

Collateral Damage? Labour Market Effects of Competing with China – at Home and Abroad

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Lisbon, October 2018

Motivation

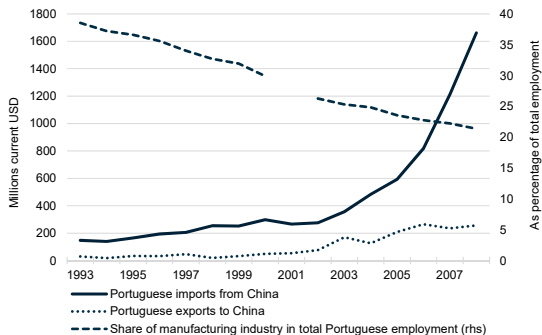
- ▶ The **increased range and quality of China's exports** is a major ongoing development in the international economy with potentially far-reaching effects, including in labour markets.
- ▶ In this context, a number of recent studies have examined the micro-level effects of rising imports on different groups of workers (e.g. Autor et al., 2014, Utar (2018), and Dauth et al., 2018), generally focusing on the cases of **large developed economies** or countries with **distinct specialisation patterns**.
- ▶ This research has documented **substantial adjustment costs** in the sectors most exposed to Chinese imports in the US.
- ▶ "When the Chinese rise gained momentum, this has then mainly led to a **diversion of German import flows** from other countries, but it has not caused major job displacements in Germany." (Dauth et al., 2014)

Our contribution

- ▶ On top of the direct effects of increased imports from China studied in previous research, we also examine the **indirect labour market effects** stemming from increased export competition in third markets.
- ▶ In fact, the large export market share gains of China in low-tech, low-skill products, like textiles, clothing, footwear, electric appliances, and toys, were accompanied by **losses in the export shares of several developed countries**.
- ▶ Our evidence is based on a rich matched employer-employee panel dataset from Portugal, a (small) open economy with a **comparative advantage profile more comparable to that of China** than more developed countries (Cabral and Esteves, 2006).
- ▶ We find evidence of negative effects on the Portuguese labour market from China's emergence in international trade, mainly through trade diversion.

The Direct Effect

Figure: Portuguese international trade with China and manufacturing employment in Portugal

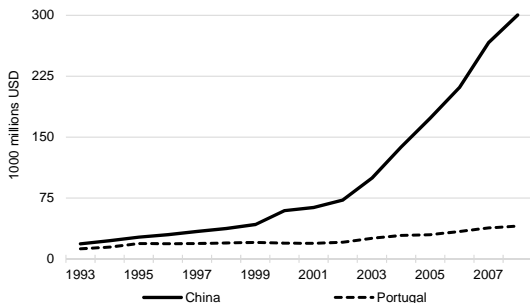


Sources: CEPII - CHELEM database and Quadros de Pessoal (QP)

Notes: Portuguese goods imports from (exports to) China in millions of current US dollars on the left scale and share of full-time employees working in the Portuguese manufacturing industry, as a percentage of total full-time private employment on the right scale.

The Indirect Effect I

Figure: Nominal exports of China and Portugal to the EU 14

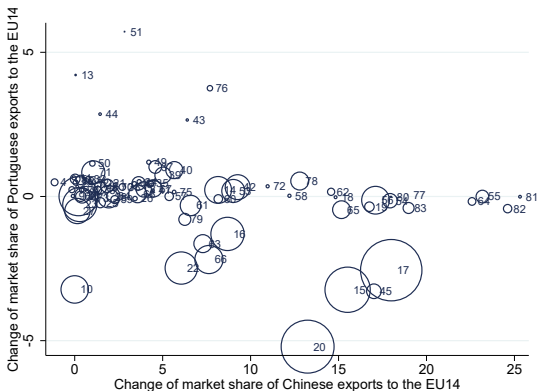


Source: CEPII - CHELEM database.

