THE INTERNATIONAL TRADE AND PRODUCTION

DATABASE FOR ESTIMATION (ITPD-E)

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Abstract

This paper introduces and describes the new International Trade and Production Database that can be used for statistical estimation (ITPD-E). The ITPD-E contains consistent data on international and domestic trade for 243 countries, 170 industries, and 17 years. The data are constructed at the industry level covering agriculture, mining, energy, manufacturing, and services, so that the ITPD-E describes nearly completely the traded sectors of each economy. The time period covered commences in 2000 and extends to 2016. The ITPD-E is constructed using reported administrative data and intentionally does not include information estimated by statistical techniques. This feature and the unprecedented coverage of industries and countries with consistent international and domestic trade data renders the ITPD-E well suited for estimation of economic models, e.g., the gravity model of trade. We demonstrate the usefulness of the ITPD-E by running standard gravity regressions.

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Disclaimer. The ITPD-E is a public good that was created in response to market demand. Its initial development and maintenance was a substantial long-term effort by the authors. Accordingly, in return for that effort, we expect two things from all users of the ITPD-E. First, please cite this paper if you are using the database. Second, if you believe that there is a mistake in the database or that the database can be improved by incorporating additional data or more reliable data, even if only for an individual country or industry, please let us know by writing to ITC's gravity portal e-mail address (`gravity@usitc.gov`). We will try to accommodate detection of errors, inconsistencies, and suggestions as soon as possible. Please visit USITC's gravity portal for updates.

1   Introduction

This paper describes the construction of the International Trade and Production Database for Estimation (ITPD-E).[1] The ITPD-E contains consistent data on bilateral international trade and domestic trade, calculated using production data, for a large number of countries, industries, and years. The data are constructed at the industry level covering the broad sectors of agriculture, mining and energy, manufacturing, and services. Therefore, the ITPD-E describes nearly completely the traded sectors of each economy. The ITPD-E covers the time period starting in 2000 and going up to 2016, the most recent year for which data across all sectors are available. The ITPD-E provides information for 243 countries, 170 industries, and 17 years. This includes 26 industries in agriculture, 7 in mining and energy, 120 in manufacturing, and 17 in services.

We envision statistical estimation as the main use of the ITPD-E. Hence, the database consists of the reported administrative ("raw") data from the sources that we describe in the next section. It includes bilateral trade flows as well as domestic trade. The latter is constructed by using production data, i.e. as the difference between production and total exports. Importantly, since exports are reported on a gross basis, production data are on a gross basis too. In order to ensure maximum coverage, we combine trade data reported by both importer and exporter to fill in as many missing values as possible in the trade and production data. It is important to note that no estimation models, such as the gravity framework, have been used to fill any missing observations in ITPD-E. This is one of the key distinguishing features of ITPD-E that makes it suitable for estimation purposes. Naturally, ITPD-E is not balanced and includes missing observations for some years and countries.

The paper is structured as follows. Section 2 describes our approach to constructing the database and provides more detail on the dimensions of ITPD-E in terms of countries,

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[1]In the future, we plan to produce two additional versions of the database. One will have missing data filled in using the latest methodological advances in structural gravity modeling. This database will constitute the second member of the ITPD family and, due to its suitability for simulations, will be called ITPD-S. A third version within the ITPD family of databases will link the trade flow information to an input-output table (ITPD-IO).

industries, and years. In Section 3 we describe the data sources used to construct ITPD-E. Section 4 compares ITPD-E to existing trade and production datasets. In Section 5 we show the application of ITPD-E to the standard gravity model. The results serve as a validation of this database and also demonstrate its usefulness, while being transparent about its limitations. The last section concludes and outlines future work planned on the data.

2 The ITP Database: Construction and Key Features

This section describes the principal steps involved in the construction of the ITPD-E and discusses the database's key features and dimensions. These steps are common to all four broad sectors included in the ITPD-E. More detail regarding data sources for each sector and any sector-specific steps undertaken to construct the data are described in Section 3.

2.1 Construction of the International Trade Data

Each international trade flow is recorded and reported separately by the two parties in the transaction, exporter and importer. In order to take full advantage of all reported international trade data we use a mirroring procedure described below. In goods trade, data on imports is considered more reliable than data on exports because of the oversight from governments enforcing their tariff schedule and other import regulations.[2] In addition, importer-reported trade values, which are reported on the c.i.f. basis, are consistent with gravity theoretical methodology. Therefore, we primarily use importer-reported values for goods trade, as is also done for example by Feenstra et al. (2005).

Since there are no tariffs levied on services trade, importing countries lack the fiscal incentive to carefully keep track of services imports. Services export data, in turn, are

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[2]See for example https://wits.worldbank.org/wits/wits/witshelp/Content/Data_Retrieval/T/Intro/B2. Imports_Exports_and_Mirror.htm and Timmer et al. (2012). Specifically for developing countries, Rozanski and Yeats (1994) show that export data are less reliable than import data.

often collected as part of mandatory surveys run by national statistical agencies and/or central banks, and therefore are considered more accurate than imports. For these reasons, and because there is no c.i.f./f.o.b. distinction in services trade, we primarily use exporter-reported values for services trade.

In our mirroring procedure for goods, we use exports reported by partner countries to fill in missing values for the import values. For services, we use reported imports to fill in missing values of exports. To denote mirrored cases, the ITPD-E includes a flag variable named $flag\_mirror$. In Section 5 we demonstrate that the additional observations that arise from mirroring do not affect estimated coefficients of standard gravity variables. Nevertheless, their inclusion is potentially important to ensure proper country and industry coverage.

2.2 Construction of the Domestic Trade Data

Domestic trade is calculated as the difference between the (gross) values of total production and total exports. Total exports are constructed as the sum of bilateral trade, as reported in the ITPD-E, for each exporting country. In the relatively few instances in which our procedure results in negative domestic trade values, we delete those observations from the database. The sources of output and trade data are described in Section 3.

2.3 Final Procedures

We combine the domestic and international trade flows for each of the 170 ITPD-E industries into a single database. Then, we create a balanced database across all dimensions of the ITPD-E by filling all missing international trade observations with zeroes. In order to distinguish between the trade zeroes that exist in the original raw data and the new zeroes that are added to balance the data, we create a flag variable called $flag\_zero$, which is equal to 'r' for observations with zeroes coming from original data sources, 'p' for observations with positive trade flows, and 'u' for observations filled with zeroes in this step. We do this for international trade observations only, not for domestic trade observations.

Since the previous procedure results in the addition of many zeroes that are irrelevant for gravity estimations, in order to eliminate outliers (e.g., countries with very few observations that would be dropped in standard gravity regressions), and to ensure that ITPD-E is suitable for even the most demanding gravity specifications, we use the Poisson pseudo-maximum likelihood (PPML) estimator with a demanding set of fixed effects (i.e., exporter-time, importer-time, and directional country-pair fixed effects) to estimate gravity for each of the 170 ITPD-E industries. Then, we retain the estimating sample for each industry as our final industry-level data. Note that this procedure will eliminate all irrelevant zeroes from our sample, e.g., if a country does not export a given industry in a given year, then the corresponding zeroes will be captured perfectly by this country's exporter-time fixed effect. Thus, even after the rectangularisation of the data that we described in the previous paragraph, ITPD-E remains an unbalanced database as some countries do not appear in some years and/or ITPD-E industries.

2.4 Country, Industry, and Year Coverage

The procedures that we implement ensure that for each country in the ITPD-E there is a sufficient number of observations in at least one industry that are meaningful for estimation purposes. The final dimensions of our database are as follows. In terms of years, the ITPD-E covers the 17-year period between 2000 and 2016. After combining the raw data from the four main sectors and implementing the data cleaning and construction procedures, we end up with about two million observations in each year. About a million observation each year has positive trade flows. The number of observations varies significantly across sectors. Usually, and as expected, in each year the large bulk of the data pertains to manufacturing. However, we also have significant number of observations for agriculture (around 75,000 non-zero trade observations per year and about 160,000 observations overall), for mining and energy (around 15,000 non-zero trade observations per year and about 35,000 observations overall), and for services (around 20,000 non-zero trade observations per year and about 40,000 observations

overall).

The ITPD-E covers 170 industries. Of those, 26 are in agriculture, 7 are in mining and energy, 120 are in manufacturing, and 17 are in services. Table 1 lists the 170 industries covered in ITPD (in Column 1), and their corresponding ITPD codes (in Column 2). In addition, for each industry, the table reports average positive exports (in Column 3), maximum exports (in Column 4), total number of observations (in Column 5), and total number of zeroes (in Column 6). Note that trade in this table includes both international and domestic trade, so the maximum exports are typically from the domestic trade. Industries 1-26 belong to the "Agriculture" broad sector. Industries 27 to 33 belong to the "Mining and energy" broad sector. Industries 34 to 153 belong to the broad sector "Manufacturing". Finally, industries 154 to 170 belong to the broad sector "Services".

Our sectoral coverage closely follows the ISIC rev. 4 classification system. Our Agriculture broad sector corresponds to division A-01 "Crop and animal production" in ISIC. Mining and energy broad sector includes ISIC sections B and D. The manufacturing broad sector corresponds to section C. The services broad sector includes sections F through K, M, N, and P through S. Several ISIC divisions are not included in the initial release of ITPD-E. They include ISIC divisions A-02 "Forestry" and A-03 "Fishing", and mostly non-traded ISIC sections L "Real Estate", O "Government", T "Household production", and U "Extraterritorial organizations". We were careful to avoid double-counting of industries when assembling data from multiple sources. For example, manufactured food is included in the manufacturing broad sector and not in the agriculture.

