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Dynamic effects of trade openness on financial development

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ABSTRACT

This paper employs the Pooled Mean Group (PMG) approach of Pesaran et al. (1999) to study the dynamic effects of trade openness on financial development. The advantage of the PMG estimator over other dynamic panel econometric techniques is that it allows short-run coefficients, speeds of adjustment and error variances to vary across countries, with cross-country homogeneity restrictions only on long-run parameters. Our results spanning 88 countries over 1960–2005 show that a positive long-run relationship between trade openness and financial development coexists with a negative short-run relationship. But when splitting the data into different income or inflation groups, this finding is observed only in relatively low-income countries or high-inflation economies.

1. Introduction

Beginning with the cross-country analysis of King and Levine (1993a, b), most empirical investigations find a strong and robust positive link between financial development and economic growth. Financial intermediaries and markets may provide information about profitable ventures, diversify risks, and facilitate resource mobilization. Then, a well-developed financial system helps improve capital formation and the efficiency of resource allocation, promoting thereby long-run economic growth.[1] In addition to improving growth, financial development may alleviate poverty and hence reduces inequality. If capital market imperfection and indivisibility of investment in human or physical capital lead to income divergence between the rich and the poor, then financial development may reduce poverty and income inequality by disproportionately relaxing credit constraints on the poor.[2]

Accordingly, understanding what causes financial development is important because of the double welfare improvement effect on two of the most important economic issues faced by a country, especially for developing countries.[3] In this paper, we examine whether financial development is influenced by international trade. Although the debate about the effects of trade on growth and inequality is yet unsettled,[4] a promoting effect of international trade on financial development offers one mechanism through which trade exerts its influence on economic growth and income inequality.

Several recent papers suggest that trade is strongly linked to financial development. Rajan and Zingales (2003) argue that trade opening, especially when combined with openness to capital flows, weakens the incentives of incumbent business firms or financial intermediaries to block financial development in order to reduce entry and competition. And, the relative political power of incumbents may decrease with trade as well. Then, trade has a beneficial impact on financial development. Braun and Raddatz (2005) explore the political channel further and demonstrate that countries in which trade liberalization reduces the power of groups most interested in blocking financial development observe an improvement in the financial system. However, when trade opening strengthens those groups, external finance suffers.

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[1] Please see Levine (1997, 2005) for an excellent, both theoretical and empirical, survey and references therein.

[2] See, e.g., Banerjee and Newman (1993), Galor and Zeira (1993), and Aghion and Bolton (1997). Beck et al. (2007) and Clarke et al. (2006) provide empirical evidence that, in a cross-country comparison, financial intermediary development reduces income inequality by disproportionately boosting the income of the poor.

[3] Existing literature also implies that finance can affect macroeconomic cycles. More developed financial markets and institutions may more efficiently match savers and investors, allowing the economy to absorb shocks more easily. The financial sector may also facilitate diversification (in both microeconomic and macroeconomic level), which would reduce risk and volatility. Finally, financial development may be a proxy for the extent of information asymmetries which may cause an increased volatility. Please see Denizer et al. (2002) for detailed discussion.

[4] Please see Nissanke and Thorbecke (2006) for a literature review about the globalization–inequality–poverty nexus, and Rodriguez and Rodrik (2000) for discussion about the trade–growth link.

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While Rajan and Zingales (2003) and Braun and Raddatz (2005) study how trade affects the supply of external finance, others focus on the demand side instead. Newbery and Stiglitz (1984) argue that trade, by affecting price elasticities, can potentially increase uncertainty and income volatility. Financial development could then be fostered by increased demand for insurance. Similarly, Svaleryd and Vlachos (2002) emphasize the role of risk diversification. To the extent that openness is associated with greater exposure to external shocks and foreign competition, it will increase the demand for financial services to diversify such risks. Do and Levchenko (2004, 2007) argue that financial development is endogenously determined in part by the demand for external finance in each country. Comparative advantage in international trade may affect a country's production pattern and in turn its demand for external finance. Then countries specializing in financially dependent goods would have a high demand for external finance and thus a high level of financial intermediation. In contrast, the financial system would be less developed in countries that specialize in goods less relying on external finance.

Accordingly, from either supply- or demand-side perspective, the effect of trade on financial development is inconclusive.[5] This paper contributes to the debate by modeling the trade–finance relationship as intrinsically dynamic, explicitly distinguishing between the short and the long run. Such a distinction is crucial because, in addition to the long-run effects, trade may have short-run effects on financial development. As argued in Huang and Temple (2005), when developing countries liberalize trade on a major scale, *e.g.*, Mexico with the NAFTA, restructuring and investment are likely to increase the demand for external finance. If trade liberalization is followed by investment and lending booms, there could be a strong positive association between openness and finance in the short run. By contrast, greater openness to world goods markets may reinforce domestic economic fluctuations (Arora and Vamvakidis, 2004; Blankenau et al., 2001; Rodrik, 1998) and/or lead to heightened vulnerability to external shocks (Loayza and Raddatz, 2007; Tornell et al., 2004), which may worsen capital market imperfections and hence impede financial development.