Notes: Chinese and Portuguese exports to the 15 original Member States of the European Union excluding Portugal (EU14). Data in 1,000 millions current US dollars.

The Indirect Effect II

Figure: Changes in export market shares of China and Portugal in the EU 14 (1993-2008)



Source: Authors' calculations based on the CEPII - CHELEM database.

Notes: EU14 refers to the 15 original Member States of the European Union excluding Portugal. Export market shares computed as Chinese (Portuguese) exports to the EU14 divided by total imports of the EU14, by industry. Changes in percentage points from 1993 to 2008.

Identification Strategy

- ▶ Our identification strategy is inspired by a number of influential articles by David Autor, David Dorn, Gordon Hanson, and several co-authors which combine changes in sector-specific import exposures with the industry affiliation of workers (Autor et al. (2014); Autor et al. (2015); Acemoglu et al. (2016)).
- ▶ As before, we exploit the fact that the **significant rise of China from a closed to a market-oriented economy** and the world's largest exporter was sudden, largely unexpected, and motivated by exogenous factors such as changes in domestic policies and in trade agreements (See Hsieh and Ossa (2016); and Brandt et al. (2017)).
- ▶ To account for **possible endogeneity issues** due to unobserved domestic (demand-side) conditions, rather than by rising Chinese productivity and market accessibility (supply-side) factors, these papers propose an **instrumental variable (IV)** approach, which we also follow.

Trade Data: Direct Effect

Following Autor et al. (2014), the **direct import exposure to China** of a specific Portuguese industry j over the τ period 1993-2008 can be measured as the change of its import penetration ratio:

$$\Delta IPdir_{j,\tau} = \frac{\Delta M_{j,\tau}^{chn \rightarrow prt}}{WB_{j,93}}, \quad (1)$$

where $M_j^{chn \rightarrow prt}$ represents Portuguese imports from China for a specific industry j and $\Delta M_{j,\tau}^{chn \rightarrow prt}$ is the change of the latter over the period τ , 1993-2008. $WB_{j,93}$ is the total wage bill of industry j in 1993, which is used as a proxy of the initial industry size (using turnover as a normalization substitute yields similar results).

Trade Data: Instrument

As discussed in the literature, Equation (1) can reflect also domestic shocks to Portuguese industries and not only the exogenous drivers of Chinese trade growth. In our instrumental variable, we use **countries with an income level similar to Portugal, excluding all members of the EU** (Argentina, Chile , Uruguay , Mexico, Turkey, Israel and New Zealand) as follows:

$$\Delta IPO_{j,\tau} = \frac{\Delta M_{j,\tau}^{chn \rightarrow O}}{WB_{j,91}}, \quad (2)$$

where $M_j^{chn \rightarrow O}$ are imports of the 7 selected countries from China in industry j . The measures are normalised by the wage bill of the respective industry j in Portugal in 1991.

Trade Data: Indirect Effect

The measure of **indirect import competition from China** in each industry j from 1993 to 2008 that we propose is:

$$\Delta IPind_{j,\tau} = \frac{\sum_{C=1}^{14} \omega_{j,93}^{prtC} \Delta M_{j,\tau}^{chn \rightarrow C}}{WB_{j,93}}, \quad \text{with} \quad \omega_{j,93}^{prtC} = \frac{M_{j,93}^{prt \rightarrow C}}{M_{j,93}^{\rightarrow C}} \quad (3)$$

where $\omega_{j,93}^{prtC}$ is the share of Portugal in total imports of each EU14 country C in each industry j in 1993, $M_{j,93}^{prt \rightarrow C}$ are imports from Portugal by country C and industry j (ie, industry j Portuguese exports to country C) and $M_{j,93}^{\rightarrow C}$ are the total imports of country C of industry j . This weight is then multiplied by the change in the absolute value of imports of country C from China from 1993 to 2008 by industry j , $\Delta M_{j,\tau}^{chn \rightarrow C}$. The measure is normalised by the wage bill of industry j in Portugal in 1993.

