



# Productivity shocks, stabilization policies and the dynamics of net foreign assets

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## ABSTRACT

In this paper we investigate the role of macroeconomic stabilization policies for the international transmission of productivity shocks and their effects on the external sector. We develop a two-country *stochastic* Dynamic New-Keynesian “perpetual youth” model of the business cycle with incomplete international financial markets. Our OLG structure implies stationary net foreign asset dynamics and allows for a thorough analysis of the interaction of monetary policy with non-balanced budget fiscal policy. We derive the dynamic and cyclical properties of fiscal deficit feedback rules and their implications for net foreign assets dynamics. Our results imply that the degree of “fiscal discipline”, i.e. the extent to which the fiscal rule responds to debt dynamics, is crucial for the dynamics of net foreign assets. We show that under a counter-cyclical fiscal rule with low fiscal discipline temporary positive productivity shocks may result in substantial deteriorations of the Net Foreign Asset position in the medium run. This result crucially hinges on the interplay among nominal rigidities, non-balanced budget fiscal policy, and the wealth effects on consumption that are implied by our OLG structure.

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## 1. Introduction

In an internationally linked world, it is essential to understand how different shocks are transmitted cross-border and counteracted by domestic macroeconomic policies. In this paper we study the role that fiscal and monetary policies play in the international transmission of productivity shocks, focusing in particular on the implications for net foreign assets (NFA) dynamics, and the possible accumulation of external imbalances. We develop a small-scale qualitative open economy Dynamic Stochastic General Equilibrium (DSGE) framework featuring a “perpetual youth” demand side which allows for a non-trivial role for non-balanced-budget (non-BB) fiscal policies and stationary NFA dynamics.

In the New Open Economy Macroeconomics (NOEM) literature, featuring nominal rigidities and monopolistic competition, several contributions have been devoted to analyze monetary policy. However, in the same literature, the analysis of fiscal behavior has been mainly limited to the analysis of balanced budget (BB) policies.<sup>1</sup> The benchmark DSGE model in the NOEM tradition moves from the seminal *Redux* model of Obstfeld and Rogoff (1995). This framework, in its baseline specification, is not suitable to study the implications of non-BB fiscal policies for NFA dynamics. Building on the

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<sup>1</sup> A non-exhaustive list of some recent contributions includes Beetsma and Jensen (2005), Benigno and De Paoli (2010), Ferrero (2009), Galí and Monacelli (2008), Ganelli (2005) and Gnocchi (2007).

joint assumption of infinitely lived household and frictionless financial markets, indeed, this model results in non-stationary net foreign asset dynamics; moreover, Ricardian Equivalence limits the range of fiscal policies that can be analyzed.

This paper overcomes both these limitations by means of a single modification of the demand side of the model. In particular, we include a “perpetual youth” structure into the baseline small-scale DSGE-NOEM framework. In our economy, agents are randomly replaced by newcomers holding zero financial wealth. The interaction between agents with accumulated financial wealth and such newcomers implies a link between aggregate consumption and financial wealth dynamics that allows us to pin down the NFA position in the steady state. In addition, it also implies a role for non-BB fiscal policies since Ricardian Equivalence no longer applies. We focus on the NFA because, from a purely theoretical perspective, it is the NFA position – and not the current account – that is relevant for consumption dynamics through the wealth effects implied by the perpetual-youth structure of our model.

In the paper, we take a positive approach and do not deal with welfare or normative issues. Optimal monetary and fiscal policies have been widely investigated in the NOEM tradition into the standard framework of the representative agent. In our context, the heterogeneity in financial market participants makes the analysis much more difficult, because non-trivial aggregation issues arise when computing the social welfare function. Nevertheless, we think that a comparative assessment of the qualitative macrodynamics associated with plausible and simple policy rules may be an important step in the construction of a larger scale quantitative model that can be used for macroeconomic policy evaluation. Our positive investigation considers different monetary and fiscal policy rules. As regards monetary policy, we study a simple Taylor rule based on the control of domestic price inflation and exchange rate policies explicitly targeting the stabilization of NFA by means of an aggressive managed floating. Given that we do not derive an optimal monetary policy, the benchmark chosen for our policy investigation is a zero-inflation policy guaranteeing price stability. This choice can be justified by observing that price stability is indeed (although differently defined from an empirical perspective) the stated objective of many Central Banks. Moreover, price stability is also the optimal policy in the closed economy version of the standard New Keynesian model (Woodford, 2003) as well as in some open economy versions of the same theoretical framework.<sup>2</sup> As regards fiscal policy, we compare counter-cyclical feedback rules characterized by having a primary surplus responding to output gap and debt dynamics with balanced budget policies implying debt stability. While the latter have been investigated in the literature, scarce attention has been devoted to non balanced budget feedback rules. However, there is widely documented empirical evidence, both in the US and the Euro Area, that fiscal policy has been often conducted in a counter-cyclical way (Galí and Perotti, 2003), without even mentioning the huge discretionary fiscal measures undertaken by most countries following the severe 2008–2009 world recession. A qualitative study of the propagation mechanism induced by different fiscal feedback rules on the main macroeconomic variables following productivity shocks can be useful for future more extensive evaluations of the empirical performance of such rules.

We show that a counter-cyclical fiscal policy that does not respond sufficiently to debt dynamics can amplify the effects of structural distortions in the international transmission of productivity shocks, thereby inducing external imbalances. This result may hence contribute to the debate on the role of macroeconomic stabilization policies and their effects on international financial markets, that spurred in the aftermath of the recent financial crisis (see, among others, Taylor, 2008). In our model, the degree of fiscal discipline plays a crucial role for NFA and exchange rate dynamics. We define the degree of fiscal discipline as the responsiveness of the counter cyclical fiscal rule to the stock of outstanding debt. If the government follows a counter-cyclical deficit rule with scarce fiscal discipline (as the empirical evidence for the US suggests), then *positive* productivity shocks may result in *deteriorations* of the NFA position and the current account in the medium run. We investigate in detail the role of different features of the model in determining this result, by discussing the role of both structural and policy parameters.

The paper is organized as follows. After a brief section dealing with the related literature, in Section 2 we lay out the model. In Section 3 we describe the linearized version of the model and the chosen benchmark allocation. Section 4 introduces monetary and fiscal policy, and discusses the implications of different policy regimes for the dynamics of NFA and the other main endogenous variables. Section 5 analyzes the relative contribution of several features of the model in driving our main result. Section 6, finally, summarizes and concludes.

### 1.1. Related literature

The analysis of the international transmission of idiosyncratic productivity shocks and their effects on the external balance dates back to Backus et al. (1992), who extend the standard Real Business Cycle model to a two-country world, and evaluate the implications for the international business cycle. They show that a positive temporary productivity shock on the home economy deteriorates the trade balance through an inflow of physical capital for about four quarters, while it implies a persistent positive balance afterwards. The same International RBC model (IRBC) is used by Kollmann (1998) to study the role of international asset market structure in the transmission of productivity shocks to the external balance in the U.S. in the 1980s. He shows that a positive productivity shock to the domestic economy can induce a persistent trade

<sup>2</sup> See Benigno and Benigno (2003) for a discussion of the conditions under which price stability is an optimal monetary policy regime in open economies.

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