

Discussion

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The goal of this paper is to investigate whether monetary policy in Korea remains as effective since the adoption of inflation targeting in 1998. While there are of course many dimensions to monetary policy effectiveness, this paper is primarily concerned with the ability of monetary policy to affect output.

This question is investigated in the context of an empirical specification of investment, inspired by the neo-classical theory of investment. In the specification considered, monetary policy affects investment through the user cost of capital:

$$I_{it} / K_{it-1} = -\sigma \sum_{h=0}^n \alpha_h (\Delta UC_{it-h} / \Delta UC_{it-h-1}) + \text{other controls}, \quad (1)$$

where σ is interpreted as a structural parameter representing the elasticity of substitution between the inputs of production and α_h are reduced-form parameters capturing the dynamics in the relationship between investment and the user cost of capital. This means that the effect of monetary policy on investment can be decomposed into two components: the elasticity of investment to the user cost of capital and the elasticity of the user cost of capital to changes in the short-term policy rate. To document the changes in the effect of monetary policy on investment in Korea, this equation is estimated over two sub-samples:

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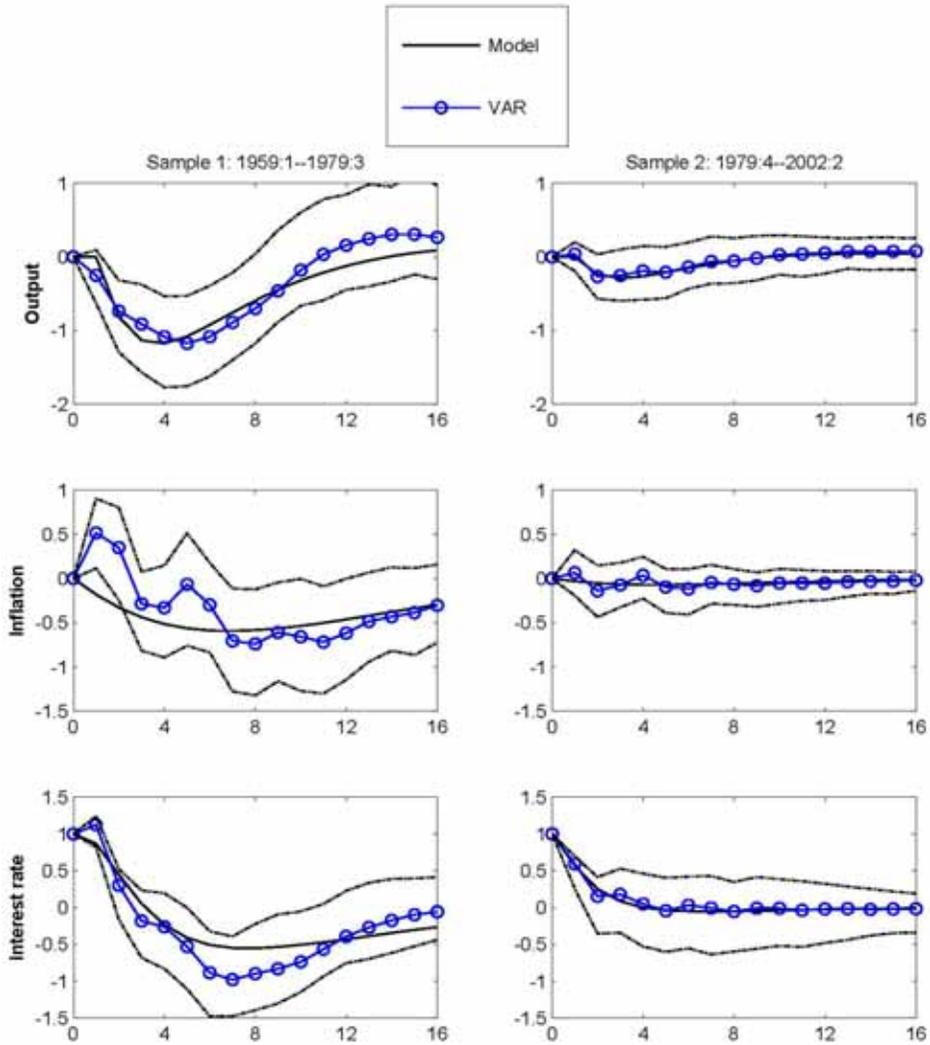
1988 to 1998 and 1999 to 2004.