We argue that Equation (3) is arguably **determined independently of Portuguese trade and labour market shocks** (see Balsvik et al. (2015) for a similar argument for Norway).

Worker-Level Data

▶ Main Sample

- ▶ Period between 1991 and 2008 (except 2001 for which worker-level data is not available).
- ▶ Workers aged 15-48 in 1991.
- ▶ Only individuals full-time employed both in 1991 and in 1993 (in either manufacturing or non-manufacturing sectors).

▶ 2 Outcome Variables

- ▶ Cumulative (real) earnings of a worker from 1994 to 2008, divided by the average earnings of 1991 and 1993.
- ▶ Cumulative employment measured as the number of times (in the October census month) that an individual is present in the dataset.¹

¹Given the nature of the data, non-employment could represent unemployment, inactivity, emigration, part-time activity, or death but also self-employment, measurement error, or employment as a civil servant.

Econometric Estimation

Our empirical analysis takes a **medium-run perspective** regarding the international trade impact of China on workers' relative cumulative wages (and employment). The direct effects equation is specified as follows:

$$Y_{i,\tau} = \beta_0 + \beta_1 \Delta IPdir_{j,\tau} + \beta_2 X_{i,93} + \beta_3 X_{f,93} + \beta_4 X_{j,93} + \varepsilon_{i,\tau}, \quad (4)$$

- ▶ **Individual:** $X_{i,93}$ includes a female dummy variable, eight formal education categories, eight formal categories of workers qualifications, age and age squared, and tenure and tenure squared.
- ▶ **Firm:** $X_{f,93}$ includes the number of employees, the natural logarithm of turnover, the share of public equity, the share of foreign equity, and twenty eight regional location dummies at the NUTS3 level.
- ▶ **Sector:** $X_{j,93}$ includes a set of dummy variables for 9 broad aggregate categories computed based on the 83 trade-exposed manufacturing industry and a measure of overall import penetration of the industry.
- ▶ $\varepsilon_{i,\tau}$ is clustered at the industry-level.

Baseline Results: Direct Effects

	OLS		IV	
	(1)	(2)	(3)	(4)
Panel A. Cumulative Earnings				
$\Delta IPdir_j$	-1.469 (1.440)	-0.116 (0.608)	-0.386 (0.959)	0.251 (0.662)
Panel B. Cumulative Employment				
$\Delta IPdir_j$	-0.676 (0.637)	-0.250 (0.543)	-0.299 (0.426)	-0.019 (0.544)
First stage ΔIPO_j			9.093*** (0.635)	8.366*** (0.693)
First stage F test			204.884	145.841
Individual controls	No	Yes	No	Yes
Firm controls	No	Yes	No	Yes
Sector controls	No	Yes	No	Yes

Notes: The main sample includes 602 073 workers employed in 1991 and 1993.

Baseline Results: Direct and Indirect Effects

	OLS		IV	
	(1)	(2)	(3)	(4)
<u>Panel A. Cumulative Earnings</u>				
ΔIPO_{dirj}	2.733 (1.777)	0.413 (0.624)	4.656** (2.157)	1.012 (0.903)
ΔIPO_{indj}	-8.268*** (2.767)	-1.534** (0.686)	-8.754*** (2.772)	-1.652** (0.729)
<u>Panel B. Cumulative Employment</u>				
ΔIPO_{dirj}	1.060 (0.731)	0.120 (0.496)	1.772** (0.903)	0.511 (0.595)
ΔIPO_{indj}	-3.417*** (1.179)	-1.073*** (0.411)	-3.597*** (1.197)	-1.150** (0.447)
First stage ΔIPO_j			8.743*** (0.355)	8.094*** (0.614)
First stage F test			608.161	173.853
Controls	No	Yes	No	Yes

Baseline Results: Direct and Indirect Effects

Interpretation: comparing a 1993 manufacturing worker at the 3rd quartile of each import penetration distribution and a manufacturing worker at the 1st quartile, the resulting reduction in earnings in the outcome period is 25%.

