Supplementary Appendix: Value Added and Productivity Linkages Across Countries

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A Empirical Appendix

A.1 Data source

Trade Comovement Puzzle Unless explicitly stated, we focus the empirical analysis on 40 OECD countries and major emerging markets, which account for around 90% of world GDP.[1] Our bilateral trade flows data come from Johnson and Noguera (2017) who separated between final and intermediate goods for 42 countries between 1970 and 2009. According to their data appendix A.2, they construct their data as follows. For bilateral goods trade, they use the NBER-UN Database for 1970-2000 and the CEPII BACI Database for 1995-2009. This data is reported on a commodity-basis. They assign commodities to end uses and industries using existing correspondences from the World Bank. To assign commodities to end uses, they use correspondences between SITC (Revision 2) 4-digit or HS (1996 Revision) 6-digit commodities and the BEC end use classifications. To assign commodities to industries, they use correspondences between SITC and HS categories and ISIC (Revision 2) industries. GDP data comes from the 9th Penn World Tables. We use the output-side real GDP at chained PPPs

[1] The list of countries is: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States and Vietnam.

(variable *rgdpo*), to compare relative productive capacity across countries and over time.[2] We also use OECD data and quarterly based price GDP data in some robustness checks. In total, we have 630 country-pairs appearing 4 times and 190 pairs appearing 2 times (both in the case of 10 years time windows), leading to a dataset with a total of 2900 observations.

Extensive and Intensive Margins Trade data for the construction (using the HK decomposition) of the extensive and intensive margins are collected from the observatory of economic complexity. We use the SITC4 REV. 2 classification in the main analysis and the HS6 classification (from 1995 to 2008) as robustness check.[3]

Markups In the paper, we use two different markup index estimates. We first used aggregated micro markups estimated by De Loecker and Eeckhout (2018). They use micro data of 70,000 firms in 134 countries from 1980 to 2016 and estimate aggregate average markups using a cost-based approach. This method defines markups as the ratio of the output price to the marginal costs, and therefore relies solely on information from the financial statements of firms (sales value and cost of goods sold). Aggregating all firms specific markups for each country, De Loecker and Eeckhout (2018) provide a detailed and comparable measure of market power between countries. The sample that we use from their estimates includes 29 countries from 1980 to 2016.[4]

Second, we use Price Cost Margin (PCM) as an estimate of markups within each industry using data from 22 countries from 1971 to 2010.[5] Introduced by Collins and Preston (1969) and widely used in the literature, PCM is the difference between revenue and variable cost (the sum of labor and material expenditures, over revenue): $PCM = \frac{\text{Sales}-\text{Labor exp.}-\text{Material exp.}}{\text{Sales}}$

Data at the industry level come from the OECD STAN database, an unbalanced panel covering 107 sectors for 34 countries between 1970 and 2010. Due to missing data for many countries in the earliest years, we restrict the analysis for 22 countries.[6] We compute PCM for

[2]We drop Romania and South Africa from their sample because of lack of GDP series in the Penn World Tables. Moreover, in Johnson and Noguera (2017)'s data for Russia starts only in 1990 while data for Estonia, Slovak Republic, Slovenia and Czech Republic start only in 1993. All country-pairs involving one of those five countries appears only two times in the case of 10 years time-windows and cannot be used at all in the case of 20 years time-windows.

[3]Data are available here: `https://atlas.media.mit.edu/en/resources/data/`

[4]The list of countries is: Austria, Belgium, Canada, Colombia, Denmark, Finland, France, Germany, Greece, Ireland, Iceland, Indonesia India, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, Turkey, the United-Kingdom and the United-States.

[5]The list of countries is: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Iceland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Portugal, Spain, Sweden, the United-Kingdom and the United-States.

[6]For Germany, data are available only from 1991 onward (after the reunification), which is why the total number

each industry-country-year and then construct an average of PCM within each country-year by taking the sales-weighted average of PCM over each industry. Finally, the average PCM for a given time window is simply the mean of country-year PCM over all time periods.

A.2 Summary statistics

Table 1 shows the summary statistics of the data used throughout the empirical investigations of the paper.

Table. 1. Summary statistics

Statistic	Min	Max	Mean	Pctl(25)	Median	Pctl(75)	N	St. Dev.
log_inx_tot_trade	−19.280	−2.430	−7.768	−8.838	−7.583	−6.486	2,900	2.004
log_inx_int_trade	−19.945	−2.869	−8.314	−9.360	−8.132	−7.007	2,900	2.025
log_inx_fin_trade	−20.003	−3.468	−8.759	−9.874	−8.522	−7.368	2,900	2.100
corr_GDP_HP	−0.933	0.973	0.277	0.003	0.327	0.592	2,900	0.396
corr_GDP_BK	−0.928	0.961	0.280	0.013	0.330	0.592	2,900	0.387
corr_GDP_FD	−0.976	0.978	0.253	−0.023	0.293	0.554	2,900	0.388
third_tot	0.090	0.942	0.528	0.400	0.534	0.665	2,900	0.173
sector_ex	0.023	0.722	0.307	0.211	0.294	0.390	2,520	0.133
index_C_claims_2	0.00000	1.431	0.035	0.001	0.003	0.011	1,030	0.122
index_TOT_FDI	−0.002	0.012	0.0004	0.00001	0.0001	0.0003	783	0.001
SITC_sector	0.081	0.806	0.452	0.344	0.451	0.557	2,900	0.145

A.3 Trade Comovement Slope

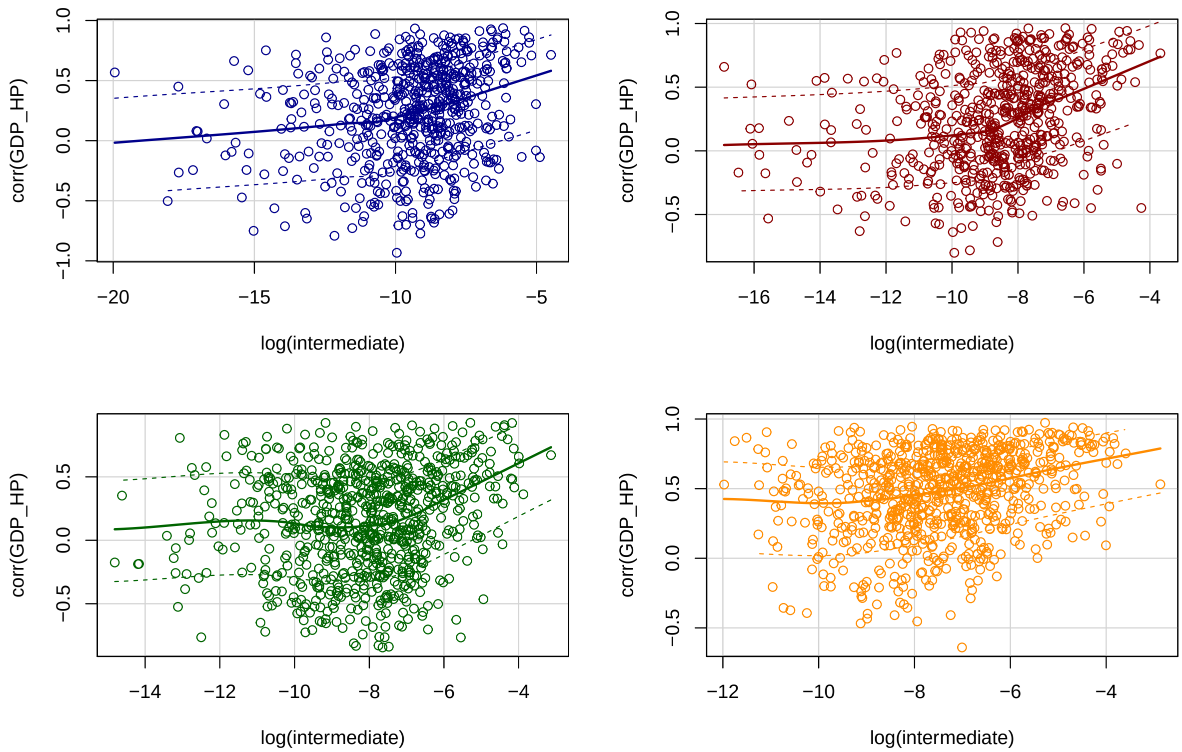
In this section, we conduct additional robustness checks and show that our main empirical results concerning the trade co-movement slope are robust to alternative specifications, sample selection and time period. We start by providing in figure 1 scatter-plots relating GDP co-movomenets and trade intensity for each time windows. In each time-windows, their is a positive relationship between the two variables. Therefore, the main analysis consists in disentangling effects coming from unobserved heterogeneity (common borders, same language etc.) and specific time effect (the global rise in GDP correlation through time).

