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Quality Upgrading and Import Competition: Impact of Chinese Competition on Developing Asia

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Abstract

This paper studies how Asian developing countries respond to the rise of China in the US market using product-level bilateral trade data from BACI-CEPII dataset for the period from 1995 to 2015. In particular, I investigate the effect of competition from rising China's exports on value, quantity, and quality of exports from Asian developing countries in the US market. I find robust evidence that Chinese competition has a non-negative effect on value and quantity of exports from Bangladesh, Vietnam, and Sri Lanka but a negative effect on exports from Indonesia, Malaysia, Philippines, India, Pakistan, and Thailand. This difference in the effects on value and quantity of exports might arise from the difference in response with respect to product quality. All countries upgrade product quality when facing tougher competition from China and more so for their comparative advantage products or products where China has a comparative advantage, but the rate of quality upgrading is higher for Bangladesh, Vietnam, and Sri Lanka. I also find that greater competitive pressure from China's exports leads to more quality upgrading for products close to the world quality frontier for Bangladesh, Vietnam, and Sri Lanka and for short-ladder products for Indonesia, Malaysia, Philippines, India, Pakistan, and Thailand.

Keywords: Quality Upgrading, Chinese Competition, Developing Asia, Comparative Advantage

JEL Codes: F10, F14

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1 Introduction

China has integrated dramatically into the world economy since the late 1990s, causing a large positive global supply shock for manufacturing. This rapid integration of China has raised concerns regarding its impacts on labor markets (Autor, Dorn, & Hanson, 2013; 2016), innovation, IT, and productivity of firms (Bloom, Draca, & Van Reenen, 2016; Pellegrino & Zingales, 2018), or political polarization (Autor, Dorn, Hanson, & Majlesi, 2020). Most of the research focuses on the impact on developed countries, probably due to the availability of data and the distributional effects of trade derived from trade theory.[1]

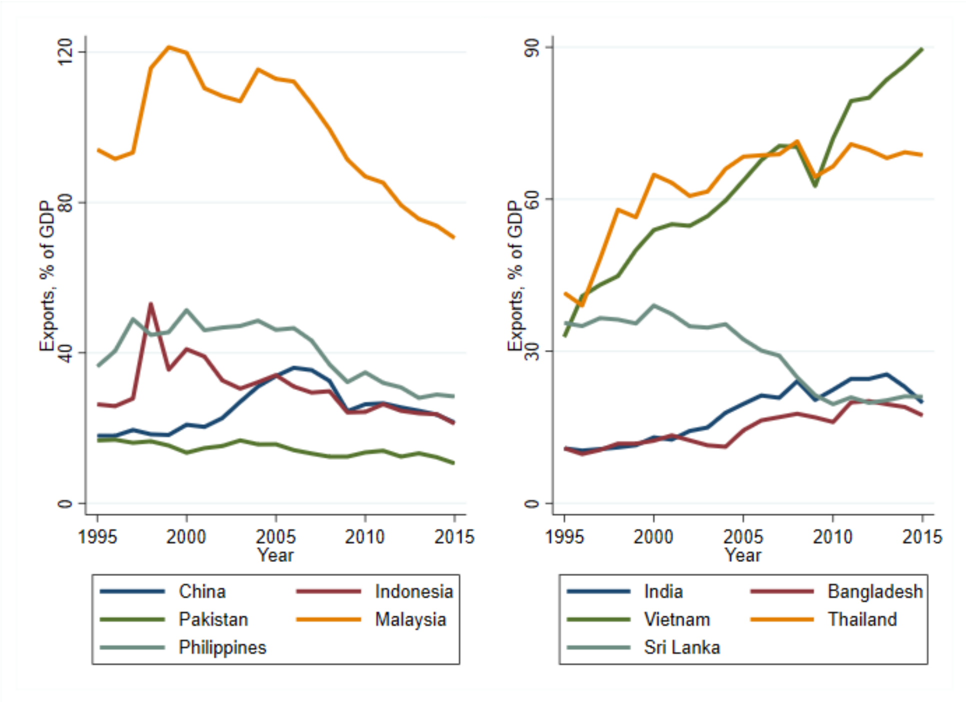
However, when considering the competition effect, developing countries, in particular those in Asia, are likely to be the ones more severely affected by the rise of China. These countries and China not only exhibit similar comparative advantages in labor-intensive industries and similar export structures but also are close in geography. Therefore, China's growth is expected to adversely affect the exports of these countries, but export growth has widely been regarded as a significant contribution to economic growth in these countries (Ekanayake, 1999). Exports have constituted a large share in GDP of these countries with the share being higher than 60% in Vietnam, Thailand, and Malaysia (see figure 1).

Despite this strong concern, there is little systematic evidence on the extent to which the trade shock from China's rise affects Asian developing countries. Study on the role of comparative advantage and product quality in these countries' responses to the China trade shock is also relatively rare.

This paper seeks to fill the gap by investigating the impact of Chinese competition on value, quantity, and quality of exports to the US by Asian developing countries. The sample of Asian developing countries includes Bangladesh, India, Indonesia, Malaysia, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam because of their similarities to China in geography, comparative advantage, and export structure. I focus on exports to the US since the US has been an important export destination of China and all countries in the sample (see table 1). Shares of exports to the US have accounted for more than 15 percent of total exports of Sri Lanka, Vietnam, Bangladesh, India, and Pakistan.

[1] According to the Stolper-Samuelson theorem, an increase in trade with low-wage countries is likely to be a force for greater inequality in developed countries.

Figure 1: Share of total exports in GDP in several developing countries



Source: Author's calculation from the World Development Indicators of the World Bank. The figure presents the share of exports in the GDP of each country.

Using product-level bilateral trade data from the BACI database for the period from 1995 to 2015, I show that the impact of rising competition from China on the value and quantity of exports to the US is heterogeneous. I ascribe this difference in export performance to their differences in response with respect to product quality. The effect on export value and quantity is non-negative for the group of Bangladesh, Vietnam, and Sri Lanka (group 1), while it is negative for the group of the other countries (group 2). By contrast, all countries upgrade the quality of exports to the US when facing tougher competition from China. Quality improvement in both groups is also higher for their comparative advantage products or products where China had a comparative advantage. However, while countries in group 1 improve quality more for frontier varieties, countries in group 2 improve quality more for short-ladder products.[2][3]

Chinese competition is measured by China's share in the US market at the six-digit Harmonized System (HS6, 1992 version) product level. I follow Autor et al. (2013) to identify the impact of trade shocks emanating from China by exploiting exogenous intensification of

[2]Frontier varieties are varieties where their proximity to the world quality frontier belongs to the top quartile of the distance to the frontier distribution of the product at the six-digit Harmonized System (HS6, 1992 version) level. A variety's proximity to the frontier is defined as the ratio of its transformed quality to the highest quality within each HS6 product. This is presented in detail in Section 4.2.

[3]Short-ladder products are products with lengths of their quality ladders belong to the first, second, or third quartile of the ladder length distribution of all products, where ladder length is the difference between the maximum and the minimum quality of a product (Khandelwal, 2010). This is presented in detail in Section 4.2.

Chinese exports to other developed countries at the product-year level. In contrast to previous approaches which use unit value as a proxy for quality, I estimate quality at the product level for bilateral import data in the US using both price and quantity information following Khandelwal (2010). Subsequently, I construct a measure for the length of the quality ladder following Khandelwal (2010) and a measure for proximity to the world quality frontier following Amiti and Khandelwal (2013).

I also compute the revealed comparative advantage (RCA) index at the product-level using the method in Balassa (1965) for China and Asian developing countries. One drawback of this RCA index is that it could not correct for distortions in trade flows due to trade costs or proximity to market demand. Nevertheless, by being based solely on raw trade data the index is simple and intuitive (French, 2017). I employ the RCA index to identify products where the rise of China was more pronounced, i.e. China had a comparative advantage in the production of these products, and allow the heterogeneity in the impact according to the comparative advantage.

Employing the bilateral trade data at the HS6 product level, I first show the effects of Chinese competition on the value and quantity of exports from Asian developing countries. I, then, investigate possible reasons leading to the differences in the impacts on different countries by examining the effect on product quality and the heterogeneity in the effects on product quality according to the comparative advantage, the proximity to the quality frontier, and the length of quality ladder.

This paper relates to three strands of the international trade literature. First, the paper is most directly related to the rapidly growing literature on the impact of China's rise on other countries. Acemoglu, Autor, Dorn, Hanson, and Price (2016), Autor et al. (2013), and Autor, Dorn, Hanson, and Song (2014) focus on the labor market outcomes in the US in response to the Chinese competition. Firm-level data have also been used to quantify the impact of Chinese competition on productivity in advanced economies (Bloom et al., 2016; Autor, Dorn, Hanson, Pisano, & Shu, 2020). Regarding the impact on developing countries, Utar and Ruiz (2013) use Mexican plant-level data to investigate the impact of the competition from China on the evolution of the maquiladora industry in the US market. Hanson and Robertson (2010) examine the impact of China's growth in manufacturing export on the demand for export from ten other developing countries, finding a modest negative impact but larger on labor-intensive industries. While the literature focuses on the effect of the rise of China on the labor market in developed or middle-income countries, I analyze the effect on export performance for a group of Asian developing countries with similarities to China in geography, comparative advantage, and export structure in the US market. I also propose possible reasons for the heterogeneity in the impact.

My paper is closely related to the empirical papers investigating the competition between China and Asian countries (Herschede, 1991; Ahearne, Fernald, Loungani, & Schindler, 2003; Eichengreen, Rhee, & Tong, 2007; and P.-c. Athukorala, 2009). However, these studies examine the impact for the period before 2005, which does not quite capture the period after China joined the World Trade Organization (WTO). Using data at an aggregated level, this literature focuses on the traditional notion of homogeneous products and thus could not take into account the heterogeneity between products at a more disaggregated level. Eichengreen et al. (2007) use exports to various destinations, which shows an absolute change in the exports but not a relative change. They use the distance between China and the importing country and China's real GDP as instruments for the growth of China. However, the distance is constant over time, while China's GDP does not vary across importers. This would mean that they are using the cross section variation or the variation at the country-year level in their instruments to identify the exogenous component of China's exports, but changes in China's exports occur at the sector-year level. Moreover, China's exports contribute to around 40% of China's GDP, which raises a concern regarding the validity of the instrument. My paper provides an updated study on the impact of Chinese competition for a long period including both the periods before and after China joined the WTO. I also look at a more disaggregated level of trade data, which allows me to capture the heterogeneity between products within an industry, especially the differences in product quality.

The paper is also related to the literature on quality upgrading and innovation. Quality upgrading is expected to positively affect export performance and, hence, economic growth and development (Grossman & Helpman, 1991; Hausmann, Hwang, & Rodrik, 2007). Thus, understanding how competition affects product quality is important. Aghion and Howitt (2006), Aghion, Bloom, Blundell, Griffith, and Howitt (2005), and Aghion, Blundell, Griffith, Howitt, and Prantl (2009) build models to predict effects of competition on firms' innovation. There are also empirical studies focusing on the impact of rising competition from China on firm's innovation in advanced countries such as France (Martin & Mejean, 2014), Denmark (Utar, 2014), or Belgium (Mion & Zhu, 2012).

My paper is most closely related to Amiti and Khandelwal (2013) where they use product-level data from 56 countries to the US. They show that lower tariffs encourage quality upgrading for products close to the frontier, while the effect is the opposite for products distant from the frontier. While also investigating the impact of competition on product quality, my paper differs from Amiti and Khandelwal (2013) in a number of ways. First, they measure import competition by a decrease in the US's import tariffs, while I use a different measure of competition, which is the share of imports from China. Second, unlike their main focus on the impact on quality upgrading, I analyze the impact on product quality and relate it to the impact on value and quantity of exports. I show that the heterogeneity in the impact on value and quantity of exports from different countries might derive from the differences in response with respect to quality and whether a product is close to the frontier or is a long-ladder product. Third, while their sample includes both developed and developing countries, my sample contains only Asian developing countries which are similar to China in various aspects such as comparative advantage, export structure, and geography. Thus, I can further examine the heterogeneity in the effect according to comparative advantage. Finally, I find that not all countries improve quality more for products close to the frontier. This result raises the question of why some countries upgrade quality more for products close to the frontier, while other countries do not.

Antoniades (2015) argues that an increase in market toughness induces increases in both price and quality of the long-ladder products, while tougher competition leads to a decline in price and an improvement in the quality of the short-ladder products. Fan, Li, and Yeaple (2015) also find that a reduction in import tariffs induces a firm to increase export quality and raises its export price in industries where the scope for quality differentiation is large and lowers its export price in industries where the scope is small. Additionally, Khandelwal (2010) confirms that price is a good proxy for the quality of long-ladder products, but not for short. I contribute to this literature by providing evidence showing tougher competition leads to more quality upgrading for short-ladder products compared to long-ladder products in countries in group 2.

This study also considers the role of comparative advantage in the context of international competition. A substantial amount of literature has tried to generalize the simple Ricardian model and to predict a pattern of trade (Dornbusch, Fischer, & Samuelson, 1977; Eaton & Kortum, 2002; and Bernard, Redding, & Schott, 2007). Bernard et al. (2007) predict that trade liberalization induces an aggregate productivity growth in all industries, but this productivity growth is strongest in comparative advantage sectors because resources reallocate between and within sectors. Consistent with this model, Amiti and Khandelwal (2013) find that more rapid quality growth is associated with comparative advantage sectors. According to the learning-by-doing models of productivity evolution by P. R. Krugman (1987) and Young (1991), learning is faster in sectors that produce more, and sectors with comparative advantage are the ones that produce more. These models imply that relative productivity differences between countries increase over time, or in other words, comparative advantage strengthens. Another strand of literature has attempted to infer (unobservable) differences in relative productivity using information from the (observable) pattern of trade based on Ricardian trade theory, which is called the revealed comparative advantage index (Balassa, 1965; French, 2017). In this paper, I employ the RCA index to provide evidence that countries upgrade quality more for comparative advantage products.

The rest of the paper is structured as follows. Section 2 describes the main dataset used in the paper and some stylized facts. Section 3 presents the empirical analysis of the impact on export value and quantity. In Section 4, I estimate product quality and analyze the impact of Chinese competition on product quality of exports. Section 5 presents the robustness checks and section 6 provides some concluding remarks.