In terms of country coverage, the ITPD-E includes 243 countries.[3] There are only two countries (French Guiana and Monaco) in the ITPD-E that appear only as exporters but not

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[3]Consistent with the practice in USITC's DGD, the number of countries in the text and in Table 2 reflects the total number of distinct entities. In cases when countries split at certain points in history, this then includes the single code for both regions prior to the split as well as the two newly created codes post-separation. In ITPD-E this is the case for "Serbia and Montenegro (SCG)" prior to 2006, which appear as Serbia (SRB) and Montenegro (MNE) respectively afterwards, as well as for "Netherlands Antilles (ANT)", which appear as Curacao (CUW) and Sint Maarten (SXM) after 2010, even though both entities continue to be part of the Kingdom of the Netherlands.

as importers. For all other countries there is data as both exporters and importers. Table 2 lists the 243 countries covered in ITPD-E (in Column 2), and their corresponding 3-letter ISO codes (in Column 1).[4] In addition, for each country, the table reports average positive exports (in Column 3), maximum exports (in Column 4), total number of observations (in Column 5), and total number of zeroes (in Column 6). Similarly to Table 1, trade in Table 2 includes both international and domestic trade, so the maximum exports are typically from the domestic trade.

2.5   File Format and Columns

The database is distributed as a comma-separated file, ITPD_E_RXX.csv, where XX is the release number. Therefore, the initial release file is called ITPD_E_R01.csv. The columns in the database are described in Table 3. The ISO 3-letter country codes and year can be used to merge the ITP database with the USITC's Dynamic Gravity Dataset as well as other datasets that use the standard ISO codes.[5]

Trade values are expressed in millions of current United States dollars. Trade is international when exporter and import countries are different. Trade is domestic when the importer and exporter are the same country. As explained in Section 2.1, *flag_ mirror* is equal to 1 for observations that are obtained from the mirror trade data. The variable *flag_ zero* shows whether the current observation contains zero or positive trade and, in case of zero, the origin of the zero. If the current observation contains positive trade, then *flag_ zero* is equal to 'p' ("positive"). If the current observation had a zero in the original raw data then *flag_ zero* is equal to 'r' ("reported"). If the current observation is filled in with a zero when the dataset

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[4]There are three countries that have multiple 3-letter alpha codes in the alternative original databases, which were used to construct ITPD-E. These countries are Chinese Taipei (Taiwan), which appears as CHT or TWN, the Democratic Republic of Congo, which appears as DRC, ZAR, or COD, and Romania, which appears as ROM or ROU. Without any strong preference and any implications, and only for consistency purposes and ease of use of ITPD-E, we selected to use TWN, COD, and ROU.

[5]Note that ITPD-E uses a constant country code for Romania, ROU, while the DGD version 1.0 uses historically-accurate country codes, which means it denotes Romania by ROM in 2000-2001 and ROU in 2002 and later. Thus, the only adjustment that needs to be made when merging ITPD-E with DGD is to change all instances of ROM to ROU in DGD.

is balanced (see Section 2.3), then *flag_ zero* is equal to 'u' ("unknown").

3   Data Sources

This section discusses the original data sources that are employed in the construction of the data, as well as their strengths and limitations. We split this discussion into four subsections: (1) Agricultural data, (2) Mining and energy data, (3) Manufacturing data, and (4) Services data. For each broad sector, we discuss sources of international trade and production data. The common principles and steps in the construction were described in Section 2. The steps and procedures that are specific to each broad sector are described in this section. In selecting constituent raw data sources for the ITPD-E, we considered that data sources should provide clear documentation, contain data that was not estimated by statistical procedures, and are regularly updated.

3.1   Agriculture

The agriculture broad sector is divided into 26 industries that cover products contained in ISIC rev. 4 division A-01, which includes production of crop and of animal products.[6] The initial release of ITPD-E does not include forestry and logging (contained in ISIC division A-02) and fishing and aquaculture (contained in ISIC division A-03) because the data for those industries are not included in the FAOSTAT dataset, which is our main data source in agriculture. The agricultural industries in the ITPD-E are listed in Table 4.

3.1.1   Trade Data

The Food and Agriculture Organization of the United Nations Statistics Division (FAO-STAT)[7] collects information on an annual basis for more than 245 countries. The source data come from UNSD, Eurostat, and other national authorities as needed. This source data

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[6]The ITPD-E industrial classification for agriculture was developed with assistance from USITC staff.
[7]http://faostat3.fao.org/home/E.

is checked for outliers and data on food aid is added to take into account total cross-border trade flows.[8] FAOSTAT's Detailed Trade Matrix reports information on agricultural bilateral trade quantities (in tons) and values (in thousands of US dollars). Bilateral trade data are available from 1986 to 2017 for many countries.

The original FAO data are classified according to the FAOSTAT Commodity List (FCL) which includes more than 600 items.[9] As we provide a database containing agriculture, mining, energy, manufacturing, and services, we have to carefully avoid double counting. Specifically, some of the FAO FCL items contain mining and manufactured industries, so we do not include these FCL items in ITPD's agriculture industries. Specifically, we classify all industries between 1500 and 1601 of ISIC rev. 3 as manufacturing industries. Using the FCL to HS and HS to ISIC rev. 3 correspondence tables, we identify the FCL items that are part of the manufacturing data.[10] Note that these FCL items typically do not have matching production data in the FAO's database. Some FCL items could not be uniquely matched to broad sectors. In these cases, we allocated FCL items according the number of constituent HS lines.[11] We also dropped industries we could not match to any ISIC or HS code[12] and industries with FCL item codes above 1296, which are aggregates and industries such as

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[8]http://www.fao.org/faostat/en/#data/TM.

[9]http://www.fao.org/economic/ess/ess-standards/commodity/en/.

[10]These are FCL items 16, 18, 19, 20, 21, 22, 23, 24, 26, 28, 29, 31, 32, 34, 36, 37, 38, 39, 41, 45, 46, 48, 49, 50, 51, 57, 58, 60, 61, 64, 66, 72, 76, 80, 82, 84, 86, 90, 95, 98, 104, 109, 110, 111, 113, 114, 115, 117, 118, 119, 121, 126, 127, 129, 150, 154, 155, 158, 159, 160, 162, 163, 164, 165, 166, 167, 168, 172, 173, 175, 212, 235, 237, 238, 239, 240, 241, 244, 245, 246, 247, 252, 253, 257, 258, 259, 261, 262, 264, 266, 268, 269, 271, 272, 273, 274, 276, 278, 281, 282, 290, 291, 293, 294, 295, 297, 298, 306, 307, 313, 314, 331, 332, 334, 335, 337, 338, 340, 341, 343, 390, 391, 392, 447, 448, 450, 451, 466, 469, 471, 472, 473, 474, 475, 476, 491, 492, 496, 498, 499, 509, 510, 513, 514, 517, 518, 519, 538, 539, 562, 563, 564, 565, 575, 576, 580, 583, 584, 622, 623, 624, 625, 626, 631, 632, 633, 634, 657, 658, 659, 660, 662, 664, 665, 666, 672, 737, 753, 768, 770, 773, 774, 828, 829, 831, 840, 841, 842, 843, 845, 849, 850, 851, 852, 853, 854, 855, 867, 869, 870, 871, 872, 873, 874, 875, 877, 878, 882, 883, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 903, 904, 905, 907, 908, 909, 910, 916, 917, 919, 920, 921, 922, 927, 928, 929, 930, 947, 949, 951, 952, 953, 954, 955, 957, 958, 959, 977, 979, 982, 983, 984, 985, 988, 994, 995, 996, 997, 998, 999, 1008, 1010, 1017, 1019, 1020, 1021, 1022, 1023, 1035, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1058, 1059, 1060, 1061, 1063, 1064, 1065, 1066, 1069, 1073, 1074, 1075, 1080, 1081, 1089, 1097, 1098, 1102, 1103, 1104, 1105, 1108, 1109, 1111, 1112, 1127, 1128, 1129, 1130, 1141, 1151, 1158, 1160, 1163, 1164, 1166, 1167, 1168, 1172, 1173, 1174, 1175, 1186, 1187, 1221, 1222, 1223, 1225, 1241, 1242, 1243, 1273, 1274, 1275, 1276, 1277, and 1296.

[11]This leads in dropping of industries with FCL items 653, 868, 948, 978, 1018, 1036, 1232, and 1259. We kept the following FCL items in agriculture: 667, 777, 780, 782, 826, 987, 1009, and 1293.

[12]Specifically, we could not match FCL items 10, 30, 464, 944, 972, 1012, 1032, 1055, 1070, 1077, 1084, 1087, 1094, 1120, 1122, 1124, 1137, 1144, 1154, 1159, and 1161.

fertilizers, pesticides, and machinery, belonging to one of the other broad sectors. Table 4 includes the correspondence between ITPD-E agricultural industries and FCL items.

FAOSTAT does not include international trade data for FCL item 27 "rice (paddy)". Instead, we use data from the UN Commodity Trade Statistics Database (COMTRADE), HS sector 100610 "Cereals; rice in the husk (paddy or rough)".

3.1.2 Production Data

The FAOSTAT also provides disaggregated agricultural production data.[13] We use the data on the "Value of Agricultural Production" because we are interested in values in order to be able to combine and compare data across sectors.

