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**Working Paper**

## The rise of China and India: blessing or curse for the advanced countries?

ECB Working Paper, No. 1620

**Provided in Cooperation with:**

European Central Bank (ECB)

*Suggested Citation:* Stracca, Livio (2013) : The rise of China and India: blessing or curse for the advanced countries?, ECB Working Paper, No. 1620, European Central Bank (ECB), Frankfurt a. M.

This Version is available at:

<https://hdl.handle.net/10419/154053>

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EUROPEAN CENTRAL BANK

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## WORKING PAPER SERIES

NO 1620 / DECEMBER 2013

# THE RISE OF CHINA AND INDIA BLESSING OR CURSE FOR THE ADVANCED COUNTRIES?

Livio Stracca



In 2013 all ECB publications feature a motif taken from the €5 banknote.



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**NOTE:** This Working Paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB.

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**Acknowledgements**

I thank one anonymous referee as well as participants at a seminar at the ECB and at the Central Bank of the Republic of Turkey, in particular Murat Ünğör, for useful comments. The views expressed in this paper belong to the author and are not necessarily shared by the ECB.

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<b>ISSN</b>	1725-2806 (online)
<b>EU Catalogue No</b>	QB-AR-13-117-EN-N (online)

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## Abstract

This paper evaluates the impact of the rise of large emerging manufacturing exporters such as China and India on economic growth in advanced countries. After illustrating the possible theoretical channels, I estimate a growth regression based on 3-year average data augmented with country-specific measures of import and export competition from China and India using instrumental variables. Stronger import competition from China and India leads to stronger income growth in advanced countries, but to a loss of manufacturing jobs. A more flexible labour market, lower concentration of employment in manufacturing and pre-existing trade links with China and India help advanced countries to maximise the growth dividend resulting from their rise in world export markets.

**Keywords:** Globalisation, China, India, economic growth, trade, comparative advantage, offshoring.

**JEL:** F02, F15.

## Non-technical summary

In this paper I focus on the impact of the rise of key emerging markets in exports on income and employment growth in advanced countries. In particular, I focus on China and India because they have been by far the most important manufacturing exporters and do not look at commodity exporters which are driven by different factors and have different implications for world trade.

The empirical analysis is based on a panel of advanced countries. I first define measures of import and export competition from China and India that are country-specific, and I regress income and employment growth in each advanced country on them. Because both of them may be potentially affected by country-specific shocks emanating from each advanced country, I apply an instrumental variables estimation in order to deal with the reverse causality problem. I instrument import and export competition with the first difference in the world export share of China and India, after controlling for growth in advanced countries other than the one considered. In a second step of the analysis, I regress income and employment growth in each advanced country directly on the first difference of the China and India's export share, and interact the change in the export share with pre-determined country characteristics in order to find out which of them makes each advanced country better prepared to face the rise in emerging countries.

The key results of the paper are three. *First*, I find that the role of import competition from China and India is positive for income growth in advanced countries, while export competition is insignificant. This implies that, overall, competition from China and India has been mostly beneficial for advanced countries. *Second*, both export and import competition are negative for manufacturing employment, but not for total employment. *Third*, the analysis of the transmission channels reveals that countries with a lower share of employment in manufacturing and lower Employment Protection Legislation have benefited comparatively more from the rise of China and India. To some extent, also pre-existing trade links with China and India have a beneficial impact on the growth consequences of the rise in China and India for advanced countries. Results for both the baseline analysis and the transmission channels are both economically significant and policy-relevant.

Overall, the answer to the question whether the rise of China and India is more a benefit or a curse for advanced countries is that on balance the effect is beneficial. Moreover, economies that are less specialised in manufacturing, more flexible and with stronger trade connection with China and India benefit more from their rise in world export markets.

# 1 Introduction

Large emerging countries have become a powerhouse of the world economy in the last two decades. The BRIC (Brazil, Russia, India and China) account for about 25% of the world economy, a quarter of world's land and more than 40% of the world's population. Manufacturing powerhouses such as China and India, in particular, have reshaped world trade. The world export share of China and India has increased dramatically between 1970 and 2012 (*Figure 1*), and over on tenth of all world exports are now coming from China.<sup>1</sup> This has correspondingly changed the global allocation of income. The weight of China and India in world GDP increased from little above 4 per cent in 1980 to over 20 per cent in aggregate in 2012. The boom in emerging markets has been particularly visible starting in particular from the late 1990s, in the aftermath of the Asian crisis, as visible in the acceleration of the export share. Trade between the world's two largest economies, the US and China, has also boomed (*Figure 2*), with the US now importing goods for close to 500 billion US dollars from China each year, or about 3% of its GDP.

The rise of large emerging markets (the "South") and the boom in trade with advanced economies (the "North") led to a situation where, starting in 2010, North-South trade has become larger than North-North trade (the North is proxied by the OECD, the South by the non-OECD countries). The turn of the 2000s also marks the historic event of China joining the World Trade Organisation (in 2001) a few years after Brazil and India (1995), while Russia has joined only recently. Given the importance of China within the BRIC group, there is reason to believe that 2000 marked a real change in the world economic order and in international trade.<sup>2</sup>

The consequences of this *qualitative* revolution in world trade are an important subject of public debate in the advanced countries. In particular, concerns about the consequences of the rise of the large emerging economies for growth, jobs and welfare in advanced countries, not least the US, have been voiced. Despite the great public interest and media attention (see e.g. the book by Lawrence and Edwards 2010), few studies have addressed this question in a systematic manner. In this paper I focus on the impact of the rise

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<sup>1</sup>Note that the figures reported in Figure 1 do not net out intra-euro area trade. If intra euro area trade was netted (i.e. the euro area was considered as a single economy) the weight of China and India becomes even larger.

<sup>2</sup>In 2010, China accounted for about 62% of total BRIC exports and 55% of BRIC GDP.

of key emerging markets in exports on (especially) income and employment growth in advanced countries. In particular I focus on China and India because they have been by far the most important *manufacturing* exporters, and do not look at commodity exporters which are driven by different factors and have different implications for world trade.<sup>3</sup> In a nutshell, has the export boom of China and India been more a blessing or a curse for advanced countries?<sup>4</sup>

The empirical analysis is based on a panel of advanced countries (the North). I first define measures of import and export competition from China and India that are *country-specific*, and I regress income and employment growth in each advanced country on them. Because both of them may be potentially affected by country-specific shocks emanating from each advanced country, I use instrumental variables in order to address reverse causality. In particular, I instrument import and export competition with the first difference in the world export share of China and India, after controlling for growth in advanced countries other than the one considered. In a second step of the analysis, I regress income and employment growth in each advanced country directly on the first difference of the China and India export share, and interact the change in the export share with pre-determined country characteristics in order to find out which of them makes each advanced country better prepared to face the rise in emerging countries. For example, are countries that are already more concentrated on manufacturing losing out to stronger Chinese and Indian competition, in terms of income growth? Among these country characteristics, I also include measures of pre-existing trade links with China and India.

The focus of this paper is on the effect of the export boom in China and India on advanced countries from a *medium to long term perspective*, and I therefore use 3-year averages to smooth out fluctuations at business cycle frequency. This distinguishes this paper from previous research (see Dreger 2011) that is more focused on the business cycle frequency, for example quarterly. Moreover, I do not look at the effect of imports from

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<sup>3</sup>Indeed, between 1995 and 2011 the share of world manufacturing exports went from 3.4% to 15.4% for China, and from 0.6% to 1.6% for India. Manufacturing exports are less significant in other large emerging economies; the growth rate was much smaller for Brazil and Russia. Mexico went up from 1.7% to 2.1%, but most of its manufacturing exports are to the US. I thank Murat Üngör for providing me with these data.

<sup>4</sup>Note that the question of impact of trade with emerging countries on growth is related to, but distinct from, the effects of *globalisation* more generally; the focus here is on the effect of the boom in emerging countries as such - and in particular their better ability to export - on advanced countries' economies.

emerging markets on inflation; on that question, see among others Lipinska and Millard (2011).

