FROM CHINA WITH LOVE

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ABSTRACT

China plays a key role in determining the course of international trade patterns. In the period 1995-2010, the increased availability of Chinese exports of goods and services has been thought to put pressure on employment in sectors that face strong import competition. However, in the context of shared international production, China provides both cheaper final and intermediate goods in key sectors. Using the OECD-WTO Inter Country Input-Output (ICIO) tables, we show that there are two mechanisms at work. China's trading partners benefit, in terms of value added and output, if their production structure is complementary to China's. In contrast, high income countries see their output and value added shrink because of their higher exposure to Chinese imports that represent fierce competition.

Main Idea of the paper: greater availability of cheaper Chinese intermediates could indeed generate gains for foreign countries who use them as intermediates for their own domestic markets.

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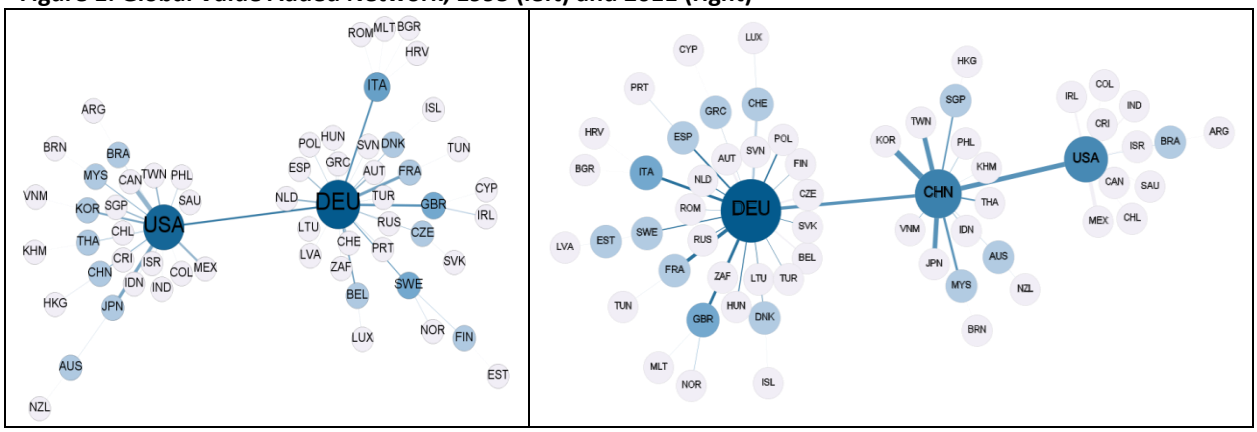
The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent, or any of the aforementioned individuals or the institutions they are affiliated to. We are grateful to Deborah Winkler, ## and ## for helpful suggestions.

1 INTRODUCTION

China can arguably be considered the poster-child of achieving development through integration in Global Value Chains (GVCs)**.** Over the past two decades, China has captured the opportunity, participated in the rise of GVCs and benefited from it. It has risen to be the largest manufacturing country in terms of share of global value added. From a relatively peripheral node in the global trade network in 1995, by 2011 it has developed as one of the three main world hubs along Germany and the United States. Its share of global value added was 26 percent in 2014, significantly higher than any other country, including the United States, Germany, and Japan (Figure 1). Nowadays China has grown to be one of the largest trading nations.

Figure 1: Global Value Added Network, 1995 (left) and 2011 (right)



Source: Authors' computations from OECD-WTO TiVA Data, October 2015.

The increased availability of cheaper Chinese goods is thought to have created pressure on import competing industries in developed countries (Autor et Al. 2013, Acemoglu et Al. 2015, David et Al. 2016). In reaction of the competition pressure from Chinese industries, manufacuting sectors tend to shrink in developed countries. However, in a context of shared global production firms trade not only goods but tasks too (Robert-Nicoud, 2007, Baldwin & Robert-Nicoud, 2014). The availability of cheaper Chinese intermediate goods may benefit some industries or countries. In the paper, we look at how much the value added and output in 60 countries has been affected by the import penentration of both Chinese intermediate goods in the period 1995-2010.

We embrace the accounting framework of input-output tables that serves as a standard to analyze GVCs and intra industry trade (Johnson and Noguera, 2012, Koopman et al. 2014, Wang et al. 2013). From the input-output we disentangle flows of intermediate goods, industry production and value added. We quantify the effect of import penetration into domestic production and value added with the help of the metholodogy of Autor et Al. (2013). We apply his idea of measuring the import penetration of China as a weighted average taking into account the economic exposure of the domestic economy with respect to the rest of the world. By comparing each industry's output with the World average output, we are able to distinguish which industries and countries where important in the World economy in 1995.

We tackle the empirical task with help of the OECD-WTO Trade in Value Added database which reports Inter Country Input-Output tables for 34 industries and 63 countries in a panel database spanning from 1995 to 2010. We find two major results. First, we estimate that a 1% increase of the weighted import penetration of Chinese intermediate goods is associated with a 0.18 % decrease in the domestic output and a reduction of 0.21 % of value added. Second, when distinguisghing between the effect for lower-middle income, upper-middle income and high-income countries, we find that the negative result is driven by the high-income countries. In fact, both lower-middle income and upper-

middle income countries seem to have benefit from higher exposure to Chinese intermediate goods imports. We hypothize that Chinese value added complements domestic production in these countries and allows for capturing higher value added in final demand. The negative import penetration effect of Chinese imports that many papers find in the literature may be driven by the high income sample.

Our analysis is important for at least three reasons. First, as Gaulier et al. (2015) highlight, China's integration and developments in global trade in intermediates may have been sufficient alone to influence much of the acceleration-deceleration of global trade observed in the recent years. This is a particular example of the `large country case', where the irruption of a large player influences international prices. We show that the value added from China herself has contributed to the increase in income of some sectors, but that is only part of the story.

