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Monetary shocks, exchange rates, and the extensive margin of exports ☆

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A B S T R A C T

This paper develops a two-country Dynamic General Equilibrium model to assess the relationship between the real exchange rate and the extensive margin of exports. Exchange rate pass-through to consumer prices governs the relative strength of a demand channel onto the exporting decision of a firm. With incomplete pass-through, a favorable movement in the real exchange rate generates increased export participation and an expansion in the extensive margin of exports. This result is consistent with firm-level studies, and contributes to an ongoing empirical debate as to the importance of changes in export participation over the business cycle.

1. Introduction

Recent empirical studies based on firm-level data have shown that exchange rate movements induce firm entry and exit in export markets. For example, Berman et al. (2012) and Fitzgerald and Haller (2012) find that favorable movements in the real exchange rate generate entry into foreign markets (for French and Irish firms, respectively). However, using product-level data for the US and OECD, Alessandria and Choi (2008) and Kehoe and Rhul (2013), argue that the number of exporters has little correlation with the real exchange rate and the extensive margin of exports is largely invariant to

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general fluctuations in the business cycle.[1] This paper attempts to discriminate between these findings using a two-country Dynamic General Equilibrium model.

I start with a standard explanation for real exchange rate movements and business cycle fluctuations: the interaction of monetary shocks with sticky goods prices.[2] In this environment I allow for endogenous export participation based on per-period export costs. I show that exchange rate pass-through to consumer prices determines the relative strength of a demand channel onto the export participation decision of a firm. With incomplete exchange rate pass-through, a favorable movement in the exchange rate expands the set of firms that find it profitable to export because increased demand dominates the rising costs of production. This relationship between the exchange rate and extensive margin of exports is consistent with firm-level studies.

Although favorable movements in the exchange rate are associated with expansions in the extensive margin of exports, the magnitude of this change depends on the extent of pass-through.[3] In this sense, even if pass-through were low, it could still be possible that the extensive margin is only weakly correlated with the business cycle, as suggested by product-level studies. To determine whether this is indeed the case, I calibrate the model and show that the relative strength of the demand channel identified in this paper is quantitatively important. In the low pass-through specification, a 1 percent rise in the money stock (after one year) results in a 0.2 percent expansion in the extensive margin of exports, on impact.[4]

There are two features of the model that generate the pass-through-based trade-off between demand and costs for firms, and thus strong results with regard to the extensive margin. First, consumed goods undergo two stages of production, with international trade in intermediate inputs, similar to Huang and Liu (2007). Intermediate firms (stage one) use labor as an input, are heterogeneous in productivity, and export subject to a per-period cost. Firms that produce consumer goods (stage two) use domestic and available foreign intermediate goods as inputs and also sell their output in domestic and export markets. The price of consumer goods is sticky in either producer or local currency terms, which limits exchange rate pass-through.

The second feature of the model is that firm creation is subject to a sunk entry cost.[5] Because firm creation requires resources, the export participation decision of all preexisting intermediate firms is conditional on the mass of new entrants, and greater firm creation, all else equal, leads to fewer firms in the export market. The decision of an intermediate firm to export then depends on both the demand for its output (by firms producing consumer goods) and the mass of new entrants in the domestic market. As such, changes in the extensive margin of exports depend on international relative consumer prices, which affect demand, and the terms-of-labor, which affects costs. The demand channel dominates at low levels of exchange rate pass-through.

Ghironi and Melitz (2005) consider an environment in which firms face sunk entry and per-period export costs but focus on technology shocks as the source of business cycle fluctuations.[6] They study both a permanent and transitory (with 0.9 persistence) 1 percent increase in home productivity. This results in a 0.55 and 0.21 percent expansion in the extensive margin, on impact, respectively, and positive co-movement between the home and foreign extensive margins. With monetary shocks, nominal rigidities, and incomplete pass-through, the results are comparable, yet the channel is markedly different. Positive international co-movement and pro-cyclical extensive margins are

[1] Alessandria et al. (2012) provide evidence on real exchange rates and extensive margins across emerging markets.

[2] For example, see Chari et al. (2002) and the multi-sector model of Carvalho and Nechio (2011). Iversen and Soderstrom (2012) discuss the role of non-monetary shocks in sticky-price models.

[3] If pass-through has fallen over time, as suggested by Marazzi and Sheets (2007), increased export participation following a favorable movement in the real exchange rate is more likely.

[4] Berman et al. (2012) and Fitzgerald and Haller (2012) both estimate linear probability models. In the former (latter), a 10 percent home currency depreciation, generates a 2 (0.5) percentage point increase in the probability of exporting. Berman et al. (2012) also show that larger firms raise export prices and not volumes in response to exchange rate changes (the average exporter raises price by 0.8 percent and volume by 4 percent).

[5] The relationship between monetary policy and firm creation is discussed in Bilbiie et al. (2007), Bergin and Corsetti (2008), Lewis (2009), and Lewis and Poilly (2012).

[6] See Alessandria and Choi (2007) for an analysis with sunk export costs.