Discussion of "QE 1 vs. 2 vs. 3. . . : A Framework for Analyzing Large-Scale Asset Purchases as a Monetary Policy Tool"*

Olivier Blanchard
International Monetary Fund and
Massachussetts Institute of Technology

1. Introduction

This is a useful paper, for three reasons. First, as a partial equilibrium contribution, it offers a nice and tractable characterization of bank intermediation, rich enough to capture many of the mechanisms central to the crisis. Second, as a general equilibrium contribution, the assumptions used to integrate the model of banks in a general equilibrium setting lead to an elegant closure (although some of the assumptions, such as exogenous entry and exit of banks, make calibration even more of an art than usual). Third, as a contribution to the issue at hand, namely the role and the scope of targeted easing, the framework is the right one to start addressing the issues.

2. The Approach

Banks intermediate funds between households on the one hand, and government and firms on the other. They issue deposits and hold long government bonds and loans (or more accurately, shares in firms; I wonder how much difference shares versus loans would make to the dynamics of bank capital in the model). The constraint they face comes from an agency problem, which gives rise to a capital constraint. I must admit to a doubt here, which applies to this paper and many others: Taken literally, the formalization of the

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agency problem—namely, that bankers can abscond with some of the funds—does not seem to capture the main reason why, in the real world, banks decide to hold (or are forced to hold) capital. This being said, the capital constraint that the assumption delivers seems plausible, namely that properly weighted assets do not exceed some multiple of capital. This looks like Basel II rules, with two differences: (i) the weights reflect the relative ease with which bankers can steal the different assets rather than the risk characteristics of the assets, and (ii) the multiple determining leverage is a complex function of the economic environment, and I do not have a good sense of whether it can replicate the behavior of actual leverage in response to shocks.

The central bank acts as another intermediary. It does not have an agency problem (or, alternatively, it is assumed that the fiscal authority will do what is needed to make depositors whole). It is, however, less efficient in holding assets, whether those assets are long-term government bonds or loans to firms. Again, one can quibble. It is clear that the central bank is unlikely to be able to monitor loans as well as banks do, but why there is a monitoring issue in holding long government bonds is less clear.

3. The Basic Mechanism

Anything that leads to lower bank capital, and thus a tighter capital constraint, leads to a reduction in bank intermediation. Banks reduce their demand for long-term government bonds and for shares, and the prices of the two assets come down. Central bank purchases can in turn increase the prices. Purchases increase the price of the asset purchased directly and, through the effect of the higher price on the relaxed capital constraint of banks, the demand and the price of the other asset as well.

Two interesting results come out. First, for a given amount of purchases, purchases of shares have more effect on both prices than purchases of long bonds. This is because an increase in the price of shares has a larger effect on the capital constraint than an increase in the price of long bonds. Second, regardless of whether the central bank buys shares or long bonds, the prices of the two assets go up in proportion, with the price of shares going up more than the price of long bonds. One might have guessed that the price of the asset

being purchased would go up more than the price of the other asset. I suspect this is not a very robust result and that it depends on the specific assumptions made to differentiate between the two assets in the model; indeed one of the strengths of the model is to force one to identify the type of imperfect substitution, or market segmentation, that would lead to different results. One might also have guessed that if the central bank is bad at monitoring loans, larger central bank holdings would decrease monitoring, leading to worse behavior on the part of the firms and possibly to a lower price for equities. The formalization adopted here excludes this possibility.

4. The Origin of Spreads

What moves spreads in this model is shifts in the demand for assets, not changes in borrowers' characteristics—such as higher perceived risk. These shifts in demand are due in turn to a distortion, namely the agency problem facing banks. Thus, to the extent that the central bank does not face this agency problem, intervention is good until the constraint is no longer binding for banks. (The model introduces one reason not to go all the way, an efficiency cost coming from the lower ability of the central bank to monitor firms or the government.)

A relevant question in this context is whether, in the various episodes of quantitative or targeted easing we have observed, shifts indeed came from shifts in the demand for assets (or more precisely, shifts in the demand function for assets) or instead came from changes in perceived risk. There is little question that, in many cases, price declines indeed partly reflected fire sales, the decision by private investors to sell not because the asset was necessarily more risky, but because they needed to reduce their position or they needed the funds elsewhere. With respect to this fire-sales component, purchases by the central banks were indeed the right response to shifts in investors' portfolios.

In many cases, however, the decline in prices also had to do with perceptions that the assets had become more risky. This was clearly the case for mortgage-backed securities in 2008 and 2009 in the United States. This was probably the case for sovereign Italian bonds in Europe in 2011: Some of the increase in spreads was due to worry about an impending liquidity run, in this case the worry by investors that other investors might not be willing to roll over in the

following few months; but, like most liquidity runs, it was triggered by worries about solvency, the worry that Italian public finances might not be as solid as previously thought. In the related context of liquidity provision, this was true also in the case of the provision of liquidity to European banks in 2011 and 2012. The danger came again partly from rollover risk, but partly also from genuine worries by investors about the value of the assets held by banks.

In this case, the optimal response of the central bank is less obvious. Take the case where the decline in prices is entirely due to changes in the characteristics of borrowers, say an increase in perceived risk. In this case, an intervention by the central bank can still increase prices. It is, however, in effect doing so by fighting a distortion with another distortion, and whether it is optimal to do so seems more ambiguous. Or take Operation Twist: Suppose the spread of the long rate over the short rate reflects partly risk, partly constraints on investors' long positions at the long end of the yield curve; what is then optimal monetary policy?

Reality is that, in many instances, movement in prices is likely to reflect both concerns about the characteristics of the borrowers and shifts in investors' portfolio decisions; the optimal intervention may not be so obvious.

5. Where Do We Go from Here?

The paper yields some simple conclusions. To work best, central bank intervention needs two conditions: (i) some segmentation of the market the central bank intervenes in and (ii) some strong connection of that market to the real economy. Both segmentation and connection are important. There is no point in intervening in a market if it is not segmented, or if it is not connected to the real economy.

In the model (at least in its simple version), there is segmentation between the short-term bond market on the one hand and the long-term bond market and the private claims market on the other. And there is a strong effect of private claims prices on the real economy.

In the real world, the challenge is to understand the geography of these markets, in terms of segmentation and connection. And to the extent that we are thinking about the design of future

monetary policy, the challenge is to understand how segmentation and connection differ in normal times versus times of financial crisis.

Thinking of Europe, should intervention (by the European Central Bank or by the European Financial Stability Facility/European Stability Mechanism) take place in primary or in secondary bond markets? How segmented are the two? What is the connection between sovereign yields in the secondary market and the rates at which private borrowers can borrow, either from banks or from corporate bond markets? Thinking of the United States, how segmented are the different portions of the yield curve, and what is the rate that affects economic activity the most? This paper does not give us the answers, but it tells us what we should be looking for and how we can integrate our results in a general equilibrium structure.