Second, we make the important distinction between the actual value addition from China and the value that is originated in third countries. This is important as the debate on the effect of Chinese imports into manufacturing sectors has been only studied from the side of gross imports. We repair this conceptual fallacy by estimating the effect in value added terms.

Third, we point out that although Chinese competition that is contributing to the production in income in developed countries, deloping nations seem to have benefit of it. The question is of particular importance given that China is yet witnessing another transition. It is evolving to a growth model driven by innovation and productivity gains, relaying less and less on foreign direct investment and foreign value added. According to the OECD-WTO TiVA data, in 2011, the share of foreign value added embodied in Chinese gross exports was equal to 32% of the total. In 2000, the share was 5 percentage points higher and the share of domestic value added 5 percentage points lower. Meanwhile, countries such as Korea and Japan saw the share of foreign value added embodied in domestic gross exports greatly increase (from 29.6% to 41.6% for Korea, and from 7.4% to 14.6% for Japan). According to existing reasearch, the pattern observed in China is not unusual, but China represents a best practice case. Analysis at the World Bank Group[1] suggests that usually countries that leverage GVCs for development first integrate as buyers (using foreign value added to produce own exports) and, once they have acquired technology, skills, and know-how through this channel, they become sellers in GVCs (i.e. export comparatively higher share of domestic value added). China's reduced reliance on foreign value added is symptomatic of a successful strategy of leveraging GVCs for enabling productivity gains and development through the creation of a world competitive supplier base. The main source of contribution to China's value added embodied in its exports was indeed generated by the domestic suppliers to the exporting sector and not by the exporters themselves. Kee and Tang, analyzing firm level data show that the bulk of growth in domestic value added is due to the choice of individual processing exporters that decreased the volume and variety of imported inputs, increasingly preferring domestic suppliers. Van Aasche and Bieserbroek[2] further find that the export processing sector in itself has become more competitive, transitioning from a pure assembly regime, in which the foreign supplier retains full control over the use of the inputs, to a import assembly regime, which allows the Chinese export plant to become increasingly responsible for selecting the appropriate suppliers themselves.

We faced three main challenges in esimating the effect of import penetration of Chinese goods on domestic output and value added. First, we need a reliable source of inter-industry flows to measure import penetration at the industry level. Second, we need a measure of economic exposure that represent supply changes and takes into account the size of an industry in the global production system. Third, import penetration shocks might be endogenous and demand driven. We solve the first problem with the help of the WTO TiVA input-output tables, so to account for the exact amount of imports by industry of origin and industry of destination. To measure economic exposure, we apply the methodology of Autor et Al. (2013) that relies on long-term changes cross-country variability. We solve the endogeneity problem with the help of an instrumental gravity *a la* Frankel and Romer (1999)

[1] Taglioni and Winkler (2016) *Making GVCs work for development*, World Bank; Santoni and Taglioni (2015) "Networks and structural integration in global value chains" in Amador and di Mauro (eds.), *The Age of Global Value Chains: Maps and Policy Issues,* pp. 68-84, CEPR.

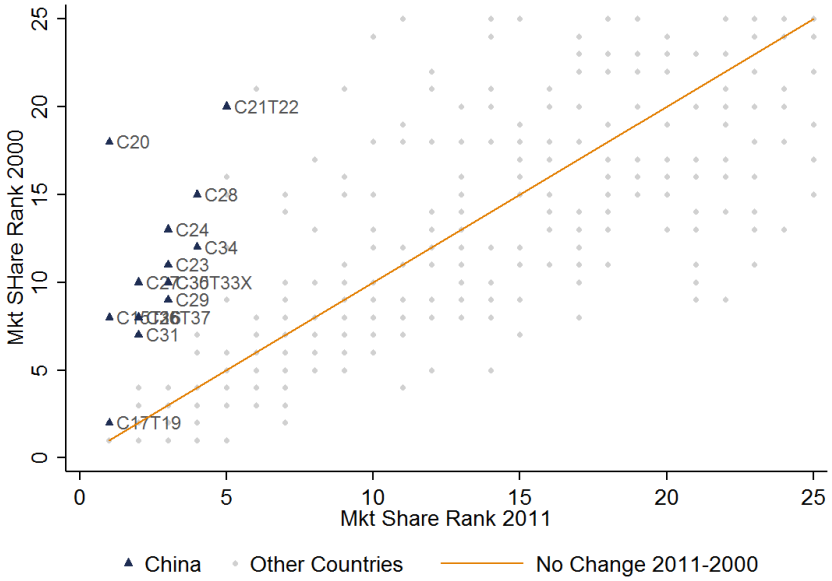
The rest of the paper is organized as follows. Section 2 presents the database. Section 3 describes the empirical strategy. Section 4 discusses the economic significance of the results. Section 5 concludes.

2 DATA ANALYSIS

Our analysis is based on the Inter Country Input-Output (ICIO) tables developed by the OECD-WTO partnership. In the current version the OECD-WTO global input-output tables are available for 61 countries (plus the Rest of the World) with a breakdown into 34 industries (based on the ISIC Rev. 3) and the time coverage includes: 1995, 2000 2005, 2008-2011. A list of the countries and sectors covered in the database is given in the appendix.

The first striking fact is that China has increased its value added export market share in almost all the manufacturing and service sectors (see Figure 6). In 2011 China ranks among the first 5 exporters of value added in manufacturing sectors. Where by value added export we mean the value-added generated by a country but absorbed by another country.

