabilities taken to be relevant includes currency in circulation). Long before the recent crisis, however, this standard textbook account had ceased to bear a visible relationship to the actual conduct of monetary policy by most of the world's major central banks.

The point is most obvious today in systems like the Euro-system, in which the central bank maintains standing facilities both for banks' deposits of reserves and for marginal lending of reserves to the banks. The result, under normal circumstances, is the absence of any day-to-day relationship between the volume of reserves supplied and movements in the central bank's policy interest rate. The "corridor" system instead operates by maintaining a constant degree of supply-demand pressure in the market for reserves, *at the margin*, regardless of the total quantity supplied. Hence the central bank can move its policy interest rate without necessarily making any change in its own balance sheet.

But even in the United States – where in principle the standard textbook story ought to have applied most naturally because of the prevailing institutions (most importantly, until October 2008 no interest paid on reserve balances) – before 2000 the amount by which the Federal Reserve System increased or decreased bank reserves in order to move the federal funds rate was not only extremely small but becoming smaller over time. On many occasions moving the federal funds rate required no, or almost no, central bank transactions at all. Since 2000 the amount by which reserves have changed on days of policy-induced moves in the federal funds rate has become noticeably larger on average. But in a significant fraction of cases – one-third to one-fourth of all policy-induced rate changes – the movement in reserves has been in the wrong direction: a *decrease* in reserves accompanying a *reduction* in the interest rate, or vice versa.

This separation between the central bank's balance sheet and the influence it is exerting on short-term interest rates bears two significant implications. At a fundamental level, it represents a departure from the role of central bank liabilities that has underpinned much of monetary economics for more than a century. According to Wicksell's classic analysis, what was necessary to keep the market interest rate below the "natural" rate, and thereby expand economic activity, was not just a one-time injection of additional reserves but a continual increase in the supply of reserves. As a result, the "accelerationist" view of inflation, according to which real economic activity maintained at greater than its natural rate would lead not to a one-time increase in prices but to a perpetual increase (in some renderings, a perpetual increase in the rate of increase), was consistent with the classical notion of a fixed relationship between prices and money (in this case, central bank money). By contrast, if a corridor system for interest rate setting enables the central bank to hold interest rates at a sub-"natural" level without increasing the supply of its liabilities, then at least one relationship in the chain running from interest rates to real activity to prices to money must break down.

The crisis and the policy response to it have also brought to light a further, more practical implication. At least over some period of time potentially sufficient to matter for macroeconomic purposes, central banks have not one instrument of conventional monetary policy, as traditionally assumed, but two: not the short-term interest rate *or* the quantity of central bank liabilities, but the short-term interest rate *and* the quantity of central bank liabilities.

A reductionist form of this proposition had already become evident from the "quantitative easing" program undertaken by the Bank of Japan earlier in this decade. But in that case the central bank did not actually have two effective policy instruments; the occasion for the

quantitative easing in the first place was that the Japanese short-term risk-free interest rate had reached the zero lower bound, so that the quantity instrument was a replacement for the interest rate instrument. In a narrow sense, the same is true in the United States today: the federal funds rate is likewise at the zero lower bound.

But this focus places too narrow a construction on the point at issue. The import is that with the institution of interest paid on reserve balances, the central bank no longer faces the constraint of choosing one point along a fixed, downward-sloping reserve demand schedule. It can use one policy tool (the reserve remuneration rate) to determine the interest rate at which banks' demand for reserves becomes horizontal, and another (open market operations) to fix the quantity of reserves. Hence the size of the central bank's balance sheet is potentially independent of the policy interest rate that it sets.

Although this lesson of the last few years would probably have surprised Franco, once he had seen the principle in action he would immediately have intuited a highly significant consequence. Presumably there is little policy import to expanding banks' reserves via open market operations only to re-absorb them through a standing facility by which banks deposit, and the central bank remunerates, excess reserve holdings. But once the size of the central bank's balance sheet is, in effect, an independent instrument of monetary policy, the *composition* of the assets that the central bank holds represents a further degree of freedom. Here the Federal Reserve presents the most striking case.

In October 2008, at the height of the crisis, the Federal Reserve created its Commercial Paper Funding Facility. The spread between the interest rates on commercial paper and equal-maturity OIS rates had widened to unprecedented levels. In parallel, the volume of new

commercial paper issuance had virtually collapsed. As the CPFF's holdings grew, reaching some \$350 billion by early 2009, the commercial paper-OIS spread narrowed sharply, and new-issue volume recovered. A Harvard thesis that I supervised this year, using an estimated model of supply-demand equilibrium in the commercial paper market, concluded that the CPFF's purchases reduced the AA-rated three-month finance paper-OIS spread by 50 basis points – hardly a small amount in these markets, and a very welcome contribution to the markets' recovery. Franco, with his theory of “preferred habitats” and segmented markets, would not have been surprised.

By far the largest use of the Federal Reserve's balance sheet has been its purchase of residential mortgage-backed securities. The Federal Reserve established a Term Asset-Backed Securities Loan Facility in March 2008, but it did not begin to purchase securities until March 2009. Purchases of mortgage-backed securities then increased rapidly, and they continued through early 2010. As of last week, the volume held was approximately \$1.1 trillion.