2 Data source and stylised facts

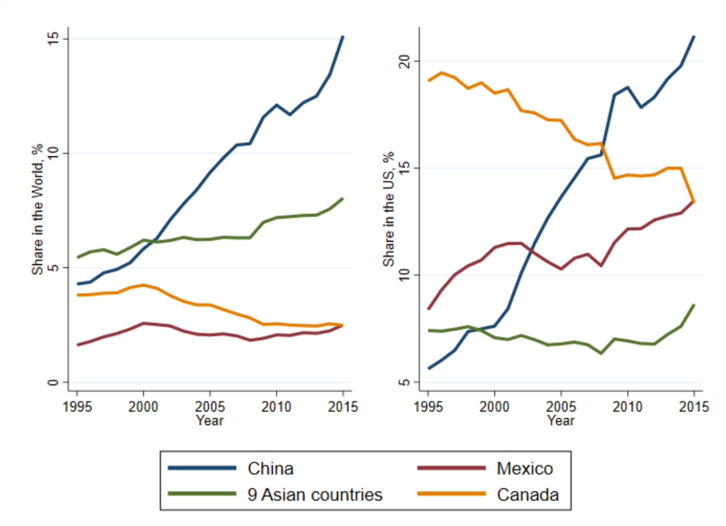
2.1 Data source

The data used in this paper are primarily the annual product-level trade data from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), the BACI-CEPII dataset, which is constructed from the United Nations (UN) Comtrade database (Gaulier & Zignago, 2010). This dataset provides information on bilateral trade including trade values and quantities at the six-digit HS product disaggregation for 224 countries, covering the 1995-2015 period. The dataset corrects for differences in export and import figures of bilateral flows. By using disaggregated product-level trade data, I capture substantial heterogeneity in products within industries. I use HS - SITC (Standard International Trade Classification) correspondence tables to restrict the sample to manufacturing industries (SITC 5-8) which are the focus of this study. The sample reduces to 3954 manufacturing six-digit HS products from 5018 products.

2.2 Rise of China and export similarities

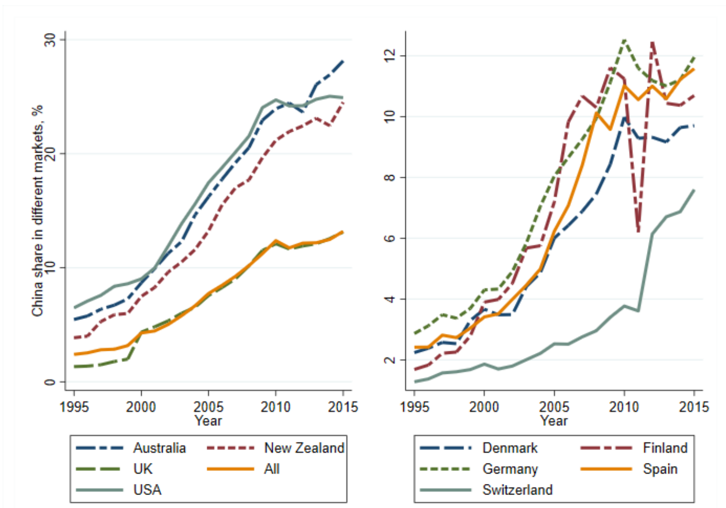
China's exports have grown dramatically since 2000. The share of Chinese exports in total world trade has tripled over the past two decades - from around 4.3% in 1995 to 15.1% in 2015 and has been about 1.5 times higher than the share of the second-largest export country since 2010. Similarly, its share in the US market has increased more than fourfold over the period from 1995 to 2015, dominating all other US trading partners since 2009 and surpassing Mexico despite the signing of the North American Free Trade Agreement in 1994. China's export shares in the World and the US have also exceeded the total share of all nine Asian developing countries in the sample since 2001 when China joined the WTO (figure 2). The share of manufacturing exports from China to other developed economies has also grown substantially during the period from 1995 to 2015 (figure 3).

Figure 2: Export shares of several countries in World's total exports and the US's total imports



Source: Author's calculation from BACI-CEPII database. The figure presents the export share of each country or group of countries in the world's total exports and the US's total imports.

Figure 3: China's market shares in several developed countries



Source: Author's calculation from BACI-CEPII database. The figure presents the share of imports from China in the total imports of each country.

Using export correlation coefficients and the RCA index, I observe substantial similarities in export structures to the US market between China and other Asian developing countries, which implies that the rise of China may pose a considerable threat to these economies.

Export correlation coefficients

The export correlation coefficient is the correlation coefficient between structures of exported products to the US of country c and of China. It is used to measure the export similarity between a country and China and is computed using the Pearson correlation coefficient formula, as follows:

$$corr_{s_t^{cUS}, s_t^{CHUS}} = \frac{\sum_h \left(s_{ht}^{cUS} - \frac{1}{N} \sum_h s_{ht}^{cUS} \right) \left(s_{ht}^{CHUS} - \frac{1}{N} \sum_h s_{ht}^{CHUS} \right)}{\sum_h \left(s_{ht}^{cUS} - \frac{1}{N} \sum_h s_{ht}^{cUS} \right)^2 \sum_h \left(s_{ht}^{CHUS} - \frac{1}{N} \sum_h s_{ht}^{CHUS} \right)^2},$$

where s_{ht}^{cUS} refers to country c's export share of HS6 product h to the US in c's total exports to the US at time t, s_{ht}^{CHUS} is China's export share of HS6 product h to the US in China's total exports to the US at time t, and N denotes the total number of HS6 products exported to the US by both countries c and China at time t. This correlation coefficient has been used in the literature to measure the export similarity between countries (De Benedictis & Tajoli, 2007; Autor et al., 2016).

Table 2 reports the correlation coefficients between the structures of exports to the US of each country and of China. All coefficients are significantly positive except for some coefficients of India, meaning that the export structures of China and countries in the sample are largely similar. Vietnam's export structure is becoming more and more similar to China's with coefficients higher than 0.50 during recent years. By contrast, Indonesia, Malaysia, and Thailand are moving away from China's export structure, but they still share great similarities to China in their export structures compared with other countries (except for Vietnam). The export structures of the Southern Asian countries appear to be less similar to China's compared to other countries in the region.

Comparative advantage

I also use the number of products exported to the US where both China and an Asian developing country have a comparative advantage in their production to show their similarity in export structure. The Balassa (1965) revealed comparative advantage index for HS6 products is computed as follows:

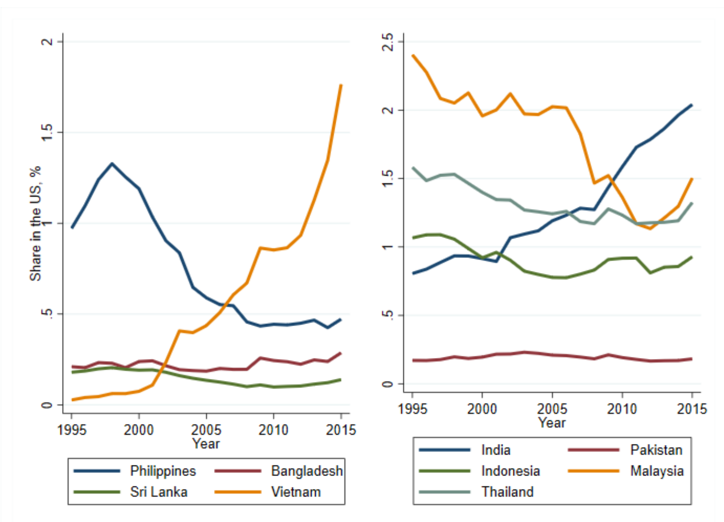
$$RCA_{ht}^c = \frac{E_{ht}^c / E_t^c}{E_{ht} / E_t} = \frac{E_{ht}^c / E_{ht}}{E_t^c / E_t},$$

where E_{ht}^c denotes country c's total exports of product h at time t, $E_{ht} = \sum_c E_{ht}^c$ is the world's total exports of product h at time t, E_t^c refers to country c's total exports at time t, and $E_t = \sum_c E_t^c$ is the world's total export at time t. Thus, the revealed comparative advantage index is the ratio of product h's share in country c's exports (E_{ht}^c / E_t^c) to its share in world trade (E_{ht} / E_t). A revealed comparative advantage index greater than one ($RCA_{ht}^c > 1$) implies that country c has a comparative advantage in producing product h at time t.

I, then, compute the fraction of HS6 products exported to the US where both China and country c have revealed comparative advantage indices greater than one ($RCA^c_{ht} > 1$) in country c's total number of comparative advantage products exported to the US. Table 3 show these fractions for each country in 1995, 2005, and 2015. The proportion ranges from 47% (for Malaysia in 2015) to 88% (for Bangladesh in 1995). More than 50% of comparative advantage products exported to the US from these countries are also exported by China and China also has a comparative advantage in the production of these products. Vietnam, Bangladesh, and Sri Lanka are the three countries with the highest numbers. These figures imply that China and Asian developing countries also reveal substantial similarity in comparative advantage.

These stylized facts suggest that China and its Asian neighbors are remarkably similar in their exports to the US market. While China's exports to the US have grown significantly in the last 20 years, exports of its Asian counterparts have increased slightly (e.g. India and Vietnam) or even decreased (e.g. Malaysia, Thailand, and Philippines) (figure 4). Although instructive, these summary statistics, which do not control for other factors that also affect the export performance of these developing countries and for the endogeneity of the growth of China, were primarily descriptive. In the next section, I employ econometric methods to investigate the impact of China's rise on the export performance of its Asian neighbors in the US market.

Figure 4: Shares of Asian developing countries in the US market



Source: Author's calculation from BACI-CEPII database. The figure presents share of imports from each country in US's total imports.

3 Impact on export value and quantity

3.1 Empirical strategy

This section presents the measure of Chinese competition and the empirical specification to study the impact of the China trade shock on the value and quantity of exports. The trade shock from China is measured as the share of import from China in US total imports at the HS6 product level:

$$China\_share_{ht} = \frac{M_{ht}^{CH}}{M_{ht}},$$

where M_{ht}^{CH} refers to US's import of HS6 product h from China at time t, and M_{ht} denotes US's total imports of the product h at time t (Bloom et al., 2016).

The following specification is used to explore the impact of China's growth on exports of other countries:

$$y_{cht} = \beta China\_share_{ht-1} + \alpha_1 ln(GDP_{ct-1}) + \delta_{ch} + \delta_t + \varepsilon_{cht} \tag{3.1.1}$$

where y_{cht} denotes one of the two different outcomes: log of value and log of quantity of exports from country c to the US at time t. The product-exporter fixed effects, δ_{ch}, is included to control for systematic differences at the country-product level. General technological change and other time-varying factors are captured by year fixed effects, δ_t. $ln(GDP_{ct-1})$ refers to the log of the real gross domestic output of country c, which controls for country-level shocks such as technological shocks or changes in relative endowments that affect exports.

In estimating equation (3.1.1) it is important to take into account the potential endogeneity problem of the *China share* variable ($China\_share_{ht-1}$). This variable potentially embodies domestic demand shocks in the US, changes in US's industry production, changes in production capabilities in other exporters (these changes may in part a response to supply shocks from China), and China's supply shocks. For example, a positive demand shock in a sector in the US market is likely to induce an increase in imports from both China and all countries in the sample, which might lead to a positive correlation between *China share* and the error term. On the other hand, a positive sectoral productivity shock in the US tends to raise domestic production and thus reduces imports.

To identify the impact of the China trade shock, I follow Autor et al. (2013; 2016) to instrument China's share in US imports with China's share in imports of other high-income markets. I use data on the contemporaneous product-level share of Chinese exports to other high-income markets which are Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom (UK), to construct the share of imports from China in total imports of these countries.[4] A shift-share (or "Bartik") instrument in typical settings averages a set of shocks (the China trade shock in my case) using exposure share weights to have the shocks and the regression observations at the same level. Goldsmith-Pinkham, Sorkin, and Swift (2020) show that the identification of the shift-share instruments can be based on the exogeneity of the share weights in some research designs, while Borusyak, Hull, and Jaravel (2022) provide an econometric framework in which identification follows from the quasi-random assignment of shocks and share weights are allowed to be endogenous. In my paper, the share weights is not necessary as both the shocks (the *China share* variable) and the regression observations are at the product level.

The exclusion restriction assumption is satisfied when the shocks are exogenous. The identification assumption requires that the common component of rising Chinese imports to the US and the comparable high-income countries stems from China's rising competitiveness, falling prices, or falling trade costs in exporting sectors, which is likely to be the case in the period from 1995 to 2015. The exclusion restriction may be invalid if product demand shocks are correlated across high-income countries or there are correlated technological shocks leading to import growth in the US and the group of developed countries. In my robustness checks, I partially eliminate this concern by controlling for countries' total exports at the four-digit HS (HS4) level, US total imports at the HS4 level, or year-HS2 fixed effects. However, this potential threat to the identification strategy cannot be ruled out completely as noted by Autor et al. (2013; 2016). Therefore, estimates using this instrumental variable (IV) should be interpreted with this caveat in mind.

Table 4 reports the correlation coefficients between imports from China of the US and of other high-income economies that are used to compute the instrumental variable for China's share in the US. The correlation coefficient is calculated as the Pearson correlation of the share of import from China in total imports at the HS6 product level between the US and an advanced country, as follows:

$$corr_{s_t^{dCH}, s_t^{USCH}} = \frac{\sum_h \left(s_{ht}^{dCH} - \frac{1}{N}\sum_h s_{ht}^{dCH}\right)\left(s_{ht}^{USCH} - \frac{1}{N}\sum_h s_{ht}^{USCH}\right)}{\sum_h \left(s_{ht}^{dCH} - \frac{1}{N}\sum_h s_{ht}^{dCH}\right)^2 \sum_h \left(s_{ht}^{USCH} - \frac{1}{N}\sum_h s_{ht}^{USCH}\right)^2},$$

where s_{ht}^{dCH} refers to country d's share of HS6 product h imported from China in d's total imports of product h at time t, s_{ht}^{USCH} is US's share of HS6 product h imported from China in

[4]The set of high-income countries is similar to the sample used in Autor et al. (2013; 2016), except for the United Kingdom. I replace Japan in their original sample by the United Kingdom since Japan is an important trading partner of various countries in the sample and is close in geography to China and all Asian developing countries. Therefore, any shock to Chinese imports in Japan market is likely to be correlated with changes in supply capabilities of other countries in the sample, which invalidates the exclusion restriction requirement.

US's total imports of product h at time t, and N denotes the total number of HS6 products imported from China by both countries d and the US at time t. Chinese exports to the US are highly correlated with Chinese exports to other high-income countries with correlation coefficients ranging from 0.48 (Switzerland) to 0.67 (UK). Figure 3 also shows similar trends in China's shares in the US and these high-income markets. These similarities suggest that the instrumental variable used in the paper satisfies the relevance condition.

3.2 Empirical results

Regressions in equation (3.1.1) are estimated separately for each country in the sample. Results are reported in table 5. The effects on export value are significantly negative for most of the countries in the sample, except for Bangladesh, Vietnam, and Sri Lanka. The negative effect is strongest for Thailand with a decrease of approximately 2.885 percent in export value for a one-percentage-point rise in China's share, following by Malaysia (about 2.691 percent). By contrast, a one-percentage-point increase in China's share leads to a rise of around 4 percent in the value of exports from Vietnam and around 2.6 percent in Bangladesh. The coefficient for Sri Lanka is also negative, but it is insignificant.

