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# Central bank transparency: Does it matter?

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ABSTRACT

We study transparency of monetary policy in a dynamic stochastic general equilibrium model. The economy consists of many industries and experiences both supply and demand shocks. The central bank has private information regarding these shocks and releases its forecasts of shocks under the transparent regime. For a certain class of preferences social welfare does not depend on the degree of transparency and the policy that keeps the wedge between the marginal rate of substitution and the marginal product of labor constant across the states is shown to be optimal. However, in general the opaque regime welfare dominates the transparent regime.



## 1. Introduction

As central banks have been moving towards more transparent policies over the last two decades, some of them started publishing their own forecasts on the future state of the economy. Projections of future growth rate of GDP and inflation rate are but two examples of such forecasts. These changes in the practice of central banking resulted in considerable growth in the literature. The standard approach in the literature on central bank transparency uses a steady-state log-linear approximation of the economy. The central bank is assumed to maximize an ad hoc welfare function, which is usually quadratic in inflation and employment. In this paper, we study the issue of transparency of monetary policy based on an explicit dynamic general equilibrium modeling approach without having to rely on linear or quadratic approximations. Our model, a variant of the standard DSGE model with sticky prices (e.g., Woodford, 2003), consists of a representative household, a continuum of monopolistically competitive firms belonging to several industries, and a central bank who chooses monetary policy action to maximize welfare of the representative household. It is assumed that the central bank has private information about supply and demand shocks in the economy.[2] The aspect of transparency we are interested in has to do with release of central bank projections of the future state of the economy.

In the model, the central bank can operate under two monetary policy regimes, transparent and opaque. In the transparent regime, it announces its forecasts of the shocks. We assume that there is no strategic attempt to manipulate the public's beliefs and thus the forecasts are truthful. In the opaque regime, the central bank does not release its forecasts. We first establish that the Friedman rule of zero interest rate holds in both regimes even though the central bank pursues an activist monetary policy. We next demonstrate for two special cases (when (i) the economy consists of only one industry, or (ii) when preferences are Leontief

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[2] Romer and Romer (2000) demonstrate that privately made Federal Reserve forecasts are superior to those made by private forecasters.

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with respect to goods from different industries) that under the opaque regime, the central bank can replicate the outcome of the optimal policy under the transparent regime. In other words, the welfare level under the opaque regime is at least as high as under the transparent regime. This is due to the fact that the set of allocations available to the Ramsey planner under the opaque regime includes all allocations available under the transparent regime. We next establish that for a special class of preferences (when the utility function is logarithmic in consumption or linear in leisure), the two regimes deliver the same level of welfare. This is due to the fact that the perfect-forecast allocation is optimal for both regimes; for this allocation, the wedge between the marginal rate of substitution between labor and consumption and marginal product of labor is constant across times and states.[3] For preferences outside this class we are able to show that the welfare level is higher under the opaque regime as long as the central bank's forecasts are sufficiently accurate. The optimal allocation exhibits varying wedges across states. The presence of multiple industries makes the analysis more difficult than in the single-industry case because it creates nonlinearity in expectations in the implementability condition of the Ramsey problem. A numerical analysis supports our findings. It indicates that under the opaque regime, the wedges in the optimal allocation vary across states, and this yields higher welfare than the constant-wedge allocation.

The standard New Keynesian model exhibits two kinds of distortion: (i) a real distortion: monopolistically competitive firms, having some monopoly power, charge a price higher than their marginal cost; this price markup (over marginal cost) induces an inefficiently low level of output; and (ii) a nominal distortion associated with stickiness of prices: the inability of firms to adjust prices when hit by supply or demand shocks. The role of monetary policy is to deal with these distortions. The markup in the economy is the ratio of price to the firms' marginal cost. It may be viewed as a distortionary tax: a higher markup raises the implicit tax on labor. With sticky prices, expansionary monetary policy leads to an increase in the marginal cost and thus to a fall in the markup and the corresponding distortion (e.g., Goodfriend & King, 1997). The sticky price distortion stems from the inability of firms to react to shocks.

Let us suppose for a moment that the forecasts are perfect. Under the transparent regime, firms would know what the shocks will be in the next period and thus set their prices accordingly. In this case, even though the level of price stickiness has not changed, the prices themselves are set as if they were flexible because of the firms' knowledge of the future shocks. Therefore, with perfect forecasts, transparency completely eliminates the sticky-price distortion. Yet the sticky price distortion is still present under opacity. The same intuition works for the case when the forecasts are not perfect. However, the welfare effects of the markup distortion work in the opposite direction: the markup distortion under transparency turns out to be worse than that under opacity. Under the transparent regime, the firms' markups (the ratio of price over marginal cost) turn out to be the same and do not depend on the value of the shocks. Under the opaque regime, on the other hand, the markups change with the shock values, and this is welfare improving. Thus, our result stating welfare superiority of the opaque regime can be viewed as follows: when switching from the transparent regime to the opaque one, the effect mitigating the markup distortion associated with monopolistic competition is stronger than the effect pronouncing the sticky price distortion. Finding the mentioned trade-off between the two distortionary effects in the context of central bank transparency is one of the contributions of this paper.

Let us discuss the intuition behind our results in the case when the utility function is linear in leisure or logarithmic in consumption. Consider the limiting case when the central bank receives a perfect signal about the shock. In the transparent regime, the central bank releases its forecast of the shocks, and producers set their prices taking into account this information. This is equivalent to having perfectly flexible prices. In this case, keeping wedges constant across states is shown to be an optimal policy. When the regime is opaque, price-setting firms make their decisions based only on their own knowledge of the economy. The central bank moves after the prices are set, and the optimal monetary policy actively responds to both technology and preference shocks. Despite the result mentioned earlier that the central bank can obtain a richer set of outcomes under the opaque regime, we demonstrate that it cannot do better than the optimal allocation attained under the transparent regime. The policy of keeping the wedges constant across states is still optimal. When the utility function is linear in leisure, the marginal utility of leisure does not depend on consumption or leisure, and the constant wedge allocation satisfies the optimality conditions for both the transparent and opaque regimes. When the utility function is logarithmic in consumption, aggregate employment is constant across states, and the constant wedge allocation again satisfies the optimality conditions for both the transparent and opaque regimes. Putting it differently, for this class of preferences the trade-off between the two kinds of distortions discussed earlier disappears.

In practice, a growing number of central banks release their forecasts of inflation and other macroeconomic variables. For example, the Federal Reserve in the U.S. publishes its forecasts of GDP growth, unemployment rate and inflation four times a year; they look three years into the future and include the range of views of the members of the Federal Open Market Committee. The Bank of Canada publishes point estimates of inflation rate and the growth rate of GDP. The Bank of England and Swedish Riksbank publish inflation and GDP fan charts, which are probabilistic distributions over possible future values of inflation and GDP. In our model, the central bank may release a one-period-ahead probabilistic forecast of supply and demand shocks. Both households and price-setting firms take this into account when making their decisions.

Despite increasing transparency of central banks and its public support this development is not without its doubters. In Morris and Shin (2002), an individual agent's payoff depends on both fundamental values and, crucially, on the expectations of other agents. If the central bank releases a sufficiently clear signal, it can act as a coordinating point that can distract agents from their private information and fundamentals, which reduces social welfare. Dale, Orphanides and Österholm (2011), in a theoretical

[3] See Chari, Kehoe and McGrattan (2007) for a general argument that it is important to understand changes in wedges in order to account for economic fluctuations.