The rise of the South in the last two decades can be seen as a large natural experiment which should give the profession some useful information about international interdependency and their modelling. Although this paper is empirical, it may be useful to first outline the potential theoretical channels. In the standard theory of international trade (Grossman and Helpman 1991), more trade - including North-South trade - is always beneficial for all participants. The rise of the South and the larger possibility for the North to trade with the South pushes the global economy to a more efficient frontier where both North and South can leverage their comparative advantage. On the supply side, Northern firms are better able to off-shore production where it is most convenient and intensify intra-industry trade. Navas and Licandro (2011) also emphasise the nexus between trade openness and innovation and productivity growth; Melitz and Ottaviano (2008) propose a tractable model to study the effect of market openness and competition on firm productivity and mark-ups. In this connection, Bloom et al. (2013) develop an interesting mechanism whereby stronger competition from a low wage country causes innovation to increase in high wage regions. In their model, factors of production have costs of adjustment and are partially "trapped" in producing old goods; trade liberalization with a low wage country reduces the profitability of old productions leading to a fall in the opportunity cost of innovating. Fujiwara et al. (2013) suggest that, in a standard neoclassical two-country model, opening up and productivity growth in China leads to stronger growth of output and improved welfare also in advanced economies, but the main channel is different. In their model, the improvement in the terms of trade in the rest of the world (countries which import from China) leads to an increase in output, consumption, investment and labour.

However, it is also possible to build models where trade with the South is not necessarily and always beneficial to the North. Krugman and Venables (1995) show that a single factor, the decline in transportation costs, can first create an advantage for manufacturing in the North (due to larger agglomeration effects and increasing returns to scale), creating an industrialised core and a de-industrialised periphery, but then take away this advantage if manufacturing in the South becomes more profitable due to lower labour costs. Therefore, the fall in transportation costs first produces a division into a rich North and



a poor South, but later a convergence which can be detrimental to the North, even in absolute terms. Using more standard models without agglomeration effects, Kehoe et al. (2011) show that there is no general connection between trade liberalization and increases in real GDP per capita and the relationship may even be negative. In particular, in a dynamic model with capital accumulation some countries experience slower rates of growth under free trade than under autarky. While opening to trade improves welfare, it does not necessarily increase real GDP per capita or speed up growth. The authors even point out that if openness does in fact lead to large increases in real GDP, these increases do not come from the standard mechanisms of international trade.

Other models have emphasised that increased trade integration may lead to benefits in the long term but to costs in the short term. In particular, competitive pressure from the South as well as greater market opportunities abroad may spur a sectoral reallocation of production in the North. In Dinopoulos and Segerstrom (2007), with trade globalisation Northern firms devote more resources to Research and Development (R&D), while Southern countries like China take care of the production side. Moreover, profits by Northern quality leaders rise when these firms are able to sell to a large South market of consumers. In the long run, such reallocation is optimal and leads to higher growth and welfare, but in the short to medium term it may be hindered by adjustment costs. As noted by Arnold (2002), labour market institutions play a crucial role in making this adjustment process smoother: Northern workers who lose their job due to imitation from the South have to be able to quickly find a new job in one of the sectors where the North maintains a comparative advantage. Without enough labour market flexibility, the gains from trade may be dissipated. Product market flexibility should play a similar role.<sup>5</sup>

The analysis in this paper is most closely related to recent work by Autor et al. (2013), who look at the effects of Chinese import competition in local labour markets (commuting zones) in the United States between 1990 and 2007, using decade-level data. Autor et al. also use instrumental variables and find that stronger import competition from China leads to a fall in manufacturing employment in US commuting zones, lower labor force participation, and reduced wages. While the spirit of the analysis is similar, this paper departs from Autor et al. in several respects. First, and obviously, it is based on country

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<sup>5</sup>Note that in this paper I do not look at the effect of the rise of emerging markets on growth *volatility*. It has been known at least since Newberry and Stiglitz (1984) that trade integration may facilitate the spillover of shocks across borders and increase volatility. See also Stiglitz (2010).

rather than regional data and focuses on income rather than employment. Second, in this paper I also look at export competition, and not only at import competition. Third, one advantage in using country data is the possibility to test for possible transmission channels, by interacting country characteristics with the shock associated to the rising importance of China and India in international trade. More generally, it is important to stress that taking a country perspective may differ from a regional or industry-level perspective, as pointed out by Krugman (1996).

There is also a small literature on the transformation of China specifically. Iacovone et al. (2013) look at the impact of the surge in Chinese imports into Mexico between 1994 and 2004. They find that the Chinese shocks causes a significant reallocation among Mexican firms, with smaller plants and more marginal products seeing their sales reduced but not large plants and core products. Schott (2008) shows that China's export bundle significantly overlaps with that of developed economies, but on the other hand Chinese exports sell at a discount relative to other countries, indicating that these countries have moved to higher value added productions. More generally, he also finds that country export prices co-vary positively with their level of development. Overall, this implies that implications of China as a competitor for wages in advanced countries are not clear-cut. Üngör (2012) looks at the impact of the industrialisation of China on US industrial employment share between 1978 and 2005. Bugamelli et al. (2010) find that increases in the share of Chinese products in total Italian imports have a negative causal impact on firms' price dynamics, but a positive impact on firm productivity.

The empirical analysis uncovers three main results. First, the role of import competition from China and India is found to be positive for income growth in advanced countries, while export competition is insignificant in the instrumental variables regressions. On the whole, therefore, I find that competition from China and India has been beneficial for advanced countries. At the same time, and this is the second main result, I also find that both export and import competition are negative for manufacturing jobs, but not for jobs more generally. This confirms the idea that competition from China and India has triggered a reallocation process within advanced countries, away from manufacturing. In the short term, this process may be costly. Consistent with this idea, in the analysis of the transmission channel my third main result is that countries with (i) a higher share of employment in manufacturing and (ii) higher Employment Protection Legislation -

namely countries where the reallocation process may have been more difficult - have benefited comparatively less from increases in the China and India export share. I also find, but this appears to be a somewhat less robust result, that pre-existing trade links with China and India have a beneficial impact on the growth consequences of the rise in China and India for advanced countries. Finally, results for both the baseline analysis and the transmission channels are economically significant. For example, I find that one standard deviation increase in import competition from China and India raises growth in income per capita by about 1% per year. All in all, the answer to the question posed in the title of this paper is "more a blessing", and a blessing accruing in particular to countries that are less specialised in manufacturing and more flexible.

The paper is organised as follows. Section 2 describes the empirical model, Section 3 the database. Results are presented in Section 4. Section 5 contains conclusions and policy implications.

## 2 The empirical model

The empirical includes two parts. First, I test the effect of import and export competition on income and employment growth in advanced countries (Section 2.1). Second, I look at the transmission channels (Section 2.2).

### 2.1 The effect of competition from China and India on income and employment growth

The baseline estimated equation in the first part of the econometric analysis is

$$\Delta y_{it} = k_i + \rho \Delta y_{i,t-1} + \alpha y_{i,t-1} + \beta \Delta y_{it}^{*i} + \gamma_{imp} Mcomp_{it}^{chindia} + \gamma_{exp} Xcomp_{it}^{chindia} + \delta z_{it} + \varepsilon_{it} \quad (1)$$

where  $\Delta y_{it}$  is per capita output growth,  $z_{it}$  is a vector of controls,

$$Mcomp_{it}^{chindia} = \Delta \left( \frac{M_{it}^{chindia}}{M_{it}} \right) * openness_{i,t-1} \quad (2)$$

$$Xcomp_{it}^{chindia} = \Delta \left( \frac{X_{chindia,t}}{X_{it}} \right) * openness_{i,t-1} \quad (3)$$

and  $\setminus i$  defines the group of advanced countries with the exception of  $i$ . Equation (1) is estimated on 3-year averages, so as to eliminate at least some of the noise associated with business cycle fluctuations.

Import and export competition from the aggregation of China and India, henceforth "Chindia", are  $Mcomp$  and  $Xcomp$ . They are respectively defined as in (2) and (3), where  $M$  measures log exports and  $X$  log imports (in US dollars) and  $openness$  is the country's trade openness. Import competition (competition in the *Home* market) is assumed to depend on the first difference of the import share of Chindia in country  $i$ , multiplied by the country's trade openness, which is assumed to increase the country's sensitivity to trade with Chindia. A similar specification applies for export competition (i.e. competition in the *World* market), where the driving factor is assumed to be the change in the relative performance of Chindia vs. the considered country.