Consequently, econometric testing of the theory should ideally uncover the relevant long-run parameters as well as a complex and possibly non-causal relationship between trade and financial development in the short run. This can be accomplished by specifying an autoregressive distributed lag (ARDL) model for each country, pooling them together in a panel, and then testing the cross-equation restriction of a common long-run relationship between the two variables using the Pooled Mean Group (PMG) estimator developed by Pesaran et al. (1999). Therefore, instead of averaging the data for each country to isolate trend effects, both long- and short-run relationships are estimated using a panel of data pooling time-series and cross-sectional effects.[6] As put forth in Loayza and Ranciere (2006), while averaging clearly induces a loss of information, it is not obvious that averaging over fixed-length intervals effectively eliminates business-cycle fluctuations. Averaging eliminates information that may be used to estimate a more flexible model that allow for some parameter heterogeneity across countries. Further, averaging hides the dynamic relationship between trade and financial development, particularly, in the presence of opposite effects at different time frequencies.

Using a panel data pooled from 88 developed and developing countries for the 1960–2005 period, we find evidence of a strong link between financial development and trade openness. While trade openness is detrimental to financial development in the short run, it ultimately contributes to financial development in the long run. But when splitting the data into different income or inflation groups, these results can be observed only in relatively low-income countries or high-inflation economies.

The remainder of the paper is organized as follows. Section 2 introduces the PMG estimator proposed by Pesaran et al. (1999). Section 3 describes the data and source, Section 4 reports empirical results and robustness tests. And Section 5 concludes the analysis.

2. The autoregressive distributed lag approach

To examine the long-run effect of trade openness on financial development, it is common to estimate the following (static) cross-sectional regression:

$$finance_{it} = \alpha + \beta trade_{it} + \omega' controls_{it} + \varepsilon_{it}, \quad (1)$$

Where $finance_{it}$ is the level of financial development in period t for country i, $trade_{it}$ is the trade openness index, $controls_{it}$ is a set of control variables, and ε_{it} is the error term. Since all variables are averaged over 5- or 10-year period in order to abstract from the business cycle effects, t indicates a period index representing the 5- or 10-year window.

As an alternative, this paper assesses the effect of trade on financial development using dynamic panel econometric techniques. As argued in Catao and Solomou (2005) and Catao and Terrones (2005), the dynamic panel approach not only mitigates endogeneity issues but also accommodates the substantial persistence of trade adjustments and captures potentially rich financial development adjustment dynamics. In addition, the model also allows us to control for heterogeneity in the relationship between trade and finance across countries by including individual-specific effects. Moreover, we are able to estimate an empirical model that encompasses the long- and short-run effects of trade on financial development using a data field composed of a relatively large sample of countries and annual observations.

In a panel data specification, Eq. (1) is nested in an ARDL specification to allow for rich dynamics in the way that financial intermediary development (*finance*) adjusts to changes in trade openness (*trade*) and other explanatory variables (*controls*). The ARDL (p, q, … ,q) model where the dependent and independent variables enter the right-hand side with lags of order p and q, respectively, can be written as

$$y_{it} = \mu_i + \sum_{j=1}^{p} \lambda_{ij} y_{it-j} + \sum_{j=0}^{q} \delta_{ij}' x_{it-j} + \varepsilon_{it} \quad (2)$$

where $i = 1, 2, \ldots, N$ is a country index, $t = 1, 2, \ldots, T$ is a time index (at the annual frequency), j is the number of time lag, $y_{it} = finance_{it}$, $x_{it} = (trade_{it}, controls_{it})$ and μ_i is for the fixed effects.

By re-parameterization, Eq. (2) can be written as

$$\Delta y_{it} = \mu_i + \phi_i y_{it-1} + \beta_i' x_{it} + \sum_{j=1}^{p-1} \lambda_{ij}^{*} \Delta y_{it-j} + \sum_{j=0}^{q-1} \delta_{ij}^{*\prime} \Delta x_{it-j} + \varepsilon_{it}, \quad (3)$$

where

$$\phi_i = -(1 - \textstyle\sum_{j=1}^{p} \lambda_{ij}),\ \beta_i = \sum_{j=0}^{q} \delta_{ij},$$

$$\lambda_{ij}^{*} = -\sum_{m=j+1}^{p} \lambda_{im},\ j = 1, 2, \ldots, p-1, \text{and}$$

$$\delta_{ij}^{*} = -\sum_{m=j+1}^{q} \delta_{im},\ j = 1, 2, \ldots, q-1.$$

[5] There are also feedbacks from financial development to trade either for insurance consideration (Svaleryd and Vlachos, 2002), or because better financial systems allow countries to specialize in goods that rely on external finance in production (Kletzer and Bardhan, 1987; Beck, 2002).

[6] The PMG estimator has been recently applied to measure the effect of exchange rate uncertainty on investment (Byrne and Davis, 2005), to assess the trade effect of real effective exchange rates (Catao and Solomou, 2005), to examine the impacts of fiscal deficits on inflation (Catao and Terrones, 2005), to estimate the relationship between financial development and economic growth (Loayza and Ranciere, 2006), to investigate the effect of income inequality to economic growth (Frank, 2009), and to test for the Fisher effect (Lin, 2009).