Review of Political Economy ›
Volume 22, 2010 - Issue 1

Original Articles

Pricing Behaviour and the Cost-Push Channel of Monetary Policy

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Pages 19-40 | Published online: 16 Dec 2009

Cite this article https://doi.org/10.1080/09538250903391863

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We are grateful to Philip Arestis, Massimo Pivetti and three anonymous referees for their comments on an earlier version of this paper. Any remaining errors are our own.

Notes

[1]The cost-push channel is also referred to as Gibson's paradox (following Keynes, 1930), the Cavallo-Patman effect (following Taylor, 1991) and the ‘price puzzle’ (following Eichenbaum, 1992).

[2]It is beyond the scope of this paper to explore these implications. See Lima & Setterfield (2008) for a preliminary investigation.

[3]As they explain: ‘The presence of a price puzzle is important because it casts serious doubts on the possibility of correctly identifying a monetary policy shock. If the central bank monitors and responds to a larger information set than that of the econometrician, what may be referred to as a policy shock by the latter is actually a combination of a genuine policy shock and some endogenous policy reactions. The result of this omission is that a policy tightening in anticipation of future inflation could be wrongly interpreted by the econometrician as a policy shock, delivering spurious correlation between a tightening of policy and a rise in inflation: the price puzzle’ (Casteln rgument. Sims wa le’. He also claimed pture enough s puzzle.

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a higher real interest rate commands a higher tax rate since it implies higher interest payments on the existing stock of debt and because reduced demand diminishes the tax base. Thus, by discouraging current labour supply for intertemporal substitution reasons, there is an upward pressure on wages and hence prices. Note that a heterodox variant of this mechanism could be derived by combining Linnemann's (2005) balanced budget assumptions with Mott & Slattery's (1994) discussion of tax shifting. In this case, monetary-policy-induced tax increases would directly impact prices via firms' price setting behaviour.

[6]It should be noted that the presence of the cost-push channel of monetary transmission in New Keynesian models of optimal monetary policy has serious implications for equilibrium determinacy, uniqueness and stability. For instance, Brückner & Schabert (2003) introduce working capital into an otherwise conventional New Keynesian model and show that active interest rate policy remains necessary but should be moderate to ensure real determinacy. The nominal interest rate enters the aggregate supply curve as it raises the marginal costs of firms, implying that the reactiveness of the interest rate rule now has both a lower bound (the Taylor principle, which requires that the nominal interest rate is raised by more than one for one in response to changes in the inflation rate, so as to avoid self-fulfilling inflation expectations) and an upper bound (which varies negatively with the elasticity of labour supply) to ensure equilibrium uniqueness.

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the natural rate. In other words, when savings are abundant or deficient in relation to the demand for them for investment at the pre-existing level of interest, the rate does not adjust itself to the new situation quick enough to maintain equilibrium between savings and investment' (Keynes, 1930, p. 182). As it goes well beyond the scope of this paper to discuss either Keynes's or Fisher's explanations of the Gibson paradox, we would redirect the reader to Shiller & Siegel (1977), where the whole controversy surrounding Gibson's work (including Wicksell's and other later contributions to the debate) is empirically evaluated.

[10]Pivetti's notion of normal distribution does not refer to actual or effective profits, but to normal profits: 'The latter, reckoned gross of interest, correspond to the rate of return on capital which would be obtained by firms using dominant or generally accessible techniques, and producing output at levels regarded as normal at the time the capacity was installed' (Pivetti, 1991, p. 20). As for the money rate of interest, Pivetti means the 'rate on long-term government bonds, or an arithmetical average of this rate and the ordinary interest rate on reasonably secured long-term private loans' (Pivetti, 1991, p. 21).

[11]Another implication of this view is that changes in interest rates will tend to be related to changes in aggregate demand, but through a very different route from that traditionally emphasised. For instance, demand for capital goods will not be directly affected endent of the inter (increase) in the lo od relative to its suppl ult of a lasting r s to consume ence on the latter in in the norm 45).

[12]There est rates on firms' pr 'tax shifting' of higher prices). ase in interest of as a counterp her than fiscal) policy on pricing procedures (and ultimately macroeconomic outcomes) is the

focus of attention. There is also a parallel between the analysis of the cost-push channel of monetary policy pursued in this paper and Arestis & Milberg's (1994) analysis of exchange rate pass-through in a Kaleckian framework, where changes in the nominal exchange rate lead to changes in either unit prime costs or mark ups. In an open economy with capital mobility and flexible exchange rates, therefore, a rise in the domestic interest rate, by causing an appreciation in the nominal exchange rate, would have an indirect cost-reducing effect on domestic inflation, alongside the cost-push effect examined in this paper. The reason is that such an exchange rate appreciation would reduce unit prime costs associated with imported inputs (including any external borrowing) and/or mark ups.

[13]See also Kreisler & Lavoie (2007, p. 391) on these and other references to the cost-push channel in Post Keynesian macroeconomics, including several of those discussed below.