A.3.1 Robustness: excluding EU and USSR country-pairs, alternative time windows and time periods

We conduct three sets of analysis concerning our main empirical findings that trade in intermediate inputs is associated with more GDP correlation while trade in final goods is not.

of observation in the regressions is 43.

Figure 1. Bilateral trade intensity and GDP correlation (HP-filter) for the four time windows from 1970 to 2009. Blue: 1970-1979, Red: 1980-1989, Green: 1990-1999, Orange: 2000-2009.



(i). In table 2, we first provides additional results of the main regressions ((1) and (2) in the main paper) with 20 years time windows and fixed effects. The results confirm the robustness of our findings under alternative time windows. Using this dataset, we find a significant trade in inputs co-movement slope using HP filter or first difference.

Table. 2. Trade - GDP correlation, Disaggregated trade, 20 years time windows

	Corr GDP$^{\text{HP filter}}$					Corr ΔGDP				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ln(Trade$^{\text{total}}$)	0.047***	0.019*				0.016**	0.017			
	(0.007)	(0.011)				(0.007)	(0.013)			
ln(Trade$^{\text{input}}$)			0.056*	0.074**	0.081**			0.070**	0.074**	0.079**
			(0.033)	(0.033)	(0.033)			(0.030)	(0.031)	(0.031)
ln(Trade$^{\text{final}}$)			−0.005	−0.054	−0.063*			−0.047*	−0.057*	−0.063**
			(0.029)	(0.034)	(0.034)			(0.026)	(0.031)	(0.031)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Time Window FE	No	Yes	No	Yes	No	Yes	No	Yes		
EU + URSS dum.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
N	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450
R^2	0.058	0.068	0.061	0.075	0.103	0.009	0.009	0.017	0.017	0.032

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

(ii). In table 3 we run the same empirical analysis with fixed effects but we exclude country-pairs with two countries in the 2000 European Union, while in table 4 we exclude USSR countries. This is motivated by the fact that the European Union (or trade unions) have made correlated policies to improve trade each other, which may influence the correlation between trade intensity and GDP correlation. Perhaps surprisingly, dropping country-pairs in the European Union from the sample increases the correlation between trade in intermediate goods and GDP comovement. We find a similar conclusion when excluding USSR countries.

(iii). In table 5, we focus only on the three first time windows that cover the period from 1970 to 1999. In that case, we still find a significant trade co-movement slope, with a larger effect of trade intensity on GDP comovement.[7]

Table. 3. Trade and GDP correlation with 10 years time windows - no EU country-pairs

	Corr GDP$^{\text{HP filter}}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\ln(\text{Trade}^{\text{input}})$	0.056**	0.066***	0.067***	0.067***	0.049**	0.047*	0.048**	0.046*
	(0.026)	(0.025)	(0.026)	(0.025)	(0.024)	(0.024)	(0.024)	(0.024)
$\ln(\text{Trade}^{\text{final}})$	0.005	−0.043*	−0.051**	−0.050*	−0.005	−0.020	−0.030	−0.028
	(0.023)	(0.025)	(0.026)	(0.026)	(0.021)	(0.024)	(0.024)	(0.024)
$sector_{prox}$				−0.107				−0.253
				(0.161)				(0.158)
$third_{country}$			0.326**	0.332**			0.354**	0.366**
			(0.161)	(0.162)			(0.147)	(0.147)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
URSS dum.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280
R^2	0.044	0.173	0.178	0.178	0.022	0.143	0.149	0.150

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

A.3.2 Robustness: sector composition

In table 6 we show the results of an analysis where the index of similarity in sectoral composition is constructed using first the ISIC classification (columns (2) and (5)) and then using the SITC 4-digits classification (columns (3) and (6)). The sample size is not exactly similar as in the main text but results are robust to this specification.

[7] Notice that findings for the points (ii) and (iii) are also valid using FD.

Table. 4. Trade and GDP correlation with 10 years time windows - no USSR countries

	Corr GDP$^{\text{HP filter}}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Trade$^{\text{input}}$)	0.064**	0.066**	0.073***	0.072***	0.063***	0.055**	0.066***	0.061**
	(0.027)	(0.027)	(0.027)	(0.027)	(0.025)	(0.025)	(0.025)	(0.025)
ln(Trade$^{\text{final}}$)	−0.006	−0.020	−0.043	−0.042	−0.020	−0.007	−0.031	−0.026
	(0.024)	(0.027)	(0.027)	(0.027)	(0.022)	(0.025)	(0.026)	(0.026)
$sector_{prox}$				−0.064				−0.302*
				(0.160)				(0.154)
$third_{country}$			0.307*	0.310*			0.361**	0.374**
			(0.164)	(0.165)			(0.150)	(0.151)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
URSS dum.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244
R^2	0.037	0.143	0.165	0.165	0.020	0.132	0.151	0.154
Notes:	*p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.							

Table. 5. Trade and GDP correlation with 10 years time windows - first three time windows

	Corr GDP$^{\text{HP filter}}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Trade$^{\text{input}}$)	0.081***	0.062**	0.071**	0.079***	0.067**	0.034	0.046	0.055*
	(0.030)	(0.028)	(0.028)	(0.028)	(0.030)	(0.029)	(0.029)	(0.029)
ln(Trade$^{\text{final}}$)	0.014	−0.034	−0.052*	−0.061**	0.001	−0.006	−0.025	−0.034
	(0.026)	(0.028)	(0.029)	(0.029)	(0.026)	(0.029)	(0.030)	(0.030)
$sector_{prox}$				0.677***				0.679***
				(0.170)				(0.173)
$third_{country}$			0.255	0.208			0.337*	0.289*
			(0.174)	(0.170)			(0.174)	(0.171)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
URSS dum.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,270	2,270	2,270	2,270	2,270	2,270	2,270	2,270
R^2	0.068	0.222	0.250	0.258	0.033	0.189	0.221	0.229
Notes:	*p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.							