The key finding of the paper is that the sensitivity of investment to the policy rate is considerably lower since 1999 than it was prior to the adoption of inflation targeting. Moreover, the paper shows that this reduced effect of monetary policy on investment comes largely from a reduction in the elasticity of investment to the user cost of capital, measured as $SUM(\alpha) = -\sigma \sum_{h=0}^n \alpha_h$. The paper's interpretation of this evidence, and its main conclusion, is that inflation targeting led to a considerable weakening of the effect of monetary policy in Korea.

This paper documents a set of striking and important empirical facts. Indeed, the results strongly suggest that the adoption of inflation targeting has altered the monetary transmission mechanism in important ways. For instance, the sensitivity of investment to the user cost, $SUM(\alpha)$, is found to be about ten times smaller in the post 1999 period than before, falling from a value of about 0.27 to a value of about 0.03. The paper shows that these results are robust to various treatment of firm-specific effects and the inclusion of a liquidity measure, to account for the potential balance sheet channel of monetary policy.

It is particularly interesting to note that these results are very much in line with evidence that has been documented elsewhere and in particular in the U.S. in the aftermath of the disinflation of the early 1980's. For instance, Boivin and Giannoni (2002, 2006) document the changes in the responses of output and inflation to a shock of given size, obtained from a VAR estimated separately on pre-1980 and post-1980 data. Figure 1 reproduces some results of Boivin and Giannoni (2006). These results imply that the response of both inflation and output to monetary policy shock was considerably reduced in the post-1980 era. As in the present paper, this evidence points to a reduced effect of changes in the interest rate on output. The disinflation experiences of these two countries thus lend support to the conjecture that changes in the way monetary policy is conducted can fundamentally alter the nature of the monetary transmission mechanism.

Figure 1. VAR and Model-Based Impulse Responses to a Same-Size Monetary Shock



What is less clear, however, is whether these changes in the Korean and US monetary transmission mechanisms necessarily imply that monetary policy in a

low inflation environment becomes less efficient, less able to affect the economy, as the author conclude. Concerning the reduced effect of policy shocks in the US, Boivin and Giannoni (2002) argue that on the basis of the estimated impulse response functions alone, it is not possible to conclude that monetary policy has lost some of its ability to affect output and inflation post-1980. The reason is that the dynamic responses of output and inflation, depend not only on the private sector behavior, and its sensitivity to monetary policy, but on also on monetary policy itself, through its endogenous and systematic response to economic developments.

To illustrate this point, Boivin and Giannoni (2002) use a simple toy model in which output is determined by an "intertemporal IS equation,"

$$y_t = E_t y_{t+1} - \psi r_t + \delta_t \quad (2)$$

which relates the output (gap), y_t , to expected future output (gap), $E_t y_{t+1}$, negatively to current interest rate and to a term representing unforecastable demand shocks, δ_t .¹⁾ While some more precise micro-foundations could be provided, for the purpose of this example it is sufficient to think of $\psi > 0$ simply as representing the private sector sensitivity to the interest rate.

For simplicity, and abstracting from the role of inflation, the central bank is assumed to follow an interest rate rule of the form

$$r_t = \phi y_t + \varepsilon_t \quad (3)$$

where $\phi > 0$ is a parameter representing the strength with which monetary policy responds to output (gap) fluctuations. In particular, the real interest rate is systematically increased when output is above trend and reduced when output is

1) As the literature has shown, some micro-foundations could be provided to motivate this specification, but this is a relevant to the point I am illustrating here.

below trend. ε_t is the monetary policy shock, reflecting exogenous and unforecastable changes in the policy instrument. The impulse response function of a variable, say output, to a monetary policy shock represents the behavior of that variable through time in response to a one-time shock, ε_t .