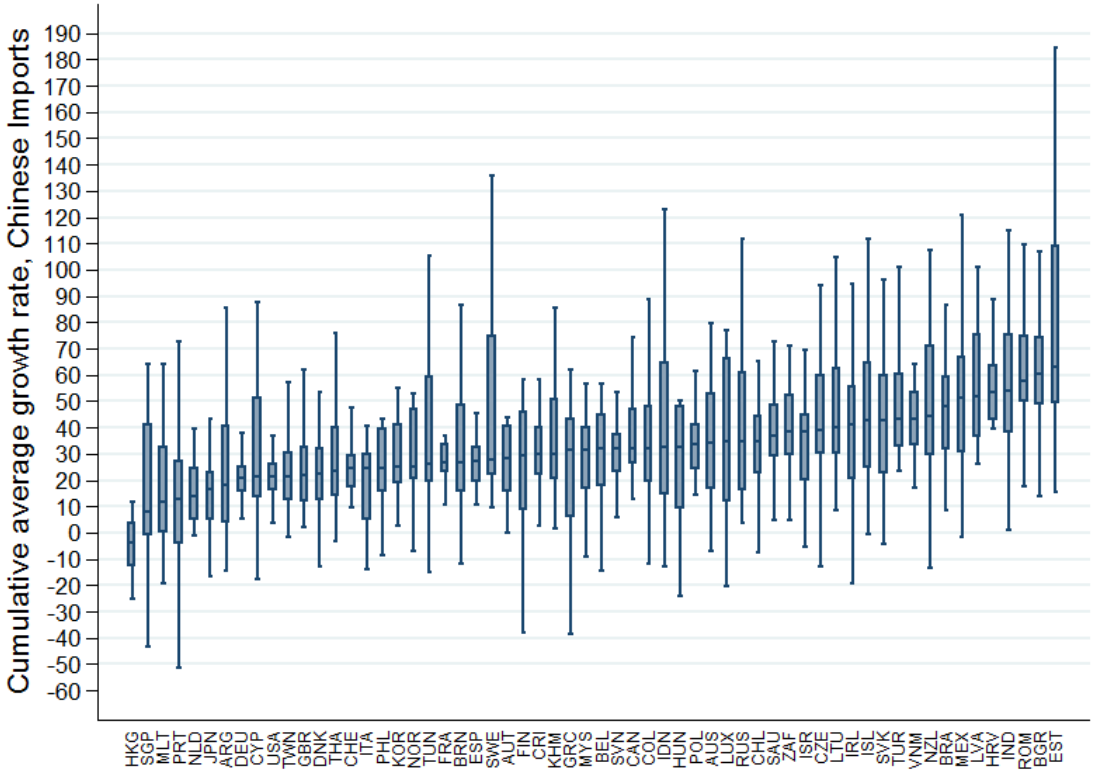
Figure 2: Export Market Share, Value Added ranking – Manufacturing



Note: Ranking of Value Added Export in year 2000 vs 2011 (excluding the ROW aggregate); Source: OECD-WTO TiVA database, October 2015.

Since 1995, the increase in Chinese exports has concerned the World as a whole. In Figure 2 we provide a box plot of the import penetration distribution across sectors, from 2000 to 2005, for each country. We observe than for all countries the median import penetration from Chinese gross exports is positive with the exception of Hong Kong.

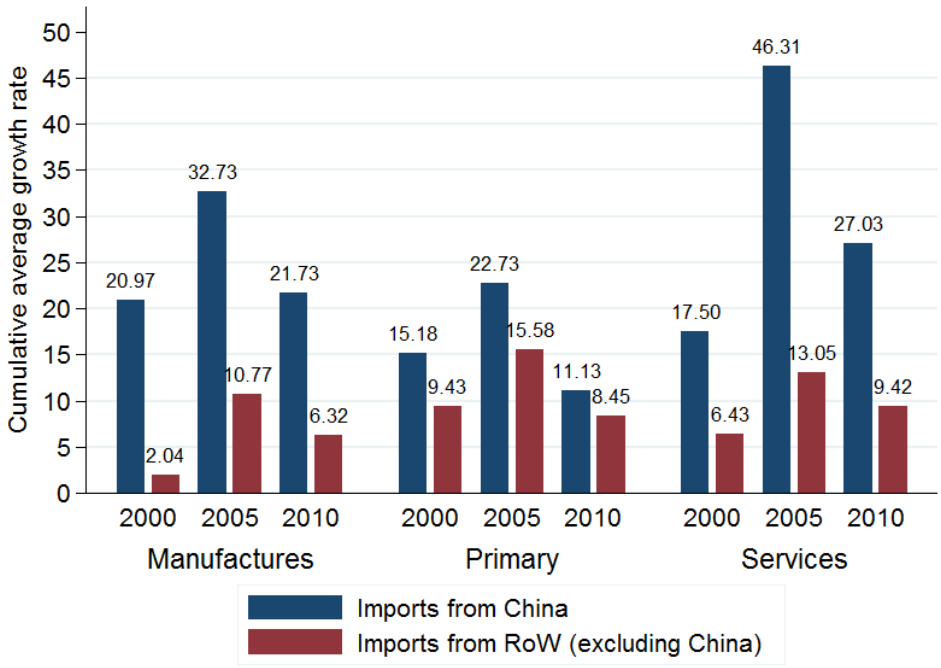
Figure 2 Import Penetration across Countries



Note: It excludes the ROW aggregate; Source: OECD-WTO TiVA database, October 2015. The figure reports annual compound growth rate from between 2000 and 2005.