Table. 6. Trade - GDP correlation, Disaggregated trade, controls with sectoral composition

	Corr $GDP^{\text{HP filter}}$			Corr ΔGDP		
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(\text{Trade}^{\text{input}})$	0.057^{**}	0.059^{**}	0.058^{**}	0.044^{*}	0.043^{*}	0.043^{*}
	(0.026)	(0.026)	(0.026)	(0.024)	(0.024)	(0.024)
$\ln(\text{Trade}^{\text{final}})$	-0.036	-0.045^{*}	-0.045^{*}	-0.018	-0.025	-0.027
	(0.025)	(0.026)	(0.026)	(0.024)	(0.024)	(0.024)
$sector_{prox}$		0.042	-0.058		-0.376^{**}	-0.219^{**}
		(0.181)	(0.115)		(0.175)	(0.110)
$third_{country}$		0.272^{*}	0.282^{*}		0.369^{**}	0.391^{***}
		(0.154)	(0.156)		(0.144)	(0.146)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes
EU + URSS dum.	Yes	Yes	Yes	Yes	Yes	Yes
N	2,520	2,520	2,520	2,520	2,520	2,520
R^2	0.143	0.144	0.145	0.126	0.132	0.132
Notes:	*p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.					

We then use the data from the World Development Indicators (WDI) of the World Bank to construct our index of proximity in sectoral composition. We use the share in value added of main sectors: service and agricultural sectors and we decompose manufacturing sectors into 7 main sub-sectors.[8] We then compute the following index:

$$index\_sector_{ij} = 1 - \frac{1}{2}\sum_{k}\left|share\_GDP_i^k - share\_GDP_j^k\right| \tag{1}$$

where k refers to a particular sector. Pairs of country with very similar sectoral composition have an index close to 1, while countries that completely specialize in different sectors would have an index of 0.

Results are gathered in table 7 and show a positive relationship between trade intensity in inputs and GDP comovement, with a similar magnitude when controlling for third index and sectoral composition. Note that the sample size is drastically reduced when using this data. Results are not significant with this sub-sample using HP-filtered data.

A.3.3 Robustness: log(mean) regressions

In the main text, we constructed the index of trade proximity by taking, for each time window, the average of the log-proximity observed every year. Alternatively, instead of taking the

[8] This includes textile, industry, machinery, chemical, high-tech, food and tabacco, other. Data are available here: https://databank.worldbank.org/data/source/.

Table. 7. Trade - GDP correlation, disaggregated trade, controls with sectoral composition using world bank data

	Corr $GDP^{HP\ filter}$			Corr ΔGDP		
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(\text{Trade}^{\text{input}})$	0.090	0.092	0.088	0.158^{***}	0.164^{***}	0.167^{***}
	(0.059)	(0.060)	(0.056)	(0.055)	(0.054)	(0.053)
$\ln(\text{Trade}^{\text{final}})$	0.046	-0.019	-0.044	-0.086^{*}	-0.127^{**}	-0.142^{***}
	(0.047)	(0.049)	(0.047)	(0.046)	(0.052)	(0.052)
$sector_{prox}$			1.587^{***}			0.393
			(0.432)			(0.459)
$third_{country}$			0.954^{**}			0.796^{*}
			(0.422)			(0.469)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes
EU + URSS dum.	Yes	Yes	Yes	Yes	Yes	Yes
N	1,291	1,291	1,291	1,291	1,291	1,291
R^2	0.253	0.292	0.314	0.233	0.283	0.289

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

"*mean of log proximity*", we could take the "*log of mean proximity*". We show in table 8 the results using the log transformation on the average trade intensities within each time-windows. As compared to results in the paper, the R^2 is slightly lowered. Moreover, notice that given the median increase in trade intensities in intermediate inputs of 5.76 and the estimates reported in column (2), the implied increase in GDP correlation is $log(5.76) * 0.052 = 0.091$, very similar to the case with "*mean of log proximity*" reported in the core paper.

A.3.4 Robustness: level regressions

We provide in table 9 the results of the following regression using level data:

$$\text{Corr GDP}_{ijt} = \beta_1 \text{Trade}_{ijt}^{\text{input}} + \beta_2 \text{Trade}_{ijt}^{\text{final}} + \text{controls}_{ijt} + \text{CP}_{ij} + \text{TW}_t + \epsilon_{ijt} \tag{2}$$

Results are shown to be robust to this specification, while it leads to a lower R^2 as compared to log transformed data.

A.3.5 Robustness: world GDP co-movement

We explore in table 10 the impact of trade in intermediate inputs relative to trade in final goods using world GDP co-movement (i.e. the correlation of a country i with the world GDP) and total trade intensity of a country (i.e. $\frac{EX_i+IM_i}{GDP_i}$ with EX_i and IM_i total exports and imports),

Table. 8. Trade and GDP correlation with 10 years time windows - Disaggregated trade - Trade Proximity constructed as log(mean) (*as opposed to mean(log)*)

	Corr $GDP^{HP\ filter}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\ln(Trade^{input})$	0.044^{*}	0.052^{**}	0.051^{**}	0.052^{**}	0.028	0.036^{*}	0.036^{*}	0.034
	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)
$\ln(Trade^{final})$	−0.027	−0.034	-0.044^{*}	-0.044^{*}	−0.010	−0.017	−0.029	−0.027
	(0.022)	(0.023)	(0.023)	(0.023)	(0.021)	(0.022)	(0.022)	(0.022)
$sector_{prox}$				0.086				-0.251^{*}
				(0.146)				(0.139)
$third_{country}$			0.337^{**}	0.334^{**}			0.442^{***}	0.450^{***}
			(0.149)	(0.150)			(0.141)	(0.141)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
URSS + EU dum.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900
R^2	0.153	0.166	0.169	0.169	0.139	0.151	0.156	0.157
Notes:	*p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.							

Table. 9. Trade and GDP correlation with 10 years time windows - Disaggregated trade - Trade Proximity in *level* (as opposed to log)

	Corr $GDP^{HP\ filter}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Trade^{input}$	38.972^{**}	33.395^{*}	33.501^{*}	34.317^{*}	34.873^{**}	33.031^{*}	33.173^{*}	31.248^{*}
	(16.821)	(17.676)	(17.385)	(17.633)	(17.131)	(17.788)	(17.416)	(16.873)
$Trade^{extfinal}$	-61.820^{***}	−34.923	−35.142	−36.037	-49.449^{**}	-37.597^{*}	-37.890^{*}	-35.778^{*}
	(21.549)	(22.480)	(22.152)	(22.205)	(21.344)	(21.943)	(21.385)	(21.131)
$sector_{prox}$				0.100				-0.235^{*}
				(0.145)				(0.137)
$third_{country}$			0.334^{**}	0.331^{**}			0.446^{***}	0.455^{***}
			(0.136)	(0.137)			(0.125)	(0.125)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
URSS + EU dum.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900
R^2	0.155	0.166	0.169	0.169	0.140	0.152	0.157	0.159
Notes:	*p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.							

controlling for country and year fixed effects.[9] Under such specification, we find that more trade intensity in intermediate inputs is associated with more GDP correlation with respect to the world GDP, while trade intensity in final goods is not. Doubling total trade intensity is associated with an increase in GDP correlation with respect to the world of about 0.1, a non negligible increase.