Chinese competition leads to an increase in the quantity of exports from Vietnam, Bangladesh, India, and Sri Lanka, but the evidences for India and Sri Lanka are not significant. On the other hand, the other countries experience a decrease in the quantity of exports due to the rising competition from China. The size of the positive effect ranges from around 0.11 (Sri Lanka) to around 3.88 (Vietnam), while the size of the negative effect is between around -0.38 (Indonesia) and about -3.19 (Thailand). An obvious interpretation for the negative effects of Chinese competition on value and quantity is that the rise of Chinese exports leads consumers in the US to substitute goods from Asian developing countries with Chinese goods.

Based on the similarity in the impact on different countries and for simplicity, I group countries into two different groups. Group 1 includes Bangladesh, Vietnam, and Sri Lanka where the effect is non-negative for both export value and export quantity. These countries also have the highest proportion of comparative advantage products exported to the US which is overlapped with China's (table 3). Bangladesh, Vietnam, and Sri Lanka are also the three countries where their shares of exports to the US in their total exports are higher than other countries in the sample. Group 2 consists of India, Indonesia, Malaysia, Pakistan, the Philippines, and Thailand where the effect is non-positive for both export value and export quantity.[5]

Columns 1 and 2 in tables 6 and 7 report results of regressions (3.1.1) using IV for the

[5]The key results in this section and the following sections remain similar with two alternative groupings, when including only Bangladesh and Vietnam in Group 1 or when including Bangladesh, Vietnam, Sri Lanka, and India in Group 1. Results are available upon request.

China share variable for different groups of countries. On average, a one-percentage-point increase in *China share* is predicted to increase the value and quantity of exports to the US from countries in group 1 by approximately 2.1% and 2.4%, respectively. On the contrary, countries in group 2 experience a negative effect of about 1.7% and 1.2% on value and quantity of exports, respectively.[6] The Kleibergen-Paap LM statistics for under-identification and the Kleibergen-Paap Wald F statistics for weak identification of the instrumental variable are reported at the bottom of tables 6 and 7. They confirm the validity of the instrument.

Given similarities in comparative advantage and geography with China, all Asian countries should be negatively affected, but the results appear that some countries successfully use their product differentiation strategy, and thus China's export expansion has not been associated with a contraction in exports from these countries in the US market, while others do not. The literature has found that consumers in the advanced countries value quality more than those in poor countries (Hallak, 2006). Based on this literature, the positive effects of Chinese competition on value and quantity might imply that higher competitive pressure from China creates an incentive for other countries to concentrate on quality upgrading to differentiate their exports from China's exports in order to better insulate themselves from Chinese competition.

I conduct a simple check on a possible effect on product quality by dividing the sample into homogeneous products and differentiated products according to the classification by Rauch (1999). Results from IV regressions of equation (3.1.1) for two groups of products are reported in the last four columns in tables 6 and 7. In both tables, the effects on homogeneous products are not statistically significant, while the effects on differentiated products are statistically significant and signs and magnitudes of coefficients are consistent with the overall effects on two groups of countries in the first two columns. The IV does not work well for the sample of homogeneous products in group 1, and this is possibly because of the small sample size. Results from fixed effect regressions also do not show any significant effect on the group

[6] These results seem to not in line with what has been found in the literature. Ahearne et al. (2003) and P.-c. Athukorala (2009) find a positive correlation between China's exports and exports of Indonesia, Malaysia, the Philippines, and Thailand. However, they study the period before 2005. During this period, exports from these four countries were more similar than recently when they have been diverging their exports from China's exports. They perform the analysis for the three-digit-level or five-digit-level industries, which is at a more aggregate level. Wood and Mayer (2011), Hanson and Robertson (2010), and Eichengreen et al. (2007) find that China's rise mostly affects developing countries with similar comparative advantage in labor-intensive industries. My results on Indonesia, Malaysia, the Philippines, and Thailand are consistent with this finding, while the results on Bangladesh and Vietnam are not in line given that Bangladesh and Vietnam have considerably similar export structures with China. However, these studies use data for the period up until 2005, while China's rise is more prominent for the period after 2001 when China has joined the WTO. The growing pressure of Chinese exports might heighten the incentive for other countries to invest in technology into the production of higher-quality products in order to compete against China, which might lead to the difference in the findings. By using aggregate data at the country or four-digit-level HS, these papers do not take into account the heterogeneity across products at a more disaggregated level in the magnitude of the shock.

of homogeneous products. These results imply that most of the impact of the rise of China on two groups of countries comes from the effect on differentiated products.

Differentiated products are those with high scope for quality differentiation, while homogeneous products have limited scope for quality differentiation. Schott (2008) extend the Heckscher-Ohlin model for vertical differentiation. In this framework, countries with different relative abundance in factor endowment will specialize in differentiated products with different quality levels, and thus they can also compete within each industry by producing products of different quality levels. According to this model of vertial differentiation, results from the last four columns in tables 6 and 7 suggest that countries in groups 1 and 2 might respond to increasing competition from China by adjusting the quality of their exports. In the next section, I estimate product quality and investigate the impact of Chinese competition on product quality.

4 Impact on product quality

Quality upgrading is often viewed as innovation and plays an important role in export success and economic growth (Hausmann, Hwang, & Rodrik, 2007). Results from our previous section imply that Asian developing countries might respond to the increasing competition from China's exports by adjusting their product quality. In this section, I apply the methodology in Khandelwal (2010) to infer product quality as the residual of a demand equation and employ the estimated product quality to analyze the effect of Chinese competition on the quality of exports from Asian developing countries.

4.1 Estimation of product quality

4.1.1 Methodology

Product quality is estimated by applying the methodology developed by Khandelwal (2010) to product-level trade data. This method controls for product price and derives the quality of exported varieties from relative differences in their market shares. For two varieties with the same unit values, the one with a higher market share is assigned higher quality. To allow for more appropriate substitution patterns between varieties of each product, the method uses a nested logit demand framework by Berry (1994).

In this study, I define products at the six-digit HS codes (HS6 product), denoted by h. Each six-digit HS code is considered as a nest for the application. A variety is a US import from country c within a product (variety ch). A four-digit HS code is referred to as an industry (HS4 industry). Berry (1994) shows that under the assumption that each consumer makes a discrete choice among different varieties depending on their prices, observed characteristics, quality, and on random consumer "tastes", market share is derived as the aggregation across consumers of their individual probability of choosing one variety over the others. Therefore, the quality of each variety *ch* can be measured as the residual from the estimation of the following demand model:

$$ln(s_{cht}) - ln(s_{0t}) = \alpha p_{cht} + \sigma ln(ns_{cht}) + Q_{cht} \tag{4.1.1}$$

where $ln(s_{cht})$ is the log market share of variety *ch* and $ln(s_{0t})$ refers to the log market share of an 'outside variety'. The term $ln(ns_{cht})$ denotes the 'nest share' of variety *ch*, namely the market share of variety *ch* within product *h* at time *t*. This term allows a product in the market to be segmented in subclass *h* of closer substitute varieties. The unit value is used as a proxy for a variety's export price p_{cht}. Q_{cht} refers to the quality of variety *ch* at time t.

As I do not have information on detailed characteristics of varieties, following Khandelwal (2010), I control for variety fixed effects ($\lambda_{1,ch}$) and year fixed effects ($\lambda_{2,t}$). The variety quality includes three components, a time-invariant component ($\lambda_{1,ch}$), a time trend common across all varieties ($\lambda_{2,t}$), and $\lambda_{3,cht}$ which varies across varieties and time as in equation (4.1.2). This last component of quality, $\lambda_{3,cht}$, is not observed by the econometrician and plays the role of the estimation error in equation (4.1.2).

$$ln(s_{cht}) - ln(s_{0t}) = \alpha p_{cht} + \sigma ln(ns_{cht}) + \lambda_{1,ch} + \lambda_{2,t} + \lambda_{3,cht} \tag{4.1.2}$$

Two key challenges are present when estimating equation (4.1.2). First, $\lambda_{3,cht}$ and the nest share ns_{cht} are potentially correlated with the variety's price p_{cht}. I instrument the price with the variety's unit cost including all freight, insurance, and other charges (excluding import duties). The relevance requirement is satisfied since unit costs are obviously correlated with prices, but one may raise a concern that transportation cost may be correlated with a variety's quality because of the "Washington Apples" effect, i.e. transportation costs lead distant countries to ship high-quality goods (Hummels & Skiba, 2004). Following Khandelwal (2010), I use this instrument under the assumption that shocks to trade costs do not affect deviations $\lambda_{3,cht}$ from a variety's average quality $\lambda_{1,ch}$.

To deal with the endogeneity problem of the nest share, I use the number of varieties within product *h* and the number of products exported by country *c* within each industry as the instrumental variables for the nest share. The identification assumption is the intensive (i.e. quantities exported) and the extensive (i.e. number of different varieties and products exported) margins of trade are correlated, but the extensive margin is uncorrelated with the quality of each individual variety. This assumption is satisfied if exporting firms choose varieties' quality after variety entry and exit occur (Khandelwal, 2010).

Second, Khandelwal (2010) notes the problem of hidden varieties in estimating equation

(4.1.2), i.e. if a country exports more finely classified (hidden) varieties within a product, market share of the product at a more aggregate level will be larger. I follow Khandelwal (2010) to use a country's population as a proxy for countries' hidden varieties. This proxy is derived from the model in P. Krugman (1980) where a larger country produces more varieties.

After adjusting for the hidden varieties, I estimate the following specification of the demand model:

$$ln(s_{cht}) - ln(s_{0t}) = \alpha p_{cht} + \sigma ln(ns_{cht}) + \gamma ln(pop_{ct}) + \lambda_{1,ch} + \lambda_{2,t} + \lambda_{3,cht} \tag{4.1.3}$$

where pop_{ct} denotes the population of country c. Once consistent estimates of the demand parameters α and σ are obtained, the estimator of quality is obtained as:

$$\hat{Q}_{cht} = \hat{\lambda}_{1,ch} + \hat{\lambda}_{2,t} + \hat{\lambda}_{3,cht} = [ln(s_{cht}) - ln(s_{0t})] - [\hat{\alpha} p_{cht} + \hat{\sigma} ln(ns_{cht}) + \hat{\gamma} ln(pop_{ct})] \tag{4.1.4}$$

4.1.2 Data source, estimation procedure, and results

I estimate equation (4.1.3) separately for each four-digit HS industry using BACI-CEPII data from 1995 to 2015 for all exporters to the US. Unit value and unit cost used to estimate product quality are taken from Schott (2008). A variety's unit value is the sum of the value, total duties, and transportation costs divided by the import quantity. A variety's unit cost is defined as the sum of all freight, insurance, and other charges (excluding US import duties) divided by the import quantity. Since the US import data taken from Schott (2008) reports information at the ten-digit HS (HS10) level, I take the mean of unit value and mean of unit cost for all HS10 varieties within each HS6 variety to have information on unit value and unit cost at the six-digit HS level. Unit values and unit costs for HS6 varieties are then deflated to real values using the US consumer price index (CPI). I restrict the sample to the manufacturing industries (SITC 5-8) and exclude the homogeneous goods defined by Rauch (1999). Since the import data are noisy, I exclude observations with unit values that fall below the 1st percentile or above the 99th percentile of its distribution.

To construct market share of outside varieties, I use US domestic output data taken from the National Bureau of Economic Research and US Census Bureau's Center for Economic Studies (NBER-CES) Manufacturing Industry Database (Becker, Gray, & Marvakov, 2016) (from 1995 to 2011) and the Annual Survey of Manufacturers (from 2012 to 2015). The classification of these domestic output data is at the six-digit North American Industry Classification System (NAICS). After excluding homogeneous goods defined by Rauch (1999) and non-manufacturing industries (SITC 0-4 and SITC 9), I construct product output as the sum of value of shipment and changes in inventories between the end of the current year and the end of the previous year. HS-NAICS Concordance from Pierce and Schott (2009) is used to merge domestic industry output data and trade data from BACI. I also use correspondence tables of different HS editions taken from the United Nations (UN) Statistics Division to convert six-digit HS codes to the same six-digit HS classifications used in 1992 to avoid problems related to the reclassification of codes. Data on population, consumer price index, and real GDP are taken from the World Development Indicator of the World Bank.

The domestic substitute for imports could be considered as the outside variety in this case. Therefore, the market share of the outside variety (s_{0t}) is defined as one minus the industry's import penetration. I construct the industry's import penetration as $IPEN_{it} = \frac{M_{it}}{M_{it} + Q_{it} - X_{it}}$ (Bernard, Jensen, & Schott, 2006), where M_{it} refers to the total value of US imports, Q_{it} denotes domestic production, and X_{it} represents total US exports at the HS4 level. I remove all HS4 industries with extreme import penetration ratios that fall below the 2nd percentile or above the 98th percentile of its distribution.

Once having the outside variety market share, the total industry output is computed as $MKT_{4t} = \sum_{ch \neq 0} q_{cht}/(1 - s_{0t})$, where q_{cht} denotes the import quantity of variety ch and $\sum_{ch \neq 0} q_{cht}$ is the sum of all HS6 products under a HS4 industry. The total product output is defined as $MKT_{6t} = \sum_{c \neq 0} q_{cht}/(1 - s_{0t})$, where $\sum_{c \neq 0} q_{cht}$ denotes the sum of all varieties exported by all exporters under a HS6 product. The imported variety market share and the nest share are computed as $s_{cht} = q_{cht}/MKT_{4t}$ and $ns_{cht} = q_{cht}/MKT_{6t}$, respectively.

Since a large number of fixed effects is included in the regressions, I drop all industries where the number of observations in all years is less than 100 to ensure having sufficient observations for each regression. Regression (4.1.3) is estimated for 1669 products in 307 different HS4 industries exported from 182 countries with standard errors clustered at the exporter level. After having estimated product quality, I exclude all industries where the coefficients of price and nest share are not consistent with theory, i.e. the price coefficient should be negative and the nest share coefficient should take values between 0 and 1.[7] The instrument variables in the regressions of these industries are unlikely to perform well. I also remove all varieties with extreme values of quality estimate that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution to mitigate any concern about measurement errors. The estimation statistics of these regressions are summarized in table 8. Estimates of the demand parameters are used to obtain the measure of quality $\hat{Q}_{cht}$ as in equation (4.1.4).

[7] This accounts for about 55% of the sample. However, the results in the next section remain the same with the inclusion of these industries, see tables 41 and 42 in the Appendix C.