The estimation of both  $\gamma_{imp}$  and  $\gamma_{exp}$  raises reverse causality concerns. Stronger growth in country  $i$ , for example driven by a country-specific technology shock, could both attract more imports from emerging markets as well as influence the relative export performance vs. Chindia. In particular, there is a potential positive bias on  $\gamma_{imp}$  and a negative one on  $\gamma_{exp}$ . Similar to Autor et al. (2013), we apply an instrumental variables (IV) estimation where the instrument is the change in the world export share of China and India. The assumption here is that the variation in the world market of Chindia is driven, especially at lower frequencies such as 3-year averages, by shocks making China and India better exporters rather than by shocks taking place in *individual* advanced countries. While the change in the export share may reflect the growth of income in *all* advanced countries, once controlling for this variable (through the inclusion of  $\Delta y_{it}^{\setminus i}$  in equation (1)), it is unlikely that growth in country  $i$  as such is of any material importance, implying that the Chindia market share is a valid instrument for  $Xcomp$  and  $Mcomp$ .<sup>6</sup>

Because the change in the Chindia export market share and its lags are not sufficiently strong instruments for both  $Xcomp$  and  $Mcomp$  simultaneously, I instrument them one at the time, leaving the other as control variable. In the continuation, therefore, "IV imp" will imply a regression where import competition is instrumented, and "IV exp" one where export competition is instrumented.

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<sup>6</sup>Bloom et al. (2011) use the removal of product-specific quotas following China's entry in the WTO as the way to address endogeneity.

A *caveat* to this identification scheme is that it assumes that country  $i$  is small enough not to affect global economic conditions (and hence Chindia overall export performance) directly. For this reason, as a robustness exercise I repeat the analysis after removing the largest three advanced countries (US, Japan and Germany); concerns about reverse causality are indeed much more limited for the remaining smaller open economies in the group of 22 advanced countries that I use (see Table 1).

Note that because equation (1) contains fixed effects  $k_i$ , we do not need to control for factors affecting per capita growth in the cross section, such as education or the geographical position. However, I include lagged CPI inflation and trade openness as they turn out to be mostly significant when included in equation (1). Results are largely the same when excluding these control variables.

I also run a separate regression for employment growth, both total and manufacturing sector only, in order to understand whether there are influences stemming from competition from China and India that do not go exclusively through the effect on income growth. The estimated equation is, in this case,

$$\Delta e_{it} = k_i + \rho \Delta e_{i,t-1} + \alpha \frac{e_{i,t-1}}{pop_{i,t-1}} + \beta \Delta y_{it} + \gamma_{imp} Mcomp_{it}^{chindia} + \gamma_{exp} Xcomp_{it}^{chindia} + \delta z_{it} + \varepsilon_{it} \quad (4)$$

where  $e$  is employment in log (total or manufacturing),  $pop$  is total population (hence  $\frac{e_{i,t-1}}{pop_{i,t-1}}$  is the lagged employment share) and we now control for per capita income growth in each country,  $\Delta y_{it}$ . Again the main focus is on the coefficients  $\gamma_{imp}$  and  $\gamma_{exp}$ .

While the perspective of this paper is country-level and macro, I also take a limited step towards a more sectoral analysis by looking at the effect of import and export competition from Chindia on value added growth in (i) manufacturing, (ii) services, (iii) tradables and (iv) non-tradables. *Prima facie*, the effect of competition from Chindia should be felt more in manufacturing and tradables. The estimated equation is, in this case,

$$\Delta V A_{ijt} = k_{ij} + \rho_j \Delta V A_{ij,t-1} + \beta_j \Delta y_{it} + \gamma_{j,imp} Mcomp_{it}^{chindia} + \gamma_{j,exp} Xcomp_{it}^{chindia} + \delta_j z_{it} + \varepsilon_{ijt} \quad (5)$$

where  $j$  identifies the sector. Note that also in this case we are controlling for income growth, since - as for employment growth - we are interested in the effects that go over and beyond the effects on income, which remain the main focus of the paper.

## 2.2 Analysis of the transmission channels

### 2.2.1 Set-up

After focusing on the effect of competition from Chindia on growth in advanced countries, in a second step of the analysis I try to shed light on the country characteristics that are most relevant to explain the sensitivity of each advanced country's income growth to the shock stemming from Chindia. For that purpose, I estimate the following equation by OLS,

$$\Delta y_{it} = \rho \Delta y_{i,t-1} + \alpha y_{i,t-1} + \beta \Delta y_{it}^{*i} + \gamma \Delta \ln \frac{X_{chindia,t}}{X_{world,t}} + \eta \Delta \ln \frac{X_{chindia,t}}{X_{world,t}} * w_{i,t-1} + \delta z_{it} + \varepsilon_{it} \quad (6)$$

where the parameters of interest are now in the vector  $\eta$ , which multiplies an interaction term between changes in the Chindia log world export share,  $\ln \frac{X_{chindia,t}}{X_{world,t}}$ , and a vector of pre-determined country characteristics,  $w_{i,t-1}$  (note that now the controls in  $z$  also include the variables  $w$ ). For example, here we will test whether countries that are already more concentrated on manufacturing such as Germany ( $w$  is in this case the share of manufacturing on value added or employment) are better or worse off when faced with, say, and increase in the (mainly manufacturing) export market share of Chindia ( $\Delta \ln \frac{X_{chindia,t}}{X_{world,t}} > 0$ ). Note that, again, we are controlling for growth in other advanced countries, and moreover the US is excluded from all regressions in this part of the analysis, so as to further mitigate concerns about reverse causality.

In order to ease the economic interpretation of the results, I standardise all variables in the  $w$  vector. The coefficients in  $\eta$  can therefore be interpreted as the marginal increase in the effect of changes in the Chindia export share on growth when moving from an average value for  $w$  to a level one standard deviation higher. Using again the example of the country concentration on manufacturing, the corresponding coefficient in the  $\eta$  vector measures the difference in the sensitivity to increases in the Chindia export share between an average country and a country one standard deviation more specialised in manufacturing. Formally, the elasticity of growth in country  $i$  with respect to changes in the Chindia export share is given in equation (6) by

$$\frac{\partial(\Delta y_{it})}{\partial(\Delta \frac{X_{chindia,t}}{X_{world,t}})} = \gamma + \eta w_{i,t-1} \quad (7)$$

If  $w_{i,t-1} = 0$  (the unconditional mean), the elasticity is  $\gamma$  which therefore measures the *average effect*. The coefficient  $\eta$  is a *marginal effect*, obtained for  $w_{i,t-1}$  one standard deviation above the conditional mean.

The vector  $w$  can be further subdivided in two sub-vectors, namely (i) the group of the country  $i$ 's own characteristics and (ii) other variables capturing links with Chindia (notably pre-existing trade with Chindia).

### 2.2.2 Elements of the $w$ vector

*Sectoral specialisation in advanced countries.* With this set of variables I want to measure the degree to which advanced countries feel the competition from Chindia (increasingly specialised in manufacturing, especially of low and medium quality) in global markets. I therefore look at value added and employment in advanced countries, in terms of shares of manufacturing, services (in particular financial services), and nontradables. The key question here is whether countries which are more specialised in manufacturing or tradables lose out or gain when manufacturing exports from China and India rise.

*Market flexibility.* As noted in the Introduction, one important element contributing to advanced countries' strategy to cope with the rise of emerging countries should be to move economic activity towards higher value added productions. In this respect, product and labour market flexibility should be of paramount importance to minimise the short term adjustment costs arising from this adjustment process. I measure market flexibility with the OECD Employment Protection Legislation index.<sup>7</sup>

*Trade and financial openness.* I include trade and financial openness for each advanced country. Trade openness is measured by the sum of imports and exports to GDP in US dollars, financial openness by the sum of cross border assets and liabilities to GDP (also in US dollars).

*Financial development.* One possible interpretation of the consequences of the rise of Chindia is that it pushed advanced countries to specialise in services, in particular finance, with a lower growth potential or with a high potential for creating systemic risk. I measure financial development in each advanced country as the ratio of stock market capitalisation and private credit to GDP.

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<sup>7</sup>Unfortunately, I cannot use the Product Market Regulation index because too few observations are available.

*Oil trade balance.* As noted, the rise of manufacturing giants such as China and India may put pressure on resources and commodities markets, the most important of which is the oil market. If this is a relevant transmission channel, countries that are more dependent on oil imports should have their growth reduced when faced with a boom in exports from Chindia.

*Pre-existing trade links to China and India.* I try to identify this channel by looking at the exports to, and imports from, China and India (as a share of the GDP of the originating country). Importantly, the rise of Chindia also creates an important export market for advanced countries, and some countries - by virtue of their geographical position, openness and/or export mix - are more likely to benefit from this possibility.