Table. 10. Trade and GDP correlation with world

	Corr $GDP^{HP\ filter}$		Corr ΔGDP	
	(1)	(2)	(3)	(4)
$\ln(Trade^{input})$	0.370^{**}	0.390^{***}	0.283^{*}	0.300^{**}
	(0.164)	(0.144)	(0.152)	(0.142)
$\ln(Trade^{final})$	-0.286^{**}	-0.187	-0.276^{***}	-0.120
	(0.133)	(0.140)	(0.106)	(0.102)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	877	877	877	877
R^2	0.067	0.105	0.075	0.158

Notes: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$. In parenthesis: std. deviation.

A.3.6 Robustness: alternative bilateral trade data

We also use the STAN Bilateral Trade Database by Industry and End-Use data (BTDIxE).[10] BTDIxE consists of values of imports and exports of goods, broken down by end-use categories. Estimates are expressed in nominal terms, in current US dollars for all OECD member countries. The trade flows are divided into capital goods, intermediate inputs and consumption. For the sake of comparison with the results in the main text, we first group the capital and intermediate goods together and create the index of trade proximity as explained in the main text. Due to data availability, we use the data from 1995 to 2014 which allows us to create four time windows of 5 years each (tables 11 and 12). With 20 countries, the dataset contains 190 pairs, for a total of 760 observations with four time windows. The tables below present the robustness results using both the HP filter (for business cycle frequencies) and then the Baxter and King filter (for medium term frequencies).

[9] We run this regression with rolling windows, such that we have an observation per year in order to increase the sample size.

[10] See at http://www.oecd.org/trade/bilateraltradeingoodsbyindustryandend-usecategory.htm.

Table. 11. Trade and HP-Filtered GDP - STAN database (1995 to 2014)

	dependent variable: corr(GDP_i^{HP},GDP_j^{HP})					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Trade)	0.064***		-0.009		0.103	
	(5.94)		(-0.14)		(1.53)	
ln(Trade$^{\text{input}}$)		0.044*		0.146*		0.209**
		(1.88)		(1.77)		(2.59)
ln(Trade$^{\text{final}}$)		0.021		-0.152*		-0.107
		(1.06)		(-2.04)		(-1.39)
Country-Pair FE	no	no	yes	yes	yes	yes
Time Trend	no	no	no	no	yes	yes
N	760					

t stat. in parentheses

Table. 12. Trade and BK-Filtered GDP - STAN database (1995 to 2014)

	dependent variable: corr(GDP_i^{BK},GDP_j^{BK})					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Trade)	0.075***		0.433***		0.397**	
	(5.23)		(3.86)		(3.16)	
ln(Trade$^{\text{input}}$)		0.115***		0.562***		0.538***
		(3.71)		(3.71)		(3.60)
ln(Trade$^{\text{final}}$)		-0.036		-0.106		-0.122
		(-1.32)		(-0.76)		(-0.83)
Country-Pair FE	no	no	yes	yes	yes	yes
Time Trend	no	no	no	no	yes	yes
N	760					

t stat. in parentheses.

A.3.7 Disaggregating further: the role of supply chains in GDP comovement

As an additional experiment, we further disaggregate trade flows and we highlight the role of manufacturing and non-manufacturing intermediate inputs in the correlation between trade intensity and GDP comovement.[11] We therefore construct trade intensity in those disaggre-

[11]Following the ISIC Rev. and the OCDE sector codes definitions, non-manufacturing industrial production sector, as defined in Johnson and Noguera (2017) refers to mining and quarrying, electricity, gas and water supply

gated sector using the same methodology as in the paper. We then run the following panel data regression with country-pairs and time windows fixed effects:

$$\begin{aligned}\text{Corr}_{ijt} = \beta_0 \ln(\text{Trade}^{\text{final}}_{ijt}) + \beta_1 \ln(\text{Trade}^{\text{manu}}_{ijt}) + \beta_2 \ln(\text{Trade}^{\text{non-manu}}_{ijt}) + \beta_3 \ln(\text{Trade}^{\text{agri}}_{ijt}) \\ + \beta_4 \ln(\text{Trade}^{\text{serv}}_{ijt}) + \text{CP}_{ij} + \text{TW}_t + \epsilon_{1,ijt}\end{aligned}$$

In table 13, we find that by filtering GDP using HP-filter or FD, trade in non-manufacturing intermediate inputs have a positive and significant correlation with GDP comovement, while trade in agricultural inputs is significantly negatively correlated with GDP comovement. However, as shown in figure 2, most variations in trades in intermediate inputs during the recent years come from manufacturing, non-manufacturing and service sectors, with only little variation in the agricultural sector.

Table. 13. Trade and GDP correlation disaggregated by intermediate goods main sectors.

	Corr $\text{GDP}^{\text{HP filter}}$		Corr ΔGDP	
	(1)	(2)	(3)	(4)
$\ln(\text{Trade}^{\text{input}})$	0.053^{**}		0.042^{*}	
	(0.024)		(0.023)	
$\ln(\text{Trade}^{\text{final}})$	-0.030	-0.003	-0.016	-0.020
	(0.024)	(0.040)	(0.023)	(0.035)
$\ln(\text{Trade}^{\text{non-manu}})$		0.030^{***}		0.026^{***}
		(0.009)		(0.009)
$\ln(\text{Trade}^{\text{manu}})$		0.052^{*}		-0.001
		(0.030)		(0.029)
$\ln(\text{Trade}^{\text{agri}})$		-0.031^{**}		-0.029^{**}
		(0.015)		(0.014)
$\ln(\text{Trade}^{\text{serv}})$		-0.033		0.014
		(0.028)		(0.025)
N	2,900	2,072	2,900	2,072
R^2	0.155	0.151	0.142	0.129

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

A.3.8 Robustness: alternative measure of trade intensities

In this section we test the TCP using an alternative measure widely used in the literature by defining $Trade_{ij} = \max\{\frac{T_{i\leftrightarrow j}}{GDP_i}, \frac{T_{i\leftrightarrow j}}{GDP_j}\}$. Table 14 and 15 summarizes the results and show that the estimates displayed in table 1 and 2 of the core paper are very consistent with this measure.

and construction sectors main sectors. Codes are available here: https://www.investmentmap.org/industry_

Table. 14. Trade and GDP correlation with 10 years time windows - Total trade, alternative measure

	Corr $GDP^{HP\ filter}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Trade)	0.052^{***}	0.019^{*}			0.040^{***}	0.019^{*}		
	(0.007)	(0.010)			(0.006)	(0.010)		
ln($Trade^{input}$)			0.050^{**}	0.052^{**}			0.049^{**}	0.039^{*}
			(0.025)	(0.024)			(0.023)	(0.023)
ln($Trade^{final}$)			0.004	−0.032			−0.007	−0.020
			(0.022)	(0.024)			(0.020)	(0.022)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900
R^2	0.032	0.152	0.034	0.154	0.020	0.140	0.020	0.140