The Value of Agricultural Production data from the FAO contains information for at least some years for 261 geographical "areas" (which include country groups) and 220 different FCL items. We use gross production values in current United States dollars.

The industry classification of the FAO production data is the same as its trade data: FAOSTAT Commodity List (FCL) (see http://www.fao.org/economic/ess/ess-standards/commodity/en/). There are 220 different items in the raw "Value of Agricultural Production" data. As explained in the previous section, our classification of agricultural industries contains 26 industries, described in Table 4. A correspondence between the country codes used by the FAO and the ISO3 country codes used by the ITPD-E can be found at http://www.fao.org/faostat/en/#data/QV.

The production data is then used to calculate domestic trade following the procedure described in Section 2.2. There are two approaches to calculating domestic trade at a more aggregate level from disaggregated data: (a) calculate domestic trade at the disaggregated level and then aggregate and (b) aggregate output and total exports separately and then calculate domestic trade at an aggregate level. The two approaches may produce different results when there is missing data. For agriculture, there are many missing values at

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[13]Available at http://www.fao.org/faostat/en/#data.

the disaggregated level. However, this is natural, as some countries will not produce some agricultural goods. We therefore use approach (a) and calculate domestic sales at the disaggregated level for agriculture. Note that constructing domestic sales as difference between output data and total exports leads to negative values for some observations, which we drop.

3.2 Mining and Energy

The mining and energy broad sector in ITPD-E consists of 7 industries that cover products that are part of ISIC rev. 4 Sections B and D. Section B includes the extraction of minerals occurring naturally as solids, liquids, or gases. This section also includes supplementary activities aimed at preparing the crude materials for marketing. Section D covers operation of electric and gas utilities that provide electric power, natural gas, steam, and hot water through a permanent infrastructure. The ITPD-E mining and energy industries are listed in Table 5.

3.2.1 Trade Data

The international trade data for the mining and energy sector come from the UN Commodity Trade Statistics Database (COMTRADE), which is the most comprehensive source for bilateral data on merchandise trade flows. The data are available at a very disaggregated level and for a long period of time. COMTRADE reports annual bilateral trade flows (in current US dollars converted from national currencies) expressed in gross value and volume from 1962. The data can be accessed online through the UN website or through the World Bank's WITS portal.[14] The COMTRADE data are accessible in different nomenclatures and in different levels of disaggregation. Trade data classified according to the Harmonised System (HS) are available up to the 6-digit level (that is, at a level of detail that distinguish about 5,000 separate goods items), which is the most disaggregated classification that

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[14]http://comtrade.un.org or http://wits.worldbank.org/Default.aspx?lang=en.

is consistent across countries at the international level,[15] thus enabling us to aggregate the mining trade data to our desired level of ITPD-E aggregation, which is determined by the availability of the production data as discussed next.

3.2.2 Production Data

To obtain production data for the mining and energy sector, we rely on the dataset on mining and quarrying and utilities sectors from the United Nations Industrial Development Organization (UNIDO) at the 2- and 3-digit levels of ISIC Code (revisions 3 & 4) called "MINSTAT - Mining and Utilities Statistics Database". MINSTAT rev. 3 covers years from 1990 and the country coverage ranges from 1 to 67, while rev. 4 data starts in 2005 with more stable country coverage, which varies from 17 to 50. In combination, revisions 3 and 4 of the MINSTAT database combine to cover a total of 110 countries.

In order to take full advantage of the MINSTAT database and to ensure maximum coverage in terms of years, countries, and industries, we create a concordance between ISIC rev. 3 and ISIC rev. 4, which appears in Table 5, together with the ITPD-E mining classification. As can be seen from this table, we have to aggregate some industries up in each of the two revisions of the ISIC classifications and also to construct some residual values as the difference between aggregate values and some subcategories.

In order to obtain maximum number of non-missing observations, our approach is to combine sub-categories by replacing missing values with zeroes for a given sub-category which we use in the aggregation, if there are non-missing corresponding values in any of the other sub-categories that were used in the same aggregation. One motivation for this approach is that often countries report values either in one sub-category or in the other.[16]

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[15]When using the HS 2002 classification, mineral products are captured in Section V (25-27), and metals in Sections XIV (71) and XV (72-83). See https://unstats.un.org/unsd/tradekb/Knowledgebase/50043/HS-2002-Classification-by-Section.

[16]We also experimented with a conservative approach, where missing values in any subcategory are treated as missing values and, as a result, the corresponding aggregate category is also missing. In other words, a non-missing aggregate value is obtained only for the cases where all corresponding sub-categories were not missing. The difference between the number of observations that we obtain with the two alternative procedures was relatively small in favor of the more liberal aggregation approach.

Once we aggregate revisions 3 and 4 to the new ITPD-E concordance, we combine the data from the two ISIC revisions using the data in revision 3 as the baseline due to the larger original number of observations in this revision. This results in 1,822 observations and completes the construction of the production data for mining. We then use the procedure described in Section 2.2 to construct domestic trade flows using the national gross production data and the data on international trade described in the previous section.

3.3 Manufacturing

The manufacturing broad sector in ITPD-E consists of 120 industries that cover products that are part of ISIC rev. 4 section C, which includes "the physical or chemical transformation of materials, substances, or components into new products". Note that manufacturing includes the processing of the products of agriculture into food for humans or animals. It also includes repair and installation of machinery and equipment. The list of manufacturing industries in ITPD-E can be found in Table 6.

3.3.1 Trade Data

Manufacturing international trade data come from the United Nations International Trade Statistics Database (COMTRADE), which is the most comprehensive source for bilateral data on merchandise trade flows.[17] International trade data was obtained in ISIC rev. 4 to match the classification of the production data described below.

3.3.2 Production Data

The primary source for industry-level manufacturing production data is the United Nations Industrial Statistics (INDSTAT) database, which exists in two versions, one in ISIC rev. 3 and one in ISIC rev. 4.[18] The latest edition of the INDSTAT database in rev. 3 covers

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[17]https://comtrade.un.org.
[18]http://stat.unido.org.

the period from 1985 onwards for 138 countries at the 3- and 4-digit levels, which includes 151 manufacturing industries. INDSTAT in rev. 4 covers the period from 2005 onwards for 89 countries at the 3- and 4-digit levels, which includes 161 industries. It should be noted that even though ISIC rev. 4 replaced ISIC rev. 3 since 2005, the ISIC rev. 3 version of the INDSTAT data includes observations for the years 2005-2014 and we took advantage of these data to ensure maximum coverage. As with other original data sources, INDSTAT coverage in terms of years and industries varies from country to country depending on data availability.

In order to ensure maximum coverage, we construct the raw manufacturing production data in two steps. First, for each revision of ISIC we combine the output data at the 3-digit level with the data at the 4-digit level to minimize the number of missing observations. Then, we combine the data from the two ISIC revisions by aggregating the two 4-digit ISIC classifications up in order to ensure matching.

To describe our decisions on how to perform the first step (i.e., where we use the 3-digit data to fill in missing 4-digit values within each revision), we use the case of Colombia. Colombia is chosen because it offers good examples of possible cases that should be considered. For example, we have all 4-digit data that corresponds to the 3-digit Sector 281. When summed, the 4-digit values add to the corresponding 3-digit value, as expected. Next, consider Sector 154 for which we have data on all but one of the 4-digit categories. The missing category is 1544. However, when we add the non-missing values, they sum exactly to the corresponding 3-digit total. This may be for three reasons: (i) because the missing value for 1544 is zero, (ii) because 1544 was aggregated with another 4-digit sector in the data (this is often indicated by a flag in the INDSTAT database), or (iii) because to get the total, the reporters or the creators of the data have simply added the non-missing 4-digit.

We believe that we can exclude option (iii). To see this consider the next industry in the example. Sector 191 includes two 4-digit industries, one is missing and one is not. However, the total at the 3-digit level is different from the total in the non-missing 4-digit industry.

This is evidence that the reporters/developers of the data did not simply add up the non-missing 4-digit values in order to obtain the corresponding 3-digit data. This also means that, in this case, we can recover the single missing 4-digit category as the difference from the 3-digit value and the non-missing 4-digit value. Note that the same procedure can be applied to recover missing 4-digit values in any industry for which we have the 3-digit value and only one missing 4-digit value. Next, consider Sector 155, where we have two missing values at the 4-digit level and a non-missing 3-digit value. In this case we cannot recover the missing 4-digit values.

We apply the procedure that we just described separately to the ISIC rev. 3 data and to the ISIC rev. 4 data. In the case of the ISIC rev. 3 data we recover 1301 values, of which 175 are negative and set to missing. In the case of the ISIC rev. 4 data we recover 948 missing 4-digit values, of which 59 are negative and set to missing.

Once we fill in the missing 4-digit values in each ISIC revision as described above, we concord them to the ITDP-E classification. The concordance appears in Table 6. As can be seen from this table, the correspondence between the two ISIC revisions is overall quite good, and only a few aggregations up are needed. Specifically, we only need to aggregate two 4-digit industries in ISIC rev. 3, 3312+3313, and there were only eleven cases in which we have to aggregate in ISIC rev. 4. These include, 1075+1079, 1311+1312, 1430+1391, 2029+2680, 2812+2813, 2818+2822, 2520+3040, 2620+2817, 2731+2732, 2660+3250, and 3211+3212.

Consistent with our approach for agriculture and mining, and in order to obtain maximum number of non-missing observations, we replace missing values with zeroes for a given sub-category, which we use in the aggregation, if there are non-missing corresponding values in any of the other sub-categories that were used in the same aggregation.[19]

After the above procedures, we have manufacturing production data for 146 countries.