### 3 Data

In this study I use data for 22 advanced countries (see the country list in *Table 1*). Data are originally annual and refer to the period from 1970 to 2012 (or longest available sample), but are converted into 3-year averages to smooth out short term fluctuations. *Table 2* contains a description of the sources of the data and the definition of the variables. *Table 3* reports summary statistics for all variables used in the paper.

(Tables 1-3 here)

### 4 Results

We now turn to the results. Before describing them in detail, it is useful to summarise the main thrust of the findings. Three main results stand out. First, import competition from Chindia is found to be positive for income growth in advanced countries. Second, both export and import competition are negative for manufacturing jobs, but not jobs more generally. Third, countries with (i) a lower share of employment in manufacturing, (ii) lower Employment Protection Legislation and (iii) higher export and import exposure to Chindia tend to benefit more, in terms of income growth, from a larger trade share of China and India, and the effects are economically significant.

I first describe the results for the baseline equation (1) in Section 4.1, and then turn to the transmission channels in Section 4.2.



## 4.1 Baseline equation

### 4.1.1 Results for income growth

The baseline results for equation (1) are presented in *Table 4*. The lag of per capita income growth is not included because it is normally insignificant. Column (1) reports results for the Mean Group estimator, column (2) for pooled OLS. I find that growth in other advanced countries is always positive and strongly significant, with a coefficient close to 1, and lagged per capita income is negative and significant, suggesting some degree of convergence across advanced countries (poorer countries grow faster on average). Turning to the key variables in the analysis, I find that import competition from Chindia is associated with positive returns for growth, at least in the OLS estimate (it is insignificant in the Mean Group estimate); the opposite holds true for export competition, whose coefficient is negative and significant in the OLS estimation.

In order to judge whether these results are due to reverse causality, in columns (3) and (4) I turn to instrumental variables estimates, where import (column (3)) and export (column (4)) competition from Chindia are instrumented using the first difference in the Chindia world export market share. In each specification, I control for import (export) competition when export (import) competition are instrumented, as well as growth in advanced countries other than  $i$ . The evidence indicates that the instrument is strong. I find that export competition becomes insignificant in the IV estimates, while import competition becomes more positive than in the OLS estimate and significant. This suggests that the bias in the OLS estimate goes in the expected direction for both variables, and that only import competition matters for growth in advanced countries. From an economic perspective, the effect of import competition is significant. Indeed, an increase by one standard deviation in import competition results in higher growth on average by about 1 per cent per year.

Columns (5) and (6) provide some robustness of the baseline results for import competition. In column (5) I exclude the three largest countries in the sample, namely the US, Japan, and Germany. The results are largely unchanged and the coefficient is even larger for import competition. In column (6) I repeat the estimate on the most recent sample, from 1995 to 2012. Again, the key result for import competition holds and the coefficient has approximately the same size as in the baseline estimate.

(Table 4 here)

#### 4.1.2 Results for employment growth

*Table 5 and 5a* turn to the estimation of equation (4). Results are shown for total employment growth in Table 5 and manufacturing in Table 5a. As I control for per capita income growth, what we are looking at here is the effect (from import and export competition) that comes on top of the effect on income. For total employment (Table 5), I find no additional effect of import and export competition from Chindia. For employment in the manufacturing sector (Table 5a), I find negative effects of *both* stronger import and export competition, which also hold when excluding the three largest countries (columns (4) and (6)) and in the sample period 1995-2012 (columns (5) and (7)). The size of the effect is again significant: a one standard deviation increase in import and export competition leads to a fall by about 1 per cent per year in the annual growth rate of employment in manufacturing. Although they are not directly comparable, these results are qualitatively consistent with those in Autor et al. (2013) and Üngör (2012); competition does seem to impinge on jobs in advanced countries, but only in the manufacturing sector. It is also notable that stronger import competition from Chindia is actually good for income growth, but negative for manufacturing employment, suggesting some reallocation within advanced countries.

(Tables 5-5a here)

#### 4.1.3 Results for sectoral value added growth

*Tables 6-6c* report results for value added growth in four segments (manufacturing, services, tradables and non-tradables). Again, in these regressions I control for income per capita growth and want to look for effects that come on top on the macro effect on income. However, I find no evidence that export and import competition from Chindia had a statistically significant influence which was particularly concentrated on a certain sector, not even manufacturing and tradables (where it could have been expected).

(Tables 6-6c here)

## 4.2 Transmission channels

We now turn to the analysis of the transmission channels, by looking at estimates of equation (6), also in this case based on 3-year average data. The main interest in this part is on the coefficients associated to the interaction terms, namely  $\eta$  in equation (6). Note that all estimations in this section do not include the US, on account of reverse causality concerns. Estimates including the US are similar to those presented, and are available upon request.

I begin with specialisation in advanced countries as a possible determinant of the growth impact of competition from Chindia. Specialisation is defined in terms of shares of value added (*Table 7*) or employment (*Table 8*).

Starting from specialisation defined on shares of value added (*Table 7*), I find no effect of any of the considered variables (shares of value added for manufacturing, tradables, services, and non-tradables) when interacted with the first difference in the Chindia export share. However, when considering employment shares (*Table 8*), I find that a higher share of manufacturing employment (in time  $t - 1$ ) predicts lower growth when interacted with the Chindia market share in the following 3-year period. The effect is a quite large one; a one standard deviation higher manufacturing employment share leads to a fall in annual growth by 0.5% if the Chindia export share goes up by one standard deviation.<sup>8</sup> Interestingly, I also find that higher employment share in financial services is also detrimental to the growth elasticity of advanced countries to competition from Chindia, with growth being 0.1/0.2% per cent lower for an increase by one standard deviation, although the coefficient is not statistically significant. I also find that a higher employment share in financial services is negatively associated with per capita growth, though the effect disappears when excluding the global financial crisis period (not reported for brevity).

(Tables 7-8 here)

In *Table 9*, I look at trade and financial openness, and find that none of these measures are significant when interacted with the Chindia export share, although trade openness is significant in terms of average effect.

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<sup>8</sup>Note that the standard deviation of the first difference in the Chindia export share is about 0.05; see *Table 3*.

(Table 9 here)

*Table 10* considers a miscellanea of factors, including labour market regulation (proxied by the OECD Employment Protection Legislation indicator), financial development and the oil trade balance. I find that Employment Protection Legislation (column (1)) is negatively associated with the growth impact of changes in the Chindia export market share, consistent with our theoretical priors and previous research by Arnold (2002). The size of the effect is not negligible, with a one standard deviation increase in Employment Protection Legislation associated with lower growth by about 0.2% when interacted with the first difference in the Chindia export share. I also test whether Employment Protection Legislation is relevant for the employment impact (column (2)), but find that the coefficient is not significant in this case. Finally, financial development measures (stock market capitalisation to GDP and private credit to GDP) are insignificant, as is the oil trade balance.

(Table 10 here)

As a last step in the analysis, *Table 11* reports on the effect of pre-existing trade links with China and India. I find that having a good export base in China and India increases per capita growth vis-a-vis a rise in the Chindia export market share, as does a stronger pre-existing import relationship. The effect is not negligible, with growth in advanced countries increasing by about 0.1/0.2% for a one standard deviation increase in export or import share with Chindia and in the Chindia world market share. When considering over trade with Chindia (export and import together), however, the coefficient of the interaction term is still positive but insignificant.

(Table 11 here)

Based on the previous results, *Table 12* puts together all variables that have been found to be individually significant. Column (1) reports results for the whole sample period; column (2) reintroduces the US; column (3) excludes the three largest advanced countries (US, Germany and Japan) and column (4) restricts the sample to the post-1994 period. Overall, the results are robust, with the employment share of manufacturing in  $t - 1$  being associated with lower per capita growth by about 0.5% in conjunction with

a one standard deviation rise in the Chindia export market share; higher Employment Protection Legislation associated with a 0.2% lower growth; and the share of exports to Chindia to GDP associated with 0.1/0.2% higher growth, although this is the least robust result (it is not significant when including the US in the sample and in the shorter 1995-2012 sample).

(Table 12 here)

## 5 Conclusions

In this paper we have dealt with the question of whether the rise of key emerging economies (South) such as China and India and their increasing role in world export markets represent positive or negative news for advanced countries (North). Addressing this question obviously does not imply that the role of emerging markets should be overly influenced by its repercussions on advanced countries, but it may be important to understand the channels mainly for advanced countries to be better able to cope with the inevitable (and desirable) rise in importance of emerging countries.