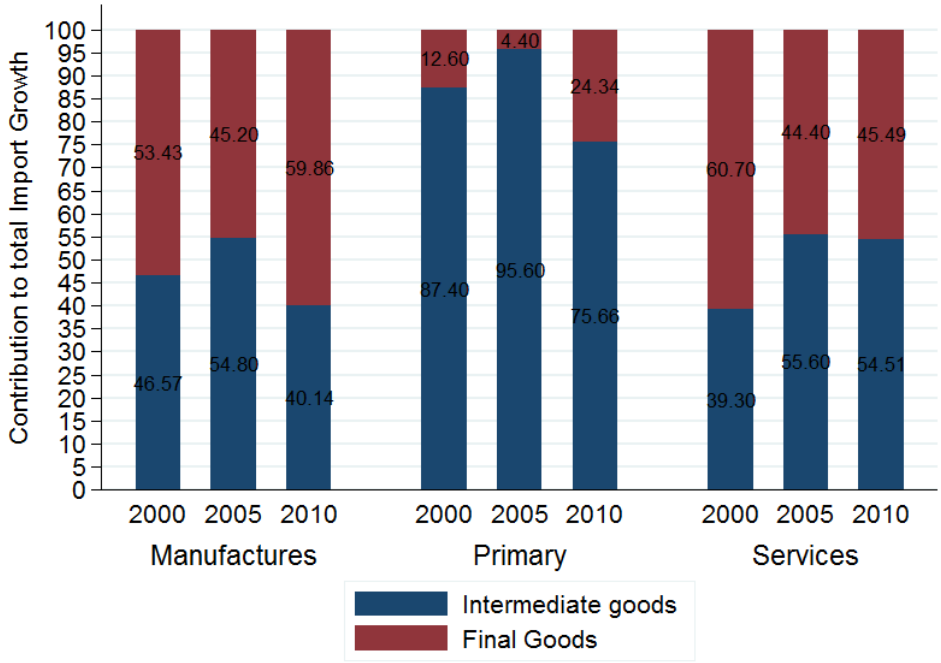
In Figure 3, we plot the growth rate of Chinese exports and the average for Rest of the World. China has outperformed the average World progression in Primary, Manufactures and Services sectors. Chinese export have grown faster thanks to the increase of both final and intermediate exports (Figure 4). From the WTO TiVa database we also extract foreign and domestic value added components. Although Chinese gross exports have sharply increased, its value added components follow different patters by industry type. China is exporting more domestic value added, relying less and less on foreign inputs. This may suggest that the Chinese economy is now capturing higher shares of revenue by transforming their production structure which is more domestically oriented.

Figure 3: Average Import Penetration, China and the Rest of the World



Note: It excludes the ROW aggregate; Source: OECD-WTO TiVA database, October 2015.

Figure 4 Contribution of Intermediate and Final Goods to Chinese Export Growth



Note: It excludes the ROW aggregate; Source: OECD-WTO TiVA database, October 2015.

4 EMPIRICAL STRATEGY

4.1 BASELINE REGRESSION

To assess the impact of Chinese import penetration at the country sector level we rely in the multi-regional input-output framework that allows for a perfect accounting of gross imports by decomposition them into intermediate, final goods and its value counterparts at the country industry-level. In addition, the use of input-output tables, allow for distinguishing between value added and gross production.

First of all we need to compute industry-level imports of Chinese intermediate goods. We use the accounting framework granted by the input-output table model to decompose gross exports in a systematic fashion. At a given time "t", gross exports can be decomposed in the sum of final and intermediate imports.

$$IMP_{chn,ijt} = IMPFIN_{chn,ijt} + IMPINT_{chn,ijt} \quad (1)$$

As a first step we adopt an empirical strategy close to the one used by Autor et al. (2015) to capture the impact of trade shocks on sectoral employment in the United States. First, we define a meaure of import exposure, IPW, defined as

$$\Delta IPW_{i,1995-2010} = \sum_j \frac{Y_{ij,1995}}{Y_{.j,1995}} \frac{\Delta IMPINT_{chn,ij,2010}}{Y_{i,1995}} \quad (2)$$

In (3), $Y_{ij,1995}$ is the production of country i in sector j in 1995. $Y_{.j,1995}$, is the average sectoral global production in sector j across all trading partners. When the ratio is above 1, the industry was produce more than the World average in 1995. $\Delta IMPINT_{chn,ij,2010}$, is the change in Chinese imports of intermediate goods in country i and sector j in the period 1995-2010. It is weighted by $Y_{i,1995}$ which is the total output of country i in 1995. There are two sources of variation in (3). First, the specialization of the country sector at the beginning of the period. Second, the variability of the changes in imports of Chinese goods during the period across industries. In addition to $\Delta IPW_{i,1995-2010}$, we construct a surrogate, $\Delta IPWVA_{i,1995-2010}$, purely in terms of value added, to asses the changes on domestic income.

We assume a baseline regression model at the country level of the type:

$$\Delta y_i = \alpha + \beta_1 \Delta IPW_{i,1995-2010} + \Delta \Gamma_i \beta_k + e_i \quad (3)$$

Where Δ designates growth rates between 1995 and 2010. The dependent variable y_i is the annualized output growth rate of country i. The effect of a shock in import supply from China is captured by β_1 that we allow to vary across income levels.

The vector Γ_i contains a series of country sector controls in growth rates, computed using the ICIO tables and from the PENN World Tables. The controls aiming at characterize the country's participation into global value chains: UPS_i , reporting the annualized growth rate of the country's distance to final demand (Upstreamness); NPS_i, measuring the change in the average number of stages country i (Downstreamness), $INTER_i$, representing the annualized growth rate of intermediates' imports of sector i between 1995 and 2010. Furthermore we control for both the growth rate of capital per worker and the Technical Possibility Frontier. Since all the covariates are in growth rates, the model controls implicitly for time-invariant covariates.

4.2 POTENTIAL ENDOGENEITY

The identification of the effect of $\Delta IPW_{i,1995-2010}$ can be subject to endogeneity problems, since the country-sector shocks depend on the domestic production structure, so they are not orthogonal to the innovations in the left hand side variables.