The solution to this model gives the following equilibrium expression for output

$$y_t = (\delta_t - \psi\varepsilon_t)/(1 + \psi\phi). \quad (4)$$

What is the effect of a monetary policy shock on equilibrium output? Based on this equation, we can see that, on impact, the effect of a monetary policy shock on equilibrium output is given by $-\psi/(1 + \psi\phi)$. Importantly, this depends on a parameter describing the private sector behavior, ψ , and a parameter describing the systematic conduct of monetary policy, ϕ . The key point is that the effect of a policy shock on output could be reduced if either the private sector sensitivity to the interest rate, ψ , was reduced, or if the central bank response to output gap fluctuations, ϕ , increased. Unfortunately, observing that the response of output to the monetary policy shock has fallen over time, like the VAR evidence reported in Figure 1, does not tell us whether this is due to a change in ψ or a change in ϕ . And the implications about whether monetary policy has become weaker, in the sense intended in the present paper, really depend on the source of the change. If the reduced output response is due to a smaller value of ψ , then monetary policy would be less potent, as this would imply that even though monetary policy is doing the same as before, output would be less sensitive to changes in the interest rate. In contrast, if the reduced response of output stems from an increase in ϕ , then this is not related to the degree of potency of monetary policy. The reduced output response simply reflects an increased willingness by the monetary authority to stabilize output. To make this point clear, in the limit when ϕ goes to infinity, policymakers would entirely stabilize output by letting the interest rate respond very strongly to any fluctuation in output. The elasticity of output to interest rate would be zero and yet, monetary would be very

effective. In fact, a reduced output response to shocks is exactly what one would expect from a successful monetary policy that aims to stabilize output.

The implication of this discussion is that it is not possible to conclude whether monetary policy is "stronger" or "weaker" on the basis of impulse response functions alone. To be able to conclude on this, the structural parameters of the economy need to be recovered, and that requires the estimation of a complete structural model of the economy. This is in fact the exercise that Boivin and Giannoni (2006) perform in the context of a more realistic model of the U.S. economy. Interestingly, they find that the reduced effect of monetary policy shock is mostly explained by a change in the way monetary policy has been conducted since the early 1980's, rather than a change in the private sector behavior. Their conclusion is that US monetary policy in fact has become more effective, not less. According to their interpretation, the reduced effect of monetary policy shock would reflect the fact that the Fed has been more successful at stabilizing the economy in the face of demand shocks since the early 1980's, including the monetary policy shock.

The same logic applies to the elasticity estimated in the present paper which forms the basis for the conclusion that monetary policy has become weaker in Korea. The key finding is that $SUM(\) = -\sigma \sum_{h=0}^n \alpha_h$ has fallen considerably after the adoption of inflation targeting. However, taking the investment model laid out in the paper literally, this elasticity, is a mixture of a structural parameter, σ , and reduced form parameters. Any of these parameters could have been responsible for the observed fall in the absolute size of this elasticity. To the extent that this evidence reflects a fall in σ , than the conclusion that the monetary policy has become weaker in terms of its effect on output would be warranted. However, this possibility, favorable to the paper's conclusion, still leaves at least one open question: if we take the interpretation of this parameter as the elasticity of substitution in inputs of production literally, why would a change in the monetary policy regime caused a change in the production function?

More importantly, there is nothing in the evidence provided that rules out the possibility that the reduced elasticity was due to changes in the other, non-structural, parameters, the α_h 's. If these are instead the root caused of the reduced elasticity of output to the user cost of capital, than it is not clear that monetary policy has become weaker. In fact, these non-structural parameters can capture various factors, such as adjustment costs and expectations. In principle, the α_h 's would thus be functions of any structural parameters, including some describing monetary policy, like the parameter α in the simple example discussed above. For instance, if the monetary policy regime changed, one would expect expectations to be formed differently, which would imply a change in the α_h 's. One story, which cannot be confirmed or infirmed on the basis of the results reported in the paper, could be that inflation targeting, by providing a more solid anchor, has made inflation expectations less responsive to short term movements in the user cost, which has in turn led to a reduced sensitivity of investment to the user cost of capital. If that is the case, this would be evidence suggesting that monetary policy has in fact become more effective.

In summary, this paper provides a set of very useful results that suggest that the adoption of inflation targeting has led to important changes in the monetary transmission mechanism in Korea. These results, which are consistent with evidence obtained elsewhere in the world, helps to quantify the extent to which changes in the monetary policy can have important repercussions on the workings of the economy. However, whether this evidence implies that monetary policy has become less powerful, or less efficient, is in my view, an open question. In fact, the evidence provided in the paper could be consistent with a conclusion completely opposite to the one reached in this paper: it could be that the reduced elasticity of investment to the user cost of capital reflects a better anchoring of expectations since 1999, which would be a testimony to an improved efficiency of Korean monetary policy.

References

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