International Trade - Replication 1

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1 Table 1

I obtained the latest versions of data from the OECD STAN database and University of Groningen's GGDC Productivity Level Database.

- **Data Sources:** OECD STAN Bilateral Trade Database; GGDC Productivity Level Database: International Comparisons of Output, Inputs, and Productivity at the Industry Level.
- **Time (Year):** 2017
- **Countries:** Australia, Belgium, Czechia, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic and U.S.

Sector	**ISIC rev. 4 description**	**ISIC rev. 4 code**
Agriculture	Agriculture, forestry, fishing	A
Mining	Mining and quarrying	B
Manufacturing	Manufacturing	C
Utilities	Electricity, gas, steam and air conditioning supply	D+E
Construction	Construction	F
Trade	Wholesale and retail trade	G+I
Transport	Transportation and storage	H
Business	Information and communication	J+M+N
Finance	Financial and insurance activities	K
Real estate	Real estate activities	L
Government	Public administration and defense	O+P+Q
Other services	Arts, entertainment and recreation	R+S+T+U

2 Table 2

To replicate Table 2 in the paper, I followed the following steps:

- I downloaded GGDC Productivity Level Database 2023 Edition in Excel format. Then, I filtered the data for the year 2017 and for the chosen sectors and countries.
- I used Pivot Tables in Excel where the columns representing sectors (acronyms of sectors' names as per the PLD) and the rows representing the country code (as per the PLD) and the entries of the cells are the sum of PPPva values (where PPPva is is value added PPP, LCU/USD)(Please see RowData.xlsx).
- I normalized the values to one in all sectors for the U.S. and in all countries for the Agriculture sector. Data imported into Stata to perform the necessary normalizations and produce Table 2 below. (Please see: File1.xlsx, Stata1.do and File1Results.csv files).

Table 2: Relative productivity levels, by country and industry

Country	Agriculture	Business	Construction	Real Estate	Finance	Manufacturing	Mining	Other Services	Utilities	Government	Transport	Trade
AUS	1	0.76	1.03	0.60	0.76	0.78	0.41	0.85	0.42	1.07	0.82	1.02
BEL	1	0.69	2.93	0.82	1.01	0.49	0.56	0.84	0.27	0.99	1.61	1.01
CZE	1	1.22	7.16	2.22	1.53	0.72	0.42	1.70	0.49	3.49	0.05	1.85
DEU	1	0.93	1.95	1.19	1.16	0.87	0.82	1.00	0.24	1.45	1.33	1.75
DNK	1	0.65	2.35	0.65	0.83	0.51	1.05	0.57	0.23	1.06	0.19	0.92
ESP	1	0.82	4.60	1.12	1.13	0.61	0.43	0.99	0.29	1.50	1.62	0.95
FIN	1	0.95	2.16	1.00	1.45	0.83	0.99	0.95	0.65	1.57	1.05	1.89
FRA	1	1.06	2.96	1.29	2.19	1.02	0.98	1.22	0.55	1.85	1.03	1.21
GBR	1	0.99	3.88	0.72	1.14	1.18	1.34	1.21	0.58	1.61	1.22	1.52
GRC	1	1.52	16.20	3.31	1.43	1.06	0.53	2.24	0.94	3.35	0.91	1.36
HUN	1	1.36	9.34	3.41	2.12	0.73	0.40	2.16	0.95	3.81	0.00	2.41
IRL	1	1.03	2.27	1.01	1.10	1.01	0.87	1.22	0.76	1.40	0.93	1.08
ITA	1	1.23	8.20	1.85	1.59	0.93	1.62	1.44	0.55	1.79	0.99	1.85
JPN	1	4.44	6.48	6.38	8.82	5.84	2.17	4.33	2.66	9.21	0.00	4.28
KOR	1	3.38	26.91	7.72	4.75	2.72	1.18	5.26	5.12	7.81	0.00	4.45
LUX	1	1.15	2.15	0.96	1.52	0.94	0.75	1.24	0.96	1.19	0.88	2.29
NLD	1	0.85	2.78	0.79	1.15	0.64	0.91	1.05	0.49	1.22	1.31	0.81
POL	1	1.42	6.27	6.26	1.41	0.82	0.34	1.91	0.57	3.60	0.36	1.27
PRT	1	1.00	11.79	1.81	1.24	0.54	0.47	1.35	0.30	2.01	1.43	1.55
SVK	1	1.11	6.82	1.75	1.28	0.63	0.52	1.61	0.61	3.47	1.39	1.52
USA	1	1	1	1	1	1	1	1	1	1	1	1