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[19]We also experimented with a conservative approach, where missing values in any sub-category are treated as missings and, as a result, the corresponding aggregate category is also missing. The difference between the number of observations that we obtain with the two alternative procedures was relatively small.

We combine the production data with trade trade to calculate domestic trade, as explained in Section 2.2. In a small number of cases we had output data, but not total exports.

3.4 Services

The Services broad sector includes 17 industries that perform the activities classified as services. It includes the activities in ISIC rev. 4 sections F through K, M, N, and P through S. The mostly non-traded activities contained in sections L "Real Estate", O "Government", T "Household production", and U "Extraterritorial organizations" are not included in this broad sector.

3.4.1 Trade Data

Bilateral trade data on services are still relatively limited, and its quality is widely viewed as not on par with trade statistics for merchandise goods. The reasons can be seen in the inherent difficulty of reliably recording intangible and non-storable service trade flows. Nevertheless, over recent years significant progress has been made to offer better services trade statistics. Drawing on the best and most comprehensive statistics available, the services trade data in the ITPD-E come from the 'WTO-UNCTAD-ITC Annual Trade in Services Database' and the UN 'Trade in Services Database' (UN TSD).[20]

We take the UN Trade in Services database in the form currently incorporated into Comtrade.[21] We use this dataset to obtain services trade statistics for the early years 2000-2004, since the WTO-UNCTAD-ITC dataset only commences in 2005. However, we also retain data for subsequent years (post-2005) from the UN TSD because there is considerable scope for blending both datasets to achieve maximum coverage. This is partly because the WTO-UNCTAD-ITC dataset formally commences in 2005 but during the early years many countries only report *World* exports, rather than bilateral flows, and broad-based reporting

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[20]The UN TSD and the WTO-UNCTAD-ITC datasets are both Balance of Payments statistics and as such capture Modes of Supply 1, 2, and 4 and exclude Mode 3 (sales of foreign affiliates).

[21]https://comtrade.un.org.

at the bilateral level only commences after 2010.

We note that the raw data contain a small number of negative export flows, which tend to be concentrated in the insurance (reinsurance) industry as well as in merchanting, and thus may reflect the particular accounting principles in these industries. Following the basic principles of ITPD-E construction outlined in Sections 2.1 and 2.2, we set these negative international trade values to missing.

Statistics on cross-border services trade are reported using the Extended Balance of Payments Services classification (EBOPS). The fifth edition of the Balance of Payments and International Investment Position Manual (BPM5), released in 1993, employs the EBOPS 2002 classification, whereas the latest sixth edition of the Manual (BPM6) employs the EBOPS 2010 classification, which provides the most recent and detailed services trade statistics. The trade data in UN TSD are organized according to the EBOPS 2002 classification, which we concord to EBOPS 2010 as this newer classification ensures the best level of industry-level granularity in services trade. This is also consistent with the fact that more and more countries switch their reporting from BPM5 (EBOPS 2002) to BPM6 (EBOPS 2010). Most items are in principle straightforward to map across the two classifications, and the concordance used for ITPD-E, which follows Wettstein et al. (2019), is provided in Table 7.[22] After various data procedures including mirroring, we obtain approximately 280,000 observations from the UN TSD.

The WTO-UNCTAD-ITC dataset[23] includes data on bilateral trade in services classified according to EBOPS 2010. Countries are identified by UN 2-digit alphanumeric codes, and we apply a mapping to supplement ISO 3-digit alphanumeric country codes. Nearly three-quarters of the observations (73.5%) in the WTO-UNCTAD-ITC dataset are sourced from Eurostat. This is in contrast to the UN TSD dataset, which draws on different sources. After

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[22]One major difference between BPM5 and BPM6 is the treatment of manufacturing services on physical inputs owned by others and repairs of goods. As a result, the EBOPS 2002 code for Merchanting ("270") as part of 'Other business services' does not have a correspondence in BPM6; conversely, the EBOPS 2010 codes for manufacturing services and maintenance ("SA" and "SB") cannot be concorded backwards to BPM5.

[23]https://www.wto.org/english/res_e/sta tis_e/trade_datasets_e.htm.

various procedures including mirroring, we obtain approximately 300,000 observations from the WTO-UNCTAD-ITC dataset, of which 130,000 are reported zeroes.

Yet before trade statistics from the WTO-UNCTAD-ITC and the UN TSD databases are combined, we perform hierarchical consistency checks and mirroring within each constitutent dataset. Regarding the former, EBOPS is a hierarchical classification and so there is scope for replenishing or updating higher-level entries with sums of reported bilateral trade flows from lower-level items. Specifically, we carry out vertical consistency check across the two EBOPS categories 'SI' (telecommunications, computer and information services) and 'SJ' (Other business services). Regarding the mirroring protocol, as explained in Section 2.1, we use reported exports as the main source of bilateral trade in services. To maximize coverage, we use mirrored import flows from reporting countries to fill in missing export values. A flag is retained in the database to identify values that derive from mirroring.

Both services trade flow datasets—UN TSD and WTO-UNCTAD-ITC—are then merged to obtain the best possible coverage of bilateral services trade. The contribution from each principal source in terms of observation counts is documented in Table 8, which suggests substantial gains from blending these two mirrored datasets. We emphasize that the WTO-UNCTAD-ITC dataset remains the primary source of service trade data, meaning that raw data from this dataset are never overwritten or replaced. This is because the WTO data of later years appear to be more comprehensive, and possibly of higher quality, than the data of earlier years.[24] At the same time, trade values replenished from the UN TSD account for 38% of the combined services dataset. Of these additional non-missing observations, 31% pertain to the initial years 2000-04 that are not covered by the WTO-UNCTAD-ITC dataset at all.

Overall, while the nature of services trade raw data remains qualitatively unchanged, the data in ITPD-E are appreciably enhanced by blending two principal sources of statistics,

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[24]For instance, the value share of reported trade in Travel, Transport and Other Commercial Services (as opposed to non-tradable, unallocated, and Government services) rises continuously throughout the years covered by ITPD-E and reaches 85% in 2016.

a conservative use of mirroring techniques, and casting all services trade data in the latest EBOPS 2010 format, suitably grouped for a correspondence to services sections in the ISIC rev. 4 industry classification.

3.4.2   Production Data

We obtain information on gross output at basic prices from the UN National Accounts database using the ISIC rev. 4 classification.[25] Production data from the UN National Accounts requires two principal modifications before it can be merged with trade flow data: first, gross output data as obtained from the UN Statistical Division are denominated in local currency units. Since the conversion of services production statistics should ideally use the same USD exchange rates that are used for services trade flow data, we apply the average annual exchanges rates from the IMF's International Financial Statistics series.

Second, in terms of statistical concepts for output data, information is reported in two different frameworks within the ISIC rev. 4 industrial classification, namely SNA 1993 and SNA 2008, respectively.[26] The UN data show that some countries report only in the former, some only in the latter, and some countries report in both frameworks, at least for some intermittent years as their reporting transitions from SNA 1993 to SNA 2008. We blend data from both SNA frameworks so as to maximize coverage in terms of countries and industries.[27]

In preparation for merging trade and gross output information, the last step involves the construction of a mapping from ISIC rev. 4 to EBOPS 2010, shown in Table 7. This trade to output concordance follows—with very minor exceptions—the EBOPS-ISIC bridge table used in the methodological paper for the WTO's "Trade in Services data by mode of supply

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[25]http://data.un.org/Explorer.aspx?d=SNA.

[26]It should be noted that a small number of mainly emerging economies are not included in the UN SNA data. Most of these economies do not report gross output statistics to the UN at all, neither in ISIC rev. 3 nor in rev. 4, and so there is no obvious solution within the realm of UN statistics. Examples include Australia, China, Indonesia, Malaysia, Russia, Thailand or Turkey.

[27]We start with all gross output data reported in SNA 2008 but retain additional information by mapping data reported in SNA 1993 into SNA 2008. On the basis of a comparison of differences in values for industries in which gross output is reported simultaneously in SNA 1993 and SNA 2008, it was decided to keep SNA 1993 output information in industries in which the observed difference is less than 10 percent on average.

(TISMOS)" dataset (Wettstein et al., 2019, Table 14).[28]

As mentioned in the previous subsection, not all product codes are amenable to concording; in particular, five EBOPS 2010 codes—SA (manufacturing services on physical inputs), SB (maintenance and repair services), SH (charges for intellectual property rights), SL (government goods and services) and SN (services not allocated)—have no meaningful correspondence in an ISIC industry classification. Yet in order to maximize information available to users, trade values recorded under these five items are retained in ITPD-E; however, no internal trade can be constructed for these categories because output is undefined on conceptual grounds.

We combine the production data with trade trade to calculate domestic trade in services as explained in Section 2.2. To summarize the industry coverage for domestic trade in services, out of 17 service industries in ITPD-E, five industries do not have any domestic trade data because they have no equivalent production data, and two industries have domestic trade starting in 2005 because these categories (arts, entertainment, recreational and other personal services) were newly introduced in EBOPS 2010 and do not have corresponding items in EBOPS 2002. Hence, total exports cannot be calculated prior to 2005 for these industries. Overall, after various cleaning and concording procedures, we obtain 12,260 observations for services gross output from UN SNA.