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

Table. 15. Trade and GDP correlation with 10 years time windows - Disaggregated trade

	Corr $GDP^{HP\ filter}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln($Trade^{input}$)	0.052^{**}	0.058^{**}	0.059^{**}	0.060^{**}	0.039^{*}	0.048^{**}	0.049^{**}	0.047^{**}
	(0.024)	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)
ln($Trade^{final}$)	−0.032	-0.041^{*}	-0.049^{**}	-0.050^{**}	−0.020	−0.028	-0.040^{*}	-0.038^{*}
	(0.024)	(0.024)	(0.024)	(0.024)	(0.022)	(0.023)	(0.023)	(0.023)
$sector_{prox}$				0.089				-0.247^{*}
				(0.146)				(0.139)
$third_{country}$			0.320^{**}	0.318^{**}			0.432^{***}	0.439^{***}
			(0.148)	(0.148)			(0.139)	(0.139)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
URSS + EU dum.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900
R^2	0.154	0.167	0.169	0.170	0.140	0.153	0.158	0.159

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

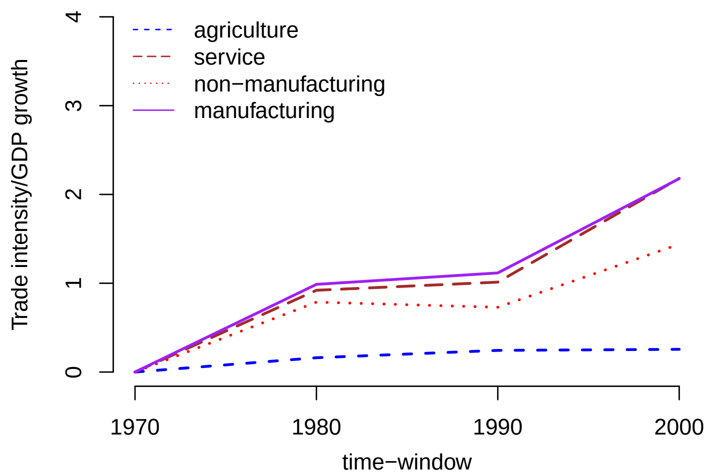


Figure 2. Growth of trade intensity by sectors normalized with GDP for 3 time-windows of 10 years.

A.4 The role of the Extensive Margin

A.4.1 Robustness: using first difference

We display in table 16 the results of the paper using first difference data. We find consistent results with a positive link between the extensive margin and GDP co-movement.

Table. 16. GDP and Solow Residual (SR) correlations and the margins of trade – using First Difference [a]

	Corr ΔGDP						Corr ΔSR			
	HK indexes		EDD measures		Model (base.)		HK indexes		Model (base.)	
	Avg.	Std.	Avg.	Std.	Avg.	Std.	Avg.	Std.	Avg.	Std.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EM measure	0.064***	0.059***	2.131**	0.069	0.069***	0.088***	0.067***	0.006	0.069***	0.053***
	(0.024)	(0.020)	(1.011)	(0.051)	(0.012)	(0.004)	(0.024)	(0.020)	(0.009)	(0.002)
IM measure	0.007	−0.023**	−0.090	−0.007	0.003	0.033***	0.018	-0.006	0.008	0.025***
	(0.017)	(0.010)	(0.138)	(0.047)	(0.010)	(0.001)	(0.018)	(0.011)	(0.007)	(0.001)
CP FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TW FE	Yes	Yes	Yes	Yes	-	-	Yes	Yes	-	-
N	2,357	2,356	135	135	455	455	2,235	2,231	455	455
R^2	0.103	0.107	0.641	0.651	0.020	0.447	0.204	0.209	0.167	0.730

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. dev.
Avg. refers to specifications where we assess the link between GDP/SR comovement and the *average* of each margin in different configuration. *Std.* refers to specifications where we assess the link between GDP/SR comovement and the *volatility* (standard deviation) of each margin in each configuration.
[a]We use EDD data from 1997 to 2014 for EDD measures, UN COMTRADE data from 2001-2010 and NBER United Nations Trade Data from 1971 to 2000 for the HK decomposition.

classification.aspx.

A.4.2 Robustness: EDD with alternative measures

In table 17 we provide the results with an alternative measure of volatility defined as $log(std(EM)) = log(std(\frac{\text{Entry - Exit}}{\text{Nb Exp}})$. Results show a positive correlation between GDP comovement and the volatility of the extensive margin. It is statistically significant only when using HP filtered data without time windows fixed effects, which might be due to the reduced sample of the EDD.

Table. 17. Extensive and intensive margins and GDP correlations (alternative volatility measures)

	Corr GDP$^{\text{HP filter}}$		Corr ΔGDP	
	(1)	(2)	(3)	(4)
log(std(EM))	0.118*	0.054	0.116	0.041
	(0.063)	(0.038)	(0.071)	(0.045)
log(std(IM))	−0.015	−0.0004	−0.019	0.006
	(0.050)	(0.051)	(0.041)	(0.044)
Country-Pair FE	Yes	Yes	Yes	Yes
Time Window FE	No	Yes	No	Yes
N	120	120	120	120
R^2	0.048	0.538	0.043	0.635

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

A.4.3 Robustness: EDD, alternative time-windows excluding crisis

In table 18 and 19, we provide the results using the EDD while removing observations in the last time window (2007-2011). As compared to the results of the paper, results are strengthened when we exclude the crisis period. Results highlight the key role of the extensive margin as opposed to the intensive margin, both in terms of volatility and in terms of average.

A.4.4 Robustness: number of exporters surviving X years

In table 20, we investigate the role of the number of new exporters surviving at least one, two and three years on the GDP comovement. We find that long established exporters tend to have a higher explanatory power than younger exporters in explaining the TCP. For all those alternative specifications, the intensive margin is insignificant, when applying HP-filter or first difference.

Table. 18. Trade and GDP correlation with 10 years time windows

	Corr $GDP^{\text{HP filter}}$		Corr ΔGDP	
	(1)	(2)	(3)	(4)
(Entry - Exit)/Nb Exp	4.203^{**}	4.573^{**}	2.980^{**}	2.472
	(1.637)	(2.004)	(1.197)	(1.569)
ln(widetildeIM)	−0.080	−0.163	−0.117	−0.003
	(0.149)	(0.275)	(0.086)	(0.199)
Country-Pair FE	Yes	Yes	Yes	Yes
Time Window FE	Yes	Yes	Yes	Yes
N	67	67	67	67
R^2	0.346	0.350	0.329	0.341

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

Table. 19. Extensive and intensive margins and GDP correlations (volatility measures)

	Corr $GDP^{\text{HP filter}}$		Corr ΔGDP	
	(1)	(2)	(3)	(4)
log(std(EM))	0.143^{*}	0.116	0.134^{**}	0.142^{**}
	(0.076)	(0.110)	(0.053)	(0.071)
log(std(IM))	−0.030	0.007	−0.050	−0.060
	(0.053)	(0.108)	(0.047)	(0.079)
Country-Pair FE	Yes	Yes	Yes	Yes
Time Window FE	No	Yes	No	Yes
N	67	67	67	67
R^2	0.216	0.223	0.373	0.373

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

Table. 20. Extensive and intensive margins and GDP correlations: different measure of extensive margins using exporters surviving X years.