As an instrument for $\Delta IPW_{i,1995-2010}$ we propose a weighted average of the import competition shock in the same sector by other countries weighted by inter-country production linkages. In particular, we estimate the $\Delta IMPINT_{chn,ij,2010}$ component as:

$$CMPINT_{chn,ij,2010}{}^{IV} = \mathrm{w}_{\mathrm{ijt}}^{\mathrm{Gr}} * \sum_1^I CHN_{ijt} \qquad (5s)$$

For any country-sector ij we define $CMPINT_{chn,ij,2010}{}^{IV}$ as a weighted average of the centrality of its other partners, weighted by the exogenous determinant of inter-country production linkages, $\mathrm{w}_{\mathrm{ijt}}^{\mathrm{Gr}}$. In order to derive the set of weights we employ a gravity-model specification to instrument intermediates flows between countries using only the exogenous bilateral determinants. As in Frankel and Romer (1999) we fit the following instrumental gravity equation for the cross-country flows of intermediates from country i to country j separately for each sector s3:

$$ln\mathrm{w}_{ij,t} = \alpha + \beta_1 \mathrm{Border}_{\mathrm{ij}} + \beta_2 \ln \mathrm{Area}_{\mathrm{i}} + \beta_3 \ln \mathrm{Area}_{\mathrm{j}} + \beta_4 \ln \mathrm{Pop}_{\mathrm{it}} + \beta_5 \ln \mathrm{Pop}_{\mathrm{jt}} + \beta_6 \mathrm{Landlocked}_{\mathrm{i}} + \beta_7 \mathrm{Landlocked}_{\mathrm{j}} + \beta_8 \mathrm{Colony}_{\mathrm{ij}} + \beta_9 \mathrm{Language}_{\mathrm{ij}} + \sum_{t=1}^{4} \beta_t \ln \mathrm{Dist}_{\mathrm{ij}}^{\mathrm{t}} + \epsilon_{cst} \qquad \forall\ k \qquad (6)$$

For any sector k, y_{ij} represents the intermediate flow from country i to country j; $ln\mathrm{Area}$ and $ln\mathrm{Pop}$ represent the (log) of the area and the population of the country and $\ln \mathrm{Dist}_{\mathrm{ij}}^{\mathrm{t}}$ is the (log) of the geodesic distance between i and j, and we allow the effect of distance to adjust over time, t=1995, 2011. $\mathrm{Landlocked}$ is dummy equal to 1 for inland countries; Colony, $\mathrm{Language}$ and Border are bilateral dummies for colonial ties, common language and border4. Estimation is performed using Poisson pseudo-maximum likelihood (PPML) estimator developed by Santos Silva and Tenreyro (2006). The main advantage of using PPML is that it produces consistent estimates in presence of heteroscedasticity and measurement error, which makes it preferable to ordinary least squares in our set up5. Gravity results are reported in the Appendix.

3 We are considering only flows of intermediate products within the same sector but different countries.

4 Data are from two main sources: World Bank WDI for country population and Mayer and Zignago (2011) for the remaining gravity variables, while the dependent variable is form the ICIO tables (OECD-WTO).

5 In particular given the underlying proportionality assumptions made to derive the ICIO tables.

5 ESTIMATION RESULTS, BASELINE

We estimate our baseline equation (4) by ordinary least squares. The model is written in growth rates terms, annualized for the period 1995-2010. Since we work on differences between two periods, we are implicitly controlling for time-invariant country-specific factors. The results should be interpreted in terms of elasticities. Table 1 shows the effect of the IPW from China. In column (1) we report the effect with no controls, where the effect of 1 % change in IPW is associated with a reduction of 0.18 % in gross output at the country level. When separating the effect by the World Bank income categories in 1995 (column (2)), we find heterogeneous effects. In particular, we observe that the negative effect of Chinese import penetration is driven by the high income sample. Figure 5 shows the slopes for the whole sample (upper-left panel), high income countries (upper-right panel), upper-middle income countries (lower-left panel) and lower-middle income countries (lower-right panel). While the positive effect for lower middle income countries falls short of significance in columns (4) and (5), the heterogeneous trend persists. Our specification of choice is the one in column (5) where all the parameters exhibit the expected signs. In particular, we do not observe a significant effect of import penetration from Chinese intermediate goods for lower-income countries. For middle-income countries, we find that a 1 % increase in import penetration is associated with a 0.5 % increase in output. For high-income countries, a 1 % increase in import exposure depresses output by 0.11 %. The growth rate of the Technical Possibility Frontier is positive and signficant and so is the upstreamness coeffient.

Table 4: Intermediate Flows by Sectors, Gravity estimation (SE clustered at country pair in parenthesis)Table 2 shows the results for value added. Since output and value added are highly correlated, we expected to have similar results, with slight differences in magnitude. Indeed, in column (5) we observe the same heterogeneous patterns for import exposure to Chinese intermediate goods. For lower-middle income countries, we do not find a significant effect. The effect of a 1 % increase in the variable of interest results in an increase of 0.7 % in value added in upper-middle income countries. The negative effect for high-income countries persists, a 1 % increase in the degree of exposure to Chinese intermediate imports results in a decrease of 12 % of value added.

The results support the hypothesis that intermediate goods are acting as complements in upper-middle income countries. These countries appear to have specialized their production in line with the greater availability of Chinese intermediates. In contrast, high-income countries are suffering from competition of Chinese inputs or might yet be to adopt a technology that is complimentary with Chinese intermediates.

The 2SLS estimation, reported in Table 3, confirms previous results.