4.2 Empirical results

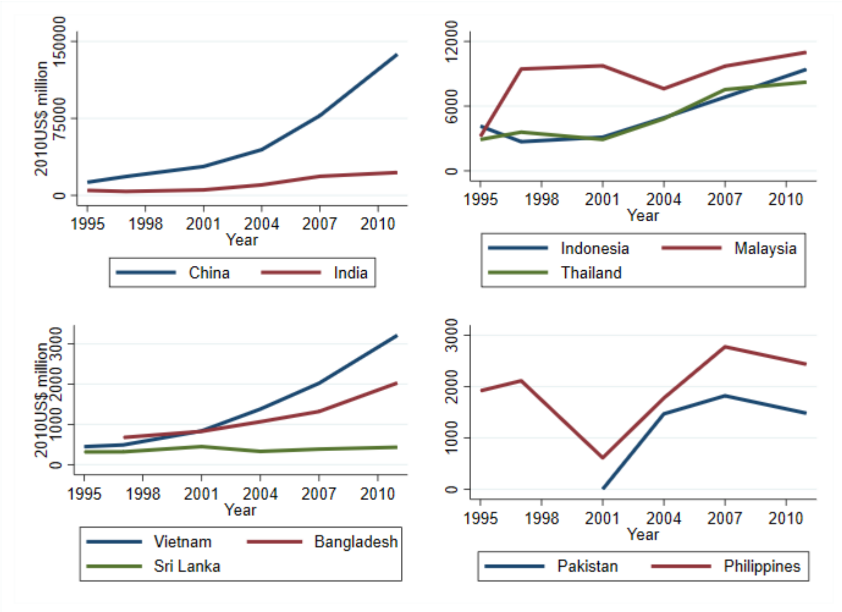
After estimating product quality, I investigate the effect of Chinese competition on product quality using the same specification as equation (3.1.1), but the dependent variable is the quality estimated according to the method described in Section 4.1. In the quality regression, including the exporter-product fixed effects ensures that the estimation exploits the variation within the product because the qualities are estimated separately across industries (Amiti & Khandelwal, 2013).

Table 9 reports the effect on product quality estimated using IV for unit price and nest share for two groups of countries. Unlike the impacts on export value and export quantity, the effect of Chinese competition on product quality is significantly positive for both groups of countries.[8] Asian developing countries upgrade their product quality in order to compete against China when facing increasing competitive pressure from China. This finding supports the escape-competition effect argument in Nickell (1996) and Bastos and Straume (2012) that stronger competition increases incentives to invest in innovation (quality upgrading) to survive the competition. The finding is consistent with the result in Amiti and Khandelwal (2013) where they also find that greater competition leads to an increase in export quality. The result also complies with an increase in the skilled labor value added content of exports from these countries over the same period reported in figure 5.

Results in columns 2 and 4 in table 9 seems to show that the magnitude of the coefficient of the regression for group 1 is higher than the one for group 2. However, the 95% confidence interval of the coefficient for group 1, which is [1.68; 4.01], is overlapped with the 95% confidence interval of the coefficient for group 2, which is [1.28 and 2.36]. A formal test shows that the coefficient of group 1 is not significantly higher than the one of group 2. This might imply that countries in both groups upgrade product quality at an almost similar rate. Nevertheless, the effects on export value and quantity are different between the two groups, and the level of similarity in export structure, especially in the proportion of comparative advantage products, is not similar between the two groups. There might be certain products where some countries are better at quality upgrading, but some countries are not.

[8] The effect is significantly positive for each country as well, see table 8 in the Appendix C. By contrast, if using unit value as a proxy for product quality, the coefficient on the *China share* variable is significantly negative for both groups of countries. The difference in the results on product quality and on unit value confirms that using unit value as a proxy for product quality will mislead the impact in this case (Khandelwal, 2010; Szczygielski & Grabowski, 2012; and Jakel & Sorensen, 2020). Higher prices might reflect the wage differential, higher manufacturing costs, or trade costs.

Figure 5: Skilled labor value added content of exports



Source: The Labor Content of Exports Database (Cali et al., 2016). The graph plots the skilled labor value added content of total exports (in 2010US$ million) in each country.

Bernard et al. (2007) and Amiti and Khandelwal (2013) suggest that quality growth is associated with comparative advantage sectors. This raises the question of whether the impacts of China's rise on quality will differ between comparative advantage and comparative disadvantage products and this heterogeneity in the impact will be different between the two groups of countries. I test for heterogeneous impacts of China's rise according to the comparative advantage of these countries in equation (2.0.1) in the Appendix. The results reported in the first two columns of table 11 in the Appendix show that countries tend to upgrade quality more for products where they have a comparative advantage in the production. Nevertheless, there is no substantial difference in the results between the two groups of countries.

The escape-competition theory in Nickell (1996) and Bastos and Straume (2012) argues that stronger competition raises incentives to invest in quality upgrading. Additionally, the competitive intensity from China might be greater for products where China has a comparative advantage than those where China does not have a comparative advantage. Thus, one possible explanation for differences in impacts on value and quantity between the two groups of countries could be different responses on product quality with respect to the competitive intensity from China. I analyze the heterogeneity in the impact on product quality according to China's comparative advantage using the specification in equation (2.0.2) in the Appendix. The results reported in the last two columns of table 11 in the Appendix show that both groups of countries improve quality more for products where China has a comparative advantage than those where China does not have a comparative advantage.

Aghion et al. (2009) allow the relationship between competition and innovation to depend on the proximity of the product to the world technology frontier. The authors show that threat from entrants induces incumbent firms in the industry close to the frontier to innovate more since they know that they can escape and survive entry by innovating successfully. By contrast, firms in the industry far from the frontier do not have an incentive to innovate since entry threat reduces the expected rents from innovation. This mechanism is mentioned as the escape-entry effect in their paper. Based on this theory, I investigate the heterogeneity in the impact according to the proximity to the world quality frontier:

$$\begin{aligned}\hat{Q}_{cht} = \beta China\_share_{ht-1} + \gamma_5 China\_share_{ht-1} * (PF^c_{h95} > p75) \\ + \alpha_1 ln(GDP_{ct-1}) + \delta_{ch} + \delta_t + \varepsilon_{cht}\end{aligned} \tag{4.2.1}$$

where $\hat{Q}_{cht}$ refers to the quality of product h exported by country c at time t, which is estimated following the method described in Section 4.1. PF^c_{h95} denotes the proximity to the quality frontier of variety ch in 1995 and $PF^c_{h95} > p75$ is a dummy variable where the proximity to the quality frontier of product h exported by country c belongs to the fourth quartile of the distance to the frontier distribution of product h in 1995. A variety with the distance to the frontier in the fourth quartile of its distribution is considered as close to the frontier. I fix the proximity to the frontier measure at the figures computed in 1995, the initial year in the sample, to mitigate any endogeneity concerns.

The proximity to frontier measure is constructed following Amiti and Khandelwal (2013). I take a monotonic transformation of the quality estimates to ensure that all qualities are nonnegative: $\hat{Q}^T_{cht} = exp[\hat{Q}_{cht}]$. A variety's proximity to the frontier is defined as the ratio of its transformed quality to the highest quality within each HS6 product: $PF^c_{ht} = \frac{\hat{Q}^T_{cht}}{max_{c \in ht}(\hat{Q}^T_{cht})}$. The proximity to frontier is bounded between 0 and 1. This measure is close to 1 for varieties close to the frontier and is close to 0 for varieties far from the frontier.

Similar to the specification in equation (3.1.1), there are likely endogeneity problems with the *China share* variable ($China\_share_{ht-1}$) when estimating equation (4.2.1). Therefore, I instrument the *China share* variable with the same instrument as above (i.e. China's share in other high-income markets) and instrument the interaction term with the interaction between the China's share in other high-income markets and the dummy indicator for belonging to the fourth quartile of the distance to the frontier distribution of product h in 1995 ($PF^c_{h95} > p75$).

The first two columns in table 10 present the results for equation (4.2.1). In line with Amiti and Khandelwal (2013) and the escape-entry effect in Aghion et al. (2009), products close to the world frontier in group 1 are further upgraded quality when facing tougher competition from China, which is shown by the significantly positive coefficient of the interaction term $China\_share_{ht-1} * (PF^{c}_{h95} > p75)$. On the contrary, the coefficient of the interaction term $China\_share_{ht-1} * (PF^{c}_{h95} > p75)$ is negative but insignificant for group 2. I don't find any evidence of the heterogeneity in the effect on product quality according to the proximity to the world frontier for countries in group 2.

Finally, there might be more scope for quality differentiation for long-ladder products than short-ladder products. Therefore, I allow the relationship between competition and product quality to depend on the length of the quality ladder. Following Khandelwal (2010), the quality ladder is constructed as the difference between the maximum and minimum quality of a product: $Ladder_{ht} = \hat{Q}^{max}_{ht} - \hat{Q}^{min}_{ht}$. I estimate the following regression:

$$\begin{aligned}\hat{Q}_{cht} &= \beta China\_share_{ht-1} + \gamma_7 China\_share_{ht-1} * (Ladder_{h95} > p75) \\ &\quad + \alpha_1 ln(GDP_{ct-1}) + \delta_{ch} + \delta_t + \varepsilon_{cht}\end{aligned} \tag{4.2.2}$$

where $Ladder_{h95} > p75$ is a dummy variable equal to one if the length of the quality ladder of product h belongs to the fourth quartile of the ladder length distribution of all products in 1995. To mitigate endogeneity concerns, I use the quality ladder of a product at the length measured in 1995 (i.e. the first period in the sample). One might raise a concern that "short" ladders could become "long" or vice versa over time (Khandelwal, 2010). However, the correlation coefficients between a product's initial ladder length and its lengths in later years (until the last year in the sample) are significant and higher than 0.85. This implies that a product's ladder length is persistent over time. I use the same method as in equation (4.2.1) to deal with the endogeneity problem.

Results of regression (4.2.2) are reported in the last two columns in table 10. The coefficient of the interaction term $(China\_share_{ht-1} * (Ladder_{h95} > p75))$ is negative for countries in both groups but significant for only group 2. However, the magnitude of the coefficient is smaller than the coefficient on $China\_share_{ht-1}$. Countries in group 2 further upgrade the quality of short-ladder products when facing tougher competition from China. However, short-ladder products are likely to have a low correlation between price and quality, i.e., expensive imports in short-ladder products do not usually receive a high valuation from the average consumer (Khandelwal, 2010). Moreover, the quality ladder can be used as a proxy for vertical differentiation. In short-ladder products, the scope for quality differentiation is likely to be limited. Therefore, it might not be a wise strategy to upgrade the quality of short-ladder products. This could be a possible reason for the decrease in the value and quantity of exports in group 2 when facing tougher competition from China.

Overall, the two groups of countries follow different strategies when facing tougher competition from China. While countries in group 1 upgrade quality more for products closed to the frontier than those distant to the frontier, countries in group 2 upgrade quality less for long-ladder products than short-ladder ones. These different strategies could possibly emanate from the variation in the level of export concentration between the two groups. Exports of countries in group 1 highly concentrated on the garment industry; and hence, group 1 countries are likely to produce high-quality products and keep focusing on upgrading the quality of these products to expand their exports in high-income markets (Rahman, 2008; P.-C. Athukorala, 2007; and Chaponnière, Cling, & Zhou, 2010). Lopez-Acevedo and Robertson (2012) also find that Bangladesh, Vietnam, and Sri Lanka have upgraded the quality of their textile products. On the other hand, most countries in group 2 have a more diverse export portfolio; and thus they may produce less differentiated goods.

5 Robustness analysis

In this section, I check the robustness of the results to different ways to cluster standard errors, additional controls, new estimated quality, and different measures of the proximity to the world frontier and quality ladder measures.

First, I estimate the effect on value and quantity for the group of products used in the regressions of the effect on product quality. This is because the data trimming for the quality estimation procedure substantially reduces the size of the sample used in the quality regressions relative to the sample size of the regressions of the impacts on value and quantity. The results on value and quantity remain similar for this sample, except for the effect on quantity in group 2, it is insignificant but still negative (see table 7 in the Appendix C).

Since the variable of interest (*China share*) varies at the HS6-year level, I cluster standard errors at the HS4-year level for regressions in the above sections. As a robustness check, I estimate all regressions again and cluster standard errors at the exporter-HS4 level (tables 9 and 10), at the exporter-year level (tables 11 and 12), and at the HS6 product level (tables 13 and 14).[9] The significance of the main coefficients does not change.

One might concern that productivity shocks at the industry level may bias the results. I check the sensitivity of the results by including the one-period lag of the log of a country's total exports at the HS4 level to control for any productivity shocks at the HS4 industry level. The sign and significance level of all estimates are the same as before, and the magnitudes of the coefficients change moderately (tables 15 and 16). Industry-specific shocks or domestic demand shocks at the industry level in the US could affect the results. Therefore, I estimate another specification controlling for the one-period lag of the log of total US import at the

[9]The results of the robustness checks are reported in the Appendix C.

HS4 industry level to capture these shocks (tables 17 and 18). I also estimate other regressions controlling for year fixed effects, exporter fixed effects, and HS6 fixed effects (tables 19 and 20), or controlling for exporter fixed effects, HS6 fixed effects, and year-HS2 fixed effects (tables 21 and 22). The impact of China's rise could be instantaneous. To address this concern, I regress the current value of the dependent variables on the current value of the *China share* variable instead of using the one-period lag of *China share* (tables 23 and 24). Also, the comparative advantages of China and these Asian countries are probably evolving over time. Therefore, I control for the one-period lag of the normalized revealed comparative advantage indices at the HS6 level of China and these Asian countries in tables 25 and 26, where the normalized revealed comparative advantage index of product h produced by country c at time t is computed as $NRCA^c_{ht} = \frac{RCA^c_{ht} - 1}{RCA^c_{ht} + 1}$. In tables 27 and 28 I include both the one-period lag of the normalized revealed comparative advantage indices and the exporter-year fixed effects. I receive similar results when performing all these robustness checks.

Quality upgrading of these countries may result from the complementary effect of the rise of China. Studies have found that better access to greater variety and high quality of imported inputs can stimulate firms' innovation and productivity (Goldberg, Khandelwal, Pavcnik, & Topalova, 2010). Countries in my sample have imported a considerable amount of intermediate inputs from China (above 10% of total imports of Bangladesh, Pakistan, Vietnam, and some other countries), which could be the source of quality upgrading in these countries. Since it is almost impossible to have information on intermediate inputs for each product at the HS6 level, I include the one-period lag of countries' shares of capital and intermediate inputs imported from China in their total imports to partially control for the complementary effect of the rise of China (tables 29 and 30).[10] I also include the one-period lag of the log of China's exports to these countries at the HS6 level (tables 31 and 32). The results remain robust to adding this control.

There could be a problem of measurement errors in the proximity and ladder variables due to outliers of the highest and lowest quality varieties. I address this concern by redefining the frontier using the third-highest-quality variety rather than the maximum and redefining the ladder using the difference between the third-highest-quality variety and the third-lowest-quality variety. The results remain robust to these alternative measures of the world frontier and the quality ladder (tables 33 and 34). Moreover, China's export quality may be overstated because of its large shares of exports in the US market (hidden varieties problem) and its small value added compared to its gross value (while the US import data record gross values) (Amiti & Khandelwal, 2013). Thus, I reestimate quality using equation (4.1.3) for a

[10]Products are categorized into four different groups including raw materials, intermediate goods, consumer goods, and capital goods according to UNCTAD (United Nations Conference on Trade and Development) categorization.

sample excluding China, redefine the frontier and ladder variables after re-estimating quality, and estimate the above regressions using the new quality estimate (tables 35 and 36). Magnitudes of the coefficients change, but their signs are mostly consistent with the main results.