Comments: Table 2 presents the relative productivity measures across various countries and sectors. The productivity levels are normalized to 1 for each sector in the U.S. and for the Agriculture sector across all countries. Which means that for any other country in Agriculture, the number reflects how its productivity compares to the U.S. Agriculture sector, with the U.S. having a relative productivity measure of 1. For example, a relative productivity of 0.6 in the Agriculture sector for a given country means that the country's productivity in Agriculture production is 60% that of the U.S. in that industry. A productivity of 1.2 indicates that the country is 20% more productive than the U.S. in that industry. The table provides data that is used in Theorem 1 in the paper to analyze trade patterns by comparing relative productivity levels across countries and sectors. These baseline results are crucial for testing the Ricardian model of comparative advantage.

3 Table 3

To replicate Table 3 in the paper, I followed the following steps:

- I downloaded trade flow data from OECD Structural Analysis (STAN) Bilateral Trade Database as follows (Bilateral Trade in Goods by Industry and End-use (BTDIxE)):
  - Time: Year of 2017.
  - Countries (both reporting and partner): The above mentioned 21 countries.
  - Flow: Exports and Imports.
  - End-use: Total trade in goods.
  - Industry:
    Agriculture forestry and fishing **(D01T03)**.
    Mining and quarrying **(D05T08)**.
    Manufacturing **(D10T32)**.
    Electricity, gas, steam and air conditioning **(D35)**.
    Information Communication Technology goods **(ICTPRD)**.
    Other activities **(D36T99)**.
    Only six industries have been chosen to match the PLD data.
  - Variable: Values in thousand USD.
- I downloaded data on R&D expenditure (IV in the analysis) from the Analytical Business Enterprise Research and Development (ANBERD) database collected by the OECD.
- Steps A to G (please see Table3.do).

Table 3: Cross-sectional results—baseline

Dependent variable	log (corrected exports)		log (exports)	
	(1)	(2)	(3)	(4)
log (productivity based on producer prices)	0.1416705**	1.200136 **	-1.001963**	27.36818**
	(0.050609)	(0.5733367)	(7.724561)	(67.33454)
Estimation method	OLS	OLS	IV	IV
Exporter × importer fixed effects	YES	YES	YES	YES
Industry × importer fixed effects	YES	YES	YES	YES
Observations	123	124	35	36
R^2	0.6178	0.7183	.	.

- Comments:
  - **Column (1):** The coefficient (0.1417) represents the elasticity of exports with respect to productivity and it is positive and statistically significant. It suggests that an increase in productivity leads to an increase in exports, which is in line with the theoretical prediction from Theorem 1 in

the paper. For every 1% increase in productivity, exports increase by approximately 0.14%. This supports the Ricardian comparative advantage theory: more productive countries and industries export more.

- **Column (2):** The log productivity coefficient of 1.2001, which is positive and statistically significant, indicates a positive relationship between productivity and export values. A 1% increase in observed productivity is associated with a 1.20% increase in exports, all else equal. This is a strong result, but the coefficient is higher than what was in Column (1), where log productivity was 0.14. This overestimation in Column (2) is expected as it does not account for the adjustment between observed and fundamental productivity. This reinforces the idea from the paper that the unadjusted productivity differences lead to an overestimation of their importance for trade flows.
- **Column (3):** The coefficient of log productivity is -1.00196, but it is not statistically significant (p-value = 0.897).
- **Column (4):** The coefficient for log productivity is 27.36818, but it is not statistically significant (p-value = 0.684). This means that, in this specification, after adjusting for endogeneity with the IV method, log productivity does not significantly affect exports. The coefficient is positive, but the lack of statistical significance indicates that the relationship is uncertain (in this specific context of my replication!).