4 Comparison with Other Trade and Production Datasets

In this section we compare ITPD-E to other trade and production datasets. Just as ITPD-E, each of the databases referenced here are products of great efforts to construct consistent data on international and domestic trade flows, and each of them has been used in a number

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[28]For instance, the regrouping involves the combination of trade in audiovisual services with trade in telecom and information services, or likewise the combination of trade in educational services with that part of travel services that is undertaken for educational purposes.

of influential academic and policy papers. A common feature across all databases is that each of them includes international and domestic trade flows. Below, we compare ITPD-E with each alternative dataset across the following criteria: (i) industry coverage; (ii) country coverage; (iii) time coverage; and (iv) suitability for estimations.

- **World Bank's TPP.** The World Bank's Trade, Production and Protection (TPP) database[29] covers approximately 100 countries, for the period 1976-2004 where information is available in ISIC rev. 3 at the 3-digit level. Similarly to the ITPD-E, the World Bank's TPP is constructed from reported administrative data and, therefore, is suitable for estimations. In addition, the TPP covers a longer time span. However, it has been discontinued and data for the years post 2004 are not included in it. In terms of country coverage, the ITPD-E includes significantly more countries. Finally another important advantage of the ITPD-E is that it is designed to cover the complete economy, i.e., all industries, while the TPP is limited to manufacturing industries only.

- **CEPII's TradeProd.** CEPII's Trade, Production and Bilateral Protection (Trade-Prod) database[30] covers manufacturing (at ISIC rev. 2 at the 3-digit level) for over 150 countries during the period 1980-2006. Similarly to the ITPD-E, the CEPII's Trade-Prod is constructed from reported administrative data and, therefore, is suitable for estimations. In addition, the TradeProd covers a longer time span than ITPD-E. However, it has been discontinued and data for the years post 2006 are not included in it. In terms of country coverage, the ITPD-E includes significantly more countries than TradeProd. Finally, another important advantage of the ITPD-E is that it is designed to cover the complete economy, i.e., all industries, while the TradeProd is limited to manufacturing industries only.

- **GTAP Dataset.** The GTAP Dataset 10 covers the full economies of 121 countries

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[29]https://datacatalog.worldbank.org/dataset/trade-production-and-protection-database. The database has been developed by Nicita, A. and Olarreaga, M., 2007, "Trade, Production, and Protection Database, 1976–2004", *World Bank Economic Review* **21**(1), pp. 165–171.

[30]http://www.cepii.fr/CEPII/fr/bdd_modele/presentation.asp?id=5.

and 20 country aggregates.[31] It includes data for the years 2004, 2007, 2011, and 2014. It covers 65 industries that are classified according to the GTAP sector classification. Thus, the GTAP dataset and the ITPD-E both cover all industries within an economy. However, the ITPD-E has a wider country, sector, and time coverage.[32] In addition, the ITPD-E offers consistent panel data. The key difference between the GTAP dataset and the ITPD-E is that the former is suitable for simulations while the latter is suitable for statistical estimations. Specifically, the GTAP dataset relies on economic models to estimate missing data so that it can offer a fully balanced dataset that can be used for simulation analysis but not for estimations. On the other hand, the ITPD-E is not fully balanced and cannot be used for simulations. The key advantage of ITPD-E is that it is constructed from reported administrative data, which makes it suitable for estimation purposes.

- **WIOD.** The latest edition (Release 2016) of the World Input-Output Database (WIOD) covers the period 2000-2014 for 56 industries.[33] Similarly to the GTAP dataset and the ITPD-E, the WIOD dataset covers the entire economies. In terms of coverage, the ITPD-E has similar time coverage but a significantly wider industry, and especially country coverage compared to the WIOD. Another key difference between the WIOD dataset and the ITPD-E is that the former is suitable for simulations while the latter is suitable for estimations. Specifically, the WIOD dataset relies on economic models to estimate missing data so that it can offer a fully balanced dataset that can be used for simulation analysis but not for estimations. On the other hand, the ITPD-E is not fully balanced and cannot be used for simulations. However, the key advantage of ITPD-E is that it is constructed from reported administrative data, which makes it suitable for estimation purposes.

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[31]https://www.gtap.agecon.purdue.edu/databases/v10/.

[32]GTAP also provides a Bilateral Time Series Trade Data for all regions in GTAP 10 with a wider time coverage (1995 to 2016), but only for merchandise trade.

[33]http://www.wiod.org/home.

To summarize, the ITPD-E offers superior country and industry coverage compared to other existing trade and production databases. It covers non-manufacturing industries, includes recent years, and has data for nearly all countries in the world. Importantly, unlike several of the datasets reviewed above, ITPD-E is suitable for estimation of economic models because it is constructed from reported administrative data and does not include "data" estimated using statistical techniques and economic models.

5   Sectoral Gravity Estimates: ITPD-E Validation

This section demonstrates that the ITPD-E is suitable for disaggregated gravity estimations. Due to space constraints, our objective is merely to offer a proof of concept by using ITPD-E to obtain a set of basic estimates for each ITPD-E industry.[34] To this end, we employ the traditional (and still very widely used) log-linear gravity specification, which we estimate with the OLS estimator. We also take advantage of the separability of the structural gravity model to obtain estimates for each of the 170 ITPD-E industries.

Given our purpose to put ITPD-E to the test, we employ a set of standard gravity covariates in our estimations including the logarithm of bilateral distance between two countries, and indicator variables for contiguity, common official language, colonial relationships, and the presence of free trade agreements. Data on all gravity variables come from the Dynamic Gravity Dataset (DGD), which is constructed and maintained by the U.S. International Trade Commission (see Gurevich and Herman (2018)).[35]

An important advantage of the ITPD-E is that it includes both international and do-

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[34]For a thorough gravity analysis with the ITPD-E, we refer the reader to Borchert et al. (2020), who validate the use of the ITPD-E by implementing the latest developments in the empirical gravity literature, as summarized by Yotov et al. (2016), and who provide a discussion of a series of stylized facts and best practice recommendations for gravity estimations in the light of the detailed industry-level estimates.

[35]It is encouraging to note that the country coverage of ITPD-E is very close to the comprehensive coverage of the USITC's Dynamic Gravity Dataset. Specifically, DGD covers all 243 countries that appear in ITPD-E. More importantly, there are only 10 very small regions/territories that appear in DGD but do not appear in the ITPD-E. These include ALA (Aland Islands), GAZ (Gaza Strip), GGY (Guernsey), GLP (Guadeloupe), JEY (Jersey), KSV (Kosovo), MAF (Saint-Martin), MTQ (Martinique), REU (Reunion), and SJM (Svalbard and Jan Mayen).

mestic trade flows. This offers an opportunity to estimate and compare border effects in a comprehensive way across all industries, i.e. the trade-reducing impact of there being an international border, conditional on all other gravity forces including distance. We therefore also include a set of country-specific dummy variables ($SMCTRY$) that take a value of one for internal trade and zero for international trade. Finally, following Anderson and van Wincoop (2003), all models include full sets of exporter-time and importer-time fixed effects to control for unobservable multilateral resistance terms.

Due to the large number of gravity estimates (170 estimates for each of the 6 gravity variables in our specifications), we present our regression results graphically, using six panels/plots (one for each gravity covariate) in Figure 1. Each dot within a panel represents the point estimate for a particular industry, and the estimates are ordered from the smallest to the largest estimate. Panel A of the figure shows that distance coefficient estimates are all negative and many of them sizable. Hence, our estimates confirm that distance is a strong impediment to trade. The estimates in Panel B reveal that sharing a common border promotes trade in all but one industry. Similarly, Panel C shows that in all but 4 industries the estimates of the impact of common official language on trade are positive. The estimates in Panel D capture the empirical regularity that countries with a colonial relationship trade more (only 8 of the estimates of colonial ties are negative). Further, in Panel E, we confirm that FTA's promote trade between members in all but 7 industries. Finally, we find that international borders reduce international trade considerably, even after controlling for the impact of geography and other significant determinants of trade, as evidenced by the very large positive coefficients in Panel F of Figure 1. These estimates confirm the finding of very substantial border barriers (Anderson et al., 2018) for a much broader set of industries.

We conclude this section with a robustness exercise that evaluates the impact of the mirror data used in ITPD-E on gravity estimations. To perform this exercise, we drop all observations for which the flag variable for mirroring is equal to one. Our findings are reported in Figure 2. Comparison between the estimates in Figures 1 and 2 suggests that the

mirrored trade flows do not play a very important role for common estimates of the standard gravity variables. Thus, the benefits of adding more data through mirroring do not seem to come at the cost of biasing the standard gravity results. Nevertheless, we recommend caution with the use of mirrored trade flows, especially if the focus is on heterogeneous gravity estimates.

In sum, the industry-level gravity estimates that we obtain in this section are as expected and are readily comparable to existing estimates from the related literature. For example, in terms of magnitude and direction, our estimates are very close to the meta-analysis results from Head and Mayer (2014). Thus, our results offer preliminary evidence that validates the use of the ITPD-E for gravity estimations. For a more thorough analysis of the suitability and implications of using the ITPD-E for gravity estimations, we refer the interested reader to Borchert et al. (2020).

6   Summary

Analyzing and quantifying trade policies requires consistent information on both international and domestic trade flows. While a few databases containing this information exist, they have significant limitations, such as sectoral coverage limited to manufacturing, limited country coverage, absence of recent updates, and use of estimated data in place of reported administrative data.

