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Are valuation effects desirable from a global perspective?[☆]

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ABSTRACT

Recent studies have emphasized the role of valuation effects due to exchange rate movements in easing the process of adjustment of the external balance of a country. This paper asks to what extent valuation effects are desirable from a global perspective as a mean to achieve an efficient allocation of resources. In a frictionless world, it is desirable to have large movements in prices and exchange rates. But once a small degree of price rigidity is introduced not only should prices be stabilized but also the response of the exchange rate should be muted. There is a minor role for valuation effects that depends both on the size and composition of assets and liabilities.

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The analysis of the external imbalances of a country has recently become a compelling subject of research for the historically high current account deficits recorded in the US economy together with the increasing worsening of its net foreign asset position.[1]

The current paradigm to think about the external balance of a country is the so-called "intertemporal approach to the current account". According to this theory, the external adjustment of a country occurs through movements in the trade balance, as a consequence of changes in the allocation of real quantities and equilibrium relative prices.[2]

This approach misses an important channel of adjustment, a financial one, since it assumes that the portfolio return is not varying over time and neglects the heterogenous composition of the financial instruments that are part of the portfolio of a country. Even if there are no changes in the borrowing decisions of a country, the net foreign asset position can change because the market value of the stock of assets and liabilities varies. Movements in the nominal exchange rate are an important source of these valuation effects.

This paper analyzes the extent to which the valuation channel due to the exchange rate is desirable from a global welfare perspective. The main finding is that whereas in a frictionless world valuation effects are of important magnitude once a small degree of price rigidity is introduced they are less desirable and play a minor role. The prescription for adopting inflation-targeting regimes that results from current monetary models is strong enough to dominate other objectives like the world distribution of wealth through valuation effects.

The issue of desirability has been neglected by the current literature. Studies as Gourinchas and Rey (2005, in press), Lane and Milesi-Ferretti (2004, in press-a,b) and Tille (2003, 2005), have documented that in the recent experience of the US economy valuation effects have accounted for a large fraction of the changes in the international investment position of the country and have concluded that a depreciation of the US dollar can ease the real adjustment needed to reduce the external imbalances.[3] As pointed out by Obstfeld (2004), a theory in which financial adjustments and in particular exchange rate movements are important in determining the frontier of the feasible allocation of quantities and relative prices can raise the tempting argument that exchange rates adjust to sustain any real allocation achieved. They can even balance any current imbalance with the risk of being at the end destabilizing for the economy.

Desirability puts discipline on the allocation of consumption and relative prices that should be of interest by focusing on which movements in exchange rates are compatible with that real allocation.

To address this issue, we propose a two-country model in which each country is specialized in the production of a bundle of goods. In the benchmark case, there are no frictions except for the ex-ante incompleteness of financial markets. In particular it is assumed that each country can only borrow in a risk-free nominal bond denominated in its currency and lend in a risk-free nominal bond denominated in the other country's currency.[4]

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[1] See Clarida (2006) for a collection of works on the subject.

[2] This is the approach taken by Obstfeld and Rogoff (2005).

[3] See also Blanchard et al. (2005) and Cavallo and Tille (2006).

[4] The case of a debtor country that borrows only in foreign currency is also considered.

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In a frictionless world, exchange rate and assets movements are desirable for achieving the efficient allocation of resources across countries. In a rough quantitative experiment we find that they should be of important magnitude compared with that of the shocks. For a 1% permanent increase in productivity, the exchange rate should appreciate by 4.71% and the net foreign asset position worsen in the amount of 3% of gross domestic product for the country that experiences the increase in productivity. However, once a small degree of price friction is introduced that implies an average duration of price contracts just above the unit interval (3 months), producer prices should be stabilized even following permanent shocks. Moreover the short and long-run responses of the exchange rate are substantially dampened and reduced to one tenth of the magnitude we observe in the frictionless-case economy. Valuation effects are less desirable.

This paper further contributes to the current literature by revisiting the implications of the theory of the "intertemporal approach to the current account" on the mechanism of adjustment following permanent or transitory shocks with the twist of valuation effects.

Following a *permanent* productivity shock in one country, the intertemporal approach to the current account would suggest that the consumption of the country that experiences the favorable shock increases proportionally without any changes in the net foreign asset position.[5] Instead, global efficiency would require a transfer of real wealth to the other country. In a frictionless world valuation effects work in this direction: an appreciation of the nominal exchange rate acts as a negative financial shock that reduces the portfolio return of the country with the high productivity. This channel is strong enough to worsen in a permanent way its net foreign asset position and results in a permanent transfer of wealth to the other economy. Through this mechanism consumption can also increase abroad.[6]

