

**Discussion of “Asset Prices, Financial Imbalances and Monetary Policy:  
Are Inflation Targets Enough?”, by Charles Bean**

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April 2003

## 1. Introduction<sup>1</sup>

Whether and how monetary policy should react to asset price misalignments and financial imbalances is a time-honoured question for both the central banking and the academic professions. This question has gained even more relevance as we have been through the New Economy bubble and, following the recent Japanese experience, risks of deflation are no longer confined to the footnotes of macroeconomic textbooks. Charlie Beans' paper is therefore very much welcome, not least as he is a distinguished member of both professions. The paper is a rich blend of theory, empirical analysis and policy considerations. The question whether monetary policy should explicitly react to asset prices is rephrased as "Is inflation targeting enough?", and the answer is unequivocal: "Yes, it is enough", provided it is "flexible".

In what follows I shall address three issues: i) Is this answer too general?; ii) Is "flexible inflation targeting", as advocated by Bean, operational?; iii) Given real world non-linearities, could there be a case, even within an inflation targeting framework, for monetary policy explicitly reacting to asset price misalignments?

## 2. Too general a framework?

Following Svensson,<sup>2</sup> Bean makes clear that flexible inflation targeting (FIT) is not a policy reaction function but a monetary policy framework that depends on an explicit intertemporal *loss* function, a *model* of the economy and the nature of *shocks* affecting the economy. Typically, the loss function is quadratic in the deviation of actual inflation from an inflation target,  $\pi$ , and a measure of the output gap,  $x$ . In this framework, forecasts of policy objectives and implied policy instruments that satisfy "optimal" trade-offs are generated. These trade-offs are obtained by equating the marginal rate of transformation (MRT) between  $\pi$  and  $x$  (from the model's supply function) to the marginal rate of substitution (MRS) between these two objectives (from the policy maker's loss function). In a linear model of the economy, with a forward-looking rational expectations supply function such as the one considered by Bean, the trade-off is completely characterised by the ratio  $-\lambda/k$ .

In this case there is no explicit role for other variables or demand shocks. They enter the implicit policy rules through their effects on the forecasts of  $\pi$  and  $x$ .<sup>3</sup> As exemplified in the model examined in section 3 of the paper, (linear) supply shocks also affect the trade-off. In particular, Bean assumes that total factor productivity depends linearly on firms' outstanding debt that is, in turn, dependent on the capital stock, as firms borrow against collateral. The higher the debt-output ratio, the sharper is the credit crunch. This takes place, however, with a given and constant probability. Reflecting the model changes (that is the new MRT) the trade-off in this case is  $-\lambda\psi/k$  (with  $\psi$  likely less than one). Thus, the fact that, as Bean puts it, "there is apparently *less* incentive to stabilise current output" is a consequence of the particular forward-looking supply function adopted in the model, not of the preferences of the policy maker. A different result would be obtained with a backward-looking supply function and/or adaptive expectations.<sup>4</sup>

Within a FIT framework, then, if it is possible to identify asset price misalignments that would eventually affect the economy (that is, the paths of inflation and output), they should be countered pro-actively, as suggested by Cecchetti et al. (2000).<sup>5</sup> In particular, forecasts of future inflation and output gaps should extend over longer horizons than is typically the case (that is longer than one or two years). In fact, as suggested by Bernanke and Gertler (2001), the relevant asset price effects are those on expected inflation and growth and they possibly take place with considerable lags. In agreement with Bernanke and Gertler, and differently than Cecchetti et al.,<sup>6</sup> Bean concludes that specific instrument rules (such as Taylor or inflation-forecast targeting rules), possibly augmented to include asset prices or financial imbalances as separate arguments, are *inefficient* compared to the optimal "time-consistent" targeting of the FIT type. In other words, in the latter framework, reaction to asset prices should not be "over and above" their effects on  $\pi$  and  $x$ .

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<sup>1</sup> The views expressed are those of the author and do not reflect those of the Bank of Italy.

<sup>2</sup> See, for example, Svensson (2002).

<sup>3</sup> Implicit policy rules may be derived by combining the trade-off and the model equations and solving for the policy instruments.

<sup>4</sup> On the puzzling dynamic effects of monetary policy in forward-looking models of inflation-unemployment dynamics, see Mankiw (2001).

<sup>5</sup> See also Cecchetti, Genberg and Wadhvani (2002).

<sup>6</sup> See also Blanchard (2000).