One might raise concerns about the instrument variables in the quality estimation regressions, which might lead to inconsistent estimated quality. I estimate the main specifications for both the quality estimated by fixed-effect regressions and quality estimated using IV (tables 37 and 38). I also estimate product quality using median unit cost instead of mean unit cost as an IV for the unit price and estimate the effect on product quality using this new measure of quality (tables 39 and 40). The results remain robust to these robustness checks.

6 Conclusion

The rapid integration of China into the world economy has considerably affected the exporting environment faced by other developing countries in the region. However, the paper provides clear evidence that the impacts of the increasing competition from China on value and quantity are mixed depending on the similarity in export structure between a country and China. In countries with considerably high numbers of similar comparative advantage products with China such as Vietnam, Bangladesh, and Sri Lanka, China's export expansion has not been associated with a contraction in their exports to the US. On the other hand, there is a tendency for China's exports to crowd out the exports of other countries, who are diverging their exports from China's export products or have a smaller number of similar comparative advantage products with China.

All countries respond to tougher competitive pressure from China by upgrading product quality, which is consistent with the fact that their exports have become more sophisticated. The share of machinery, transport, and equipment to total exports has surpassed that of other primary products. Nonetheless, the rate of quality upgrading depends importantly on whether the product is a comparative advantage product, how far the product is from the world quality frontier, and the length of the quality ladder. Both groups of countries upgrade quality more for their comparative advantage products or products where China has a comparative advantage, but the rate of quality upgrading is higher for the group of Vietnam, Bangladesh, and Sri Lanka (group 1 countries). Tougher competition from China also encourages quality upgrading for products close to the frontier for countries in group 1. By contrast, I find no difference in response with respect to quality according to the proximity to the frontier for products exported by Indonesia, Malaysia, Philippines, India, Pakistan, and Thailand (group 2 countries). Countries in group 2 improve quality more for short-ladder products when facing

China's export expansion.

However, the China-United States trade war in 2018, new free trade agreements such as the Regional Comprehensive Economic Partnership (RCEP), and the pandemic pressure might have changed the global trade environment after 2015. While exports to the US of Asian developing countries might directly benefit from the increase in tariffs that the US imposed on imports from China, the competition environment might also change due to China's policy in response to the China-US trade war. The Chinese government approved new Foreign Investment Law to enhance protection on intellecture property, which is expected to play a positive role in encouraging a more innovative environment in China (Liu, 2019). The trade war and the pandemic pressure have brought stiff challenges to the manufacturing industries in the Asian developing countries, motivating the sectors in these countries to innovate and transition from simple assembly production to more complex higher value-added manufaturing to stay competitive in the global economy. At the same time, the Regional Comprehensive Economic Partnership[11] is expected to broaden and deepen the economic linkages and connectivity among its membership countries, bringing more opportunities for its member countries to "move up" from their current position in global value chains. All these factors might change the patterns of the impact of the competition from China on its Asian neighbors, which is an interesting issue for further study.

[11]RCEP is a free trade agreement between the ten member states of the Association of Southeast Asian Nations (ASEAN) (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam) and its five partners (Australia, China, Japan, South Korea, and New Zealand).

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Appendices

A Tables

Table 1: US as a main export destination of Asian countries

	1995		2005		2015	
	Rank in destinations (1)	Share in total exports (2)	Rank in destinations (3)	Share in total exports (4)	Rank in destinations (5)	Share in total exports (6)
Bangladesh	1	33.68	1	27.67	1	17.34
India	1	16.33	1	17.38	1	15.94
Indonesia	2	15.17	2	12.05	1	12.42
Malaysia	2	21.25	1	19.65	2	12.75
Pakistan	1	17.76	1	21.86	1	15.01
Philippines	1	39.62	2	15.52	3	13.08
SriLanka	1	39.32	1	31.85	1	25.44
Thailand	1	20.17	1	16.54	1	12.37
Vietnam	6	3.82	1	19.07	1	20.57
China	2	19.64	1	23.70	1	19.28

Source: Author's calculation from BACI database.
Notes: Columns 1, 3, and 5 report rank of the US in the top export destinations of each country. Columns 2, 4, and 6 report share of exports to the US in total exports of each country in 1995, 2005, and 2015, respectively.

Table 2: Correlation coefficients between structure of products exported to the US of each country and China

	1995	2000	2005	2008	2009	2010	2011	2012	2013	2014	2015
Vietnam	0.01	0.16*	0.17*	0.19*	0.19*	0.19*	0.16*	0.22*	0.51*	0.66*	0.67*
Bangladesh	0.09*	0.05*	0.05*	0.06*	0.07*	0.07*	0.05*	0.05*	0.05*	0.04*	0.05*
SriLanka	0.16*	0.08*	0.06*	0.08*	0.09*	0.08*	0.06*	0.05*	0.05*	0.05*	0.05*
India	0.05*	0.04*	0.05*	0.07*	0.06*	0.04*	0.03	0.02	0.02	0.02	0.02
Pakistan	0.07*	0.06*	0.04*	0.05*	0.07*	0.06*	0.05*	0.04*	0.05*	0.04*	0.04*
Indonesia	0.34*	0.51*	0.25*	0.17*	0.22*	0.15*	0.09*	0.11*	0.11*	0.10*	0.11*
Malaysia	0.19*	0.53*	0.72*	0.76*	0.67*	0.48*	0.32*	0.29*	0.30*	0.25*	0.17*
Philippines	0.14*	0.22*	0.24*	0.20*	0.25*	0.21*	0.19*	0.21*	0.17*	0.22*	0.16*
Thailand	0.32*	0.45*	0.39*	0.32*	0.25*	0.25*	0.21*	0.20*	0.20*	0.21*	0.19*
Average	0.15	0.23	0.22	0.21	0.21	0.17	0.13	0.13	0.16	0.18	0.16

Source: Author's calculation from BACI database.
Notes: The export correlation coefficient between exports to the US of each country and China is defined as follows: $corr\left(\frac{E_{ht}^{cUS}}{E_t^{cUS}}, \frac{E_{ht}^{CHUS}}{E_t^{CHUS}}\right)$, where E_{ht}^{cUS} refers to total value of country c's exports of product h to the US at time t, E_{ht}^{CHUS} indicates total value of China's exports of product h to the US at time t, and E_t^{cUS} and E_t^{CHUS} are respectively total exports to the US of country c and China at time t. * indicates coefficients significantly different from zero at the 5% level.

Table 3: Similarity in the number of comparative advantage products exported to the US

Country	$\frac{\# \text{ products exported to US where both China \& country c have CA}}{\text{Total CA products exported to US of c}} * 100$		
	1995	2005	2015
Vietnam	85.2	77.0	74.4
Bangladesh	88.0	83.0	85.0
Sri Lanka	82.8	72.4	68.8
Indonesia	63.8	64.0	65.4
Malaysia	51.1	54.1	47.0
Pakistan	79.2	75.3	71.1
Philippines	74.9	67.9	55.6
India	53.4	54.5	58.8
Thailand	64.2	58.4	54.2

Source: Author's calculation from BACI database.

Notes: Comparative advantage products (CA products) are HS6 products with revealed comparative advantage indices greater than 1. The revealed comparative advantage index for each product is the ratio of product h's share in country c's exports (E^c_{ht}/E^c_t) to its share in world trade (E_{ht}/E_t): $RCA^c_{ht} = (E^c_{ht}/E^c_t)/(E_{ht}/E_t) = (E^c_{ht}/E_{ht})/(E^c_t/E_t)$. The columns present the proportion of the number of HS6 products exported to the US that both China and country c have comparative advantages in their production in country c's total number of comparative advantage products exported to the US.

Table 4: Correlation coefficients between imports from China of the US and other high-income countries

	Correlation with US's imports from China
Australia	0.58
Denmark	0.49
Finland	0.51
Germany	0.66
New Zealand	0.54
Spain	0.62
Switzerland	0.48
United Kingdom	0.67

Source: Author's calculation from BACI-CEPII database.

The correlation coefficient between imports from China of country d and US's imports from China is defined as: $corr\left(\frac{M^{dCH}_{ht}}{M^d_{ht}}, \frac{M^{USCH}_{ht}}{M^{US}_{ht}}\right)$, where M^{dCH}_{ht} refers to country d's import of product h from China at time t, M^d_{ht} is d's total imports of product h at time t, M^{USCH}_{ht} indicates US's import of product h from China at time t, and M^{US}_{ht} denotes US's total imports of product h at time t.

Table 5: Impact on value and quantity

	Value	Quantity
Bangladesh	2.587***	3.468***
	(0.510)	(0.594)
Vietnam	3.978***	3.882***
	(0.450)	(0.502)
Sri Lanka	-0.536	0.113
	(0.445)	(0.549)
India	-0.664***	0.180
	(0.187)	(0.210)
Indonesia	-1.109***	-0.381
	(0.239)	(0.280)
Malaysia	-2.691***	-2.013***
	(0.278)	(0.315)
Pakistan	-0.575*	-0.392
	(0.298)	(0.378)
Philippines	-1.896***	-1.562***
	(0.244)	(0.269)
Thailand	-2.885***	-3.187***
	(0.230)	(0.277)

Notes: All regressions are estimated for exports at the HS6 product level for each country. The dependent variables are log of value and log of quantity of exports from each country to the US. All regressions control for year fixed effects and HS6-level product fixed effects. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. Standard errors clustered at the year-HS4 industry level are shown in parentheses. * and *** indicate coefficients significantly different from zero at the 10% and 1% level, respectively.

Table 6: Impact on value and quantity, Group 1

	All Products		Homogeneous Products		Differentiated Products	
	Value	Quantity	Value	Quantity	Value	Quantity
	(1)	(2)	(3)	(4)	(5)	(6)
L.China share	2.055***	2.417***	-5.312	-120.245	1.999***	2.357***
	(0.286)	(0.331)	(204.454)	(393.083)	(0.288)	(0.334)
Year FE	X	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X	X
Observations	41944	38742	317	306	41627	38436
KP LM stat	692.631	610.531	0.062	0.126	683.933	602.033
KP Wald F stat	1108.310	969.606	0.046	0.094	1091.965	953.717

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 1 which includes Bangladesh, Vietnam, and Sri Lanka. Homogeneous and differentiated products are categorized according to the classification by Rauch (1999). The dependent variables are log of value and log of quantity of exports from countries in group 1 to the US. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 7: Impact on value and quantity, Group 2

	All Products		Homogeneous Products		Differentiated Products	
	Value	Quantity	Value	Quantity	Value	Quantity
	(1)	(2)	(3)	(4)	(5)	(6)
L.China share	-1.688***	-1.211***	0.650	2.126	-1.777***	-1.307***
	(0.128)	(0.141)	(1.250)	(1.429)	(0.130)	(0.143)
Year FE	X	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X	X
Observations	224651	216879	3724	3651	220927	213228
KP LM stat	1570.313	1509.836	36.222	35.952	1532.109	1472.281
KP Wald F stat	3588.976	3397.645	42.248	42.065	3491.830	3303.539

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 2 which includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. Homogeneous and differentiated products are categorized according to the classification by Rauch (1999). The dependent variables are log of value and log of quantity of exports from countries in group 2 to the US. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 8: Quality estimation results

	Mean	Median	3rd quarter	s.d.
FE price coefficient	-0.0004	-0.00002	0	0.002
IV price coefficient	-0.0023	-0.0002	-0.00004	0.0104
FE nest share coefficient	0.957	0.975	0.991	0.051
IV nest share coefficient	0.685	0.789	0.917	0.283
Observations per estimation	1968	1226	2550	2360
Quality FE	-1.507	-2.043	1.064	8.508
Quality IV	-1.821	-2.646	1.738	17.760

Notes: The table reports estimation statistics of estimating equation (4.1.3) separately for each of the 129 HS4 manufacturing industries. The standard errors of regressions are clustered at the exporter level. FE refers to fixed effect regression and IV refers to regression using instrumental variables for price and nest share.

Table 9: Impact on product quality

	Group 1		Group 2	
	FE	IV	FE	IV
	(1)	(2)	(3)	(4)
L.China share	0.867***	2.844***	0.651***	1.819***
	(0.168)	(0.596)	(0.103)	(0.275)
Year FE	X	X	X	X
Exporter-HS6 FE	X	X	X	X
Observations	4889	4889	23043	23043
KP LM stat		65.309		191.244
KP Wald F stat		93.835		342.776

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 10: Proximity to the frontier, length of quality ladder, and quality upgrading

	Frontier Products		Long Ladder Products	
	Group 1	Group 2	Group 1	Group 2
	(1)	(2)	(3)	(4)
L.China share	5.204***	2.388***	2.996***	2.009***
	(1.428)	(0.343)	(0.586)	(0.296)
L.China share*(PF1995>p75)	2.109***	-0.180		
	(0.791)	(0.339)		
L.China share*(Ladder1995>p75)			-0.616	-1.204***
			(0.712)	(0.286)
Year FE	X	X	X	X
Exporter-HS6 FE	X	X	X	X
Observations	1683	13704	4436	20869
KP LM stat	19.683	130.589	62.041	191.226
KP Wald F stat	8.650	113.848	44.996	160.129

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

B Comparative advantage, competition, and quality upgrading

As being mentioned in Section 2.2, China and Asian developing countries reveal substantial similarity in comparative advantage. This raises the question of the role of comparative advantage in these countries' responses to China's rising competitive pressure. I test for heterogeneous impacts of China's rise according to comparative advantage by including an interaction between China's share in the US market and a dummy for country c having comparative advantage in the production of product h in 1995:

$$\begin{aligned}\hat{Q}_{cht} = & \beta China\_share_{ht-1} + \gamma_1 China\_share_{ht-1} * RCA^c_{h95} \\ & + \alpha_1 ln(GDP_{ct-1}) + \delta_{ch} + \delta_t + \varepsilon_{cht}\end{aligned} \tag{2.0.1}$$

where $\hat{Q}_{cht}$ refers to quality estimated according to the method described in Section 4.1. RCA^c_{h95} is a dummy equal one if country c had comparative advantage in the production of product h in 1995, i.e. the revealed comparative advantage index for product h exported by country c in 1995 was greater than one. I fix the revealed comparative advantage at the index computed in 1995, the first period in the sample, to mitigate endogeneity concerns. I apply the same method as in equation (4.2.1) to solve the endogeneity problems in equation (2.0.1).

Table 11: Comparative advantage, competition, and quality upgrading

	Exporter's CA		China's CA	
	Group 1 (1)	Group 2 (2)	Group 1 (3)	Group 2 (4)
L.China share	2.214***	1.663***	1.105***	1.276***
	(0.562)	(0.248)	(0.418)	(0.210)
L.China share*RCA1995	1.544***	0.347*		
	(0.423)	(0.202)		
L.China share*$RCA1995_{CH}$			1.719***	0.590**
			(0.392)	(0.236)
Year FE	X	X	X	X
Exporter-HS6 FE	X	X	X	X
Observations	4889	23043	4889	23043
KP LM stat	65.841	192.995	69.775	195.314
KP Wald F stat	40.025	172.135	49.444	186.912

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. *RCA*1995 is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10, 5, and 1% level, respectively.