The International Trade and Production Database for Estimation (ITPD-E) contains consistent data on domestic and international trade for 243 countries, 170 industries, and 17 years commencing from the year 2000. It provides data for four broad sectors of the economy: agriculture, mining, manufacturing and services. Due to this coverage, ITPD-E describes each economy nearly completely.

As we only use reported administrative data and not statistical estimates to fill in database entries, the ITPD-E is well-suited for statistical inference such as the estimation

of gravity models. We demonstrate this usefulness with standard gravity estimates. Further insights into estimating gravity from ITPD-E are offered in Borchert et al. (2020).

The ITPD-E is a public good for the benefit of researchers, civil servants and many others. In return for creating and maintaining this public good, we kindly ask that all users of the ITPD-E please cite this paper. Moreover, in an effort to continuously improve the coverage and quality of ITPD-E data, we welcome feedback including error reports to the ITC's gravity portal e-mail address (`gravity@usitc.gov`). Please visit USITC's gravity portal for updates.

In the future, we plan to use the latest methodological advances in structural gravity modeling to project bilateral trade when such information is missing. This augmented version will constitute the second member within the family of ITPD databases, which should be useful for simulations and counterfactual analysis. Hence, we may call this version of the database the International Trade and Production Database for Simulation (ITPD-S).

We also plan to offer a third database version within the ITPD family by recasting the trade flow information according to the industry structure of the well-known World Input-Output Database (WIOD). This will enable users of the data to employ the latest input-output tables in their analysis in order to allow for inter-industry links on the supply side. This third version may be called the International Trade and Production Database with Input-Output information (ITPD-IO).

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Table 1: ITPD-E: Industry Coverage and Summary Statistics
for International and Domestic Trade Flows

ID	Industry Description	Mean Exports	Max Exports	#Observations	#Zeroes
1	Wheat	84.22	50955	77845	50305
2	Rice (raw)	204.44	117214	63997	45094
3	Corn	78.60	106817	87885	53488
4	Other cereals	28.68	11918	81678	49366
5	Cereal products	1.13	193	39654	26564
6	Soybeans	68.96	21637	55957	36540
7	Other oilseeds (excluding peanuts)	38.57	95962	160283	89937
8	Animal feed ingredients and pet foods	2.76	883	71448	43299
9	Raw and refined sugar and sugar crops	340.37	45732	10651	7503
10	Other sweeteners	2.80	1108	82972	50552
11	Pulses and legumes, dried, preserved	9.26	13545	134352	76837
12	Fresh fruit	60.53	189855	211150	114823
13	Fresh vegetables	114.45	323976	175575	99368
14	Prepared fruits and fruit juices	0.71	235	106861	62526
15	Prepared vegetables	3.21	1717	16594	10079
16	Nuts	11.95	15018	127163	72949
17	Live Cattle	9.16	1796	31588	19813
18	Live Swine	7.88	1207	16511	9728
19	Eggs	66.85	60757	65981	42101
20	Other meats, livestock products, and live animals	3.62	6513	173954	100797
21	Cocoa and cocoa products	9.91	1121	38609	24716
22	Beverages, nec	5.51	10386	192290	105467
23	Cotton	20.17	27391	99474	62499
24	Tobacco leaves and cigarettes	7.04	9484	104397	62538
25	Spices	2.44	3958	186919	99077
26	Other agricultural products, nec	7.52	11296	271908	132358
27	Mining of hard coal	126.19	445807	75090	48800
28	Mining of lignite	31.80	36894	19707	13874
29	Extraction crude petroleum and natural gas	779.50	166676	92441	61933
30	Mining of iron ores	142.48	119661	45156	30533
31	Other mining and quarring	38.54	173194	306736	154841
32	Electricity production, collection, and distribution	1657.40	711982	21438	13061
33	Gas production and distribution	442.79	82946	17634	12996
34	Processing/preserving of meat	78.49	310942	264080	146761
35	Processing/preserving of fish	15.58	38660	304756	159213
36	Processing/preserving of fruit & vegetables	14.73	52296	333462	166554
37	Vegetable and animal oils and fats	28.28	116795	266236	138783
38	Dairy products	42.39	94969	253217	136888
39	Grain mill products	18.02	125311	270470	146590
40	Starches and starch products	6.89	36249	183214	98206
41	Prepared animal feeds	30.04	111443	169836	90475
42	Bakery products	25.36	57461	252274	131157
43	Sugar	14.56	16695	188988	110856
44	Cocoa chocolate and sugar confectionery	11.65	20310	280421	141973
45	Macaroni noodles & similar products	6.72	38863	184870	103418
46	Other food products n.e.c.	21.51	112924	374789	183580
47	Distilling rectifying & blending of spirits	14.33	69585	246847	133915
48	Wines	8.81	17195	213716	117754
49	Malt liquors and malt	18.45	23818	179923	101884
50	Soft drinks; mineral waters	17.70	58983	257976	140498
51	Tobacco products	26.13	102640	235124	134336
52	Textile fibre preparation; textile weaving	21.34	246517	344835	171213
53	Made-up textile articles except apparel	6.36	17651	391348	192908
54	Carpets and rugs	3.46	16354	265513	143581
55	Cordage rope twine and netting	0.96	1331	234543	125027
56	Other textiles n.e.c.	6.50	20764	307153	153166
57	Knitted and crocheted fabrics and articles	10.42	42050	397698	196339
58	Wearing apparel except fur apparel	23.01	91896	506144	238280
59	Dressing & dyeing of fur; processing of fur	1.63	6379	130653	74210
60	Tanning and dressing of leather	6.78	22684	184452	99312
61	Luggage handbags etc.; saddlery & harness	4.66	8285	366600	186902
62	Footwear	12.06	43163	372876	196295
63	Sawmilling and planing of wood	17.96	31578	247071	134990
64	Veneer sheets plywood particle board etc.	12.86	78298	224925	121628
65	Builders' carpentry and joinery	14.97	46014	209825	116001
66	Wooden containers	3.42	7112	195088	107693
67	Other wood products; articles of cork/straw	3.06	16621	331583	170806
68	Pulp paper and paperboard	30.99	106969	301621	150070
69	Corrugated paper and paperboard	16.37	66759	283916	142817
70	Other articles of paper and paperboard	8.35	20824	374885	184797
71	Publishing of books and other publications	3.20	8351	378505	195730
72	Publishing of newspapers journals etc.	13.34	26845	175255	99674
73	Publishing of recorded media	2.82	1806	169299	102308
74	Other publishing	1.22	2403	330683	168921
75	Printing	18.32	97399	373622	181414
76	Service activities related to printing	9.89	9353	104597	58065
77	Reproduction of recorded media	22.95	20472	33613	21363
78	Coke oven products	314.59	210261	53512	34302
79	Refined petroleum products	158.84	689720	319655	169260
80	Processing of nuclear fuel	12.04	11806	81830	48410
81	Basic chemicals except fertilizers	60.20	225749	367995	173250
82	Fertilizers and nitrogen compounds	22.32	99179	197467	105856
83	Plastics in primary forms; synthetic rubber	41.85	158036	296165	146461
84	Pesticides and other agro-chemical products	7.17	27703	214444	108127
85	Paints varnishes printing ink and mastics	12.84	55007	295304	150218