Table 1 Effect of Chinese Import Penetration on Domestic Production, OLS

	(1) Production	(2) Production	(3) Production	(4) Production	(5) Production
IPW	-0.183 **				
	(0.090)				
IPW * LM Income		1.095 ***	0.749 ***	0.074	0.081
		(0.262)	(0.234)	(0.296)	(0.332)
IPW * UM Income		0.475 ***	0.849 ***	0.329 ***	0.457 **
		(0.146)	(0.220)	(0.106)	(0.189)
IPW * H Income		-0.237 **	-0.249 **	-0.151 *	-0.119 *
		(0.112)	(0.109)	(0.082)	(0.069)
Capital per worker			0.502 ***	0.110	0.042
			(0.156)	(0.149)	(0.147)
TFP-growth			0.859 ***	0.388 **	0.325 *
			(0.256)	(0.178)	(0.162)
Imports, RoW				0.564 ***	0.646 ***
				(0.079)	(0.086)
Upstreamness					1.201 **
					(0.455)
Production Stages					-1.938 ***
					(0.548)
Constant	7.026 ***	6.567 ***	4.757 ***	1.848 ***	74.435
	(0.358)	(0.372)	(0.569)	(0.462)	(47.082)
Number of observations	60	60	57	57	57
Adj. R-Squared	0.035	0.225	0.469	0.694	0.730

Robust Standard Errors in Parenthesis. All variables in growth rates.

* p$<$0.10, ** p$<$0.05, *** p$<$0.01

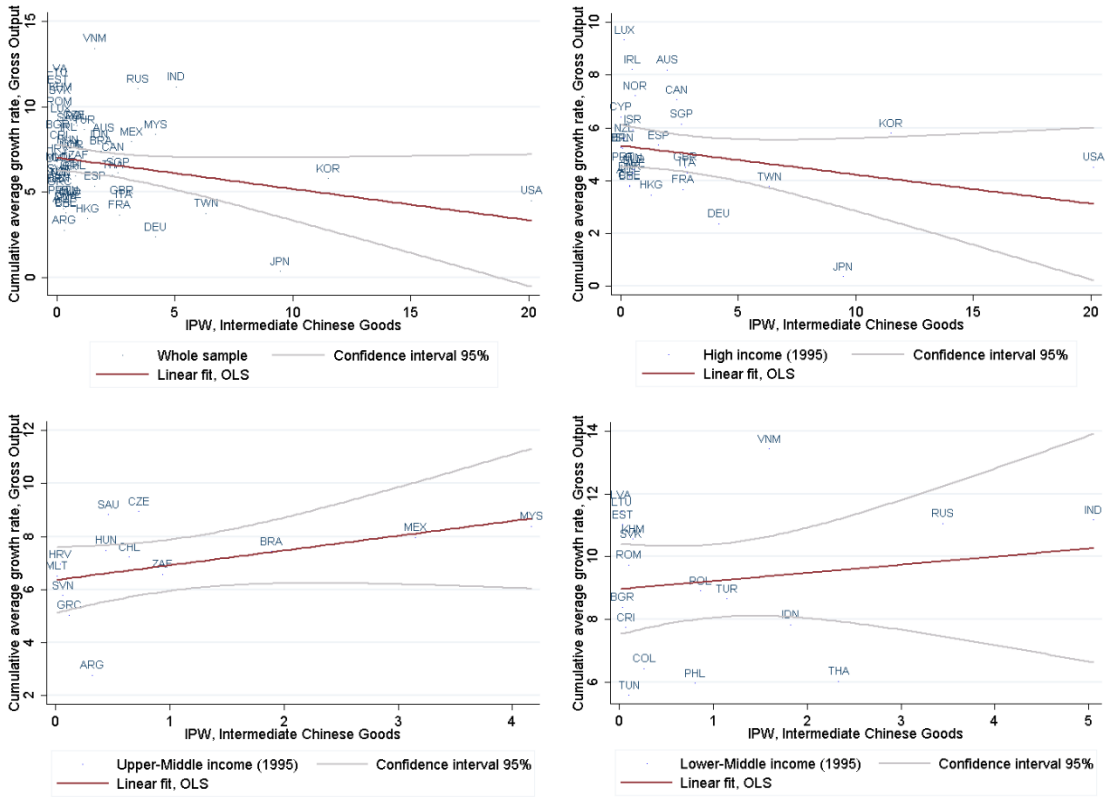
Table 2 Effect of Chinese Import Penetration on Value Added, OLS

	(1) Value Added	(2) Value Added	(3) Value Added	(4) Value Added	(5) Value Added
IPW, VA	-0.211 *				
	(0.115)				
IPW * LM Income		1.340 ***	0.967 ***	0.169	0.270
		(0.284)	(0.281)	(0.417)	(0.450)
IPW * UM Income		0.328	0.820	0.151	0.645 ***
		(0.323)	(0.530)	(0.285)	(0.219)
IPW * H Income		-0.256 *	-0.258 *	-0.161	-0.125 *
		(0.149)	(0.149)	(0.120)	(0.074)
Capital per worker			0.538 ***	0.176	0.067
			(0.159)	(0.177)	(0.136)
TFP-growth			0.774 ***	0.347	0.350 **
			(0.274)	(0.223)	(0.160)
Imports, RoW				0.522 ***	0.602 ***
				(0.101)	(0.080)
Upstreamness					1.142 **
					(0.466)
Production Stages					-3.310 ***
					(0.517)
Constant	6.675 ***	6.266 ***	4.430 ***	1.747 ***	216.421 ***
	(0.353)	(0.377)	(0.562)	(0.560)	(43.356)
Number of observations	60	60	57	57	57
Adj. R-Squared	0.035	0.193	0.400	0.584	0.751

Robust Standard Errors in Parenthesis. All variables in growth rates.

* p$<$0.10, ** p$<$0.05, *** p$<$0.01

Figure 5 Weighted Import Penetration of Chinese Intermediate Goods and Gross Output Growth, by Income Class



Source: Authors' calculations from OECD-WTO TiVA database, October 2015.