The first two columns in table 11 reports results for equation (2.0.1). The coefficient on *China share* is still significantly positive, which confirms that quality upgrading happens when facing tougher competition. The coefficient on the interaction term $China\_share_{ht-1} * RCA^c_{h95}$ is positive for both groups but more significant for group 1 than group 2. It appears that the impact on product quality differs according to the comparative advantage of each country. Countries tend to upgrade quality more for products they have a comparative advantage in their production, but the rate of quality upgrading is higher for countries in group 1 than group 2. This result is compliant with the finding in the literature where productivity growth or quality growth is associated with comparative advantage sectors (Bernard et al., 2007; Amiti & Khandelwal, 2013) and is consistent with the learning-by-doing models of productivity evolution by P. R. Krugman (1987) and Young (1991).

Next, I analyze the heterogeneity in the effect according to the comparative advantage of China. The competitive intensity from China might be different between products where China has comparative advantages and those where China does not have comparative advantages. Therefore, the impact on the quality of products where China's rise was more prominent might be different from the impact on products where China's rise was less pronounced.

To separate the impact on products that are highly exposed to Chinese competition from the impact on low-exposure products, I interact the *China share* variable with a dummy variable for China having comparative advantage in the production of a product in 1995:

$$\begin{aligned} \hat{Q}_{cht} &= \beta China\_share_{ht-1} + \gamma_2 China\_share_{ht-1} * RCA^{CH}_{h95} \\ &+ \alpha_1 ln(GDP_{ct-1}) + \delta_{ch} + \delta_t + \varepsilon_{cht} \end{aligned} \tag{2.0.2}$$

where $\hat{Q}_{cht}$ refers to quality estimated according to the method described in Section 4.1. RCA^{CH}_{h95} is a dummy equal one if China had a comparative advantage in the production of product h in 1995, i.e. the revealed comparative advantage index of product h from China in 1995 was greater than one. Countries face the toughest competition from China in products that the rise of China was more pronounced, i.e. China had a comparative advantage in their production. I apply the same method as in equation (4.2.1) to deal with the endogeneity concerns.

Results of regression (2.0.2) are reported in the last two columns in tables 11. The coefficient of the interaction term is positive for both groups, but the magnitude for group 2 is smaller than that of the coefficient for group 1. Both groups improve the quality of products where China's rise was more pronounced more than the quality of China's comparative disadvantage products, but the upgrading rate is higher for group 1. The results are consistent with the summary statistics where most countries in group 2 are diverging their exports from China's export products while Vietnam's exports are converging toward China's export products. This finding is also compliant with the escape-competition theory in Nickell (1996) and Bastos and Straume (2012).

C Robustness check results

Table 12: Robustness checks for impact on value, Group 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
L.China share	2.055***	2.055***	2.055***	2.361***	1.938***		2.291***	2.255***	1.962***	1.661***	1.857***	2.692***
	(0.541)	(0.415)	(0.483)	(0.278)	(0.285)		(0.275)	(0.306)	(0.285)	(0.429)	(0.372)	(0.360)
China share						2.201***						
						(0.281)						
Tot Export				X								
US Import					X							
Input Import									X			
China's Export										X		
RCA											X	X
China's RCA											X	X
Year FE	X	X	X	X	X	X	X		X	X	X	
Exporter-HS6 FE	X	X	X	X	X	X		X	X	X	X	
Exporter FE							X					
HS6 FE							X	X				X
Year-HS2 FE								X				
Exporter-Year FE												X
S.E. Cluster	Exporter-HS4	Exporter-Year	HS6	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4
Observations	41944	41944	41944	41758	41944	42965	42816	42680	41944	30211	32386	32719
KP LM stat	187.269	50.908	124.396	682.930	699.491	473.204	762.048	605.719	693.597	462.085	447.810	500.761
KP Wald F stat	533.974	1281.357	205.785	1092.405	1121.714	887.992	1331.032	988.082	1109.707	579.846	521.549	625.980

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 1 which includes Bangladesh, Vietnam, and Sri Lanka. The dependent variable is log of value of exports from countries in group 1 to the US. In all regressions, China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. *Total Export* refers to log of total exports to the world of each country in Group 1 at the HS4 industry level. *US Import* refers to log of total US imports at the HS4 industry level. *Input Import* refers to shares of intermediate inputs and capital of each country in Group 1 that come from China in their total imports. *China's Export* refers to China's exports to country c at the HS6 level. *RCA* is the normalized revealed comparative advantage index of country c at the HS6 level. *China's RCA* is China's normalized revealed comparative advantage index at the HS6 level. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. *** indicates coefficients significantly different from zero at the 1% level.

Table 13: Robustness checks for impact on quantity, Group 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
L.China share	2.417***	2.417***	2.417***	2.782***	2.323***		2.611***	2.861***	2.318***	2.019***	2.430***	3.297***
	(0.614)	(0.409)	(0.540)	(0.321)	(0.330)		(0.319)	(0.364)	(0.328)	(0.486)	(0.432)	(0.418)
China share						2.606***						
						(0.321)						
Tot Export				X								
US Import					X							
Input Import									X			
China's Export										X		
RCA											X	X
China's RCA											X	X
Year FE	X	X	X	X	X	X	X		X	X	X	
Exporter-HS6 FE	X	X	X	X	X	X		X	X	X	X	
Exporter FE							X					
HS6 FE							X	X				X
Year-HS2 FE								X				
Exporter-Year FE												X
S.E. Cluster	Exporter-HS4	Exporter-Year	HS6	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4
Observations	38742	38742	38742	38590	38742	39538	39614	39480	38742	27954	30153	30488
KP LM stat	164.793	50.571	107.296	602.023	616.258	411.029	667.704	531.132	611.373	416.777	396.368	443.661
KP Wald F stat	471.458	1261.207	177.308	956.320	981.539	769.502	1154.527	857.641	970.845	530.393	452.268	542.998

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 1 which includes Bangladesh, Vietnam, and Sri Lanka. The dependent variable is log of quantity of exports from countries in group 1 to the US. In all regressions, China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. *Total Export* refers to log of total exports to the world of each country in Group 1 at the HS4 industry level. *US Import* refers to log of total US imports at the HS4 industry level. *Input Import* refers to shares of intermediate inputs and capital of each country in Group 1 that come from China in their total imports. *China's Export* refers to China's exports to country c at the HS6 level. *RCA* is the normalized revealed comparative advantage index of country c at the HS6 level. *China's RCA* is China's normalized revealed comparative advantage index at the HS6 level. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. *** indicates coefficients significantly different from zero at the 1% level.

Table 14: Robustness checks for impact on value, Group 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
L.China share	-1.688***	-1.688***	-1.688***	-0.703***	-1.855***		-1.572***	-1.047***	-1.694***	-2.358***	-0.825***	0.461***
	(0.208)	(0.175)	(0.222)	(0.110)	(0.115)		(0.118)	(0.122)	(0.128)	(0.146)	(0.132)	(0.125)
China share						-1.219***						
						(0.121)						
Tot Export				X								
US Import					X							
Input Import									X			
China's Export										X		
RCA											X	X
China's RCA											X	X
Year FE	X	X	X	X	X	X	X		X	X	X	
Exporter-HS6 FE	X	X	X	X	X	X		X	X	X	X	
Exporter FE							X					
HS6 FE							X	X				X
Year-HS2 FE								X				
Exporter-Year FE												X
S.E. Cluster	Exporter-HS4	Exporter-Year	HS6	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4
Observations	224651	224651	224651	224498	224651	238023	226401	226391	224651	187465	194507	195895
KP LM stat	632.962	93.261	352.287	1532.881	1599.764	1599.943	1495.801	1247.169	1569.402	1397.988	1444.161	1382.033
KP Wald F stat	2429.474	2728.347	801.449	3444.291	3637.988	3875.742	3756.031	2871.946	3584.808	2913.077	2962.337	3197.407

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 2 which includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. The dependent variable is log of value of exports from countries in group 2 to the US. In all regressions, China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. *Total Export* refers to log of total exports to the world of each country in Group 2 at the HS4 industry level. *US Import* refers to log of total US imports at the HS4 industry level. *Input Import* refers to shares of intermediate inputs and capital of each country in Group 2 that come from China in their total imports. *China's Export* refers to China's exports to country c at the HS6 level. *RCA* is the normalized revealed comparative advantage index of country c at the HS6 level. *China's RCA* is China's normalized revealed comparative advantage index at the HS6 level. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. *** indicates coefficients significantly different from zero at the 1% level.

Table 15: Robustness checks for impact on quantity, Group 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
L.China share	-1.211***	-1.211***	-1.211***	-0.199	-1.395***		-1.151***	-0.818***	-1.227***	-1.876***	-0.208	1.077***
	(0.228)	(0.208)	(0.242)	(0.127)	(0.130)		(0.133)	(0.142)	(0.141)	(0.157)	(0.148)	(0.143)
China share						-0.734***						
						(0.134)						
Tot Export				X								
US Import					X							
Input Import									X			
China's Export										X		
RCA											X	X
China's RCA											X	X
Year FE	X	X	X	X	X	X	X		X	X	X	
Exporter-HS6 FE	X	X	X	X	X	X		X	X	X	X	
Exporter FE							X					
HS6 FE							X	X				X
Year-HS2 FE								X				
Exporter-Year FE												X
S.E. Cluster	Exporter-HS4	Exporter-Year	HS6	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4
Observations	216879	216879	216879	216741	216879	228501	218679	218669	216879	182081	188403	189787
KP LM stat	587.284	93.866	332.757	1470.719	1543.055	1514.669	1434.412	1200.335	1509.033	1373.550	1401.251	1337.627
KP Wald F stat	2259.716	2699.384	755.345	3261.856	3447.790	3648.794	3572.441	2760.888	3394.755	2813.587	2817.627	3053.656

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 2 which includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. The dependent variable is log of quantity of exports from countries in group 2 to the US. In all regressions, China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. *Total Export* refers to log of total exports to the world of each country in Group 2 at the HS4 industry level. *US Import* refers to log of total US imports at the HS4 industry level. *Input Import* refers to shares of intermediate inputs and capital of each country in Group 2 that come from China in their total imports. *China's Export* refers to China's exports to country c at the HS6 level. *RCA* is the normalized revealed comparative advantage index of country c at the HS6 level. *China's RCA* is China's normalized revealed comparative advantage index at the HS6 level. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. *** indicates coefficients significantly different from zero at the 1% level.

Table 16: Impact on Unit Value, Group 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
L.China share	-0.347**	-0.347**	-0.347**	-0.347**	-0.332**	-0.350**		-0.268**	-0.385***	-0.342**	-0.355*	-0.579***	-0.541***
	(0.136)	(0.166)	(0.134)	(0.168)	(0.136)	(0.136)		(0.130)	(0.146)	(0.136)	(0.200)	(0.187)	(0.178)
China share							-0.376***						
							(0.126)						
Total Export					X								
US Import						X							
Input Import										X			
China's Export											X		
RCA												X	X
China's RCA												X	X
Year FE	X	X	X	X	X	X	X	X		X	X	X	
Exporter-HS6 FE	X	X	X	X	X	X	X		X	X	X	X	
Exporter FE								X					
HS6 FE								X	X				X
Year-HS2 FE									X				
Exporter-Year FE													X
S.E. Cluster	Year-HS4	Exporter-HS4	Exporter-Year	HS6	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4
Observations	38742	38742	38742	38742	38590	38742	39538	39614	39480	38742	27954	30153	30488
KP LM stat	610.531	164.793	50.571	107.296	602.023	616.258	411.029	667.704	531.132	611.373	416.777	396.368	443.661
KP Wald F stat	969.606	471.458	1261.207	177.308	956.320	981.539	769.502	1154.527	857.641	970.845	530.393	452.268	542.998

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 1 which includes Bangladesh, Vietnam, and Sri Lanka. The dependent variable is log of unit value of exports from countries in group 1 to the US. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. *Total Export* refers to log of total exports to the world of each country in Group 1 at the HS4 industry level. *US Import* refers to log of total US imports at the HS4 industry level. *Input Import* refers to shares of intermediate inputs and capital of each country in Group 1 that come from China in their total imports. *China's Export* refers to China's exports to country c at the HS6 level. *RCA* is the normalized revealed comparative advantage index of country c at the HS6 level. *China's RCA* is China's normalized revealed comparative advantage index at the HS6 level. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ***, **, and * indicate coefficients significantly different from zero at the 1%, 5%, and 10% level, respectively.

Table 17: Impact on Unit Value, Group 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
L.China share	-0.482***	-0.482***	-0.482***	-0.482***	-0.511***	-0.491***		-0.461***	-0.312***	-0.469***	-0.456***	-0.602***	-0.614***
	(0.068)	(0.092)	(0.084)	(0.101)	(0.070)	(0.069)		(0.067)	(0.075)	(0.068)	(0.082)	(0.079)	(0.075)
China share							-0.409***						
							(0.065)						
Tot Export					X								
US Import						X							
Input Import										X			
China's Export											X		
RCA												X	X
China's RCA												X	X
Year FE	X	X	X	X	X	X	X	X		X	X	X	
Exporter-HS6 FE	X	X	X	X	X	X	X		X	X	X	X	
Exporter FE								X					
HS6 FE								X	X				X
Year-HS2 FE									X				
Exporter-Year FE													X
S.E. Cluster	Year-HS4	Exporter-HS4	Exporter-Year	HS6	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4	Year-HS4
Observations	216879	216879	216879	216879	216741	216879	228501	218679	218669	216879	182081	188403	189787
KP LM stat	1509.836	587.284	93.866	332.757	1470.719	1543.055	1514.669	1434.412	1200.335	1509.033	1373.550	1401.251	1337.627
KP Wald F stat	3397.645	2259.716	2699.384	755.345	3261.856	3447.790	3648.794	3572.441	2760.888	3394.755	2813.587	2817.627	3053.656

Notes: All regressions are estimated for exports at the HS6 product level from countries in group 2 which includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. The dependent variable is log of unit value of exports from countries in group 1 to the US. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. *Total Export* refers to log of total exports to the world of each country in Group 1 at the HS4 industry level. *US Import* refers to log of total US imports at the HS4 industry level. *Input Import* refers to shares of intermediate inputs and capital of each country in Group 1 that come from China in their total imports. *China's Export* refers to China's exports to country c at the HS6 level. *RCA* is the normalized revealed comparative advantage index of country c at the HS6 level. *China's RCA* is China's normalized revealed comparative advantage index at the HS6 level. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 18: Impact on value and quantity - Same sample as quality regressions

	Group 1				Group 2			
	Value		Quantity		Value		Quantity	
	FE	IV	FE	IV	FE	IV	FE	IV
L.China share	-0.852***	1.750*	-0.579**	2.853***	-0.727***	-0.994***	-0.530***	-0.221
	(0.240)	(0.895)	(0.268)	(1.004)	(0.128)	(0.348)	(0.146)	(0.399)
Year FE	X	X	X	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X	X	X	X
Observations	4939	4939	4939	4939	23429	23429	23429	23429
KP LM stat		64.468		64.468		187.220		187.220
KP Wald F stat		89.242		89.242		327.324		327.324