At this level of generality, a FIT framework accommodates various sources of information besides the variables and the parameters contained in a particular model of the economy. It allows for the use of judgement in the evaluation of the effects of asset prices and financial imbalances on the economy, as well as the feedback to changes in the policy instruments. And the specification of a loss function in terms of both inflation deviations and output gaps allows for the inflation targeting to be conducted as “flexibly” as desired. It would be difficult then to disagree with Bean’s conclusions, but one may ask whether this might be too general a framework to provide an actual guide for monetary policy-making. It is indeed striking that, as Charlie Bean writes, “this view of what monetary policy makers are seeking to achieve is also a fair description of central banks like the Federal Reserve or the European Central Bank”.

Also the main conclusion of the paper, that monetary policy should counter asset price misalignments and/or financial imbalances so long as they affect the arguments of the authorities’ loss function, may not match what prominent central bankers say and do. Consider, for instance, the following statement: “... central banks do not respond to gradually declining asset prices. We do not respond to gradually rising asset prices. We do respond to sharply reduced asset prices... But you almost never have the type of 180-degree version of the seizing up on the up side. If indeed such an event occurred, I think we would respond to it”.<sup>7</sup>

### 3. How operational is FIT?

It is evident that the more flexible a framework is, the more likely its ability to encompass a large number of cases. In practice, however, it would be interesting to understand whether FIT is something more than just specifying a loss function with current and future inflation as a specific monetary policy target, together with the output gap (with a substitution coefficient of  $\lambda$ ). The computation of the trade-off is model-dependent, as it is crucially affected by the shape of the supply function. As mentioned, it is especially important to establish whether past inflation has a significant effect on output decisions and whether the assumption of rational expectations can be maintained. That the framework asks for a serious discussion on the shape of the supply function taking place among monetary policy makers should not be considered a weakness. Even if central banking is as much art as science, also the exercise of judgement is dependent on an interpretation of the real world, and forcing monetary policy makers to come out not only with their preferences on the final objectives, but also with their views on the supply function, should be seen as a constructive challenge.

Besides the specification of the loss function and a view of how the economy operates, two elements seem however to be essential ingredients of FIT. The first is some sort of commitment not to change policy without “new” information having become available. This is technically achieved in Bean’s paper by following Svensson and Woodford<sup>8</sup> in deriving the trade-off equations under commitment from “the timeless perspective”. As this is an important condition, it would have been interesting if Bean had discussed how it could be achieved in practice. Even more importantly, transparency is a key element of the framework. However, not only it is doubtful whether this is part of the framework within which all the central banks characterized by Bean as (explicitly or implicitly) engaged in flexible inflation targeting operate, but also it is by no means clear how they should communicate the perception of risks associated with an asset price misalignment or a bubble.

To account for the effects of asset prices, Bean suggests that “... central banks may need to look out further into the future than is usual...”. A number of issues come immediately to mind with regard to this recommendation. They refer respectively to the identification of asset price misalignments, the evaluation of their effects on the real economy and the proper communication strategy that should be followed.

First of all it is essential to understand how asset price misalignments develop and how they may produce financial imbalances. Identification of misalignments and imbalances is not an easy task, but it should not be considered impossible. One might start by considering whether asset prices appear to be sharply deviating from some sort of historical averages.<sup>9</sup> Then, it would be natural to ask whether these deviations are justified by observed changes in fundamentals, referring for instance, in the case of stock prices, to complex entities, such as price-earnings ratios, that are often used by practitioners and policy makers. Consider, for example, the New Economy bubble. It is certainly possible that productivity increases linked to the New Economy have not been negligible. However, on the basis of calculations founded on the discounted dividend model or Gordon formulae, already in early 1998 a consensus was being established that stock prices (especially but

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<sup>7</sup> Grenspan (1999), p. 143.

<sup>8</sup> See Svensson and Woodford (2003) and Svensson (2002).

<sup>9</sup> As is done, for example, in Bordo and Jeanne (2002b).

not only in the Nasdaq) were rising without correspondence to fundamental variables such as changes in discount factors, opportunity costs and risk premiums.<sup>10</sup>

For another example, consider the case study conducted by Bean in section 4 of his paper. From a preliminary, though thorough, analysis of the risk that recent property prices in the United Kingdom might be substantially misaligned, Bean concludes that while this risk cannot be easily dismissed, it might be too early to conclude that relevant imbalances have already built up. While this is a relatively optimistic assessment, I am more inclined to conclude from Bean's evidence that the odds that a sharp correction in house prices might take place are not negligible. Given the related build-up of household debt this could lead to severe consequences for the economy. In any case, this example shows how subjective the assessment may be and how important it is to evaluate the possible impact of asset price changes on the final variables of interest.<sup>11</sup>