IV RESULTS (TBA)

IV results TBA …

CONCLUSION & POLICY IMPLICATIONS

In the context of international shared production, the rise of China as main exporter of intermediate and final goods has affected the countries capacity of production. The higher availability of Chinese goods allows for some countries to take advantage and expand their current production and income by building complementary linkages. This seems to be the case for Upper-Middle income countries. In contrasts, high income countries appear to be the main losers of the new production paradigm. In line with the economic literature on the United States, high-income countries suffer from Chinese competition; facing a higher import penetration and exposure to Chinese competition, their output has shrunk.

The main point of the paper is showing that the impact of import penetration on income is an empirical question. Two potential channels are at stake: Competition losses, Complementarity gains.

Our first hypothesis concerns final goods. In that category of imports China is more likely to be perceived as a competitor. In fact, China has traditionally specialized in the final assembly of manufacturing goods.

Our second hypothesis concerns imports of intermediate goods. Because they are complementary to sectoral production, we expect complementarity gains for the final goods sector that is using the Chinese cheaper inputs.

Gross imports do not exclusively reflect Chinese competition. In fact, China's exports contain a substantive part of foreign value added. Domestic sectors are not suffering from China's competition but instead from the global integrated production system that appears to be more productive.

MORE TBA…

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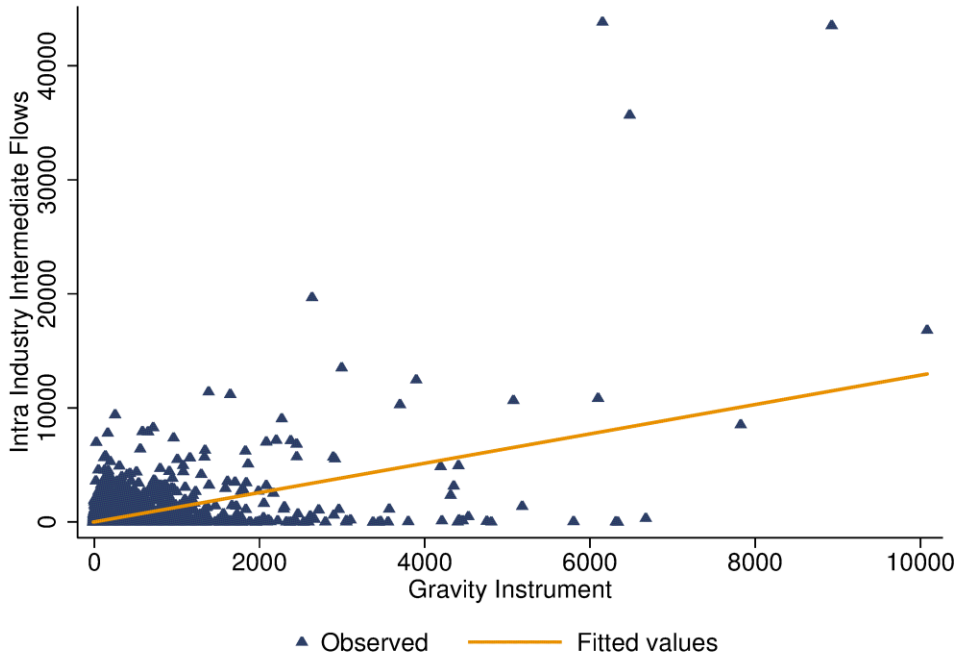
Figure 6: Correlation between predicted and observed Intra-industry intermediates, year 2011 all sectors



Note: the intra-industry intermediate flows are taken from the ICIO tables underlying the TiVA (OECD-WTO) databse; gravity prediction are the prediction from Equation (3). The Pearson correlation between the instrument and the observed flows is 52%.

Table 3: Intermediate Flows by Sectors, Gravity estimation (SE clustered at country pair in parenthesis)

VARIABLES	C15T16	C17T19	C20	C21T22	C23	C24	C25	C26
Border	0.559***	-0.226	0.750***	0.509***	0.549	0.084	0.197	0.438*
	(0.168)	(0.285)	(0.203)	(0.195)	(0.343)	(0.203)	(0.217)	(0.224)
Colony	0.134	0.032	-0.149	0.054	0.160	0.653**	0.419*	0.575
	(0.177)	(0.190)	(0.261)	(0.230)	(0.390)	(0.284)	(0.238)	(0.350)
Language	0.707***	0.340	0.662***	1.012***	0.912***	0.802***	0.388*	0.391**
	(0.127)	(0.221)	(0.240)	(0.183)	(0.313)	(0.178)	(0.216)	(0.194)
Landlocked dest	-0.733***	-0.210	0.079	-0.223	-1.922***	-0.497**	-0.075	-0.068
	(0.150)	(0.156)	(0.237)	(0.224)	(0.215)	(0.216)	(0.209)	(0.169)
Landlocked orig	-0.926***	-0.417**	0.149	-0.290*	-2.018***	0.007	-0.048	0.044
	(0.115)	(0.167)	(0.287)	(0.174)	(0.259)	(0.214)	(0.152)	(0.155)
larea_d	0.057	0.082	0.086	0.149	-0.308***	0.016	0.224***	0.202***
	(0.042)	(0.058)	(0.075)	(0.092)	(0.099)	(0.065)	(0.065)	(0.071)
larea_o	0.235***	-0.164***	0.611***	0.455***	0.297***	-0.017	-0.114	-0.057
	(0.037)	(0.052)	(0.107)	(0.066)	(0.096)	(0.053)	(0.086)	(0.074)
ldist1995	*-1.045****	*-1.143****	*-1.221****	*-1.148****	*-1.345****	*-1.047****	*-1.314****	*-1.207****
	(0.066)	*(0.105)*	*(0.125)*	*(0.098)*	*(0.119)*	*(0.081)*	*(0.085)*	*(0.089)*
ldist2000	*-1.060****	*-1.144****	*-1.219****	*-1.146****	*-1.316****	*-1.037****	*-1.308****	*-1.199****
	(0.066)	*(0.102)*	*(0.119)*	*(0.098)*	*(0.116)*	*(0.081)*	*(0.084)*	*(0.089)*
Ldist2005	*-0.993****	*-1.131****	*-1.172****	*-1.129****	*-1.181****	*-0.964****	*-1.236****	*-1.150****
	(0.066)	*(0.103)*	*(0.121)*	*(0.098)*	*(0.115)*	*(0.080)*	*(0.083)*	*(0.088)*
Ldist2011	*-0.916****	*-1.116****	*-1.168****	*-1.087****	*-1.032****	*-0.894****	*-1.168****	*-1.105****
	(0.066)	*(0.104)*	*(0.131)*	*(0.100)*	*(0.117)*	*(0.079)*	*(0.082)*	*(0.086)*
lpop_o	0.250***	0.891***	-0.069	0.130*	0.301***	0.543***	0.730***	0.722***
	(0.041)	(0.065)	(0.111)	(0.071)	(0.064)	(0.059)	(0.092)	(0.082)
lpop_d	0.475***	0.581***	0.597***	0.479***	0.715***	0.620***	0.446***	0.369***
	(0.048)	(0.059)	(0.061)	(0.100)	(0.084)	(0.059)	(0.064)	(0.068)
Constant	4.311***	7.601***	-0.404	1.449	7.552***	7.475***	5.918***	4.366***
	(0.621)	(0.914)	(1.125)	(1.046)	(1.765)	(0.900)	(1.083)	(1.109)
Observations	14,640	14,640	14,640	14,640	14,640	14,640	14,640	14,640
R-squared	0.350	0.266	0.423	0.370	0.107	0.276	0.272	0.200