	Corr $GDP^{\text{HP filter}}$			Corr ΔGDP		
	(1)	(2)	(3)	(4)	(5)	(6)
log(nb.entrant)	0.740^{**}			0.232		
	(0.305)			(0.176)		
log(nb.entrant.surv.2y)		1.161^{***}			0.408^{*}	
		(0.218)			(0.241)	
log(nb.entrant.surv.3y)			1.112^{***}			0.331
			(0.173)			(0.240)
log(export_val)	−0.093	−0.229	−0.087	−0.089	−0.115	−0.122
	(0.161)	(0.168)	(0.146)	(0.138)	(0.137)	(0.127)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	No	Yes	No	Yes	Yes	Yes
N	120	115	113	120	115	113
R^2	0.599	0.663	0.712	0.637	0.622	0.638

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

A.4.5 Robustness: HK decomposition using HS6 classification

In table 21, we provide the results of the estimation performed in section 6 of the paper using the HK decomposition with the HS6 classification. It turns out that our results are consistent with this alternative specification (i.e. the slope is positive with respect to EM and negative with respect to IM). Only results with volatility of the EM measures is statistically significant. This could be due to the fact that we are not able to identify enough variation in the data with only two time windows, since our sample with the HS6 classification started from 1995 to 2006.

Table. 21. Extensive and Intensive margins and GDP correlation with 5 years time windows using HS6

	Corr $GDP^{HP\ filter}$		Corr ΔGDP	
	(1)	(2)	(3)	(4)
ln(EM)	0.057		0.059	
	(0.087)		(0.098)	
ln(IM)	-0.103^{**}		-0.204^{***}	
	(0.051)		(0.059)	
ln(std(EM))		0.050^{**}		0.031
		(0.024)		(0.027)
ln(std(IM))		-0.034^{*}		-0.123^{***}
		(0.017)		(0.019)
Country-Pair FE	Yes	Yes	Yes	Yes
Time Window FE	No	Yes	No	Yes
N	1,122	1,122	1,122	1,122
R^2	0.238	0.239	0.209	0.066

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

A.5 Markup estimates and Corr GDP-ToT

A.5.1 Descriptive statistics: scatterplots

Figure 3 displays the relationship between $corr(GDP, ToT)$ and markups, measured as PCM (left panel) and using estimates in De Loecker and Eeckhout (2018) (right panel).

A.5.2 Robustness: using first difference

In table 22, we show additional results on this analysis using first difference data.

Figure 3. Markups and correlation GDP and Terms-of-trade.

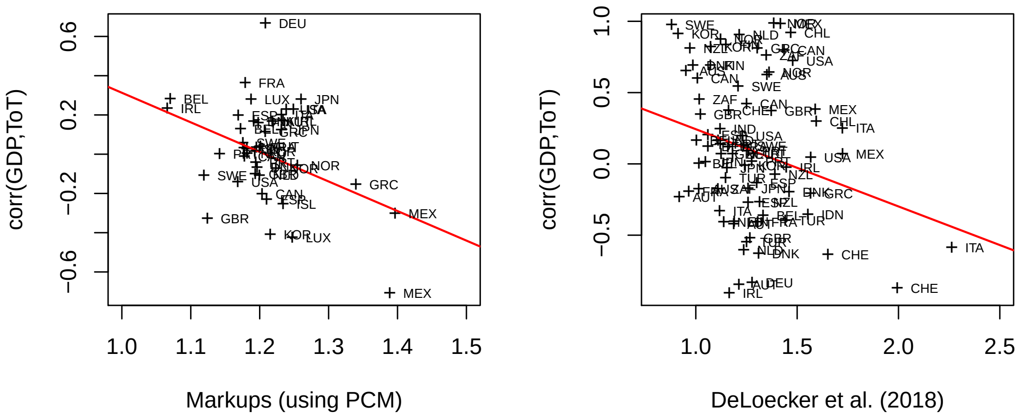


Table. 22. Markups and GDP-ToT correlation

	Corr GDP$^{\text{HP filter}}$				Corr ΔGDP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Average PCM	-1.151		-2.650^{***}		-1.008		-2.082	
	(0.967)		(0.911)		(1.311)		(1.323)	
DeLoecker et al.		-0.756^{***}		-0.495^{*}		-0.803^{***}		-0.147
		(0.187)		(0.289)		(0.194)		(0.261)
Country-Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Window FE	No	No	Yes	Yes	No	No	Yes	Yes
N	43	80	43	80	43	80	43	80
R^2	0.066	0.132	0.322	0.232	0.029	0.159	0.103	0.300

Notes: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. dev.

B Theoretical Appendix

B.1 The role of Network in the propagation of shocks

In order to investigate the mechanics driving the propagation of shocks across countries in the model, let us study a special case with $\rho^I = 1$, no trade in final goods, fixed labor, capital and mass of potential entrants.[12] The goal of this section is to compute the elasticity of GDI in any country i with respect to a technology shock in country 1 transmitted through trade in intermediate goods:

$$\eta^I_{GDI_i,Z_1,t} = \frac{\partial \log(GDI_{i,t})}{\partial \log(Z_{1,t})}$$

[12]Without capital supply, the model is completely static. A fixed mass of potential entrants does not mean a fixed mass of actual producers because entry thresholds $\overline{\varphi}_{i,i,t}$ are not fixed.

where Gross Domestic Income as computed in national statistics ($GDI_{i,t} = (w_{i,t}L_{i,t} + r_{i,t}K_{i,t} - \mathcal{T}_{i,t})/\widehat{\mathcal{P}^F_{i,t}}$). Computing the elasticity of all endogenous variable with respect to technological shocks leads to the closed-form formula in lemma 2.

Lemma 2 : In the Cobb-Douglas ($\rho^I = 1$) case, without trade in final goods and fixing labor and capital supply and with identical σ and γ across countries, the elasticity of GDI in all countries with respect to a technology shock in country 1 transmitted through trade in intermediate goods are:

$$\begin{pmatrix} \eta^I_{GDI_1,Z_1,t} \\ \vdots \\ \eta^I_{GDI_N,Z_1,t} \end{pmatrix} = \left(\frac{\gamma - (\sigma - 1)}{\sigma\gamma - (\sigma - 1)}\right).(\mathcal{I}_N - \widehat{W} - T)^{-1} \begin{pmatrix} 1 \\ 0 \\ \vdots \end{pmatrix} \tag{3}$$

with $\widetilde{W}_{i,j} = (1 - \eta_i - \chi_i)\omega^I_i(j)$ the matrix of scaled weights $\omega^I_i(j)$ representing the intensive margin adjustments and T a *Transmission* matrix[13], function of γ and σ, accounting for extensive margin movements.

These expressions are reminiscent of what can be found in static Cobb-Douglas network models (see for instance Acemoglu et al. (2012)), with an additional effect coming from firm heterogeneity and the extensive margin adjustments captured by the matrix T. In this context, the international propagation pattern of country specific shocks runs through two channels. First, for fixed spending share, the matrix $\widetilde{W}$ records the input-output (I/O) linkages in intermediate goods if the export decision of firms are kept constant. Second, the change in prices and revenues in all markets triggers a change in the productivity thresholds $\varphi_{k,k'}$. This channel is characterized by the matrix T which is a function of σ and γ which govern the adjustments along the extensive margin.