In fact, a crucial question to be answered is what do we know about the effects of asset price misalignments, and related imbalances in equity, real estate and currency markets, as well as in bank credit and government debt. My reading of the empirical literature is that these effects are in general considered to be small and financial asset price movements are generally found to play a relatively minor role in the transmission of monetary policy. But this conclusion may be seriously biased, as these are often likely to be *rare* and *extreme* events. Even if, when they materialise, the effects of asset price changes are usually strong, in macro-econometric estimates they are likely to be dominated over the sample by "normal-time" observations and, being relatively rare, they frequently end up being dummied out. In other words, their effects on the real economy are *rarely* and partly captured by our empirical models, and are often treated as exogenous shocks. Also, if captured, the econometric estimates might be *extremely* imprecise.

Much more empirical work is therefore needed (on wealth effects, asset prices, expectations and credit channels), and microeconomic information should be extensively used. But substantial uncertainty will undoubtedly remain, not the least because the effects of (monetary policy) changes on asset prices and quantities depend on rather hazy channels such as consumer and business confidence, expectations and "animal spirits". This would add to the uncertainty due to the fact that, as observed by Bean, these effects are likely to materialise over long time horizons. Even if, as suggested by Bean and Svensson, FIT might be a general framework for the conduct of monetary policy in "normal" times, since the precision of forecasts can only decline over time it is debatable whether trade-offs that depend on forecasts that extend far in the future and are by their very nature rather uncertain turn out to be stable enough to provide reliable guidance for current policy decisions.

Finally, if asset price changes and financial imbalances must be taken into account in the formulation of monetary policy, as Bean readily acknowledges (even if not "in addition" to forecasts), as I have mentioned above a substantial problem must necessarily arise concerning the transparency of policy decisions, and especially the way they are communicated to markets and the public at large. In fact, if central banks do respond to asset price misalignments, monetary authorities should explain, within a general FIT framework of the kind advocated in Bean's paper, how they affect the forecasts, and therefore interest rate decisions. But this may be difficult to assess and in the end much judgement needs to be exercised. While in principle this could be accommodated within a FIT framework, that judgement, and the inevitable uncertainty attached to it, would in turn affect the market response in a direction and a magnitude difficult to predict. This would make the assessment of the odds of a sharp asset price correction even more difficult.

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<sup>10</sup> For the use of the discounted dividend models and derivations, see Gordon (1962). The use of Gordon formulae is similar to the more sophisticated econometric tests conducted by Shiller, Campbell and others, for which I refer to the discussion in Herrera and Perry (2002). See, for a mid-1998 examination of stock market prices associated with the New Economy developments, OECD(1998), where warnings of the risk of substantial deviation of US stock prices from some historical norms (as well as the implicit anticipation of a return to those norms) were advanced.

<sup>11</sup> Even if there is a misalignment in the UK market for real estate, it is not obvious that it would be for monetary policy to respond to it. On one side, there might be effects on aggregate demand that could lead to inflationary pressures and monetary policy should obviously take them into account. On the other side, in this case the use of prudential instruments, which would lead to pricing differently the value of the collateral against which borrowing takes place, might be a better solution.

#### 4. A complex, non-linear real world

So far, I have considered the case, examined explicitly by Bean, where asset price misalignments affect the economy through linear demand or supply shocks. In section 3.1, Bean also briefly discusses the possibility that supply shocks are non-linear or that demand shocks are “unconventional”. Also in these cases Bean concludes that FIT is the proper framework to follow in designing a policy response to financial imbalances and asset price shocks.

Also in the model recently studied by Bordo and Jeanne (2002a, 2002b), financial imbalances affect total supply. Differently than in the model considered in section 3 of Bean’s paper, the probability of a credit crunch ( $\epsilon$  in Bean’s notation) is not constant but rises with the debt burden (i.e., the stock of debt and the rate of interest). The conclusion is straightforward: monetary policy should respond to asset prices, and this response would be rather complex. In particular, not only are the trade-offs between output and inflation affected by the shock, but also the policy response should *explicitly*, no longer implicitly through forecasts of inflation and output, and *non-linearly* react to asset price misalignments and related financial imbalances.

I find both the analysis and the conclusions of the Bordo and Jeanne’s papers suggestive and thorough. And so, it seems to me, does Bean. Bordo and Jeanne, however, also conclude that inflation targeting is insufficient as a policy framework, while Bean disagrees with such a conclusion. To an extent this appears to be just a semantic issue, as is clear from Bean’s observation that a “flexible inflation targeter” would follow Bordo and Jeanne’s suggested policy. In fact, they also “assume a standard loss function that is quadratic in the output gap and inflation”, and “an inflation target is really a statement about the objective function rather than the reaction function”.

