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Exchange rates as shock absorbers: The role of export margins

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A R T I C L E I N F O

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A B S T R A C T

This study addresses the role of floating exchange rates as shock absorbers when trade involves previously traded goods (intensive margin) as well as new goods and previously non-traded goods (extensive margin). In a panel VAR model of 23 developed economies, we first document that adjustment to real shocks occurs mainly at the extensive margin and particularly so in fixed regimes. This in turn amplifies output fluctuations. We then propose a model with firm entry and endogenous selection of exporters that generates dynamics in line with the estimated responses.

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1. Introduction

As is well-known since Friedman (1953), a major advantage of flexible exchange rates over fixed rates is based on the fact that, in a world with sticky prices, the nominal exchange rate could be used to insulate the economy against real shocks. When economies are hit by a real shock, the argument goes, flexible rates allow to adjust relative prices more quickly and imply smoother adjustment in terms of quantity. In flexible regimes, one should therefore observe smoother quantity responses and quicker adjustment in relative prices compared to fixed regimes. Evidence on the shock absorption property of floating regimes abounds.[1] These studies are based on the implicit premise that all adjustment occurs at the intensive margin, with changes in the volume of previously traded goods. This stands in contrast to recent evidence showing that a relevant fraction of the growth in trade volumes occurs at the extensive margin, with export of new products and previously non-traded goods (see Kehoe and Ruhl, 2013). In principle, changes in tradability can affect the transmission of shocks in the world economy. An increase in the number of exporters, for instance, induces a tendency for poorer countries to have lower overall price levels than richer countries, what Ghironi and Mélitz (2005) dub an "endogenous Balassa–Samuelson effect" (see also Bergin et al., 2006). Moreover, it leads to stronger terms of trade and a worsening of the European external balance in the aftermath of market reforms in Europe (Cacciatore et al., 2015).[2] The extent to which endogenous changes in entry affect the shock absorption property of flexible rates is, however, unclear. This paper addresses the question both empirically and theoretically.

First, we document the cyclical properties of export margins in a sample of 23 developed economies over the period 1988–2011. Four facts stand out: (1) Extensive margins are far less volatile than intensive margins. (2) Trade margins are almost acyclical and positively correlated with each other. (3) Extensive margins are less volatile in countries with fixed

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[1] Early studies include Baxter and Stockman (1989), Flood and Rose (1995), Bayoumi and Eichengreen (1994), Broda (2004), Levy-Yeyati and Sturzenegger (2003), and Ghosh et al. (1997) among others.

[2] Lewis and Winkler (2015) focus on the transmission of government expenditure shocks.

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exchange rates than in countries with floating rates. (4) The volatility of intensive margins is almost identical across exchange rate regimes.

Then, we investigate the dynamics of output and export margins in fixed and floating regimes based on a panel VAR approach. In order to focus on the Friedman's hypothesis, the analysis is restricted to a single real shock given by the terms of trade of a country.[3] The vector of endogenous includes the terms of trade and output of the exporting country together with extensive and intensive margins measured on a country-pair basis. Identification of structural shocks is achieved by assuming a contemporaneous recursive ordering where the variables are ordered as given in the definition of the endogenous vector. This entails the assumption that the terms of trade are exogenous, i.e. they cannot react contemporaneously to innovations in the other variables in the system. Evidence is provided suggesting that the terms of trade can be treated as exogenous for the sample of developed economies examined.

We find that a positive shock raises exports along the extensive margins in both fixed and floating regimes. The effect on exports of previously traded goods is, on the contrary, negligible. Moreover, the average response of extensive margins in the sample of peggers is around 3 times as large as the average response among floaters. Interestingly, a large response of extensive margins is associated with a large output effect.

Finally, we propose a two-country dynamic, general equilibrium model with firm entry that helps explain these facts. The model extends the setup in Cavallari (2013) so as to allow for the endogenous selection of exporters: while all firms serve domestic markets, only a subset of these firms will export. The share of exporters is determined endogenously in the model by striking a balance between firm-specific export costs and export profits.

Simulations show that an increase in the price of exports raises output and consumption at home while reducing them abroad. In contrast to productivity shocks, which spread their effects symmetrically in the world economy, a shock to the terms of trade implies a redistribution of wealth across countries. Interestingly, a positive shock discourages the creation of new products. The reason is expenditure switching in favour of cheaper foreign goods, which reduces the profitability of new businesses at home. This in turn reduces the range of products that will be exported for a given share of exporters. On the other hand, a larger share of firms operating in domestic markets may find it profitable to export when export prices increase. Which one of these opposing effects prevails depends crucially on the exchange rate regime: the number of exporters (the extensive margin) rises in fixed regimes while it reduces in floating regimes. Our clue is that potential exporters have a strong incentive to trade previously non-traded goods when exchange rate variability is eliminated over the whole investment horizon.

In line with the estimated responses, in our model extensive margins increase after a positive shock of the terms of trade. Moreover, they react more aggressively than intensive margins and particularly so in fixed regimes. The reason is shock absorption in flexible regimes. The depreciation of the home currency allows to partly counteract the appreciation in the terms of trade, thereby smoothing adjustment at the extensive margin. This in turn helps smoothing output.

The remainder of the paper is organized as follows. Section 2 presents new empirical evidence on export margins and exchange rates. Section 3 presents the theoretical model with its log linear approximation in Section 4. Section 5 concludes. Appendix A contains the steady state of the model and the log-linearized equations. Appendix B contains details on data and estimation.

2. Empirical analysis

In this section, we first present descriptive statistics for export margins in 23 OECD economies over the period 1988–2011. We find that: (1) Extensive margins are less volatile than GDP while intensive margins are more volatile than GDP. (2) Margins are almost acyclical and positively correlated with each other. (3) Extensive margins are less volatile in countries with fixed exchange rates than in countries with floating rates. (4) The volatility of intensive margins is almost identical across exchange rate regimes. Then, we investigate the dynamics of output and export margins in response to terms of trade shocks in fixed and floating regimes.

2.1. Data

Our sample includes 23 developed countries over the period from 1988 to 2011. GDP – measured in domestic currency at constant prices – is from the OECD StatExtracts database. Terms of trade are from the IFS-IMF database or the World Bank Data upon availability. The terms of trade are defined as the price of a country's exports towards the world relative to the price of its imports from the world. An increase in the terms of trade is therefore an appreciation. All variables are logged.

Export margins are from the UN Comtrade database. They are calculated with the World Integrated Trade Solution of the World Bank from bilateral trade measures at the four-digit Standard International Trade Classification.[4] Following

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[3] In a related study (Cavallari and D'Addona, 2015), we provide evidence about the transmission of external real and nominal shocks. We document that adjustment to both these shocks involves mainly the extensive margin in fixed regimes.

[4] http://wits.worldbank.org/wits/.

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