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Trade, growth and growth volatility: New panel evidence[☆]

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ABSTRACT

This paper examines the relationships of trade with economic growth and growth volatility using the Chudik and Pesaran (2013) cross-sectionally augmented autoregressive distributed lag (CS-ARDL) panel data approach to account for the potential dynamic heterogeneity and cross-section dependency in the effects of trade. Some important results emerge. First, greater international trade, on average, promotes economic growth and amplifies growth volatility in the long run, and hence induces a positive long-run association between growth and growth volatility. Second, greater international trade stimulates economic activities and mitigates economic fluctuations, on average, in the short run, and therefore causes a negative short-run correlation between growth and growth volatility. And third, there is large heterogeneity in the effects of trade, depending upon a country's development level, financial system, macroeconomic policies, human capital, corruption, and labor regulation.

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1. Introduction

A central debate in international trade is on whether there is a significant growth gain from trade. In spite of a strong theoretical case that trade liberalization should improve economic growth, the growth effects of trade liberalization have not been easy to demonstrate in cross-country and panel data. Theoretically, increased international trade improves economic growth by facilitating the diffusion of knowledge and technology (Barro & Sala-i-Martin, 1997; Grossman & Helpman, 1990; Rivera-Batiz & Romer, 1991), by allowing economies to better capture the potential benefits from increasing returns to scale and exploit economies of specialization according to comparative advantage (Ades & Glaeser, 1999; Alesina, Spolaore, & Wacziarg, 2000; Romer, 1989), and by creating incentives for governments to adopt more disciplined types of macroeconomic management and develop better institutions under the pressures of international competition (Levchenko, 2013; Rajan & Zingales, 2003; Sachs & Warner, 1995). Empirically, Frankel and Romer (1999), Irwin and Tervio (2002), Dollar and Kraay (2003), Alcala and Ciccone (2004), Wacziarg and Welch (2008), and Herzer (2013) find that trade significantly enhances economic growth and development. However, Rodriguez and Rodrik (2000), Lee, Ricci, and Rigobon (2004), Rodrik, Subramanian, and Trebbi (2004), and Schularick and Solomou (2011) find the relationship between economic growth and trade openness is statistically either weak or insignificant. Rigobon and Rodrik (2005) even report negative significant effects of trade openness on per-capita income levels, controlling for institutions and geography.

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The substantial postwar growth volatility that many developing countries experience has also brought to the forefront the question whether and to what extent output fluctuations can be related to trade liberalization. Understanding the link between trade and growth volatility is independently relevant for understanding the process of economic development and is indirectly related to growth because growth volatility can influence poverty and income inequality (Laursen & Mahajan, 2005). While there are strong arguments that trade liberalization should enhance international risk sharing and reduce growth volatility, in practice the empirical effects of trade on growth volatility are less clear-cut. International goods market integration can increase growth volatility, because trade promotes specialization of production according to comparative advantage, and economies with a more specialized production structure will be more vulnerable to external economic shocks. However, growth volatility could decline if rising trade flows are associated with increased vertical specialization across countries (Razin & Rose, 1994), if openness to international trade leads to production specialization in more complex goods and hence less volatile sectors (Krishna & Levchenko, 2013), if openness to foreign goods markets can reduce an economy's susceptibility to sudden stops and currency crashes (Bordo, Cavallo, & Meissner, 2010; Cavallo & Frankel, 2008), or if increased international competition and the prevalence of formal international contracts can discipline policymakers and hence limit the risk of domestic policy mistakes. On the empirical front, while some studies report a significantly positive relationship between trade openness and output volatility, especially in developing countries (di Giovanni & Levchenko, 2009, 2012; Easterly, Islam, & Stiglitz, 2001; Easterly & Kraay, 2000), others find an insignificant or even a negative effect of trade openness on macroeconomic volatility (Karras, 2006; Razin & Rose, 1994). Still, Easterly et al. (2001) claim that external shocks can only explain a small fraction of the long run variance of real per capita GDP and the underlying institutional and policy environment play a critical role. More generally, Raddatz (2007) finds that in low-income countries domestically induced shocks—related to social conflict, economic mismanagement, and political instability—account for the bulk of fluctuations in GDP per capita.