The implications of the rise in emerging countries for advanced countries has been the subject of much debate but there is surprisingly little empirical work directly addressing this important question. In this paper I have tried first to outline the possible theoretical channels, in particular related to the relocation of manufacturing activity to emerging markets such as China and India. The main purpose of the paper is to provide some empirical evidence and to identify some key facts that future modelling efforts need to take into account.

The paper is based on a panel estimation using 3-year averages and regressions of growth in per capita income in advanced countries on country-specific measures of import and export competition from China and India. The empirical analysis is aimed both at identifying the average effect of stronger competition, but also to shed some light on the potential transmission channels (marginal effects), in particular the role of pre-determined characteristics of the advanced countries themselves.

The key results of the paper are three. First, I find that the role of import competition from China and India is positive for income growth in advanced countries, while export competition is insignificant. This implies that, overall, competition from China

and India has been mostly beneficial for advanced countries. Second, both export and import competition are negative for manufacturing employment, but not for total employment. Third, the analysis of the transmission channels reveals that countries with a lower share of employment in manufacturing and lower Employment Protection Legislation have benefited comparatively more from the rise of China and India. To some extent, also pre-existing trade links with China and India have a beneficial impact on the growth consequences of their for advanced countries. Results for both the baseline analysis and the transmission channels are economically significant and policy-relevant.

One important policy implications of this study is that openness to trade with emerging markets is beneficial for growth, and that facilitating a reallocation of production away from sectors where competition is stronger (such as manufacturing) may increase the benefits. While the paper has on purpose taken a macro and country-level perspective with the aim to identify some key stylised facts, one important caveat is that results may not hold when looking at sub-components of output or at industry level data. Future research may fill this gap and shed some additional light on the channels of transmission of increased trade integration of large emerging markets for advanced countries, a phenomenon that is surely going to stay with us for some time to come. Moreover, this paper has concentrated on income and employment growth, but the deeper question is the effect of the rise of emerging giants on welfare, however more difficult it may be from an empirical standpoint due to measurement problems. Finally, distinguishing import and export competition in final vs. intermediate goods and exploring the role of global value chains is another important avenue of research.<sup>9</sup>

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<sup>9</sup>See Baldwin (2012).

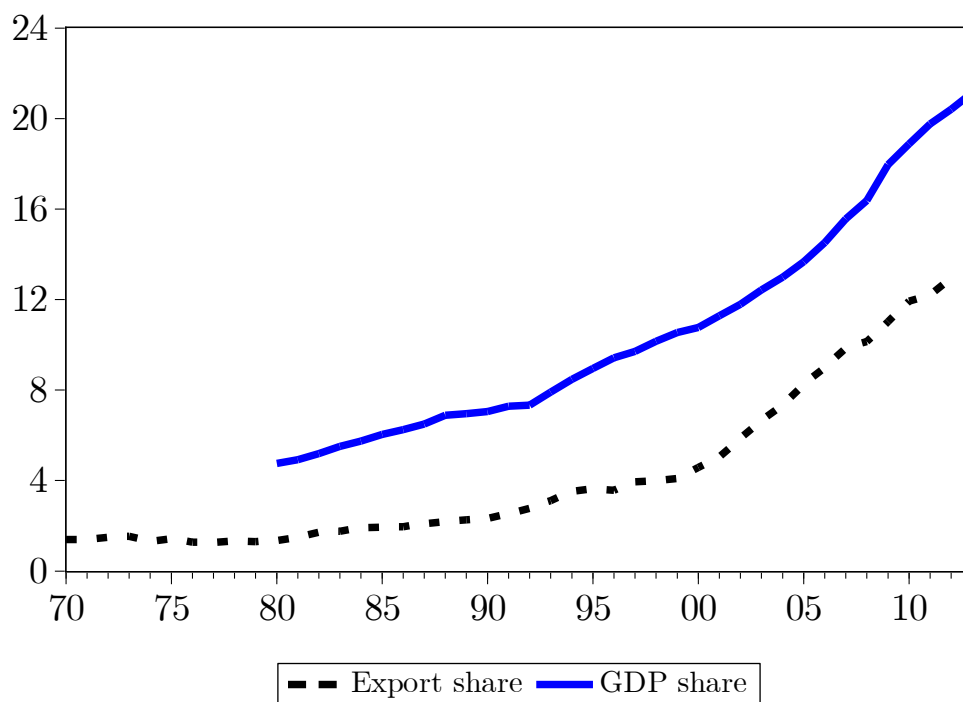
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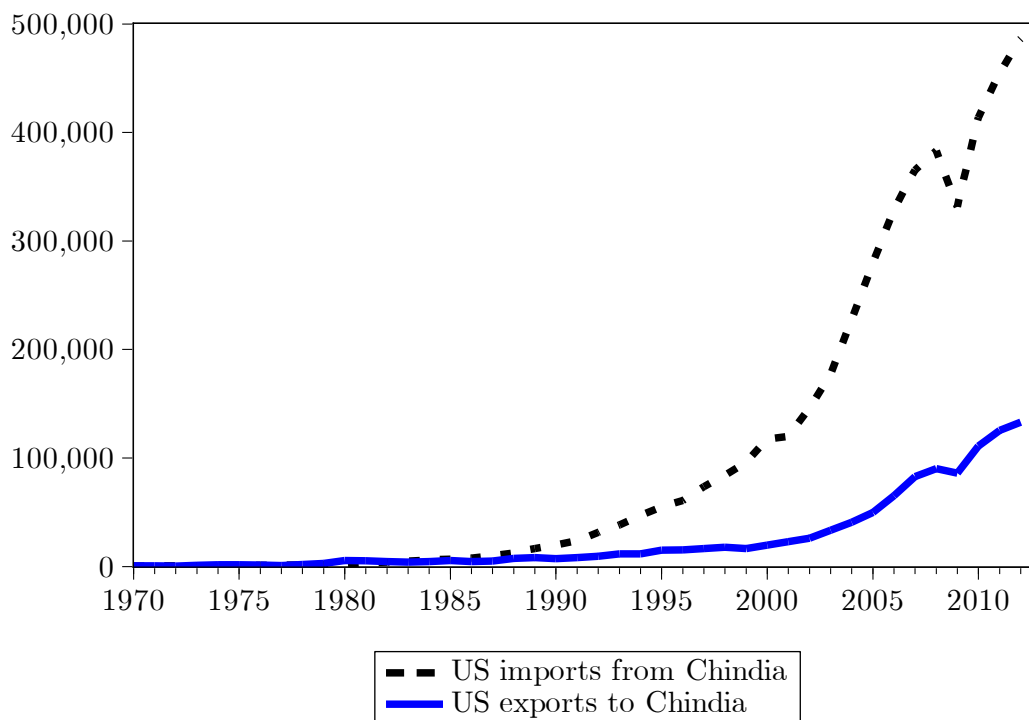


Figure 1. Chindia, world GDP and export shares.



Source: IMF WEO and IFS. Data are in percentages.

Figure 2. Trade US-China



Source: IMF WEO. Data are in USD million.

**Table 1. Country list**

Austria	Greece
Australia	Ireland
Belgium	Iceland
Canada	Italy
Switzerland	Japan
Germany	Netherlands
Denmark	Norway
Spain	New Zealand
Finland	Portugal
France	Sweden
United Kingdom	United States
Luxembourg	

**Table 2. Sources of the data**

Variable	Source
Real GDP per capita, total imports of goods and services, total exports of goods and services, CPI inflation, share of world GDP, oil trade balance to GDP	IMF WEO
World export share	OECD Economic Outlook and IMF WEO
Trade openness vs. advanced countries, exports to and imports from China and India	IMF Direction of Trade (DOT) database
Value added and employment shares of manufacturing, services, non-tradables and financial services	European Commission AMECO database
Employment Protection Legislation	OECD, STAN database
Financial openness (sum of external assets and liabilities to GDP)	IMF International Financial Statistics and WEO
Financial development (private credit to GDP, stock market capitalisation to GDP)	World Bank Database on Financial Development and Structure

Note: The data are annual and refer to the list of countries reported in Table 1.