Continued on next page

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ID	Industry Description	Mean Exports	Max Exports	#Observations	#Zeroes
86	Pharmaceuticals medicinal chemicals etc.	57.96	207183	380241	180919
87	Soap cleaning & cosmetic preparations	17.09	87468	388759	193025
88	Other chemical products n.e.c.	21.14	227393	435301	210509
89	Man-made fibres	12.97	92990	187332	96573
90	Rubber tyres and tubes	12.85	48966	275980	138581
91	Other rubber products	8.35	34360	389019	192866
92	Plastic products	40.14	197074	482105	225038
93	Glass and glass products	15.62	74879	371857	182357
94	Pottery china and earthenware	3.70	26673	323151	165148
95	Refractory ceramic products	5.62	46413	163078	86853
96	Struct.non-refractory clay; ceramic products	8.12	73291	234859	125520
97	Cement lime and plaster	27.82	147585	167892	100058
98	Articles of concrete cement and plaster	32.21	101392	193650	107092
99	Cutting shaping & finishing of stone	6.94	22175	198141	109049
100	Other non-metallic mineral products n.e.c.	9.22	69710	275469	137026
101	Basic iron and steel	98.27	964575	375386	185293
102	Basic precious and non-ferrous metals	68.60	517119	331416	161768
103	Casting of iron and steel	10.03	83981	264452	138221
104	Structural metal products	32.57	109832	288356	149921
105	Tanks reservoirs and containers of metal	7.73	13955	223679	122020
106	Steam generators	11.69	18316	146238	83301
107	Cutlery hand tools and general hardware	9.16	33652	431422	212001
108	Other fabricated metal products n.e.c.	19.75	130876	483221	227877
109	Engines & turbines (not for transport equipment)	19.06	33046	225913	122809
110	Pumps compressors taps and valves	18.31	73509	409150	197870
111	Bearings gears gearing & driving elements	9.91	37749	337549	171450
112	Ovens furnaces and furnace burners	3.08	2852	197186	104739
113	Lifting and handling equipment	15.24	63518	304791	156407
114	Other general purpose machinery	23.37	152751	436553	210243
115	Agricultural and forestry machinery	12.47	25953	248332	128833
116	Machine tools	13.96	50621	349097	178263
117	Machinery for metallurgy	6.47	24558	120723	66468
118	Machinery for mining & construction	16.89	147674	334163	173726
119	Food/beverage/tobacco processing machinery	5.17	12330	255381	131232
120	Machinery for textile apparel and leather	4.87	17778	268892	141765
121	Weapons and ammunition	8.21	17551	148226	85899
122	Other special purpose machinery	23.00	124321	371734	185338
123	Domestic appliances n.e.c.	16.87	90216	367690	187869
124	Office accounting and computing machinery	42.14	117097	448807	221711
125	Electric motors generators and transformers	20.24	154165	457444	216303
126	Electricity distribution & control apparatus	17.31	80183	407076	198665
127	Insulated wire and cable	12.39	166781	356089	179145
128	Accumulators primary cells and batteries	6.74	71609	293490	149727
129	Lighting equipment and electric lamps	7.21	25120	373200	187185
130	Other electrical equipment n.e.c.	15.30	37101	416978	202832
131	Electronic valves tubes etc.	84.59	295224	350806	177572
132	TV/radio transmitters; line comm. apparatus	37.07	92857	401113	200155
133	TV and radio receivers and associated goods	26.20	97966	417532	211872
134	Medical surgical and orthopaedic equipment	17.71	83503	379128	184182
135	Measuring/testing/navigating appliances etc.	18.55	82216	420499	199833
136	Optical instruments & photographic equipment	11.73	23638	326220	169262
137	Watches and clocks	4.94	5179	267915	143415
138	Motor vehicles	147.76	440148	362326	195277
139	Automobile bodies trailers & semi-trailers	11.16	25485	248525	137063
140	Parts/accessories for automobiles	52.42	285369	427422	210741
141	Building and repairing of ships	34.48	53927	181233	113507
142	Building/repairing of pleasure/sport. boats	5.07	9713	155453	93268
143	Railway/tramway locomotives & rolling stock	17.86	42110	128073	72058
144	Aircraft and spacecraft	44.77	84027	258794	144385
145	Motorcycles	9.63	42095	223329	128282
146	Bicycles and invalid carriages	3.09	3203	245497	137234
147	Other transport equipment n.e.c.	0.93	2078	168167	95088
148	Furniture	24.35	97079	412160	206453
149	Jewellery and related articles	14.82	19996	302899	157922
150	Musical instruments	1.50	2087	227752	128035
151	Sports goods	3.81	11085	306837	162732
152	Games and toys	7.70	21405	317275	168806
153	Other manufacturing n.e.c.	7.92	43869	427790	208205
154	Manufacturing services on physical inputs owned by others	117.08	26426	11693	5833
155	Maintenance and repair services n.i.e.	46.97	2577	18995	9403
156	Transport	1442.14	1047168	64771	21460
157	Travel	1311.46	946006	43927	17748
158	Construction	4201.07	1438899	41874	22337
159	Insurance and pension services	1871.66	1412604	46687	22605
160	Financial services	1120.47	886362	49593	22776
161	Charges for the use of intellectual property n.i.e.	139.57	18713	44255	21228
162	Telecommunications, computer, and information services	1890.46	1922669	56484	22439
163	Other business services	2795.92	3266031	61736	23986
164	Heritage and recreational services	6904.15	505072	8636	6166
165	Health services	6883.00	2299522	24006	14300
166	Education services	2781.07	1314752	34327	18931
167	Government goods and services n.i.e.	19.81	4702	40507	19334
168	Services not allocated	775.16	67672	38824	20635
169	Trade-related services	6911.71	3036797	39111	20646
170	Other personal services	6048.57	529953	9542	7064

ID	Industry Description	Mean Exports	Max Exports	#Observations	#Zeroes

Notes: This table lists in column 1 the 170 ITPD-E ID codes for the industries covered in ITPD-E and their corresponding descriptions in Column 2. In addition, for each industry, the table reports average exports in million of current US dollars (in Column 3), maximum exports in million of current US dollars (in Column 4), total number of observations (in Column 5), and total number of zeroes (in Column 6), which encompass both reported zeros in the raw administrative data and zeros created during ITPD-E construction as tracked by the *flag_zero* variable. Industries 1-26 belong to the broad sector "Agriculture". Industries 27 to 33 belong to the broad sector "Mining". Industries 34 to 153 belong to the broad sector "Manufacturing". Finally, Industries 154 to 170 belong to the broad sector "Services". See text for further details.

Table 2: ITPD-E: Country Coverage and Summary Export Statistics
for International and Domestic Trade Flows

ISO3	Country Name	Mean Exports	Max Exports	#Observations	#Zeroes
ABW	Aruba	2.58	3294	67627	52887
AFG	Afghanistan	0.38	229	112296	89008
AGO	Angola	38.51	33373	80145	61822
AIA	Anguilla	0.04	6	44262	37691
ALB	Albania	5.68	6472	134929	98000
AND	Andorra	0.12	288	124044	98825
ANT	Netherlands Antilles	1.09	926	71673	47394
ARE	United Arab Emirates	10.85	42341	373205	155148
ARG	Argentina	8.15	12186	298090	139428
ARM	Armenia	2.59	2258	109879	80495
ASM	American Samoa	0.08	83	60231	50398
ATA	Antarctica	0.16	42	13631	11807
ATF	French Southern Territories	0.08	15	11443	9895
ATG	Antigua and Barbuda	0.57	3729	107178	83528
AUS	Australia	28.45	99275	411231	151195
AUT	Austria	35.69	84077	402064	137296
AZE	Azerbaijan	20.41	20094	129709	94340
BDI	Burundi	3.55	1097	52196	42880
BEL	Belgium	45.21	121503	455415	125430
BEN	Benin	2.35	3794	84039	64793
BES	Bonaire, Sint Eustatius and Saba	0.65	87	675	391
BFA	Burkina Faso	2.54	1547	83832	63588
BGD	Bangladesh	8.38	12596	197858	126497
BGR	Bulgaria	7.14	17112	333410	161157
BHR	Bahrain	5.28	10341	161213	109426
BHS	Bahamas, The	4.91	2143	112764	87074
BIH	Bosnia and Herzegovina	4.03	4354	166510	104976
BLM	Saint Barthelemy	0.07	12	1151	682
BLR	Belarus	6.12	15189	182347	101477
BLZ	Belize	0.58	377	102160	81760
BMU	Bermuda	35.77	32101	52032	42293
BOL	Bolivia	3.57	3931	114868	78370
BRA	Brazil	101.38	450192	390469	145324
BRB	Barbados	0.25	380	134317	88128
BRN	Brunei	7.91	5971	80447	60768
BTN	Bhutan	1.07	130	38215	32162
BVT	Bouvet Island	0.50	74	6357	5308
BWA	Botswana	2.59	3872	103952	75654
CAF	Central African Republic	0.64	741	59182	50498
CAN	Canada	72.40	314038	447913	141673
CCK	Cocos (Keeling) Islands	0.03	5	28942	24952
CHE	Switzerland	48.73	192302	428383	136145
CHL	Chile	19.06	51055	247812	131685
CHN	China	204.82	964575	484848	90170
CIV	Cote d'Ivoire	3.54	2668	173161	114579
CMR	Cameroon	3.21	3927	162520	114978
COD	Congo, Democratic Republic of the	3.37	2321	85860	67199
COG	Congo, Republic of the	7.10	5455	99841	77618
COK	Cook Islands	0.28	126	28778	24406
COL	Colombia	12.65	20505	248553	134369
COM	Comoros	0.16	23	24837	20419
CPV	Cape Verde	0.54	164	66543	54235
CRI	Costa Rica	8.71	8950	204397	116330
CUB	Cuba	0.97	887	116830	86176
CUW	Curacao	1.74	814	25205	14859
CXR	Christmas Island	0.15	25	20039	17067
CYM	Cayman Islands	1.67	1013	52393	43372
CYP	Cyprus	6.33	7568	238844	144778
CZE	Czech Republic	25.25	53165	361673	134507
DEU	Germany	207.76	604221	505048	106212
DJI	Djibouti	0.28	108	50921	43495
DMA	Dominica	0.08	43	96735	76762
DNK	Denmark	27.57	72376	417392	144334
DOM	Dominican Republic	4.76	12838	188147	115199
DZA	Algeria	32.92	71378	131418	97307
ECU	Ecuador	12.76	20201	210291	129022
EGY	Egypt, Arab Rep.	8.11	29061	299337	145862
ERI	Eritrea	1.49	373	46703	39924
ESH	Western Sahara	0.06	8	6386	5390
ESP	Spain	99.64	507348	444857	119530
EST	Estonia	4.96	5249	250130	137521
ETH	Ethiopia (excludes Eritrea)	3.50	4111	169668	121932
FIN	Finland	28.49	46100	345940	141456
FJI	Fiji	0.68	502	112434	74405
FLK	Falkland Islands	1.08	185	17524	15012
FRA	France	158.17	597713	488779	105854
FRO	Faeroe Islands	1.10	167	41075	31701
FSM	Micronesia, Federated States of	0.28	57	16044	13156
GAB	Gabon	4.42	4523	105156	81146
GBR	United Kingdom	155.67	546990	493871	119178
GEO	Georgia	1.04	472	190823	134294
GHA	Ghana	3.73	6488	180850	123076
GIB	Gibraltar	0.59	671	57828	47632
GIN	Guinea	3.19	1074	97025	78332
GMB	Gambia, The	0.25	50	73257	61106

