Trade openness and economic growth: Bayesian model averaging estimate of cross-country growth regressions ☆

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ABSTRACT

In this paper, we investigate the robustness of the relationship between trade openness and long-run economic growth over the sample period 1960–2000, utilising Bayesian model averaging techniques to account for model uncertainty issues in a systematic manner. We find no evidence that trade openness is directly and robustly correlated with economic growth in the long run. We further check the robustness of this finding by employing a battery of proxies for trade openness, namely, current openness, real openness, the fraction of open years based on the Sachs and Warner (1995) criteria and the weighted averages of tariff rates, non-tariff barriers and the black market premium. The main result is robust to the inclusion of different trade openness proxies and none of the proxies is robustly associated with economic growth. The data evidence also indicates that economic institutions and macroeconomic uncertainties such as those induced by high inflation and excess government consumption are key factors in explaining economic growth.

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1. Introduction

The volume of world merchandise exports grew by 6% on average while the world GDP grew by around 3% in the second half of the 20th century.[1] This trend is even more discernable with the further integration of bigger economies such as China and India into the global economy. Does this imply that the world is to enjoy even higher long-run growth rates of material well-being as countries trade more and more with each other? This is one of the oldest questions in economic theory and has been extensively studied by empirical researchers. The literature, however, is still far from settled.

The results of empirical studies on the topic are very sensitive to model specification. Although some studies address the problem of model uncertainty, their approaches are neither systematic nor complete. For example, applying "kitchen sink" exercises, Easterly and Levine (2003), Dollar and Kraay (2003), Alcalá and Ciccone (2004)

and Rodrik et al. (2004) carry out a "horse race" among geographical, institutional and trade-related determinants of economic growth. However, these studies are still subject to model uncertainty problems as noted by Durlauf et al. (2008a) since they are based on specific choices of growth determinants.

The purpose of this paper is twofold: first, to revisit the growth and trade openness link in a cross-section of countries over the sample period of 1960–2000 and second, to take into account model uncertainty issues in a statistically coherent and comprehensive manner using Bayesian model averaging techniques. In doing so, we experiment with a number of openness measures as well as various growth theories and their proxies in the framework of the augmented neo-classical growth model developed by Mankiw et al. (1992). Using Bayesian model averaging techniques sets this study apart from previous cross-country empirical studies which predominantly estimate and report a small number of regressions. This paper explores the openness-growth link over a much longer time period, enabling us to better account for both trade policy stance and growth dynamics in the long run, whereas previous studies mainly focus on the 1970–1990 period. This paper also contributes to the debate on growth determinants in the empirical cross-country growth literature since we carefully and systematically consider a wide range of growth theories and their proxy variables in our Bayesian model averaging application.

As pointed out by Rodrik and Rodríguez (2000), measuring trade openness is a challenging task and most of the empirical work based

on cross-country growth comparison fail to provide a satisfactory openness measure. Since openness is defined as removing policy barriers to international trade rather than trade intensity, we attempt to employ openness measures directly amenable to trade policy. In doing so, we construct three additional composite trade policy indexes: the weighted average of tariff rates, non-tariff barriers and black market premium.

Another important concern in the openness-growth literature is establishing the direction of casuality: Does openness result in or from growth? Indeed, this concern is valid for most of the growth theories considered in this study. Overcoming this problem is, however, a non-trivial issue not only because of extra computational burden required but also, even more importantly, difficulties in finding or constructing valid instrumental variables, particularly so when the number of regressors is enormous.[2] Therefore, our findings reveal a robust relationship between growth and suggested explanatory variables, without establishing a direction of casuality.

We find that trade openness is not robustly associated with long-run economic growth when uncertainty issues regarding specification and measures of trade openness are dealt with and when a sample covering a longer period is used. We also find substantial evidence in favour of sound economic institutions and macroeconomic stability as determinants of long-run growth.

The paper is organized as follows. The next section, Section 2, briefly reviews the literature on the relationship between trade openness and economic growth. Section 3 describes the methodology. Section 4 provides a cross-country growth model for our Bayesian model averaging application. Section 5 deals with implementation issues. Findings are presented and discussed in Section 6. Finally, Section 7 concludes.