**Table 3. Summary statistics**

Variable	Obs	Mean	Std. Dev.
Income per capita growth	266	0.02	0.02
Average income per capita growth in other advanced	308	0.02	0.01
Import competition from Chindia	2012	0.00	1.00
Export competition from Chindia	212	0.00	1.00
World export share	294	0.03	0.03
CPI inflation	275	0.06	0.07
Employment growth	238	0.01	0.01
Employment growth in manufacturing	236	-0.01	0.02
Employment share of population	238	0.45	0.06
Employment share of population - Manufacturing	243	0.08	0.02
Manufacturing share of value added	223	0.22	0.05
Services share of value added	222	0.69	0.06
Tradables - share of value added	215	0.46	0.05
Non-tradables - share of value added	221	0.54	0.06
Manufacturing share of employment	222	0.16	0.04
Services share of employment	211	0.60	0.09
Tradables share of employment	195	0.42	0.04
Non-tradables share of employment	195	0.43	0.06
Financial services share of employment	124	0.03	0.01
Trade openness	234	0.69	0.34
Financial openness	164	2.78	2.92
Employment Protection Legislation	168	2.07	1.04
Stock market capitalisation to GDP	149	.70	.51
Private credit to GDP	274	.86	.48
Exports to Chindia to GDP	242	.01	.01
Imports from Chindia to GDP	242	.01	.01
Trade with Chindia (avg imports and exports) to GDP	242	.02	.02
Oil trade balance to GDP	235	-.15	.46

Note: The data are 3-year averages aggregated from annual data. They refer to the list of advanced countries in Table 1. Import competition is defined as the growth rate in the import share from Chindia, multiplied by trade openness in the previous period. Export competition is the growth rate in the export share of Chindia relative to the export share of the country, multiplied by the country's trade openness in the previous period.

**Table 4. Baseline regression results**

Dependent variable: Per capita income growth

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Mean Group	Pooled OLS	IV exp	IV imp	IV imp excl. US JP	IV imp 1995-2012
Income per capita level, t-1	-0.017*** (0.007)	-0.014*** (0.003)	-0.016*** (0.003)	-0.020*** (0.004)	-0.023*** (0.006)	-0.023*** (0.008)
Average income per capita growth in other advanced countries	0.910*** (0.144)	0.915*** (0.096)	0.971*** (0.080)	0.862*** (0.095)	0.839*** (0.121)	0.841*** (0.124)
Import competition from Chindia	-0.002 (0.002)	0.003*** (0.000)	0.003** (0.001)	0.012*** (0.004)	0.016*** (0.005)	0.008** (0.003)
Export competition from Chindia	0.003 (0.002)	-0.004** (0.002)	0.000 (0.002)	-0.006*** (0.002)	-0.007*** (0.002)	-0.007*** (0.003)
CPI inflation, t-1	-0.089** (0.043)	-0.044* (0.021)	-0.040** (0.020)	-0.045** (0.021)	-0.046** (0.023)	-0.046 (0.162)
Trade openness, t-1	0.027 (0.021)	0.045*** (0.008)	0.041*** (0.011)	0.038*** (0.013)	0.031* (0.017)	0.029 (0.023)
Observations	216	241	241	241	211	131
R-squared			0.503	0.386	0.229	0.650
Number of country	18		22	22	19	22
J test (P value)	.	.	.	.	.	.
Kleibergen-Paap test for underidentification (P value)	.	.	0	0.00016	0.0011	0.00018
Number of groups		22				

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.

**Table 5. Results for employment growth**

Dependent variable: Employment growth

VARIABLES	(1)	(2)	(3)	(4)		(5)	(6)		(7)
	Pooled OLS	IV exp	IV imp	IV imp excl. US		IV imp 1995-2012	IV exp excl. US		IV exp 1995-2012
				JP	DE		JP	DE	
Employment growth (t-1)	0.253*** (0.076)	0.238*** (0.063)	0.240*** (0.080)	0.228** (0.100)	0.228** (0.100)	0.256*** (0.105)	0.240*** (0.069)	0.240*** (0.069)	0.230*** (0.101)
Employment ratio (t-1)	-0.112*** (0.030)	-0.110*** (0.041)	0.002 (0.085)	0.067 (0.129)	0.067 (0.129)	-0.152*** (0.070)	-0.095*** (0.045)	-0.095*** (0.045)	-0.148*** (0.073)
Income per capita growth	0.512*** (0.050)	0.489*** (0.055)	0.598*** (0.081)	0.680*** (0.125)	0.680*** (0.125)	0.481*** (0.073)	0.504*** (0.063)	0.504*** (0.063)	0.476*** (0.069)
Import competition from Chindia	0.000 (0.001)	0.001 (0.001)	-0.008 (0.005)	-0.011 (0.007)	-0.011 (0.007)	-0.001 (0.003)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Export competition from Chindia	0.001 (0.001)	-0.003 (0.002)	0.004 (0.003)	0.005 (0.004)	0.005 (0.004)	0.001 (0.003)	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.003)
CPI inflation, t-1	-0.022*** (0.007)	-0.029* (0.017)	-0.031* (0.017)	-0.031 (0.019)	-0.031 (0.019)	0.102 (0.088)	-0.026 (0.017)	-0.026 (0.017)	0.078 (0.089)
Trade openness, t-1	0.032*** (0.010)	0.038*** (0.010)	0.044*** (0.013)	0.055*** (0.018)	0.055*** (0.018)	0.027*** (0.012)	0.041*** (0.011)	0.041*** (0.011)	0.027*** (0.012)
Observations	209	209	209	179	179	125	179	179	125
R-squared		0.568	0.381	0.227	0.227	0.619	0.572	0.572	0.623
Number of groups	22								
J test (P value)									
Kleibergen-Paap test for underidentification (P value)		5.1e-10	0.0024	0.026	0.026	0.0033	4.6e-10	4.6e-10	0.000018
Number of country		22	22	19	19	22	19	19	22

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.

Table 5a. Results for employment growth in manufacturing

Dependent variable: Employment growth

VARIABLES	(1)	(2)	(3)	(4)		(5)	(6)		(7)
	Pooled OLS	IV exp	IV imp	IV imp excl. US JP		IV imp 1995-2012	IV exp excl. US JP		IV exp 1995-2012
Employment growth in manufacturing (t-1)	-0.037 (0.040)	-0.063 (0.083)	0.006 (0.091)	0.024 (0.101)	-0.170 (0.138)	-0.052 (0.085)	-0.245* (0.147)		
Employment ratio in manufacturing (t-1)	-0.119 (0.100)	-0.085 (0.196)	-0.286 (0.231)	-0.410 (0.251)	-0.223 (0.370)	-0.198 (0.192)	-0.102 (0.352)		
Income per capita growth	0.776*** (0.088)	0.689*** (0.090)	0.817*** (0.081)	0.820*** (0.093)	0.823*** (0.101)	0.673*** (0.098)	0.663*** (0.120)		
Import competition from Chindia	-0.001 (0.001)	0.000 (0.001)	-0.011** (0.005)	-0.011** (0.005)	-0.007** (0.003)	0.000 (0.001)	0.002 (0.002)		
Export competition from Chindia	-0.004*** (0.001)	-0.010*** (0.003)	-0.001 (0.002)	-0.001 (0.002)	-0.003 (0.002)	-0.009*** (0.003)	-0.017*** (0.007)		
CPI inflation, t-1	-0.090*** (0.019)	-0.117*** (0.044)	-0.083* (0.047)	-0.060 (0.051)	-0.040 (0.241)	-0.100** (0.046)	0.037 (0.249)		
Trade openness, t-1	0.025** (0.010)	0.039* (0.021)	0.037 (0.024)	0.034 (0.025)	0.072*** (0.026)	0.029 (0.020)	0.103*** (0.034)		
Observations	199	199	199	171	111	171	111		
R-squared		0.519	0.409	0.378	0.516	0.526	0.464		
Number of groups	20								
J test (P value)									
Kleibergen-Paap test for underidentification (P value)		5.6e-10	0.000033	0.00045	0.000015	4.7e-10	0.00087		
Number of country		20	20	17	20	17	20		

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.