The computations leading to the expressions of the GDI elasticities in this lemma are greatly simplified by the assumption that factors of production (labor and capital) are fixed. In the general model, however, this constitute an important amplification channel through two effects. First, as in many macro models, a positive productivity shock in any country contributes to the decrease of prices all over the world and hence an increase in real wage. This triggers an increase in labor supply that amplifies the benefits of the shock in terms of output.[14] In addition, there is a second channel going through the change in the mass of

[13] $T = \Lambda\mathcal{I}_N$, with $\Lambda = \frac{1}{\sigma + \frac{(\sigma-1)^2}{\gamma-(\sigma-1)}}$

[14] This increase in labor supply is tempered by the wealth effect.

active firms in every country. With the assumption that the mass of potential entrepreneurs is proportional to the labor size, an increase in labor supply results in a proportional increase in the mass of potential entrants. Whether the mass of actual producing firms goes up or down in any country j will also be determined by the changes in the thresholds $\overline{\varphi}_{ij}$ for all i which in turns crucially depends on the value of the Armington elasticity ρ^I. In the Cobb-Douglas case where the expenditure shares are fixed, a positive technological shock will result in a decrease of all entry thresholds in every market. Putting pieces together, a positive shock triggers at the same time more potential entrepreneurs and a decrease of the entry threshold in every market. As a result, the new structure of I/O linkages amplifies the benefits of the shock.

B.1.1 Proof of Lemma 2

In this simplified case with no trade in final good, let us denote by $\widehat{\mathcal{P}_k}$ the price index of final goods in country k, *corrected for love for variety*. With $\rho^I = 1$ and fixed labor and capital supply, the labor and capital demand schedules $w_k L_k = \chi_k S_k$ and $r_k K_k = \eta_k S_k$ provide a one to one mapping between total spendings S_k and the wages w_k and the interest rate r_k. Moreover, inspecting the spending system above when $\rho^I = 1$ reveals that once a choice of numeraire is chosen (that is, taking $w_1 = 1$ and hence fixing $S_1 = L_1/\chi_1$), the vector of spendings $(S_i)_{i=1,\ldots,N}$ is independent of the technology level. Using lemma 1 and the fact that labor and capital supply are fixed, we can then show that total consumers' spending X_i also independent of technology level. Thus, since $GDI_k = X_k/\widehat{\mathcal{P}_k}$ the GDI elasticity is simply the opposite of the elasticity of the country's consumers price index. Moreover, with fixed labor supply and the assumption that the mass of potential entrepreneurs is proportional to labor size, the mass of firms M_i is fixed for every country i. In the next sections, I compute elasticities of all endogenous variables step by step until I can solve for the price index elasticities.

B.1.2 Ideal Price Indexes

Home Price Index at home $\mathcal{P}_k$ For simplicity, we note $\mathcal{P}_k$ the price index of domestic varieties at home (which is the price index corresponding to the domestic consumption bundle since we assume no trade in final goods here). We can easily show that

$$\frac{\partial \log(\mathcal{P}_k)}{\partial \log(Z_k)} = -1 + \frac{\partial \log(P_k^{IB})}{\partial \log(Z_k)} + \left(\frac{\gamma - (\sigma - 1)}{\sigma - 1}\right) \frac{\partial \log(\overline{\varphi}_{k,k})}{\partial \log(Z_k)}$$

Foreign Price Index "at their home" $\mathcal{P}_{k'}$

$$\frac{\partial \log(\mathcal{P}_{k'})}{\partial \log(Z_k)} = \frac{\partial \log(P^{IB}_{k'})}{\partial \log(Z_k)} + \left(\frac{\gamma-(\sigma-1)}{\sigma-1}\right)\frac{\partial \log(\overline{\varphi}_{k',k'})}{\partial \log(Z_k)}$$

Export Price indexes $\mathcal{P}_{i,j}$ The price index relative to varieties from i sold on j's market is affected by the shock according to:

$$\frac{\partial \log(\mathcal{P}_{i,j})}{\partial \log(Z_k)} = \frac{\partial \log(\mathcal{P}_{i})}{\partial \log(Z_k)} + \left(\frac{\gamma-(\sigma-1)}{\sigma-1}\right)\left(\frac{\partial \log(\overline{\varphi}_{i,j})}{\partial \log(Z_k)} - \frac{\partial \log(\overline{\varphi}_{i,i})}{\partial \log(Z_k)}\right)$$

Input Bundle Price $P^{IB}_{k'}$ **Abroad** Using the fact that wages are not affected by technology shocks, I can compute the elasticity of the input bundle price with respect to a technology shock at home as follow:

$$\frac{\partial \log(P^{IB}_{k'})}{\partial \log(Z_k)} = (1-\eta_k-\chi_k)\sum_j \omega_{k'}(j)\left[\frac{\partial \log(\mathcal{P}_{j})}{\partial \log(Z_k)} + \left(\frac{\gamma-(\sigma-1)}{\sigma-1}\right)\left(\frac{\partial \log(\overline{\varphi}_{j,k'})}{\partial \log(Z_k)} - \frac{\partial \log(\overline{\varphi}_{j,j})}{\partial \log(Z_k)}\right)\right]$$

B.1.3 Thresholds

Home Entry Threshold $\overline{\varphi}_{k,k}$ **at Home** Using the definition of the thresholds and replacing $\frac{\partial \log(P^{IB}_{k})}{\partial \log(Z_k)} - 1$ by its expression in the expression of the elasticity of the Home price index at home, we get

$$\frac{\partial \log(\overline{\varphi}_{k,k})}{\partial \log(Z_k)} = \frac{1}{\sigma-1+\kappa\sigma} \times \frac{\partial \log(\mathcal{P}_{k})}{\partial \log(Z_k)}$$

Export Entry Threshold $\overline{\varphi}_{k,k'}$ **for Home firms exporting to** k' Using the second definition of the export thresholds from above, we get

$$(\frac{\gamma}{\sigma-1})\frac{\partial \log(\overline{\varphi}_{k,k'})}{\partial \log(Z_k)} = (1+\frac{1}{\sigma-1}) \times \left(\frac{\partial \log(P^{IB}_{k})}{\partial \log(Z_k)} - 1\right) + \kappa\frac{\partial \log(\overline{\varphi}_{k,k})}{\partial \log(Z_k)} - \frac{\partial \log(\mathcal{P}_{k})}{\partial \log(Z_k)}$$

Moreover, replacing $\frac{\partial \log(P^{IB}_{k})}{\partial \log(Z_k)} - 1$ by its expression we get and using the fact that $1+\kappa = \frac{\gamma}{\sigma-1}$, we get

$$\frac{\partial \log(\overline{\varphi}_{k,k'})}{\partial \log(Z_k)} = \frac{1}{\sigma-1+\kappa\sigma} \times \frac{\partial \log(\mathcal{P}_{k})}{\partial \log(Z_k)}$$