Heterogeneity Results

- ▶ Age: indirect effects on earnings and employment years fall (more strongly) on older workers (older than 35yrs);
- ▶ Gender: indirect effects on women are stronger than those for men, both for cumulative earning and employment;
- ▶ Education: university graduates are not affected by increased competition from China;
- ▶ Origin of firms equity: individuals employed in foreign-owned firms (more than 10%) do not appear to be affected by Chinas competition.

Robustness: Alternative Measure of Trade Exposure I

The alternative measure of **indirect competition** captures the percentual change of export market shares of China in each industry-destination:

$$\Delta IPind2_{j,\tau} = \sum_{C=1}^{14} v_{j,93}^{prtC} \Delta_{\tau} \left(\frac{M_j^{chn \rightarrow C}}{M_j^{\rightarrow C}} * 100 \right), \quad \text{with} \quad v_{j,93}^{prtC} = \frac{X_{j,93}^{prt \rightarrow C}}{X_{j,93}^{prt \rightarrow}} \quad (5)$$

where $v_{j,93}^{prtC}$ represents the relative importance of each individual country/product destination market in total Portuguese exports of that industry. $X_{j,93}^{prt \rightarrow C} = M_{j,93}^{prt \rightarrow C}$ of Equation (3) and $X_{j,93}^{prt \rightarrow}$ are the total Portuguese exports of industry j .

This weight is then multiplied by the percentage change of export market share of China in each industry of each EU14 country from 1993 to 2008, where $M_j^{chn \rightarrow C}$ are imports from China of industry j by country C of the EU14 and $M_j^{\rightarrow C}$ are total imports of that country at the industry-level.

Robustness: Alternative Measure of Trade Exposure II

	OLS (1)	IV (2)
Panel A. Cumulative Earnings		
$\Delta IPdir_j$	0.255 (0.605)	1.001 (0.766)
$\Delta IPind2_j$	-0.959*** (0.292)	-0.999*** (0.293)
Panel B. Cumulative Employment		
$\Delta IPdir_j$	-0.020 (0.499)	0.447 (0.506)
$\Delta IPind2_j$	-0.595*** (0.178)	-0.621*** (0.180)
First stage ΔIPO_j		0.008*** (0.001)
First stage F test		195.466
Controls	Yes	Yes

Further Robustness Checks

- ▶ Gravity-based approach, which captures the differential changes in China's sectoral productivity and trade costs relative to Portugal
- ▶ Exports opportunities (Dauth et al., 2018);
- ▶ Alternative measure of (direct) trade exposure: substituted IV countries by 15 OECD non- EU14 countries;
- ▶ Exclude non-manufacturing workers (a worker in the 3rd Q earns 15.6% less than a worker in the 1st Q);
- ▶ Use industrys turnover as an alternative to normalize cumulative earnings (a worker in the 3rd Q earns 29.6% less than a worker in the 1st Q);
- ▶ Split the sample in two periods – before and after 2001: the negative impacts steaming from trade diversion only are concentrated in the most recent sub-period.

Concluding Remarks

- ▶ A number of studies have examined the **direct effects** from China's increased competition on labour markets worldwide.
- ▶ **The indirect effects** ('collateral damage') of increased competition with China in third-country export markets **have largely been overlooked**.
- ▶ Our results indicate that the indirect effects associated with increased Chinese competition in third-country markets can account for a **large part of the significant negative labour market effects** in Portugal.
- ▶ These effects are **also relevant for other countries** with significant shares of their workforce employed in relatively labour-intensive manufacturing exporting firms...
- ▶ ... and also potentially increasingly relevant as more and more industries around the world become exposed to the **increasing range and quality of China's exports**.
- ▶ The identification of those most affected is essential for public policies aiming at supporting workers more hurt by globalization.

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