The spread between the interest rates on U.S. thirty-year fixed-rate mortgages and ten-year Treasury bonds, which is normally some 140-180 basis points, had widened to 300 basis points by late 2008. The spread began to narrow, after the announcement of the Federal Reserve's new program but before it had actually bought any securities – just as would be expected, in a market for long-term assets, if market participants anticipated an action that would affect the prevailing supply-demand equilibrium. By mid 2009 the spread was back to normal. I am not aware of a formal econometric analysis of this sequence of events comparable to what my thesis student did for the CPFF, but the rough-level correspondence is sufficiently strong that in



all likelihood such research, once it is done, will likewise find a significant and substantial impact.

Much of today's discussion of U.S. monetary policy in the financial press focuses on the supposed need for the Federal Reserve to "unwind" these large mortgage-backed securities holdings in order to "exit" from its zero federal funds rate policy, once the nascent economic expansion gains sufficient momentum that monetary policy needs to play its customary role in preventing the accumulation of potentially inflationary pressures. The lesson we have learned from the recent experience, however, is that such an "unwinding" is not necessary for the "exit." Now that the central bank is able to pay interest on banks' holdings of excess reserves, it can exploit what amounts to the horizontal segment of the reserve demand schedule to raise short-term interest rates without shrinking its balance sheet. Selling off its portfolio of mortgage-backed securities, thereby reducing its balance sheet to the pre-crisis scale, may or may not be a wise course of action for the Federal Reserve. But it is in no way necessary for it to pursue any given trajectory for short-term interest rates. At least over business cycle frequencies, the central bank's use of its interest rate instrument and the size of its balance sheet are largely independent.

This colloquium in Lucas's honor is not merely about monetary policy, but financial stability as well. Here too, the experience of the crisis has educated us. Perhaps the most important lesson in this regard – one that Franco Modigliani surely knew all along, given his life experience – is that a democracy gets the regulation it chooses. If voters elect public officials who do not believe in regulation, and those officeholders appoint people who also do not believe in regulation to head the key agencies within the state's regulatory apparatus, then there will not be effective regulation no matter what the prevailing statutes say.

A further lesson of the crisis, which makes this basic principle of democratic governance all the more important, is that self-regulation by private firms is insufficient to meet the challenges presented by today's complex financial markets. These firms' need to raise their own capital in speculative financial markets, the distorted incentives created by a variety of features of modern corporate financial structures (beginning with limited liability), and the weakness of traditional forms of corporate governance in a world of widely dispersed share ownership, overwhelm any effective tendency toward self-regulation. Further, vigilance by creditors and counter-parties is no effective substitute for regulation either. Whether because they too face faulty governance and perverse incentives, or because they have become convinced that governments will issue blanket guarantees of insolvent firms' obligations, the idea of restraint effectively exercised by creditors and counter-parties is no longer credible. The essential implication is that regulation is necessary and that it is the responsibility of public policy to provide it.

Finally, the crisis experience has taught us something about lender-of-last-resort policy too. As seems to happen whenever the banking industry encounters difficulties, over the past two years we have repeatedly heard pious pronouncements to the effect that if central banks only adhered to the classical principles laid down by Henry Thornton and Walter Bagehot, two centuries ago and a century and a half ago, respectively, all would be in order. It is worth recalling that in Henry Thornton's time all London banks except the Bank of England had to be partnerships – no other limited-liability “joint stock banks” allowed – and with a maximum of six partners, each one personally and fully responsible for the bank's obligations. Walter Bagehot's presumption that the overwhelming majority of banks were soundly managed and solvent would

seems charmingly naive today. (What remains unchanged, however, is the potential fall-out from the failure of a large bank; as Bagehot wrote, “no cause is more capable of producing a panic, perhaps none is so capable, as the failure of a first-rate joint stock bank in London.”)

More important for purposes of lender-of-last resort policy today, the difficulty of assessing a proper value for illiquid assets has rendered Bagehot’s famous rule – lend freely, at a penalty rate, against good security – impossible to implement. In situations like the recent crisis, in which banks held large volumes (compared to their capital) of securities that were not trading, and for which prospects for future cash flows were highly uncertain, distinguishing what was or was not a “good security” was precisely the sticking point.

For just the same reason, the familiar corollary of Bagehot’s rule – come to the rescue of illiquid firms but not insolvent ones – has become equally impossible to implement in such a crisis. For practical purposes, the distinction between illiquidity and insolvency has disappeared in this kind of setting. Depending on the hypothetical value attached to these illiquid securities with uncertain future cash flows, any given bank was either solvent or not. Further, what these securities were worth – and hence whether any given bank was solvent – was itself endogenous to the decisions to be made by central banks and other policy authorities. Simply rescuing illiquid banks but not insolvent ones, as if the difference were both observable and independent of the actions to be taken, was not an operational strategy.

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The events through which we have just lived have been historic in both character and proportion. We have already learned much, and there is far more to be learned. Research in monetary economics will surely play a large role in that process. As Lucas finishes his term at

the Bank, I trust that he will continue his close involvement in that effort. As a product of Franco Modigliani's shaping, how could he not? But as President Trichet has emphasized, tonight is also an occasion to look back, and to say thank-you. We admire Lucas's contribution to the ECB throughout these tumultuous years. He has shown that, like his mentor, he is a European patriot. Even those of us who are not Europeans are grateful.