Notes: All regressions are estimated for exports at the HS6 product level. Group 1 includes Bangladesh, Vietnam, and Sri Lanka. Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. The sample includes all products used in the regressions for the impact on product quality. The dependent variables are log of value and log of quantity of exports from countries in groups 1 and 2 to the US. In the IV regressions, China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 19: Impact on quality of products exported by each country

	Quality FE		Quality IV	
	FE	IV	FE	IV
Bangladesh	1.135***	2.137***	0.814***	2.234***
	(0.219)	(0.614)	(0.267)	(0.721)
Vietnam	0.751***	1.999***	0.782***	2.571***
	(0.140)	(0.483)	(0.181)	(0.724)
Sri Lanka	1.127***	2.991***	0.932***	3.424***
	(0.188)	(0.581)	(0.218)	(0.743)
India	0.684***	2.038***	0.655***	1.864***
	(0.101)	(0.260)	(0.131)	(0.308)
Indonesia	0.912***	2.011***	0.579***	1.879***
	(0.101)	(0.285)	(0.130)	(0.340)
Malaysia	0.816***	1.931***	0.629***	2.020***
	(0.121)	(0.331)	(0.187)	(0.468)
Pakistan	0.622***	2.282***	0.689***	2.157***
	(0.133)	(0.464)	(0.157)	(0.515)
Philippines	1.174***	2.327***	0.916***	2.050***
	(0.118)	(0.340)	(0.152)	(0.395)
Thailand	0.746***	1.553***	0.529***	1.218***
	(0.091)	(0.255)	(0.147)	(0.360)

Notes: All regressions are estimated for exports at the HS6 product level for each country. The dependent variables are product quality estimated by regressions using instrumental variables for unit price and nest share (quality IV) and product quality estimated by fixed-effect regressions (quality FE). The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. All regressions control for year fixed effects and HS6-level product fixed effects. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 20: Impact on quality, Group 1 - S.E. clustered at the Exporter-HS4 level

	(1)	(2)	(3)	(4)	(5)
L.China share	2.844***	2.214**	1.105**	5.204**	2.996***
	(0.893)	(0.878)	(0.556)	(2.093)	(0.876)
L.China share*RCA1995		1.544**			
		(0.740)			
L.China share*$RCA1995_{CH}$			1.719***		
			(0.596)		
L.China share*(PF1995>p75)				2.109	
				(1.488)	
L.China share*(Ladder1995>p75)					-0.616
					(1.293)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4889	4889	4889	1683	4436
KP LM stat	21.628	23.364	22.930	5.251	20.621
KP Wald F stat	42.345	19.430	22.485	2.824	20.179

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the exporter-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 21: Impact on quality, Group 2 - S.E. clustered at the Exporter-HS4 level

	(1)	(2)	(3)	(4)	(5)
L.China share	1.819***	1.663***	1.276***	2.388***	2.009***
	(0.306)	(0.302)	(0.248)	(0.439)	(0.335)
L.China share*RCA1995		0.347			
		(0.347)			
L.China share*$RCA1995_{CH}$			0.590**		
			(0.259)		
L.China share*(PF1995>p75)				-0.180	
				(0.531)	
L.China share*(Ladder1995>p75)					-1.204***
					(0.424)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	23043	23043	23043	13704	20869
KP LM stat	100.162	101.928	100.629	63.899	100.193
KP Wald F stat	265.584	135.180	153.971	81.390	119.186

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the exporter-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 22: Impact on quality, Group 1 - S.E. clustered at the Exporter-Year level

	(1)	(2)	(3)	(4)	(5)
L.China share	2.844***	2.214***	1.105***	5.204***	2.996***
	(0.365)	(0.374)	(0.311)	(0.939)	(0.389)
L.China share*RCA1995		1.544***			
		(0.250)			
L.China share*$RCA1995_{CH}$			1.719***		
			(0.239)		
L.China share*(PF1995>p75)				2.109***	
				(0.483)	
L.China share*(Ladder1995>p75)					-0.616
					(0.623)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4889	4889	4889	1683	4436
KP LM stat	39.322	38.956	40.572	25.073	38.847
KP Wald F stat	248.233	105.511	129.927	26.733	127.174

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the exporter-year level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 23: Impact on quality, Group 2 - S.E. clustered at the Exporter-Year level

	(1)	(2)	(3)	(4)	(5)
L.China share	1.819***	1.663***	1.276***	2.388***	2.009***
	(0.128)	(0.128)	(0.112)	(0.156)	(0.131)
L.China share*RCA1995		0.347**			
		(0.141)			
L.China share*$RCA1995_{CH}$			0.590***		
			(0.112)		
L.China share*(PF1995>p75)				-0.180	
				(0.212)	
L.China share*(Ladder1995>p75)					-1.204***
					(0.188)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	23043	23043	23043	13704	20869
KP LM stat	85.784	85.427	85.753	72.175	85.318
KP Wald F stat	1395.559	685.060	637.664	444.575	693.376

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. *RCA*1995 is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the exporter-year level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 24: Impact on quality, Group 1 - S.E. clustered at the HS6 level

	(1)	(2)	(3)	(4)	(5)
L.China share	2.844**	2.214**	1.105	5.204	2.996**
	(1.196)	(1.119)	(0.760)	(3.188)	(1.172)
L.China share*RCA1995		1.544*			
		(0.827)			
L.China share*$RCA1995_{CH}$			1.719**		
			(0.768)		
L.China share*(PF1995>p75)				2.109	
				(1.854)	
L.China share*(Ladder1995>p75)					-0.616
					(1.452)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4889	4889	4889	1683	4436
KP LM stat	8.822	10.217	9.466	3.083	8.337
KP Wald F stat	17.746	8.338	9.355	1.440	8.320

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the HS6 product level are shown in parentheses. * and ** indicate coefficients significantly different from zero at the 10% and 5% level, respectively.

Table 25: Impact on quality, Group 2 - S.E. clustered at the HS6 level

	(1)	(2)	(3)	(4)	(5)
L.China share	1.819***	1.663***	1.276***	2.388***	2.009***
	(0.454)	(0.426)	(0.439)	(0.566)	(0.488)
L.China share*RCA1995		0.347			
		(0.352)			
L.China share*$RCA1995_{CH}$			0.590		
			(0.429)		
L.China share*(PF1995>p75)				-0.180	
				(0.525)	
L.China share*(Ladder1995>p75)					-1.204**
					(0.573)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	23043	23043	23043	13704	20869
KP LM stat	34.941	35.862	36.673	30.857	33.626
KP Wald F stat	76.836	39.170	41.311	26.342	35.495

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the HS6 product level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 26: Impact on quality, Group 1 - Control for exporters' total HS4 exports

	(1)	(2)	(3)	(4)	(5)
L.China share	2.755***	2.059***	0.906**	4.625***	2.906***
	(0.585)	(0.548)	(0.408)	(1.268)	(0.578)
L.China share*RCA1995		1.669***			
		(0.428)			
L.China share*$RCA1995_{CH}$			1.814***		
			(0.385)		
L.China share*(PF1995>p75)				2.653***	
				(0.822)	
L.China share*(Ladder1995>p75)					-0.585
					(0.701)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4881	4881	4881	1683	4428
KP LM stat	64.878	65.606	69.790	20.999	61.642
KP Wald F stat	93.178	40.228	49.743	9.475	44.731

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 27: Impact on quality, Group 2 - Control for exporters' total HS4 exports

	(1)	(2)	(3)	(4)	(5)
L.China share	1.967***	1.768***	1.318***	2.515***	2.116***
	(0.281)	(0.255)	(0.213)	(0.357)	(0.300)
L.China share*RCA1995		0.478**			
		(0.205)			
L.China share*$RCA1995_{CH}$			0.718***		
			(0.235)		
L.China share*(PF1995>p75)				-0.107	
				(0.338)	
L.China share*(Ladder1995>p75)					-1.133***
					(0.291)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	23037	23037	23037	13704	20863
KP LM stat	182.485	185.217	186.227	121.566	183.685
KP Wald F stat	331.945	164.918	177.061	107.375	153.324

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 28: Impact on quality, Group 1 - Control for US total import at the HS4 level

	(1)	(2)	(3)	(4)	(5)
L.China share	2.875***	2.202***	1.127***	5.095***	3.077***
	(0.598)	(0.565)	(0.420)	(1.407)	(0.580)
L.China share*RCA1995		1.550***			
		(0.421)			
L.China share*$RCA1995_{CH}$			1.729***		
			(0.394)		
L.China share*(PF1995>p75)				2.100***	
				(0.779)	
L.China share*(Ladder1995>p75)					-0.675
					(0.728)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4889	4889	4889	1683	4436
KP LM stat	68.793	67.856	73.370	20.589	68.476
KP Wald F stat	95.559	41.148	50.311	9.093	48.377

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. *RCA*1995 is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 29: Impact on quality, Group 2 - Control for US total import at the HS4 level

	Quality IV (1)	Quality IV (2)	Quality IV (3)	Quality IV (4)	Quality IV (5)
L.China share	1.800***	1.639***	1.261***	2.337***	2.013***
	(0.270)	(0.243)	(0.209)	(0.331)	(0.293)
L.China share*RCA1995		0.350*			
		(0.202)			
L.China share*$RCA1995_{CH}$			0.583**		
			(0.234)		
L.China share*(PF1995>p75)				-0.167	
				(0.336)	
L.China share*(Ladder1995>p75)					-1.209***
					(0.292)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	23043	23043	23043	13704	20869
KP LM stat	203.154	204.307	207.034	141.017	199.108
KP Wald F stat	347.675	175.081	190.341	117.569	166.649

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 30: Impact on quality, Group 1 - Control for Exporter FE and HS6 FE

	(1)	(2)	(3)	(4)	(5)
L.China share	3.090***	2.675***	1.404***	5.566***	2.924***
	(0.583)	(0.580)	(0.430)	(1.436)	(0.572)
L.China share*RCA1995		1.369***			
		(0.331)			
L.China share*$RCA1995_{CH}$			1.715***		
			(0.416)		
L.China share*(PF1995>p75)				1.886***	
				(0.374)	
L.China share*(Ladder1995>p75)					0.489
					(0.809)
Year FE	X	X	X	X	X
Exporter FE	X	X	X	X	X
HS6 FE	X	X	X	X	X
Observations	5002	5002	5002	1685	4526
KP LM stat	69.868	70.365	72.087	23.802	66.127
KP Wald F stat	104.025	50.723	53.114	11.763	49.542

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 31: Impact on quality, Group 2 - Control for Exporter FE and HS6 FE

	(1)	(2)	(3)	(4)	(5)
L.China share	1.474***	1.232***	0.828***	1.917***	1.742***
	(0.297)	(0.292)	(0.246)	(0.367)	(0.310)
L.China share*RCA1995		0.584***			
		(0.126)			
L.China share*$RCA1995_{CH}$			0.703***		
			(0.228)		
L.China share*(PF1995>p75)				1.212***	
				(0.109)	
L.China share*(Ladder1995>p75)					-1.159***
					(0.296)
Year FE	X	X	X	X	X
Exporter FE	X	X	X	X	X
HS6 FE	X	X	X	X	X
Observations	23371	23371	23371	13715	21106
KP LM stat	193.337	193.641	197.694	135.261	191.522
KP Wald F stat	375.583	187.857	204.370	121.663	175.397

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 32: Impact on quality, Group 1 - Control for Year-HS2 FE

	(1)	(2)	(3)	(4)	(5)
L.China share	2.268***	2.006***	1.598***	2.556***	2.728***
	(0.543)	(0.549)	(0.453)	(0.811)	(0.493)
L.China share*RCA1995		1.186***			
		(0.353)			
L.China share*$RCA1995_{CH}$			0.698*		
			(0.399)		
L.China share*(PF1995>p75)				1.920***	
				(0.403)	
L.China share*(Ladder1995>p75)					-1.798***
					(0.614)
Year-HS2 FE	X	X	X	X	X
Exporter FE	X	X	X	X	X
HS6 FE	X	X	X	X	X
Observations	4871	4871	4871	1606	4420
KP LM stat	65.607	65.654	66.662	35.483	63.214
KP Wald F stat	100.192	48.545	51.088	20.035	46.949

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. * and *** indicate coefficients significantly different from zero at the 10% and 1% level, respectively.

Table 33: Impact on quality, Group 2 - Control for Year-HS2 FE

	(1)	(2)	(3)	(4)	(5)
L.China share	1.821***	1.649***	1.698***	2.288***	2.315***
	(0.291)	(0.294)	(0.254)	(0.356)	(0.262)
L.China share*RCA1995		0.531***			
		(0.128)			
L.China share*$RCA1995_{CH}$			0.150		
			(0.224)		
L.China share*(PF1995>p75)				1.317***	
				(0.109)	
L.China share*(Ladder1995>p75)					-2.373***
					(0.393)
Year-HS2 FE	X	X	X	X	X
Exporter FE	X	X	X	X	X
HS6 FE	X	X	X	X	X
Observations	23329	23329	23329	13616	21067
KP LM stat	181.168	181.664	170.936	134.004	180.784
KP Wald F stat	276.700	138.107	135.526	94.319	136.151

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 34: Impact on quality, Group 1 - Contemporaneous effect

	(1)	(2)	(3)	(4)	(5)
China share	2.600***	2.024***	0.835**	4.150***	2.705***
	(0.488)	(0.484)	(0.375)	(0.938)	(0.482)
China share*RCA1995		1.413***			
		(0.376)			
China share*$RCA1995_{CH}$			1.805***		
			(0.354)		
China share*(PF1995>p75)				1.545**	
				(0.667)	
China share*(Ladder1995>p75)					-0.416
					(0.624)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	5026	5026	5026	1819	4572
KP LM stat	71.964	73.151	74.476	29.452	69.797
KP Wald F stat	104.221	46.106	52.980	13.120	51.769

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 35: Impact on quality, Group 2 - Contemporaneous effect

	(1)	(2)	(3)	(4)	(5)
China share	1.681***	1.592***	1.241***	2.316***	1.902***
	(0.238)	(0.219)	(0.190)	(0.297)	(0.254)
China share*RCA1995		0.197			
		(0.193)			
China share*$RCA1995_{CH}$			0.485**		
			(0.219)		
China share*(PF1995>p75)				-0.486	
				(0.331)	
China share*(Ladder1995>p75)					-1.132***
					(0.281)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	24104	24104	24101	14671	21920
KP LM stat	217.196	218.659	220.615	152.257	214.190
KP Wald F stat	397.176	199.263	217.066	131.744	192.259

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 36: Impact on quality in Group 1 - Controlling for Comparative Advantage overtime

