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Trend inflation, the labor market wedge, and the non-vertical Phillips curve☆

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Abstract

Recent developments in macroeconomics resurrect the view that welfare costs of inflation arise because the latter acts as a tax on money balances. Empirical contributions show that wage re-negotiations take place while expiring contracts are still in place. Bringing these seemingly unrelated aspects together in a stylized general equilibrium model, we find a disciplining effect of a positive inflation target on the wage markup and identify a long-term trade-off between inflation and output. This has important policy implications, ranging from the opportunity of revising the target in response to shocks, to the possibility of exploiting inflation as a tool to increase tax revenues via its employment-enhancing effect.

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1. Introduction

Recent developments in macroeconomics contradict the widely held belief that permanently higher inflation cannot affect unemployment. A long-run relationship between inflation and real

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activity is obtained in New Keynesian models based on price staggering, where inflation has adverse effects due to relative price dispersion and to the effect of expectations on markups (Goodfriend & King, 1997; Schmitt-Grohé & Uribe, 2004; Woodford, 2003). Benigno and Ricci (2011) resurrect the "grease in the wheels" argument, showing that downward nominal wage rigidity generates a long-run inflation-unemployment trade-off at low inflation rates. Other contributions point in the opposite direction. For instance, Graham and Snower (2008) show that the interaction of staggered nominal contracts with hyperbolic discounting leads to a positive long-run effect of inflation on real variables. Similarly, Karanassou and Sala (2010) show that changes in money growth may affect the unemployment rate and other real variables in the long run in the presence of money growth and time-contingent nominal contracts.[1]

We share the view that modern monetary models may underestimate the beneficial effects of inflation on wage markups, but we highlight a different disciplining channel. A positive inflation rate is typically associated with higher nominal interest rates, which increase the opportunity cost of holding money. Thus, inflation is a tax on money balances. To model this effect, we introduce money in the utility function, as in Christiano, Eichenbaum, & Evans (2005).[2] The next step in our analysis is to identify a channel such that the inflation-tax effect on money balances might discipline wage markups. In our stylized model, we assume that in each period wages are predetermined to macroeconomic variables.[3] As a result, wage setters internalize the effect of their wage choice on their own real money holdings. In the paper, we show that such an effect is negative and becomes stronger with the expected inflation rate, inducing wage setters to limit their wage claims. We therefore obtain a new justification for the existence of a non-vertical Phillips curve. Model simulations show that a moderate inflation rate can generate substantial output gains relative to both the Friedman rule and the commitment to price stability, popularized in standard New Keynesian models. A central tenet of the New Keynesian literature is that nominal rigidities determine socially inefficient outcomes. Our paper reverses this view: properly designed monetary policies may take advantage of predetermined nominal wages to discipline wage setters. This, in turn, requires a positive inflation rate.

The crucial mechanism behind our result lies in the combination of an inflation-tax effect on money holdings with the assumption of pre-determined wages. This latter hypothesis is in contrast with New Keynesian models that typically model nominal wage rigidities as a mechanical transposition of the Calvo pricing formalism originally designed to characterize firms' pricing behavior (Calvo, 1983). Relative to Calvo pricing, the pre-determined wage hypothesis neglects relative wage dispersion – the undesirable consequence of inflation under the Calvo formalism – but allows wage setters to internalize their consequences for household choices. In fact, our approach is in line with recent empirical evidence on wage bargaining that (i) downplays the importance of relative wage dispersion because firms concentrate nominal wage changes in a particular month of the year, following country-specific patterns (Messina, Du Caju, Duarte, Izquierdo, & Hansen, 2008) and (ii) shows that wage negotiations take place while expiring

[1] For further empirical evidence on a stable long-term tradeoff between inflation and the level of economic activity. See, e.g., Karanassou, Sala, and Snower (2005, 2008), Bajo-Rubio, Díaz-Roldán, and Esteve (2007), Favara and Giordani (2009) and references therein. Patrizio Tirelli also gratefully acknowledges financial support from EC project 320278 – RASTANEWS.

[2] See Canova and Menz (2011) for a discussion on the empirical evidence. In particular, they estimate a model with money in the utility function by modern Bayesian estimation techniques and provide evidence that giving money no role provides a distorted representation of the sources of cyclical fluctuations, of the transmission of shocks and of the events of the last 40 years.

[3] See Corsetti and Pesenti (2001) for a similar assumption.