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Trust in the monetary authority☆

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ABSTRACT

Trust in policy makers fluctuates significantly over the cycle, evaporating during crises and affecting the transmission mechanism. Despite this, it is absent from the literature. We build a monetary model where trust emerges endogenously as an equilibrium of a strategic interaction (moral hazard with uncertainty on policy actions) between betrayal-averse agents and policy makers with stochastic incentives to deviate, conditioned on past policy outcomes as signals. A fall in trust, due to shocks or policy actions, increases the price that agents attach to future contingencies, amplifies fluctuations, and steepens the sacrifice ratio. We test the transmission of shocks through VAR analyses where trust is proxied by answers to the Eurobarometer surveys.

1. Introduction

Trust is a crucial determinant of economic and financial relations (see Arrow, 1972.). While there exists an extensive literature that examines the effects of social trust among atomistic agents for growth and finance, little has been written about its endogenous relation with the business cycle, although data clearly show co-movements, and on the role of trust for policy. The efficacy of monetary policy, for instance, clearly depends upon the ability of the central bank to affect agents' risk attitudes. The latter depend upon trust which acts as a lubricant for the transmission mechanism. We move a step forward in this direction.

We build a monetary model with nominal rigidities embedding a trust game in which a continuum of agents with heterogenous degrees of betrayal aversion interacts strategically with a central banker who has ex post stochastic incentives toward moral hazard, while on average acting under an anti-inflationary Taylor rule. Agents are uncertain about policy actions and form conditional expectations. The agents' decisions to trust depend upon the costs of betrayal and on the likelihood that the central bank will deviate ex post. The central banker's distribution of incentives depends upon past inflation gaps, which act as signal.[1] This memory-inducing device provides incentives for trust building under optimal policy. Indeed, higher past inflation gaps enlarge the support of the distribution, hence its variance, and impair households' ability to predict future policy actions, effectively reducing the central banker's trustworthiness. The level of trust resulting from

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[1] For moral hazard games with uncertainty over actions (trust games) and signals see, among others, Bracht and Feltovich (2009) or Schniter et al. (2013).

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the sub-game perfect Nash equilibrium is given by the marginal agent who forms trusting beliefs, the agent whose gains from trust outweigh the expected costs of betrayal. The expected betrayal costs, hence trust itself, depend upon the business cycle[2] In face of contractionary shocks or deviating policy actions, aggregate trust, namely the fraction of trusting agents, falls endogenously. First, agents require higher insurance premia, the extent of their precautionary savings rises and consumption falls, amplifying the contraction. Second, as risk premia increase, the stochastic discount factor (the price of future contingencies) co-varies less with the policy rate. This, in turn, impairs the monetary authority's ability to affect future expectations. This observation is well in line with the fact that the evaporation of trust following the financial crisis made the implementation of forward guidance more difficult.

We simulate our macro model to various shocks. Under productivity and cost push shocks, the transmission mechanism is amplified and more persistent, with most variables exhibiting hump-shaped responses. This is so since endogenous changes in trust, by affecting the price of risk, amplify the response of consumption. In response to an exogenous increase in the interest rate, due, for instance, to deteriorating market liquidity, the fraction of trusting agents falls, hence the overall sensitivity to risk rises. This deteriorates consumption, beyond the model without trust, and steepens the sacrifice ratio upon impact. A positive trust shock is expansionary: more agents trust the central bank, and their willingness to consume rises. We extend our model to the case of multiple policy authorities. The transmission mechanism is confirmed and further amplified. Furthermore, we derive optimal Ramsey policy. The Ramsey planner internalizes the fact that the inflation gap affects agents' conditional expectations of future policy actions and has an incentive for trust building.

Finally, we compare the impulse responses of our model with those of a VAR augmented with a measure of trust based on Eurobarometer survey data on trust in the ECB. We identify trust and other shocks using the Cholesky decomposition and find a good match between the model-based and the VAR-based impulse responses.

There is a large literature studying optimal monetary policy with reputation. Trust is a wider concept as it also depends on the preferences of the truster (which can vary across agents and time) beyond those of the trustee, and it focuses on moral hazard with uncertainty over actions, rather than asymmetric information with uncertainty over types. While a central banker type can be learned over time, trust can evaporate due to a crisis or an institutional shock even in the case of a known anti-inflationary central banker. If so, it impairs the monetary transmission mechanism by increasing the price that agents assign to future contingencies, hence aggregate precautionary savings. There is a literature that studied the lubricating effects for economic and financial relations of social trust, which was modelled primarily as an exogenous preference shock. Relative to this literature, we move a step forward by endogenizing trust and studying its role for policy.

The rest of the paper is organized as follows. Section 2 presents the trust game, which is implemented into a monetary model in Section 3. Section 4 discusses quantitative results. Section 5 provides empirical evidence and its link to the model. Section 6 concludes. Figures and tables follow. Additional derivations and results are in the online appendix.

2. The trust game

We start the model description by detailing the trust stage game (see Berg et al., 1995) and then insert it into a macro/monetary model.

2.1. Set-up of the game

The trust stage game takes place between a continuum of agents, heterogenous in their degree of betrayal aversion, and the monetary authority, whose incentives can vary stochastically ex post.[3] The strategic interaction between the two is a form of moral hazard. Agents are uncertain about ex post policy actions, as the latter can vary stochastically even though the central banker type had an anti-inflationary mandate. The costs of betrayal materialize through households' decisions to invest in safe (albeit less remunerating) assets when trust declines. The support of the central banker's distribution of incentives depends upon past inflation gaps, the latter indeed provide a signal that reduces uncertainty. In the extensive form of the stage game each agent (first mover) can play actions $a_1 = \{T, NT\}$, where T denotes "trust" and NT denotes "not to trust", while the central bank can play actions $a_2 = \{TW, NTW\}$, with TW being trustworthy behavior and NTW being the non-trustworthy behavior. If agents do not trust the interaction ends. We use x_h to denote the payoff common to each of the agents in the economy after each history, and y_h for the payoff of the monetary authority. Agents are, however, heterogeneous with respect to their degree of betrayal aversion,[4] $b^j \in [0, 1]$, which represents the dis-utility of being cheated. In what follows, we skip the index j for simplicity.

Definition 1. We define the aggregate level of trust as the fraction of agents who trust the policy maker, $\tau \in [0, 1]$. This fraction is identified by the threshold player i whose cost of betrayal, $\bar{b}$, gives the mass of trusting agents as $\tau = \int_0^{\bar{b}} db$.

Central banker's ex post incentives, ϕ_t, vary stochastically according to a uniform distribution with support, $[-m(\varphi^{\pi}_{t-1}), m(\varphi^{\pi}_{t-1})]$, where $m(\cdot)$ is a monotonically increasing function of the past inflation gap, φ^{π}_{t-1},[5] with the property

[2] Ehrmann et al. (2013) also noted the dependence of trust on the business cycle.
[3] Even for a conservative central banker type, actions can vary stochastically ex post.
[4] See Bohnet and Zeckhauser (2004) for evidence on betrayal aversion.
[5] Throughout the text, we refer more generally to the inflation gap since any deviation of inflation would increase the variance of the distribution.

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