	(1)	(2)	(3)	(4)	(5)
L.China share	3.525***	2.851***	1.945**	8.692***	3.972***
	(0.849)	(0.803)	(0.960)	(3.049)	(0.902)
L.China share*RCA1995		1.497***			
		(0.464)			
L.China share*$RCA1995_{CH}$			1.244***		
			(0.461)		
L.China share*(PF1995>p75)				1.845**	
				(0.921)	
L.China share*(Ladder1995>p75)					-1.164*
					(0.660)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4130	4130	4130	1584	3736
KP LM stat	39.598	41.646	38.272	10.767	36.761
KP Wald F stat	44.997	20.823	20.824	4.468	20.968

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 37: Impact on quality in Group 2 - Controlling for Comparative Advantage overtime

	(1)	(2)	(3)	(4)	(5)
L.China share	2.298***	1.950***	1.605***	2.860***	2.440***
	(0.312)	(0.285)	(0.277)	(0.388)	(0.328)
L.China share*RCA1995		0.786***			
		(0.184)			
L.China share*$RCA1995_{CH}$			0.722***		
			(0.254)		
L.China share*(PF1995>p75)				-0.025	
				(0.319)	
L.China share*(Ladder1995>p75)					-1.136***
					(0.299)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	21451	21451	21451	13409	19390
KP LM stat	187.087	190.362	183.771	139.279	192.472
KP Wald F stat	290.143	142.883	161.806	103.776	131.648

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 38: Impact on quality in Group 1 - Controlling for Comparative Advantage over time and Exporter-Year FE

	(1)	(2)	(3)	(4)	(5)
L.China share	3.513***	3.270***	2.012**	9.544***	3.729***
	(0.827)	(0.846)	(0.881)	(3.353)	(0.845)
L.China share*RCA1995		0.711**			
		(0.361)			
L.China share*$RCA1995_{CH}$			1.204**		
			(0.473)		
L.China share*(PF1995>p75)				1.830***	
				(0.376)	
L.China share*(Ladder1995>p75)					-0.453
					(0.692)
Exporter-Year FE	X	X	X	X	X
HS6 FE	X	X	X	X	X
Observations	4191	4191	4191	1582	3783
KP LM stat	39.804	40.571	42.590	10.979	36.595
KP Wald F stat	46.005	23.107	23.814	4.791	21.149

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 39: Impact on quality in Group 2 - Controlling for Comparative Advantage over time and Exporter-Year FE

	(1)	(2)	(3)	(4)	(5)
L.China share	1.961***	1.845***	1.010***	2.374***	2.210***
	(0.297)	(0.303)	(0.290)	(0.384)	(0.309)
L.China share*RCA1995		0.217*			
		(0.127)			
L.China share*$RCA1995_{CH}$			0.997***		
			(0.257)		
L.China share*(PF1995>p75)				0.984***	
				(0.110)	
L.China share*(Ladder1995>p75)					-1.174***
					(0.306)
Exporter-Year FE	X	X	X	X	X
HS6 FE	X	X	X	X	X
Observations	21706	21706	21706	13422	19580
KP LM stat	193.269	191.786	187.227	149.871	195.241
KP Wald F stat	341.424	169.884	189.618	118.516	156.621

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. * and *** indicate coefficients significantly different from zero at the 10% and 1% level, respectively.

Table 40: Impact on quality, Group 1 - Control for capital and input imports from China

	(1)	(2)	(3)	(4)	(5)
L.China share	2.803***	2.141***	1.104***	5.207***	2.973***
	(0.594)	(0.559)	(0.417)	(1.420)	(0.586)
L.China share*RCA1995		1.604***			
		(0.421)			
L.China share*$RCA1995_{CH}$			1.682***		
			(0.392)		
L.China share*(PF1995>p75)				2.050**	
				(0.800)	
L.China share*(Ladder1995>p75)					-0.653
					(0.704)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4889	4889	4889	1683	4436
KP LM stat	65.122	65.782	69.478	19.449	61.882
KP Wald F stat	93.217	40.006	49.060	8.536	44.688

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 41: Impact on quality, Group 2 - Control for capital and input imports from China

	(1) Quality IV	(2) Quality IV	(3) Quality IV	(4) Quality IV	(5) Quality IV
L.China share	1.805***	1.650***	1.274***	2.374***	1.994***
	(0.274)	(0.248)	(0.210)	(0.342)	(0.296)
L.China share*RCA1995		0.344*			
		(0.202)			
L.China share*$RCA1995_{CH}$			0.578**		
			(0.236)		
L.China share*(PF1995>p75)				-0.196	
				(0.337)	
L.China share*(Ladder1995>p75)					-1.198***
					(0.286)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	23043	23043	23043	13704	20869
KP LM stat	191.274	192.978	195.378	130.353	191.042
KP Wald F stat	341.847	171.658	186.298	113.454	159.888

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 42: Impact on quality in Group 1 - Controlling for China's export at HS6 level

	(1)	(2)	(3)	(4)	(5)
L.China share	1.926***	1.543***	1.063**	9.585	1.977***
	(0.562)	(0.550)	(0.516)	(9.019)	(0.592)
L.China share*RCA1995		1.123***			
		(0.407)			
L.China share*$RCA1995_{CH}$			0.823**		
			(0.403)		
L.China share*(PF1995>p75)				5.292	
				(4.319)	
L.China share*(Ladder1995>p75)					-0.079
					(0.645)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	3485	3485	3485	1001	3062
KP LM stat	49.604	49.883	58.015	1.638	45.828
KP Wald F stat	70.361	29.176	39.286	0.661	32.634

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 43: Impact on quality in Group 2 - Controlling for China's export at HS6 level

	(1)	(2)	(3)	(4)	(5)
L.China share	1.545***	1.498***	1.112***	2.137***	1.754***
	(0.273)	(0.260)	(0.241)	(0.325)	(0.293)
L.China share*RCA1995		0.105			
		(0.197)			
L.China share*$RCA1995_{CH}$			0.477**		
			(0.227)		
L.China share*(PF1995>p75)				-0.504	
				(0.329)	
L.China share*(Ladder1995>p75)					-1.031***
					(0.283)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	19560	19560	19560	11679	17538
KP LM stat	193.957	192.884	199.918	134.305	188.357
KP Wald F stat	336.733	168.119	177.288	113.104	164.843

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 44: Impact on quality, Group 1 - Redefine frontier and ladder

	(1)	(2)	(3)	(4)	(5)
L.China share	2.633***	2.052***	0.968**	4.914***	2.488***
	(0.565)	(0.541)	(0.409)	(1.333)	(0.547)
L.China share*RCA1995		1.373***			
		(0.398)			
L.China share*$RCA1995_{CH}$			1.626***		
			(0.384)		
L.China share*(PF1995>p75)				1.510**	
				(0.700)	
L.China share*(Ladder1995>p75)					0.646
					(0.905)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	4545	4545	4545	1606	4152
KP LM stat	61.154	63.077	66.424	18.388	59.327
KP Wald F stat	90.595	39.769	48.537	8.068	29.866

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 45: Impact on quality, Group 2 - Redefine frontier and ladder

	(1)	(2)	(3)	(4)	(5)
L.China share	1.758***	1.557***	1.213***	2.315***	1.940***
	(0.277)	(0.253)	(0.214)	(0.344)	(0.308)
L.China share*RCA1995		0.455**			
		(0.186)			
L.China share*$RCA1995_{CH}$			0.585**		
			(0.236)		
L.China share*(PF1995>p75)				-0.215	
				(0.317)	
L.China share*(Ladder1995>p75)					-1.033***
					(0.318)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	18163	18163	18163	11262	16595
KP LM stat	164.982	167.019	167.833	106.665	163.439
KP Wald F stat	316.141	159.568	176.138	103.256	147.920

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 46: Impact on quality, Group 1 - Exclude China when estimating quality

	(1)	(2)	(3)	(4)	(5)
L.China share	1.868***	0.992*	0.460	2.529	1.289*
	(0.665)	(0.593)	(0.689)	(2.372)	(0.782)
L.China share*RCA1995		2.041***			
		(0.700)			
L.China share*$RCA1995_{CH}$			1.407***		
			(0.512)		
L.China share*(PF1995>p75)				11.060**	
				(4.340)	
L.China share*(Ladder1995>p75)					1.059*
					(0.626)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	3686	3686	3686	857	3173
KP LM stat	42.631	41.796	45.343	7.835	34.493
KP Wald F stat	55.408	21.001	29.162	3.274	23.932

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. *RCA*1995 is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 47: Impact on quality, Group 2 - Exclude China when estimating quality

	(1)	(2)	(3)	(4)	(5)
L.China share	0.697**	0.521*	0.425	1.144***	0.409
	(0.291)	(0.279)	(0.319)	(0.330)	(0.300)
L.China share*RCA1995		0.397			
		(0.257)			
L.China share*$RCA1995_{CH}$			0.299		
			(0.278)		
L.China share*(PF1995>p75)				0.874**	
				(0.355)	
L.China share*(Ladder1995>p75)					0.924***
					(0.334)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	20266	20266	20264	10998	18071
KP LM stat	163.616	168.599	179.898	120.167	149.428
KP Wald F stat	254.320	122.908	140.140	75.695	129.630

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 48: Comparative advantage, competition, and quality upgrading - Quality FE

	Exporter's CA		China's CA	
	Group 1	Group 2	Group 1	Group 2
L.China share	1.745***	1.680***	0.918***	1.309***
	(0.422)	(0.227)	(0.322)	(0.177)
L.China share*RCA1995	1.765***	0.680***		
	(0.377)	(0.175)		
L.China share*$RCA1995_{CH}$			1.519***	0.734***
			(0.337)	(0.224)
Year FE	X	X	X	X
Exporter-HS6 FE	X	X	X	X
Observations	4892	22936	4892	22936
KP LM stat	64.694	192.478	68.583	194.348
KP Wald F stat	38.490	169.838	48.029	183.787

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by fixed effect regressions. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 49: Proximity to the frontier, length of quality ladder, and quality upgrading - Quality FE

	Frontier Products		Long Ladder Products	
	Group 1	Group 2	Group 1	Group 2
L.China share	5.921***	2.358***	2.823***	2.193***
	(1.676)	(0.335)	(0.559)	(0.303)
L.China share*(PF1995>p75)	3.035***	0.237		
	(1.039)	(0.311)		
L.China share*(Ladder1995>p75)			-1.652***	-0.991***
			(0.407)	(0.282)
Year FE	X	X	X	X
Exporter-HS6 FE	X	X	X	X
Observations	1687	13624	4441	20762
KP LM stat	14.725	127.683	64.916	186.376
KP Wald F stat	6.333	111.141	40.383	163.814

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by fixed effect regressions. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.

Table 50: Impact on quality, Group 1 - IV for unit value: median unit cost

	(1)	(2)	(3)	(4)	(5)
L.China share	2.960***	2.222***	1.310***	4.845***	2.937***
	(0.610)	(0.594)	(0.506)	(1.092)	(0.624)
L.China share*RCA1995		1.712***			
		(0.406)			
L.China share*$RCA1995_{CH}$			1.684***		
			(0.374)		
L.China share*(PF1995>p75)				1.757**	
				(0.718)	
L.China share*(Ladder1995>p75)					1.266
					(1.222)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	5511	5511	5511	2018	5115
KP LM stat	76.136	78.646	78.784	34.115	48.151
KP Wald F stat	109.852	49.367	56.136	15.380	17.269

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 51: Impact on quality, Group 2 - IV for unit value: median unit cost

	(1)	(2)	(3)	(4)	(5)
L.China share	1.730***	1.603***	1.274***	2.276***	1.789***
	(0.277)	(0.257)	(0.243)	(0.341)	(0.285)
L.China share*RCA1995		0.279			
		(0.191)			
L.China share*$RCA1995_{CH}$			0.510**		
			(0.232)		
L.China share*(PF1995>p75)				-0.536*	
				(0.317)	
L.China share*(Ladder1995>p75)					-0.967***
					(0.314)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	25818	25818	25818	15794	24025
KP LM stat	204.130	207.266	204.661	137.760	220.902
KP Wald F stat	363.316	182.214	192.515	116.830	144.139

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *, **, and *** indicate coefficients significantly different from zero at the 10%, 5%, and 1% level, respectively.

Table 52: Impact on quality, Group 1 - Do not trim industries after estimating quality

	(1) Quality IV	(2) Quality IV	(3) Quality IV	(4) Quality IV	(5) Quality IV
L.China share	4.615***	4.091***	3.261***	6.220***	4.543***
	(0.690)	(0.778)	(0.890)	(1.091)	(0.703)
L.China share*RCA1995		0.794			
		(0.634)			
L.China share*$RCA1995_{CH}$			1.258		
			(0.779)		
L.China share*(PF1995>p75)				1.954**	
				(0.968)	
L.China share*(Ladder1995>p75)					5.607***
					(1.769)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	11072	11072	11072	4390	10269
KP LM stat	123.710	123.881	136.861	61.076	127.901
KP Wald F stat	178.399	93.174	98.401	29.944	87.073

Notes: Group 1 includes Bangladesh, Vietnam, and Sri Lanka. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. ** and *** indicate coefficients significantly different from zero at the 5% and 1% level, respectively.

Table 53: Impact on quality, Group 2 - Do not trim industries after estimating quality

	Quality IV (1)	Quality IV (2)	Quality IV (3)	Quality IV (4)	Quality IV (5)
L.China share	2.769***	2.704***	2.242***	2.971***	2.754***
	(0.399)	(0.374)	(0.365)	(0.434)	(0.416)
L.China share*RCA1995		0.131			
		(0.228)			
L.China share*$RCA1995_{CH}$			0.546		
			(0.427)		
L.China share*(PF1995>p75)				-0.156	
				(0.441)	
L.China share*(Ladder1995>p75)					0.041
					(0.627)
Year FE	X	X	X	X	X
Exporter-HS6 FE	X	X	X	X	X
Observations	54611	54611	54609	39472	50564
KP LM stat	390.066	390.510	402.081	321.975	410.190
KP Wald F stat	734.775	377.931	428.431	304.675	381.617

Notes: Group 2 includes India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. All regressions are estimated for exports at the HS6 product level. The dependent variable is product quality estimated by regressions using instrumental variables for unit price and nest share. The table trims all observations with estimated quality that are below the bottom 1st percentile or above the top 99th percentile of the quality distribution. $RCA1995_{CH}$ is a dummy equal to 1 if China had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. $RCA1995$ is an indicator equal to 1 if the exporter had a revealed comparative advantage index greater than 1 for a HS6 product in 1995. PF1995>p75 is a dummy variable where the proximity to the quality frontier of a HS6-exporter variety belongs to the fourth quartile of the distance to the frontier distribution of the HS6 product in 1995. Ladder1995>p75 is a dummy variable where the ladder of a HS6 product belongs to the fourth quartile of the ladder distribution of all products in 1995. China's share is instrumented with China's share in other high-income countries including Australia, Denmark, Finland, Germany, New Zealand, Spain, Switzerland, and the United Kingdom. The Kleibergen-Paap LM statistic for underidentification and the Kleibergen-Paap Wald F statistic for weak identification of the instrumental variable are reported at the bottom of the table. Standard errors clustered at the year-HS4 industry level are shown in parentheses. *** indicates coefficients significantly different from zero at the 1% level.