Following a *temporary* shock, the classic theory would suggest that the country affected by the shock accumulates net foreign assets that allow to spread across time the temporary increase in wealth and achieve higher profile of consumption in future periods. Instead, a global optimum requires on one side that there is no intertemporal propagation of the shock and on the other side that consumption should temporarily increase abroad. This is possible if the country with the high productivity experiences also a negative financial shock that distributes the additional real wealth to the other country. Again an appreciation of the nominal exchange rate would work for this end. In contrast with the permanent-shock case, the net foreign asset position improves in the short run and returns immediately back to the initial value.[7]

There has been a recent interest on the analysis of valuation effects from the view of micro-founded models. Tille (2005) presents a richer structure of financial markets, but in which the only focus is on monetary shocks and on how valuation effects affect their transmission mechanisms. Kollman (2003) studies the welfare effects of alternative, but sub-optimal, monetary policy regimes in a quantitative business cycle model of a two-country world. Ghironi et al. (2005) analyzes the impact of valuation effects on the cross- holdings of equity. Devereux and Saito (2005) presents a tractable portfolio model that emphasizes the interaction between monetary policy and the current account for hedging purpose from a positive point of view.

The structure of this work is the following. Section 1 presents the model economy, studies the efficient allocation and its implementation with decentralized markets. Section 2 discusses the response of prices, exchange rates, and assets following permanent productivity or preference shocks. Section 3 extends the benchmark model adding price rigidities, while Section 4 analyzes the constrained-efficient allocation. Section 5 studies the robustness of previous results when there are significant frictions in the price mechanism. Section 6 concludes.

1. Model

The world economy consists of two countries, which are labelled H and F or domestic and foreign, with population size n and $1-n$ respectively and $0<n<1$. The structure of the model is similar to most of the current open-macro models.[8] Each country is specialized in the production of a bundle of goods of size n and $1-n$ for country H and F, respectively. All goods are traded without frictions and households within a country are identical and have preferences of the form

$$U_{t_0} = \sum_{t=t_0}^{\infty} \beta^{t-t_0}\left[\frac{C_t^{1-\rho}g_t^{\rho}}{1-\rho} - \frac{1}{n}\int_0^n \frac{l_t(h)^{1+\eta}}{1+\eta}dh\right] \tag{1}$$

for country H and

$$U_{t_0}^* = \sum_{t=t_0}^{\infty} \beta^{t-t_0}\left[\frac{C_t^{*1-\rho}g_t^{*\rho}}{1-\rho} - \frac{1}{1-n}\int_n^1 \frac{l_t^*(f)^{1+\eta}}{1+\eta}df\right] \tag{2}$$

for country F where β is the intertemporal discount factor with $0<\beta<1$. Households are blessed with perfect foresight. The momentary utility at a generic time t depends on consumption indexes C and C^*, for households in country H and F respectively, where $\rho>0$ is the inverse of the intertemporal elasticity of substitution in consumption and g and g^* are country-specific shocks to the preferences toward consumption. The index C is defined as

$$C \equiv \left[n^{\frac{1}{\theta}}C_H^{\frac{\theta-1}{\theta}} + (1-n)^{\frac{1}{\theta}}C_F^{\frac{\theta-1}{\theta}}\right]^{\frac{\theta}{\theta-1}}$$

where θ, with $\theta>0$, is the intratemporal elasticity of substitution between the bundles of goods C_H and C_F. In particular C_H includes the consumption of all the goods produced in country H and is defined as

$$C_H \equiv \left[\left(\frac{1}{n}\right)^{\frac{1}{\sigma}}\int_o^n c(h)^{\frac{\sigma-1}{\sigma}}dh\right]^{\frac{\sigma}{\sigma-1}},$$

where σ is the intratemporal elasticity of substitution across the goods produced within country H, with $\sigma>1$, and $c(h)$ indeed denotes consumption of a variety h of these goods; C_F includes instead the consumption of the goods produced in country F with elasticity of substitution among them equal to σ

$$C_F \equiv \left[\left(\frac{1}{1-n}\right)^{\frac{1}{\sigma}}\int_n^1 c(f)^{\frac{\sigma-1}{\sigma}}df\right]^{\frac{\sigma}{\sigma-1}}$$

where $c(f)$ is consumption of one of these goods. Consumption preferences are similar across countries. It follows that n denotes at the same time the population size of country H, the size of goods produced in country H and the weight in the general consumption indexes C and C^* given to the goods produced in country H. Another implication of the above structure of consumption preferences is that there is no home bias in consumption—preferences are similar across countries. Given prices $p(h)$ and $p^*(h)$ for a generic good h, in the currency of country H and F respectively, and given prices $p(f)$ and $p^*(f)$ for a generic good f, we assume that the law-of-one-price holds for all goods, i.e. $p(h)=Sp^*(h)$ and $p(f)=Sp^*(f)$ where S is the nominal exchange rate, i.e. the price of the currency of country F relative to that of H.

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[5] This example considers a model with fixed capital stock.

[6] A depreciation should instead occur when the liabilities are denominated in foreign currency.

[7] In the main text, we discuss also the dynamics following shocks that influence consumption preferences.

[8] See Obstfeld and Rogoff (2000) among others.

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