Again, the level of generality of FIT, as exposed by Bean, is very high. I do not see how one can today disagree with the view that a good central bank should conduct monetary policy by looking at the forecasts of the variables of interest (affected by demand and supply shocks, inclusive of those on asset prices) and taking into account the relevant trade-offs in order to reach the targets that are more appropriate. Indeed, FIT seems also to accommodate the case of unconventional shocks that may cause a severe fall in aggregate demand through the unwinding of cumulative imbalances. The standard response would be “simply to offset the shock ... by lowering interest rates”. As these may encounter a zero lower bound, Bean also appears to support the recommendation of leaving some room to manoeuvre in good times. Indeed Bean recognises that the unwinding of imbalances would result in higher uncertainty in demand and greater output variability. And he readily acknowledges, following the suggestion from Brainard’s (1967) seminal paper, that being more prudent today (to reduce the build-up of imbalances) pays off by reducing future uncertainty. As in the other cases, this is also found to be entirely consistent with the definition of FIT as “a description of the objectives of policy rather than the route whereby they are achieved”.

Given the objectives of policy, however, policy decisions have to follow. Bean suggests that monetary policy should not neglect asset price misalignments and possibly bubbles, and the financial imbalances that are related to them. In this he agrees with Borio and Lowe (2002) and others, that while the issue is not “whether monetary policy should respond to asset price bubbles per se”, excessive build-up of debt should not be left unanswered. He seems also to agree with what he defines as the “heterodox” view summarised by Crockett (2003), that “authorities [should] tighten monetary policy sufficiently pre-emptively to lean against excessive credit expansion and asset price increases”. Where Bean seems to disagree is with Crockett’s following statement that “if the monetary policy reaction function does not incorporate financial imbalances, the monetary anchor fails to deliver financial stability”, with possibly serious consequences for the real economy. In his FIT framework, in fact, Bean shows that there is no need to explicitly design a monetary policy reaction function directly incorporating asset prices, as it is sufficient to derive the trade-offs between inflation and output gaps consistent with the policy objectives and the supply function of the economy.

Bean’s analysis is clear and well presented. As he illustrates, FIT is a framework that can be defined generally enough to accommodate judgement and information extraneous from the necessarily simple representations of the economy provided by even the more sophisticated econometric models typically available to central banks. However, it should be recognized that Bean’s formal analysis only covers the case of relatively simple imbalances and shocks that affect *linearly* the demand and supply decisions of households and firms. As it is also discussed in Bean’s paper, the real world is generally complex and non-linear. Even within a well-specified FIT framework, the *implicit* monetary policy reaction function would then be also non-linear (and possibly very complex, as it would not be possible to rely on certainty equivalence). As in the example considered by Bordo and Jeanne (2002a), it is rather likely that this reaction function,

even if not in the simple form of an augmented Taylor rule, would depend on asset prices and financial imbalances.<sup>12</sup>

As Bean recognises, such a world is characterised by a high degree of uncertainty. This follows from the fact that asset prices may affect the real economy with long lags, and over time the precision of forecasts necessarily falls. It also follows from the fact that statements on the timing and the effects of credit crunches or the sharp unwinding of imbalances can only be expressed in terms of subjective probabilities. Even the communication strategy that accompanies transparent policy decisions such as those taken by a central bank committed to a FIT framework might add to the overall uncertainty. In general with uncertainty of this sort it pays to be more prudent. Indeed, if shocks turn out to positively and permanently affect the real economy, some additional monetary restriction would probably not make a big difference; if they were going to result in a bubble, some extra restriction would probably prove valuable. The question, as always in the difficult art of central banking, is how much restriction would be needed, and this calls for more study and experimentation. But it hardly calls in general, as Bordo and Jeanne (2002b) aptly put it, for “benign neglect”.

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<sup>12</sup> As a Taylor rule is often used as a *description* of how monetary policy is *normally* conducted, it might turn out that for some purposes a linear rule that expresses interest rates as functions not only of deviations of inflation from the target and output from potential but also of asset price misalignments could be a simple and linear approximation of how central banks would behave in a non-linear and complex environment. Rather than a “Taylor rule” as we have come to know it, after John Taylor the economist, we may think of it as a “Taylor approximation”, after Brook Taylor the mathematician...

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