**Table 6. Results for growth of value added in manufacturing**

Dependent variable: Growth of value added in manufacturing

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Mean Group	Pooled OLS	IV exp	IV imp	IV imp excl. US JP DE	IV imp 1995-2012
Value added growth, manufacturing, t-1	-0.229** (0.107)	-0.256*** (0.068)	-0.253*** (0.053)	-0.290*** (0.066)	-0.299*** (0.075)	-0.495*** (0.116)
Income per capita level, t-1	-0.031* (0.018)	-0.009* (0.004)	-0.009** (0.005)	-0.019* (0.010)	-0.025* (0.014)	-0.042* (0.022)
Income per capita growth	1.256*** (0.163)	1.231*** (0.076)	1.256*** (0.120)	1.124*** (0.141)	1.039*** (0.173)	0.937*** (0.256)
Import competition from Chindia	-0.005 (0.006)	-0.000 (0.001)	-0.001 (0.002)	0.009 (0.009)	0.009 (0.010)	0.013 (0.010)
Export competition from Chindia	0.005 (0.005)	-0.003 (0.002)	0.000 (0.003)	-0.006 (0.004)	-0.006 (0.004)	-0.014** (0.006)
CPI inflation, t-1	-0.097 (0.108)	-0.061** (0.024)	-0.055* (0.031)	-0.079** (0.036)	-0.087** (0.039)	-0.295 (0.267)
Trade openness, t-1	-0.011 (0.047)	0.004 (0.017)	0.000 (0.018)	0.003 (0.017)	0.015 (0.017)	0.022 (0.027)
Observations	201	222	222	222	194	121
R-squared			0.660	0.606	0.589	0.618
Number of country	18		22	22	19	22
J test (P value)	.	.	.	.	.	.
Kleibergen-Paap test for underidentification (P value)	.	.	0	0.0015	.	.
Number of groups		22			0.0096	0.022

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.

**Table 6a. Results for growth of value added in manufacturing**

Dependent variable: Growth of value added in services

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Mean Group	Pooled OLS	IV exp	IV imp	IV imp excl. US JP	IV imp 1995-2012
Value added growth, services, t-1	0.145* (0.080)	0.176*** (0.049)	0.178*** (0.042)	0.209*** (0.057)	0.189*** (0.068)	0.129 (0.094)
Income per capita level, t-1	0.016* (0.009)	0.002 (0.001)	0.002 (0.002)	0.005 (0.004)	0.006 (0.005)	0.003 (0.008)
Income per capita growth	0.769*** (0.073)	0.780*** (0.029)	0.771*** (0.045)	0.815*** (0.054)	0.825*** (0.065)	0.834*** (0.107)
Import competition from Chindia	0.001 (0.002)	0.000 (0.000)	0.000 (0.001)	-0.003 (0.004)	-0.002 (0.004)	-0.003 (0.004)
Export competition from Chindia	-0.002 (0.002)	-0.000 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.001 (0.002)
CPI inflation, t-1	0.026 (0.039)	0.007 (0.013)	0.005 (0.020)	0.011 (0.019)	0.011 (0.020)	-0.059 (0.101)
Trade openness, t-1	-0.010 (0.022)	-0.005 (0.009)	-0.004 (0.007)	-0.004 (0.007)	-0.007 (0.007)	0.011 (0.012)
Observations	190	219	219	219	191	118
R-squared			0.793	0.773	0.784	0.803
Number of country	17		22	22	19	22
J test (P value)	.	.	.	.	.	.
Kleibergen-Paap test for underidentification (P value)	.	.	0	0.0023	.	.
Number of groups		22				0.016

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.



Table 6b. Results for growth of value added in tradables

Dependent variable: Growth of value added in tradables

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Mean Group	Pooled OLS	IV exp	IV imp	IV imp excl. US JP	IV imp 1995-2012
Value added growth, tradables, t-1	-0.120 (0.080)	-0.110** (0.037)	-0.112*** (0.036)	-0.152*** (0.056)	-0.191*** (0.070)	-0.265** (0.107)
Income per capita level, t-1	0.001 (0.011)	-0.001 (0.002)	-0.001 (0.002)	-0.009 (0.006)	-0.013 (0.009)	-0.018 (0.014)
Income per capita growth	1.240*** (0.103)	1.167*** (0.032)	1.186*** (0.059)	1.081*** (0.084)	1.001*** (0.110)	1.088*** (0.116)
Import competition from Chindia	-0.008** (0.004)	-0.001 (0.000)	-0.001 (0.001)	0.007 (0.006)	0.009 (0.007)	0.007 (0.006)
Export competition from Chindia	0.006* (0.004)	-0.001 (0.002)	0.002 (0.002)	-0.004 (0.003)	-0.005 (0.003)	-0.008** (0.004)
CPI inflation, t-1	-0.024 (0.062)	-0.024** (0.011)	-0.020 (0.015)	-0.041** (0.021)	-0.047* (0.025)	-0.224 (0.170)
Trade openness, t-1	-0.022 (0.025)	0.003 (0.010)	0.001 (0.009)	0.000 (0.010)	0.006 (0.012)	0.022 (0.018)
Observations	172	197	197	197	169	114
R-squared			0.847	0.781	0.738	0.827
Number of country	16		21	21	18	21
J test (P value)	.	.	.	.	.	.
Kleibergen-Paap test for underidentification (P value)	.	.	0	0.0050	0.031	0.071
Number of groups		21				

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.

**Table 6c. Results for growth of value added in non-tradables**

Dependent variable: Growth of value added in non-tradables

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Mean Group	Pooled OLS	IV exp	IV imp	IV imp excl. US JP	IV imp 1995-2012
Value added growth, non-tradables, t-1	0.168 (0.151)	0.142* (0.072)	0.135** (0.057)	0.210*** (0.077)	0.207** (0.090)	0.228** (0.116)
Income per capita level, t-1	0.022* (0.012)	0.001 (0.002)	0.002 (0.003)	0.009 (0.007)	0.010 (0.009)	0.012 (0.010)
Income per capita growth	0.710*** (0.123)	0.744*** (0.041)	0.720*** (0.062)	0.839*** (0.093)	0.860*** (0.123)	0.874*** (0.107)
Import competition from Chindia	0.003 (0.002)	0.000 (0.001)	0.001 (0.001)	-0.008 (0.006)	-0.006 (0.007)	-0.005 (0.005)
Export competition from Chindia	-0.006* (0.003)	0.002 (0.001)	-0.001 (0.002)	0.004* (0.002)	0.004 (0.003)	0.004 (0.003)
CPI inflation, t-1	0.042 (0.058)	0.013 (0.017)	0.008 (0.026)	0.024 (0.028)	0.022 (0.029)	0.111 (0.128)
Trade openness, t-1	-0.005 (0.033)	-0.004 (0.013)	-0.001 (0.011)	0.002 (0.013)	-0.003 (0.014)	0.016 (0.015)
Observations	182	202	202	202	174	113
R-squared			0.606	0.475	0.505	0.653
Number of country	17		21	21	18	21
J test (P value)	.	.	.	.	.	.
Kleibergen-Paap test for underidentification (P value)	.	.	8.0e-11	0.0049	0.027	0.016
Number of groups		21				

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Sample period 1970 to 2012, 3-year averages. The excluded instrument in IV estimates is the change in the export market share of China and India. In the "IV imp" regressions the instrumented variable is import competition, while in "IV exp" is export competition. All regressions include country fixed effects. Pooled OLS estimates: standard errors are Driscoll-Kraay.

**Table 7. Transmission channels: Specialisation in value added**

VARIABLES	(1)	(2)	(3)	(4)
Income per capita level, t-1	-0.011* (0.006)	-0.011* (0.005)	-0.013** (0.005)	-0.011* (0.005)
Average income per capita growth in other advanced countries	1.077*** (0.078)	1.074*** (0.071)	1.044*** (0.079)	1.069*** (0.078)
Change in the Chindia export share*Share of value added in manuf. (std.), t-1	0.020 (0.039)			
Share of value added in manuf. (std.), t-1	-0.003 (0.002)			
Chindia export market share, first difference	0.011 (0.020)	0.009 (0.017)	0.003 (0.017)	0.011 (0.018)
CPI inflation, t-1	-0.027 (0.056)	-0.025 (0.055)	-0.014 (0.052)	-0.023 (0.055)
Trade openness (std.), t-1	0.015*** (0.002)	0.016*** (0.002)	0.015*** (0.002)	0.015*** (0.003)
Change in the Chindia export share*Share of value added in services (std.), t-1		-0.017 (0.022)		
Share of value added in services (std.), t-1		-0.000 (0.002)		
Change in the Chindia export share*Share of value added in tradables (std.), t-1			0.008 (0.013)	
Share of value added in tradables (std.), t-1			0.003** (0.001)	
Change in the Chindia export share*Share of value added in non-tradables (std.), t-1				-0.014 (0.019)
Share of value added in non-tradables (std.), t-1				0.000 (0.001)
Observations	180	179	174	179
Number of groups	18	18	18	18

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Pooled OLS, sample period 1970-2012, 3-year averages. The United States is excluded from all regressions on account of its size, which may give rise to concerns about reverse causality. All regressions include country fixed effects. Standard errors are Driscoll-Kraay.