[14]Note that the rate of interest could affect the pricing decision through its effects on labour productivity (1/a), if technological innovation depends on external financing. Moreover, high debt-servicing costs are likely to impact negatively on firms' ability to finance technological innovation from retained net profits. We abstract from these possibilities in this paper.

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firms to raise external financing, liquidity-constrained firms will increase (lower) mark ups during recessions (booms).

[17]There are, of course, many ways of describing the determinants of wage inflation, and we make no claim that equation (4) is definitive. It is employed here (and in what follows) as a simple first approximation that, in each case, allows us to write an equation for the rate of inflation in which inflation is sensitive to (inter alia) the level of real activity—i.e., an equation that takes the recognisable form of a SRPC. The precise functional form of equation (4) has no bearing on the relationship between price inflation and the interest rate in which we are interested, except in so far as it assumes that interest rates have no direct effect on wage formation (only an indirect effect operating through actual and hence expected price inflation). This is tantamount to assuming that only firms carry debt. In a world in which households also carry debt, the interest rate may influence workers' target real wage in which case it may have a secondary effect on price inflation via the rate of wage inflation. Even if workers do not carry debt, the possibility remains (following Pivetti, 1991) that since the normal profit of the enterprise does not depend on the behaviour of any component of total unit cost other than interest expenses, wage bargaining—in order to have any permanent effect on income distribution—will seek to influence the interest rate. The models of the Phillips Curve set out in this paper can be thought of as abstracting from these possibilities. We would therefore identify the relationship between the interest rate, wage fo or further research licy.

[18]Rowth e (1992, ch. 7) and B approach to inflation arget-return pricing p -return pricin lus pricing mode emphasise the influ oie, 1992, p. 133).

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[20]Note that enterprise profit as defined here is based on firms' cash flow, so that the rate of enterprise profits derived above is, in fact, the real cash flow rate (see Setterfield, 2009 for further discussion). It is appropriate for firms to target the cash flow rate if cash flows constrain investment spending (as suggested by Fazzari & Mott, 1986–87; Fazzari et al., 1988; and Ndikumana, 1999) and the purpose of the mark up is to raise funds to finance investment.

[21]Note that not all variants of target-return pricing admit a role for the interest rate in the determination of the mark up in this fashion. See, for example, Lavoie (1992, pp. 360–361; 1995) on the pricing theory of Eichner (1987).

[22]This recalls the emphasis on permanent or lasting changes in the interest rate in the work of Panico (1988) and Pivetti (1991) discussed earlier. Hence consistent with equation (12a), short-run variations in the interest rate that leave the normal rate of interest, ι_n, unchanged will leave the equilibrium mark up and hence prices unchanged, ceteris paribus.

[23]A nonlinearity would emerge in the event that the SRPC given by equation (14a) were not linearised in the normal rate of interest, as in equation (15b). Suppose that the leverage ratio is given by , so that the term in equation (14a) becomes an inverted-U function of the normal rate of interest, with roots given by and . As a result, an increase in the normal rate of interest would lead to a rise (fall) in the level of inflation if the norm e in inflation would va nal rate of interest nlinear in the actu verage ratio is given ill vary positivel (higher) than . Gi nd in the burg y reviewed in the pr s are worthy o

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monetary policy considers only a gradual adjustment process akin to equation (6). Another problematic feature of Hannsgen's model is the assumption that firms start with no money, having to borrow the full amount of the wage bill. Nonetheless, firms are assumed to pay back their loans and retain profit at the end of each period. It is therefore unclear why firms must borrow the full amount of the wage bill at the start of the period if there may exist retained profits from preceding periods. Fortunately, the interesting macroeconomic results of the Hannsgen model are not compromised by the fact that not all of its microeconomic assumptions are spelled out.

[25]In the model developed by Godley (1999), the mark up also depends on the real interest rate because of debt-financed inventory accumulation. But the ratio of inventories to total output, ξ, is made to vary negatively with the nominal interest rate. Under these assumptions, we would again arrive at an expression identical to equation (1), with the mark up now given by , where . A rise in the nominal interest rate would now exert both an upward pressure (due to the rise in the cost of servicing debt-financed inventory accumulation) and a downward pressure (due to the fall in the ratio of inventories to total output, ξ) on the mark up. A rise in the nominal interest rate could lower the rate of inflation if it induces a sufficiently large fall in the ratio of inventories to output. See Godley & Lavoie (2007, ch. 8) for further exploration of this approach.

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[27]See Hannsgen (2006) for a recent attempt to consider the implications for macroeconomic stability of one particular variant of the cost-push channel; see Lima & Setterfield (2008) for preliminary investigation of the implications of multiple variants.

Of course, addressing the question identified above might be made easier by prior empirical analysis to determine which of the theoretically plausible SRPCs identified in this paper are most likely to be important in practice. While such empirical analysis is beyond the scope of this paper, it, too, can be identified as a key component of future research into the cost-push channel of monetary policy.