2. Literature review

In the literature, the relationship between openness and economic growth was, until recently, assessed in the framework of the traditional Ricardian–Heckscher–Ohlin model. This model points out that openness to international trade brings only a one-time increase in output, since the country allocates its resources more efficiently after opening up based on its comparative advantages, having no implications for long-run growth. The neoclassical growth model implies that per capita output growth rate in the long-run is determined by exogenous technological progress. It also suggests that an increase in the saving rate generates a temporary rise in the growth rate. Of course, openness may impact the long run growth rate if there is a technology-stimulating effect of openness. However, neither the traditional Ricardian–Heckscher–Ohlin nor the neoclassical growth model provides a theoretical framework for the hypothesis that openness stimulates technological progress.

In this regard, only more recent endogenous growth theories pay attention to the implications of trade openness on long-run growth. The models of Rivera-Batiz and Romer (1991) and Grossman and Helpman (1991, Chapters 6 and 9) provide a firmer theoretical framework linking trade policy to long-run economic growth. According to these models, openness to international trade provides four distinct opportunities that may lead to long run economic growth:

  i) Communication effect: Openness to international trade provides opportunities for communicating with foreign counterparts, which in turn facilitate the transmission of technologies.
 ii) Duplication effect: In the absence of international trade, some ideas and technologies are duplicated in multiple countries.

Openness encourages firms to invent new and distinct ideas and technologies and, consequently, prevent duplication of R&D efforts.
iii) Integration effect: Trade openness increases the size of the market accessible to firms. Assuming intermediate goods as well as final goods are traded across countries, larger market size of the R&D sector raises R&D activity and, consequently, economic growth as this sector is subject to increasing returns to scale. On the other hand, after opening up to trade, the domestic R&D sector faces foreign competition and, as a result, may lose market share at home, leading to a slowdown in economic growth.
iv) Allocation effect: Trade openness leads countries to specialise according to comparative advantages that are determined by factor endowments. Relative domestic prices of factors will alter after opening up to trade, as predicted by the Stolper–Samuelson theorem. If a country has a comparative advantage in a sector that is unskilled labour intensive, trade openness reduces the relative wage of skilled labour compared to unskilled labour. This leads to a rise in the level of R&D activities, and, consequently, in the long-run growth rate, as the cost of R&D decreases and/or the fraction of skilled labour endowment employed in R&D increases. The exact opposite takes place in a country that specialises in skilled-labour-intensive goods.

Among these different effects, only the communication and duplication channels necessarily raise economic growth. However, the allocation and integration effects are not unambiguously positive. Therefore, it is possible to conclude that the influence of openness to international trade on long-run economic growth depends on the magnitude and dominance of these different effects. In other words, endogenous growth theories do not necessarily predict that openness leads to higher economic growth under all circumstances and for all countries.

The openness-growth nexus has been the subject of a large number of empirical studies. The main body of the empirical literature consists of the cross-country studies dating back to the 1970s. Early cross-country work (for instance, Balassa (1978), Feder (1982), Ram (1987), inter alia) investigates the relationship between openness and growth in the framework of neoclassical growth accounting. They consider exports as a proxy for trade openness, and almost all of them conclude that export or outward trade orientation increases economic growth.

This issue drew renewed interest in the early 1990s, partly because of new analytical tools provided by endogenous growth theories and a considerable number of liberalisation reforms in developing countries during the 1980s. Consistent with earlier cross-country studies, they affirm the strong and positive relationship between trade openness and economic growth. The salient feature of these studies is that they employ new openness measures directly addressing trade policy and orientation. Moreover, these studies substantially benefit from the contributions of Barro (1991) and Mankiw et al. (1992) to cross-country growth empirics. Empirical researchers revisit the openness-growth relation taking into account important growth determinants.

For instance, employing an openness measure based on international price deviations, Dollar (1992) concludes that openness is positively associated with economic growth. Edwards (1992, 1998) provides strong evidence supporting that more open countries grow faster. In his later study, out of nine alternative openness and trade intervention measures, eight are found to be significant with the expected signs. Ben-David (1993) finds absolute convergence in per capita income in a sample of open countries whereas closed countries do not tend to converge. Lee (1993), constructing a composite indicator on the basis of "free trade openness", measured as the import share in the absence of trade barriers, shows that the import-weighted tariff rate and the black market premium are detrimental to economic

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[2] Some recent applications of Bayesian model averaging in the growth literature, including those by Durlauf et al. (2008a), Mirestean and Tsangarides (2009) and Moral-Benito (2012), attempt to deal with the problem of reverse casuality using panel data. These studies generally employ initial or lagged values of endogenous variables as instruments.