

A Role for Monetary Policy when Prices Reveal Information: An Example¹

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In an example, monetary policy can determine the information revealed by prices, and thus it can be effective. Monetary policy that varies only with public information can guarantee the full revelation of information at equilibrium, which is optimal. Full indexation need not attain full revelation and, as a consequence, need not implement an optimal allocation. *Journal of Economic Literature* Classification Numbers: D52, D82, E52. © 2000 Academic Press

1. INTRODUCTION

Money serves as a unit of account or numeraire; it also serves as a medium of exchange and a store of value, though this is secondary. Substantive arguments for effective monetary policy have focused on money as a unit of account.

Monetary policy can have real effects by altering the structure of payoffs of assets, which determines the attainable reallocations of revenue across contingencies: it alters the level of prices which, in turn, determines the real payoff of nominal assets; the allocations of resources at equilibrium associated with distinct asset structures are typically distinct. This argument, which had been put forward by Tobin [17], was formalized in the

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literature on equilibria with an incomplete asset market and nominal assets, first by Cass [2] and then by Balasko and Cass [1], Geanakoplos and Mas-Colell [8], and the literature that followed. That the asset market be incomplete is necessary: with a complete asset market, variations in the structure of payoffs of assets can only be inessential. It is also necessary that some assets be nominal: it was shown by Chamley and Polemarchakis [3] that, with indexed assets, variations in the supply of money and the level of prices fail to alter essentially the structure of payoffs of assets and are neutral, which parallels the argument of Modigliani and Miller [13], in corporate finance. The specification of the standard model of an economy with an incomplete asset market in which money balances are in zero net supply and monetary policy reduces to the exogenous determination of the level of prices is an abstraction: the features and conclusions of the model carry over in tact either in economies, following Clower [5], with a cash-in-advance technology of transactions, as in Dubey and Geanakoplos [7] and Magill and Quinzii [11], or, following Samuelson (1958), in economies with a demographic structure of overlapping generations, which allow for money balances in positive net supply, as in Detemple *et al.* [6].

When individuals are asymmetrically informed, rationality in the formation of expectations, following Radner [15], requires that individuals refine their private information with the information revealed by prices. Prices of assets and commodities do not convey only the aggregate scarcity of resources: they convey information across individuals.

If individuals form expectations rationally, monetary policy is neutral unless changes in the supply of money are stochastic and prevent individuals from distinguishing real from monetary shocks; this was the argument of Lucas [10]. Alternatively, as shown by Weiss [18], monetary policy can be effective by allowing prices to reveal information private to some individuals.

The information revealed by prices depends on the structure of assets available for the transfer of revenue across date-events. As shown by Chamley [4], different asset structures lead to qualitatively distinct behavior of macroeconomic variables.

Earlier work by Mischel *et al.* [12], Polemarchakis and Siconolfi [14], and Rahi [16] exploited the indeterminacy of equilibrium when assets are nominal and the asset market is incomplete to show that, when individuals are differentially informed, non-informative rational expectations equilibria exist.

Here, an example illustrates that monetary policy can determine the information revealed by prices, and, thus, it can have real effects.

There exists an open set of distinct, competitive equilibrium allocations associated with fully non-informative rates of interest and a unique

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