The empirical inconclusiveness arises in large part from methodological shortcomings. Existing empirical evidence is typically based on growth regressions in a cross-country setting or homogeneous panel data context and hence is subject to serious drawbacks in the estimation process including the endogeneity bias and country heterogeneity. Cross-country studies look at the cross-sectional correlation between trade and growth (growth volatility) rather than at the within variation. Hence existing inferences may be potentially driven by omitted factors influencing both trade and growth (growth volatility) in the long run. A causal link between trade and growth (growth volatility) suggests that we should also see a relationship between changes in trade and changes in growth (growth volatility). In other words, we should ask whether a given country (with its other characteristics held constant) is more likely to experience higher economic growth (growth volatility) with increased trade liberalization.

Panel estimation focuses on the within variation and can account for unobserved time-specific and country-specific effects that mitigate the omitted variable bias, but is not able to account for the heterogeneity in the relationship between trade and both growth and volatility across countries. This heterogeneity is emphasized in several theoretical models. Trade's growth effect varies considerably across countries and depends upon an economy's structure and institutions that determine the degree of factor mobility between sectors, the pattern of comparative advantage and the type of specialization, and the ability of a country to invest in physical or human capital or adopt foreign technology. Chang, Kaltani, and Loayza (2009) and Minier and Unel (2013) indeed provide empirical evidence in supporting that the growth effect of openness depends on a variety of structural characteristics including economic and institutional endowments, and government regulation and policies. Likewise, depending upon a wide array of country-specific factors, including financial market depth and institutional quality, that determine a country's ability to enforce contracts, hedge external risks, and diversify domestic shocks, trade may aggravate or alleviate growth volatility (Krishna & Levchenko, 2013). As put forth by Temple (1999, 2001), pooling a number of heterogeneous countries with different economic and institutional frameworks as typical in the empirical literature may suffer from influential outliers and produce unsatisfactory estimates. Moreover, and perhaps more importantly, the homogeneous panel estimators used in these studies produce inconsistent and potentially misleading estimates when the slope coefficients differ across countries (Pesaran & Smith, 1995).

While pooling of heterogeneous countries might lead to an incorrect inference, pooling of long- and short-run nature of trade in the growth process might also cause a bias conclusion. Most studies focus on the long-run effects of trade openness on growth and volatility. However, short-run considerations might also play a role in the relationships. In short-run business cycle models, trade (net exports are part of real GDP) clearly determines a country's economic activity and fluctuation. Moreover, a growing literature on the role of trade in international business cycle transmissions has established what has become a well-known empirical regularity: country pairs that trade more with each other experience higher business cycle correlation (Calderon, Chong, & Stein, 2007; Frankel & Rose, 1998). The 2008 global financial crisis has also witnessed that the increased risk of financial instability and crises with trade globalization induces greater trade volatility and recessions. Accordingly, econometric assessments of the relationships of trade with growth and volatility should ideally be capable of uncovering the relevant long-run parameters amidst a short-run link between these variables. Typically, this is handled by averaging the data over some period of time such as 5 or longer years to mitigate business cycle effects. However, averaging data may lead to information loss especially when the data are highly persistent; and it is not obvious that averaging over fixed time intervals will effectively eliminate business cycle effects as the length of the interval over which averages are computed is arbitrary and the length of business cycles varies over time and across countries.

There is also interdependence within and among countries, which arises possibly from spatial correlations, spillover effects, omitted global variables, and common unobserved shocks. Particularly, in a globalizing world economies interact through economic, cultural, political and other ties. This creates a web of interconnectedness within and across countries, leading to the breakdown of standard panel estimators employed in the existing cross-country studies (Pesaran, 2006).

In this paper, we examine the relationship between trade openness, growth, and volatility using a large panel dataset of countries. It contributes to the current empirical literature in several important dimensions. First, we investigate the volatility effects of

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