**Table 8. Transmission channels: Specialisation in employment**

VARIABLES	(1)	(2)	(3)	(4)	(5)
Income per capita level, t-1	-0.018*** (0.005)	-0.012 (0.008)	-0.018*** (0.005)	-0.011 (0.007)	-0.016** (0.005)
Average income per capita growth in other advanced countries	0.927*** (0.071)	0.957*** (0.092)	0.959*** (0.057)	0.959*** (0.089)	1.094*** (0.073)
Change in the Chindia export share*Share of employment in manuf. (std.), t-1	-0.094*** (0.026)				
Share of employment in manuf. (std.), t-1	0.004 (0.003)				
Chindia export market share, first difference	0.034 (0.021)	0.015 (0.014)	0.036 (0.021)	0.017 (0.013)	0.025 (0.026)
CPI inflation, t-1	-0.100 (0.065)	-0.103 (0.072)	-0.049 (0.060)	-0.082 (0.076)	-0.069 (0.073)
Trade openness (std.), t-1	0.012*** (0.002)	0.013*** (0.003)	0.012*** (0.002)	0.012*** (0.003)	0.015*** (0.005)
Change in the Chindia export share*Share of employment in services (std.), t-1		0.031 (0.044)			
Share of employment in services (std.), t-1		-0.007 (0.005)			
Change in the Chindia export share*Share of employment in tradables (std.), t-1			-0.050 (0.038)		
Share of employment in tradables (std.), t-1			-0.001 (0.003)		
Change in the Chindia export share*Share of employment in non-tradables (std.),				-0.005 (0.050)	
Share of employment in non-tradables (std.), t-1				-0.004 (0.005)	
Change in the Chindia export share*Share of employment in finance (std.), t-1					-0.034 (0.020)
Share of employment in finance (std.), t-1					-0.007* (0.004)
Observations	178	176	171	171	106
Number of groups	19	19	19	19	16

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Pooled OLS, sample period 1970-2012, 3-year averages. The United States is excluded from all regressions on account of its size, which may give rise to concerns about reverse causality. All regressions include country fixed effects. Standard errors are Driscoll-Kraay.

**Table 9. Transmission channels: Trade and financial openness**

VARIABLES	(1)	(2)
Income per capita level, t-1	-0.015*** (0.004)	-0.017*** (0.005)
Average income per capita growth in other advanced countries	1.001*** (0.065)	0.958*** (0.073)
Change in the Chindia export share*Financial openness (std.), t-1		0.022 (0.036)
Financial openness (std.), t-1		0.000 (0.003)
Chindia export market share, first difference	0.032* (0.017)	0.020 (0.015)
CPI inflation, t-1	-0.040 (0.022)	-0.102* (0.046)
Trade openness (std.), t-1	0.018** (0.006)	0.012*** (0.003)
Change in the Chindia export share*Trade openness (std.), t-1	-0.035 (0.039)	
Observations	229	154
Number of groups	21	21

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Pooled OLS, sample period 1970-2012, 3-year averages. The United States is excluded from all regressions on account of its size, which may give rise to concerns about reverse causality. All regressions include country fixed effects. Standard errors are Driscoll-Kraay.

**Table 10. Transmission channels: Labour market regulation, financial development and the oil trade balance**

VARIABLES	(1)	(2)	(3)	(4)	(5)
		Employment growth			
Income per capita level, t-1	-0.020** (0.007)		-0.025*** (0.003)	-0.014** (0.005)	-0.018*** (0.005)
Average income per capita growth in other advanced countries	0.880*** (0.048)		0.987*** (0.097)	0.985*** (0.071)	0.956*** (0.065)
Change in the Chindia export share*Employment Protection Legislation (std.), t-1	-0.060** (0.023)	-0.027 (0.024)			
Employment Protection Legislation (std.), t-1	0.001 (0.003)	-0.001 (0.001)			
Chindia export market share, first difference	0.007 (0.015)	-0.060** (0.019)	-0.005 (0.015)	0.029 (0.018)	0.003 (0.024)
CPI inflation, t-1	-0.118 (0.062)	-0.185*** (0.038)	-0.082 (0.062)	-0.064 (0.039)	-0.067* (0.031)
Trade openness (std.), t-1	0.011 (0.006)	0.011*** (0.003)	0.014*** (0.004)	0.015*** (0.003)	0.015*** (0.004)
Employment ratio (t-1)		-0.092* (0.045)			
Income per capita growth		0.439*** (0.040)			
Change in the Chindia export share*Stock market capitalisation to GDP (std.), t-			-0.041 (0.031)		
Stock market capitalisation to GDP (std.), t-1			0.008* (0.004)		
Change in the Chindia export share*Private credit to GDP (std.), t-1				-0.028 (0.021)	
Private credit to GDP (std.), t-1				-0.001 (0.003)	
Change in the Chindia export share*Oil trade balance to GDP (std.), t-1					0.160 (0.113)
Oil trade balance to GDP (std.), t-1					-0.006 (0.004)
Observations	149	137	140	220	170
Number of groups	21	21	21	21	19

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Pooled OLS, sample period 1970-2012, 3-year averages. The United States is excluded from all regressions on account of its size, which may give rise to concerns about reverse causality. All regressions include country fixed effects. Standard errors are Driscoll-Kraay.

**Table 11. Transmission channels: Pre-existing trade links with China and India**

VARIABLES	(1)	(2)	(3)
Income per capita level, t-1	-0.018*** (0.004)	-0.019*** (0.004)	-0.021*** (0.004)
Average income per capita growth in other advanced countries	1.045*** (0.079)	1.030*** (0.056)	1.074*** (0.070)
Change in the Chindia export share*Exports to Chindia to GDP (std.), t-1	0.046** (0.019)		
Exports to Chindia to GDP (std.), t-1	0.003 (0.002)		
Chindia export market share, first difference	0.062** (0.021)	0.046** (0.020)	0.059** (0.021)
CPI inflation, t-1	-0.046* (0.024)	-0.044* (0.023)	-0.045* (0.022)
Trade openness (std.), t-1	0.013*** (0.002)	0.013*** (0.003)	0.012*** (0.003)
Change in the Chindia export share*Imports from Chindia to GDP (std.), t-1		0.040** (0.017)	
Imports from Chindia to GDP (std.), t-1		0.002* (0.001)	
Change in the Chindia export share*Trade with Chindia to GDP (std.), t-1			0.028 (0.022)
Trade with Chindia to GDP (std.), t-1			0.005** (0.002)
Observations	229	229	229
Number of groups	21	21	21

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Pooled OLS, sample period 1970-2012, 3-year averages. The United States is excluded from all regressions on account of its size, which may give rise to concerns about reverse causality. All regressions include country fixed effects. Standard errors are Driscoll-Kraay.

**Table 12. Transmission channels: Best overall specification**

Dependent variable: per capita income growth

VARIABLES	(1)	(2)
	1995-2012	
Income per capita level, t-1	-0.022** (0.007)	-0.031*** (0.004)
Average income per capita growth in other advanced countries	0.866*** (0.056)	0.898*** (0.033)
Change in the Chindia export share*Exports to Chindia to GDP (std.), t-1	0.029*** (0.007)	0.006 (0.020)
Exports to Chindia to GDP (std.), t-1	0.003 (0.003)	0.012*** (0.002)
Change in the Chindia export share*Share of employment in manuf. (std.), t-1	-0.095** (0.032)	-0.081* (0.032)
Share of employment in manuf. (std.), t-1	0.008** (0.003)	0.006 (0.004)
Chindia export market share, first difference	0.036* (0.019)	0.035* (0.014)
Change in the Chindia export share*Employment Protection Legislation (std.), t-1	-0.041** (0.017)	-0.045*** (0.006)
Employment Protection Legislation (std.), t-1	0.004 (0.003)	0.005* (0.002)
CPI inflation, t-1	-0.275** (0.086)	-0.420 (0.202)
Trade openness (std.), t-1	0.007 (0.004)	0.003 (0.005)
Observations	129	92
Number of groups	19	19

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Pooled OLS, sample period 1970-2012, 3-year averages. The United States is excluded from all regressions on account of its size, which may give rise to concerns about reverse causality. All regressions include country fixed effects. Standard errors are Driscoll-Kraay.