Table 4: Intermediate Flows by Sectors, Gravity estimation (SE clustered at country pair in parenthesis)

VARIABLES	C27	C28	C29	C30T33X	C31	C34	C35	C36T37
Border	0.083	0.827***	0.182	-0.785*	0.151	0.599**	0.637	0.395
	(0.220)	(0.205)	(0.272)	(0.420)	(0.269)	(0.247)	(0.423)	(0.276)
Colony	0.759*	-0.109	0.557*	0.584	0.150	-0.685**	1.434***	-0.112
	(0.397)	(0.231)	(0.328)	(0.391)	(0.264)	(0.337)	(0.491)	(0.302)
Language	0.499**	0.557***	0.469**	0.963***	0.507**	0.909***	0.573*	1.330***
	(0.194)	(0.196)	(0.230)	(0.284)	(0.245)	(0.254)	(0.324)	(0.283)
Landlocked dest	-0.698***	0.134	-0.220	0.129	0.454**	-0.102	-1.052***	0.916***
	(0.215)	(0.185)	(0.246)	(0.224)	(0.225)	(0.256)	(0.273)	(0.256)
Landlocked orig	-0.263	0.166	0.425*	-0.344*	0.532**	-0.065	-1.047***	0.326
	(0.194)	(0.206)	(0.219)	(0.196)	(0.224)	(0.287)	(0.289)	(0.222)
larea_d	-0.102	0.173***	0.073	-0.024	-0.043	0.535***	0.079	-0.088
	(0.066)	(0.053)	(0.078)	(0.081)	(0.061)	(0.114)	(0.102)	(0.075)
larea_o	0.395***	-0.024	-0.101	-0.268***	-0.041	0.138	0.094	0.088
	(0.063)	(0.094)	(0.070)	(0.071)	(0.066)	(0.134)	(0.100)	(0.079)
ldist1995	*-1.246****	*-1.173****	*-0.948****	*-0.967****	*-1.182****	*-1.428****	*-0.774****	*-0.626****
	(0.103)	*(0.090)*	*(0.103)*	*(0.185)*	*(0.095)*	*(0.177)*	*(0.137)*	*(0.114)*
ldist2000	*-1.271****	*-1.159****	*-0.944****	*-0.894****	*-1.162****	*-1.388****	*-0.701****	*-0.604****
	(0.102)	*(0.090)*	*(0.103)*	*(0.182)*	*(0.093)*	*(0.177)*	*(0.136)*	*(0.115)*
Ldist2005	*-1.181****	*-1.092****	*-0.892****	*-0.875****	*-1.107****	*-1.340****	*-0.667****	*-0.549****
	(0.101)	*(0.089)*	*(0.101)*	*(0.172)*	*(0.092)*	*(0.178)*	*(0.135)*	*(0.115)*
Ldist2011	*-1.091****	*-1.022****	*-0.822****	*-0.854****	*-1.040****	*-1.310****	*-0.633****	*-0.476****
	(0.100)	*(0.088)*	*(0.099)*	*(0.167)*	*(0.090)*	*(0.179)*	*(0.135)*	*(0.115)*
lpop_o	0.225***	0.631***	0.703***	0.894***	0.736***	0.524***	0.519***	0.641***
	(0.067)	(0.099)	(0.078)	(0.085)	(0.068)	(0.129)	(0.082)	(0.071)
lpop_d	0.721***	0.316***	0.588***	0.774***	0.727***	0.222*	0.456***	0.657***
	(0.067)	(0.055)	(0.073)	(0.077)	(0.068)	(0.114)	(0.097)	(0.110)
Constant	5.813***	5.107***	5.938***	9.207***	6.865***	3.073**	2.128	0.406
	(1.005)	(1.104)	(1.086)	(1.303)	(1.045)	(1.432)	(1.641)	(1.254)
Observations	14,640	14,640	14,640	14,640	14,640	14,640	14,640	14,640
R-squared	0.320	0.223	0.145	0.253	0.198	0.378	0.060	0.176