Robust monetary policy with the consumption-wealth channel

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A B S T R A C T

This paper studies how the central bank's concerns about model uncertainty affect the design of monetary policy in the presence of wealth effects. If all exogenous disturbances are white noises, increasing the preference for robustness or the size of wealth effects implies more aggressive policy responses to cost shocks. Under persistent shocks, numerical simulations show that increasing the preference for robustness continues to imply more aggressive responses to cost shocks. By contrast, stronger wealth effects lead to less aggressive responses, dampening the effect of model uncertainty on interest rate dynamics.

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1. Introduction

Uncertainty about the most plausible model for the economy leads monetary authorities to design policies that aim to be effective even in worst-case scenarios, in which the model adopted by the central bank is no longer valid. Robust monetary policy is designed to avoid poor economic outcomes in the presence of misspecified models.

The literature on robust monetary policy is growing rapidly, especially the branch advanced by Hansen and Sargent (2008), which is related to the use of control theory. Giordani and Söderlind (2004) develop numerical methods to compute optimal robust policies. Leitemo and Söderström (2008a, 2008b) study the robust optimal monetary policy in the new Keynesian framework for closed and open economies, and obtained closed-form solutions under the assumption of white noise shocks. Tillmann (2009) examines the robust monetary policy with the cost channel of monetary transmission.

Robust policies depend on a reference model, i.e., a model that the policymaker believes to be the most likely description of an economic system. The reference model features plausible channels of monetary policy transmission. One potentially important transmission mechanism is the consumption-wealth channel, which allows asset prices to affect real activity.

The views on the importance of asset prices for consumption vary widely. For instance, Ludvigson and Steindel (1999) argue that wealth effects on consumption in the U.S. are unstable and measured with a great deal of uncertainty. In addition, Ludvigson et al. (2002) show that the consumption-wealth channel plays a minor role in the propagation of

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monetary policy in the U.S. On the other hand, Bertaut (2002) and Ludwig and Sløk (2004) point to significant impacts of equity and housing prices on consumption, especially in economies with market-based financial systems. Altissimo et al. (2005) survey the empirical literature on wealth effects and conclude that, in general, empirical studies reveal a statistically significant relationship between wealth and consumption.

In summary, the empirical evidence suggests, though not unanimously, that the effect of wealth on consumption is important. Moreover, its size seems to vary over time in a given country, as documented by Ludvigson and Steindel (1999), and across economies, as shown by Bertaut (2002) and Ludwig and Sløk (2004).

In addition to the empirical relevance of the consumption-wealth channel, central banks, concerned with its macro-economic effects, incorporate the consumption-wealth channel in their views of the monetary transmission mechanism. For instance, the European Central Bank (ECB) includes the consumption-wealth channel in the description of the monetary transmission mechanism in Europe, according to its web site[1] and the ECB Monthly Bulletin of July 2000.

Moreover, some central banks and policy institutions incorporate the consumption-wealth channel in models used by their staff members in policy analysis. Brayton and Tinsley (1996) show that the FRB/US includes a direct effect of asset prices on aggregate consumption. The NONAME model of the National Bank of Belgium, described in Jeanfils and Burggraeve (2008), embodies overlapping generations of consumers, generating an aggregate consumption function displaying the consumption-wealth channel. Additionally, models based on overlapping generations, featuring the consumption-wealth channel, have been developed to guide policy discussions at the Bank of England and the IMF. Harrison et al. (2005) describe the Bank of England Quarterly Model (BEQM) and Kumhof et al. (2010) present the IMF Global Integrated Monetary and Fiscal Model (GIMF). In both models, households are modeled in a way similar to the structure described in Appendix of this paper. In short, I show evidence that the consumption-wealth channel is a feature that actual central banks incorporate in their views about the economy's structure.

This paper studies how central banks' concerns about model uncertainty affect the design of monetary policy in the Blanchard–Yaari framework, which is an overlapping generations model featuring the consumption-wealth channel. While central banks plausibly consider the consumption-wealth channel in their models, the reasons why they might use the Blanchard–Yaari framework as their reference model are not so evident. In the following paragraphs, I argue that the Blanchard–Yaari model has merits to serve as an empirically more relevant reference model.

Indeed, the Blanchard–Yaari model provides a more empirically plausible specification for the Phillips curve. Kuttner and Robinson (2010) survey the literature on the new Keynesian Phillips curve. They show evidence that the Calvo parameter in the Phillips curve based on the representative agent model is too high in comparison with estimates from microeconomic studies. In fact, the slope of the Phillips curve has become flatter over time, implying even higher values for the Calvo parameter. Though there are alternative models that may be able to generate Calvo parameter estimates in line with the micro evidence, thus explaining the flattening of the Phillips curve, the Blanchard–Yaari model offers a reasonable explanation based on demographic changes.

First, the Blanchard–Yaari model can generate a given value of the slope of the Phillips curve with a smaller Calvo parameter, which is more in line with the micro evidence compared to the representative agent case. In fact, a given value of the slope is compatible with a smaller Calvo parameter because the slope is a positive function of the size of the wealth effect in the Blanchard–Yaari Phillips curve. The positive size of the wealth effect, due to a positive probability of dying and a positive real wealth to output ratio in steady state, compensates the negative effect of a smaller Calvo parameter on the slope. Second, given the Calvo parameter, small values of the slope over time are compatible with a decreasing probability of dying over time, which is in line with the empirical evidence on population ageing documented in Bloom and Canning (2006).

In addition, the asset meltdown hypothesis can reduce the size of the wealth effect through a reduction in steady state asset prices, leading to small values of the slope. This hypothesis, discussed first in Poterba (2001) and Abel (2001), states that a decreasing asset demand caused by smaller working-age cohorts and an increasing asset supply due to retired workers lead to falling asset prices. Despite the mixed empirical support for the asset meltdown hypothesis discussed in Bosworth (2004), Davis and Li (2003) and Takáts (2012) provide sound evidence in defense of this hypothesis. These demographic changes, accounted for by the Blanchard–Yaari model, offer a plausible interpretation of the flattening of the Phillips curve documented in Kuttner and Robinson (2010).

A more general question is whether an empirical version of the Blanchard–Yaari model, as described in Nisticò (2012), fits the data better than the standard representative agent model. Dynamic stochastic general equilibrium (DSGE) modelers have embedded the perpetual-youth story in empirical structural models with nominal rigidities and backward-looking dynamics. Castelnuovo and Nisticò (2010) estimate a closed-economy model for the U.S., showing that the consumption-wealth channel is empirically important for the monetary transmission mechanism. In addition, they perform a likelihood-based comparison with the representative agent model and obtain results that indicate the superiority of the Blanchard–Yaari model as a more plausible specification. Milani (2011) and Funke et al. (2011) provide analogous evidence of the empirical relevance of the consumption-wealth channel in a two-country model and in a small open economy setting, respectively.

In addition, the Blanchard–Yaari framework has been used to address important issues in monetary economics. Piergallini (2006) studies optimal monetary policy in a model with real balance effects. Annicchiarico et al. (2008) study

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[1] http://www.ecb.int/mopo/intro/transmission/html/index.en.html