Home Entry Threshold $\overline{\varphi}_{k',k'}$ Abroad Using the definition of the thresholds from above and replacing $\frac{\partial \log(P_{k'}^{IB})}{\partial \log(Z_k)}$ by its expression, we get

$$\frac{\partial \log(\overline{\varphi}_{k',k'})}{\partial \log(Z_k)} = \frac{1}{\sigma - 1 + \kappa\sigma} \times \frac{\partial \log(\mathcal{P}_{k'})}{\partial \log(Z_k)}$$

Export Entry Threshold $\varphi_{k',j}$ for Foreign firms exporting to j Using the thresholds definition and the expression of $\eta_{\varphi_{k',k'},Z_k}$, we get:

$$\frac{\partial \log(\overline{\varphi}_{k',j})}{\partial \log(Z_k)} = \frac{1+\kappa}{\frac{\gamma}{\sigma-1}} \times \frac{\partial \log(\overline{\varphi}_{k',k'})}{\partial \log(Z_k)}$$

Finally, using the expression for $1+\kappa$, we get

$$\frac{\partial \log(\overline{\varphi}_{k',j})}{\partial \log(Z_k)} = \frac{\partial \log(\overline{\varphi}_{k',k'})}{\partial \log(Z_k)} = \frac{1}{\sigma - 1 + \kappa\sigma} \times \frac{\partial \log(\mathcal{P}_{k'})}{\partial \log(Z_k)}$$

Price indexes as constructed by statistical agencies Using results above together with the definition of $\widehat{\mathcal{P}_k}$, we get:

$$\frac{\partial \log(\widehat{\mathcal{P}_{k'}})}{\partial \log(Z_k)} = \frac{\gamma - (\sigma-1)}{\sigma\gamma - (\sigma-1)} \frac{\partial \log(\mathcal{P}_{k'})}{\partial \log(Z_k)}$$

B.1.4 Final Expression

Using the expression for the elasticity of all thresholds as functions of the elasticities of price indexes, we can gather the results. Introducing $\Lambda = \frac{1}{\sigma + \frac{(\sigma-1)^2}{\gamma-(\sigma-1)}}$, I define a matrix T (for Transmission) as $T = \text{diag}(\Lambda, ..., \Lambda)$. This matrix characterizes the additional propagation mechanism due to the change in the mass of firms in all markets. Then, the price index elasticities are defined by

$$\begin{pmatrix} \eta_{\widehat{\mathcal{P}_1,Z_1}} \\ \vdots \\ \eta_{\widehat{\mathcal{P}_N,Z_1}} \end{pmatrix} = \left(\frac{\gamma - (\sigma-1)}{\sigma\gamma - (\sigma-1)}\right) \cdot (\mathcal{I}_N - (1-\eta-\chi)W - T)^{-1} \begin{pmatrix} -1 \\ 0 \\ 0 \end{pmatrix}$$

Finally, noting that for all i, $\eta_{\widehat{\mathcal{P}_i^F,Z_1}} = -\eta_{GDI_i,Z_1}$ concludes the demonstration.

C Quantitative Appendix

C.1 Benchmark: parameter values

Table. 23. Intermediate shares in 2000 and implied $\eta_i + \chi_i$. *Source:* WIOD

Country	AUS	AUT	CAN	DNK	FRA	DEU	IRL	ITA	JPN	MEX	NLD	ESP	GBR	USA
$\eta_i + \chi_i$	0.32	0.39	0.37	0.38	0.36	0.37	0.31	0.31	0.41	0.44	0.33	0.35	0.36	0.43

Table. 24. Self-employed persons relative to total employment (%)*

Country	AUS	AUT	CAN	DNK	FRA	DEU	IRL	ITA	JPN	MEX	NLD	ESP	GBR	USA
Model $\frac{M}{L}$	34.0	3.1	12.3	10.4	14.9	4.8	15.2	14.6	6.7	11.3	21.4	5.4	11.1	11.9
Data	20.0	13.9	14.7	10.8	15.3	9.7	23.5	28.3	21.5	8.6	11.4	25.4	13.6	12.1

*Data for the US are from the Bureau of Labor Statistics (BLS) in 1994. Data for all the other economies are from the World Bank in 1991. Data for Mexico reports total number of business registered relative to total employment (%).

Table. 25. Working age population: target and associated ψ.

Country	AUS	AUT	CAN	DNK	FRA	DEU	IRL	ITA	JPN	MEX	NLD	ESP	GBR	USA
Work. pop.	23	9	36	6	64	81	5	60	127	120	17	46	64	319
ψ	8e−3	0.06	4e−3	0.14	1e−3	7e−4	0.16	1e−3	3e−4	5e−4	0.01	2e−3	1e−3	5e−5

C.2 Two-countries version

In this section we show the results of a two-countries version of the model, calibrated to reproduce trade intensities as observed between 1980-1990 between the EU, the US and a composite of the *Rest-Of-The-World* (RoW). Recall that we only use country-pairs that do not incorporate the RoW in the model regressions. In order to generate enough variations in the simulation, we run 25 experiments for which we increase and decrease randomly the trade intensities in final goods and inputs. Table 26 provides the results. Even in the case of two countries (EU and the US), the model is able to generate high TC-comovement. However, the magnitude is lower that what is observed in the data; the TC-slope falls from 0.051 in the paper against 0.042 in the two-countries version. This is indicative of the importance of "network effects" which is at play in a model with many countries and input-output linkages.

Table. 26. Trade Comovement Slope: Data versus Model - **2 countries**

		Corr $GDP_{i,j}^{\text{HP filter}}$				
		Data TC-slope		Model		
		(1)	(2)	(3)	(4)	(5)
Trade index measure				Bench. $\rho^F = 1.0$	$\rho^F = 1.05$	$\rho^F = .95$
$\left(\frac{Trade_{EU,US}+Trade_{EU,US}}{GDP_{EU}+GDP_{US}}\right)$	$\ln(Trade_{Input})$	0.054**	0.053**	0.042***	0.041***	0.043***
	$\ln(Trade_{Final})$	0.003	-0.030	0.015***	0.011***	0.020***
Country FE		Yes	Yes	-	-	-
Time windows FE		No	Yes	-	-	-

Note: *p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.

Table. 27. Decomposition of the roles of markups and the extensive margin - **2 countries**

Model	Benchmark $\rho^F = 1$			High elasticity $\rho^F = 1.05$		
	TC - Slope [a]		GDP corr [b]	TC - Slope [a]		GDP corr [b]
	Input	*Final*		*Input*	*Final*	
Data (with CP & TW FE)	0.053**	-0.030	0.213	0.053**	-0.030	0.213
I/O linkages + Markups + EM	0.042***	0.015***	0.213	0.041***	0.011***	0.210
I/O linkages + Markups	0.019***	0.004***	0.182	0.020***	0.003***	0.181
I/O linkages	0.006***	0.005***	0.169	0.007***	0.004***	0.168

*p<0.1; **p<0.05; ***p<0.01. In parenthesis: std. deviation.
[a]The trade indexes used in those experiments are $(Trade_{ij} + Trade_{ij})/(GDP_i + GDP_j)$.
[b]Average logged and HP filtered GDP correlation for the selected sample.

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