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ISO3	Country Name	Mean Exports	Max Exports	#Observations	#Zeroes
GNB	Guinea-Bissau	5.16	990	18911	16019
GNQ	Equatorial Guinea	21.91	3188	34080	27772
GRC	Greece	27.68	72284	340433	151943
GRD	Grenada	0.09	20	58708	48105
GRL	Greenland	1.96	491	29919	24355
GTM	Guatemala	2.06	1300	174822	107039
GUF	French Guiana	0.06	0	12	5
GUM	Guam	0.12	41	36830	28633
GUY	Guyana	0.71	490	98856	71973
HKG	Hong Kong	29.52	191535	387871	135613
HMD	Heard Island and McDonald Islands	0.01	1	4358	3638
HND	Honduras	2.48	1805	145168	97178
HRV	Croatia	9.41	15188	251509	135813
HTI	Haiti	0.85	624	66869	53011
HUN	Hungary	19.47	32754	322083	135165
IDN	Indonesia	20.86	60480	398769	156056
IMN	Isle of Man	15.28	123	54	23
IND	India	69.54	458348	458718	134699
IOT	British Indian Ocean Ter.	0.11	55	27357	24094
IRL	Ireland	40.96	67868	332240	147634
IRN	Iran	28.84	106805	250447	142323
IRQ	Iraq	61.05	22701	71569	58109
ISL	Iceland	5.04	5459	190033	123061
ISR	Israel	23.88	44598	302920	132810
ITA	Italy	141.65	480001	476930	110258
JAM	Jamaica	1.35	1283	157336	107050
JOR	Jordan	3.00	6445	195097	116938
JPN	Japan	419.33	1415613	418911	126628
KAZ	Kazakhstan	23.12	31599	161252	100996
KEN	Kenya	5.75	10147	224274	143489
KGZ	Kyrgyzstan	2.66	1859	104934	76304
KHM	Cambodia	4.42	2662	131392	94496
KIR	Kiribati	0.23	85	22107	19075
KNA	Saint Kitts and Nevis	0.16	57	54605	44155
KOR	Korea, South	105.16	203221	404257	131690
KWT	Kuwait	24.96	37888	180226	117567
LAO	Laos	3.84	1803	76981	59784
LBN	Lebanon	0.52	861	269503	145285
LBR	Liberia	1.86	595	66270	56152
LBY	Libya	35.22	18754	73995	59691
LCA	Saint Lucia	0.17	144	67450	48700
LIE	Liechtenstein	8.46	295	3034	1789
LKA	Sri Lanka	4.10	17761	261440	143403
LSO	Lesotho	2.07	334	35750	29037
LTU	Lithuania	6.43	11109	268554	140093
LUX	Luxembourg	21.58	62883	255449	130761
LVA	Latvia	5.85	11463	241274	133402
MAC	Macao	1.10	1093	107253	71113
MAR	Morocco	6.79	5875	254319	141308
MCO	Monaco	0.02	0	4	2
MDA	Moldova	2.49	2010	134406	89826
MDG	Madagascar	1.47	1427	143136	100064
MDV	Maldives	0.30	115	48908	38625
MEX	Mexico	102.76	279748	332546	137594
MHL	Marshall Islands	2.33	781	30833	26292
MKD	Macedonia	3.53	2541	143330	88137
MLI	Mali	3.06	2494	121058	92946
MLT	Malta	5.00	4324	196532	124661
MMR	Myanmar	8.70	11599	101074	72647
MNE	Montenegro	1.84	1076	49748	31417
MNG	Mongolia	6.67	2780	81905	61938
MNP	Northern Marianas	0.07	42	20697	16468
MOZ	Mozambique	4.43	3123	120864	92506
MRT	Mauritania	2.60	1163	69112	56528
MSR	Montserrat	0.02	3	33768	28449
MUS	Mauritius	2.09	2159	178090	113730
MWI	Malawi	3.29	3831	110255	81967
MYS	Malaysia	21.91	37621	382376	148319
MYT	Mayotte	0.05	26	12459	9373
NAM	Namibia	1.37	1027	194306	140444
NCL	New Caledonia	1.09	386	96687	74843
NER	Niger	2.96	2715	112934	88409
NFK	Norfolk Island	0.03	2	10002	8567
NGA	Nigeria	86.33	169010	196703	133460
NIC	Nicaragua	1.73	897	124986	88073
NIU	Niue	0.13	95	23575	20091
NLD	Netherlands	62.32	193707	484893	129138
NOR	Norway	47.80	173194	324450	137472
NPL	Nepal	2.38	2464	112751	75941
NRU	Nauru	0.14	87	37406	32335
NZL	New Zealand	15.39	39099	326632	148136
OMN	Oman	9.26	22785	171143	110668
PAK	Pakistan	11.10	47625	302648	156043
PAN	Panama	1.41	1525	204284	117720
PCN	Pitcairn	0.02	9	18244	15850
PER	Peru	24.36	33889	224824	123449
PHL	Philippines	14.33	65100	313383	151355
PLW	Palau	0.04	10	15097	12616
PNG	Papua New Guinea	5.25	2471	70730	54207
POL	Poland	46.22	151853	389642	158089

ISO3	Country Name	Mean Exports	Max Exports	#Observations	#Zeroes
PRI	Puerto Rico	0.01	0	25	13
PRK	Korea, North	1.61	5944	180083	122711
PRT	Portugal	24.69	55490	366106	150324
PRY	Paraguay	3.80	2006	108819	76205
PSE	Palestine	3.95	1030	41745	32853
PYF	French Polynesia	0.13	54	63579	48282
QAT	Qatar	26.06	32236	166066	112911
ROU	Romania	23.58	49756	308195	149590
RUS	Russia	53.54	125608	350310	145379
RWA	Rwanda	3.60	2403	71646	55993
SAU	Saudi Arabia	34.63	55590	271794	150881
SCG	Serbia and Montenegro	4.99	5331	27390	11722
SDN	Sudan	10.15	9418	113170	91237
SEN	Senegal	1.22	579	176385	118751
SGP	Singapore	17.77	20860	387573	145020
SGS	South Georgia and South Sandwich Islands	0.05	9	4831	4092
SHN	Saint Helena, Ascension, and Tristan da Cunha	0.07	21	38225	32612
SLB	Solomon Islands	0.33	112	36306	30422
SLE	Sierra Leone	1.22	3321	109954	85968
SLV	El Salvador	3.49	2310	135014	86773
SMR	San Marino	0.22	598	62214	47068
SOM	Somalia	0.71	313	43068	36594
SPM	Saint Pierre and Miquelon	0.10	19	9439	7917
SRB	Serbia	8.86	11375	155497	73732
SSD	South Sudan	23.26	4329	1431	944
STP	Sao Tome and Principe	0.04	8	43583	36656
SUR	Suriname	1.40	1025	105557	82825
SVK	Slovakia	15.32	25551	292232	139053
SVN	Slovenia	7.96	14024	285543	132209
SWE	Sweden	41.65	87211	395584	132315
SWZ	Swaziland	1.57	927	147003	109008
SXM	Sint Maarten	0.07	22	4914	3415
SYC	Seychelles	0.70	287	86160	68440
SYR	Syria	5.18	45330	192354	124263
TCA	Turks and Caicos Islands	0.07	55	56611	48357
TCD	Chad	9.92	3310	43268	36985
TGO	Togo	1.46	843	99571	73004
THA	Thailand	13.41	21976	425045	146228
TJK	Tajikistan	4.09	1001	56713	44993
TKL	Tokelau	0.04	22	50304	42177
TKM	Turkmenistan	15.22	9441	53615	42702
TLS	East Timor	0.48	431	39710	33827
TON	Tonga	0.12	46	28536	23409
TTO	Trinidad and Tobago	4.64	4764	161523	102957
TUN	Tunisia	3.22	4383	228179	128868
TUR	Turkey	22.34	60632	408159	134593
TUV	Tuvalu	0.31	71	18968	16416
TWN	Taiwan	33.33	82328	396874	127856
TZA	Tanzania	2.31	2309	193263	129629
UGA	Uganda	2.98	5424	145506	103693
UKR	Ukraine	20.97	48904	335438	172535
UMI	U.S. Minor Outlying Islands	0.07	71	42973	36875
URY	Uruguay	3.07	5460	173672	109832
USA	United States	720.86	3266031	513572	99200
UZB	Uzbekistan	3.82	2861	83616	61015
VAT	Holy See	0.03	6	21378	18508
VCT	Saint Vincent and the Grenadines	0.24	102	63868	49271
VEN	Venezuela	16.95	44638	182439	114485
VGB	British Virgin Islands	0.77	988	94766	76493
VIR	U.S. Virgin Islands	0.47	16	71	26
VNM	Vietnam	14.12	37670	317891	156808
VUT	Vanuatu	1.02	314	36771	30097
WLF	Wallis and Futuna Islands	0.01	1	10395	8922
WSM	Samoa	0.31	94	47287	37063
YEM	Yemen	6.79	4205	108046	82108
ZAF	South Africa	8.97	27623	415897	157415
ZMB	Zambia	3.27	4297	114920	82221
ZWE	Zimbabwe	1.17	680	136006	94472

Notes: This table lists the 243 countries/regions covered in ITPD-E (in Column 2), and their corresponding 3-letter ISO codes (in Column 1). In addition, for each country, the table reports average exports in million of current US dollars (in Column 3), maximum exports in million of current US dollars (in Column 4), total number of observations (in Column 5), and total number of zeroes (in Column 6), which encompass both reported zeros in the raw administrative data and zeros created during ITPD-E construction as tracked by the *flag_zero* variable. See text for further details.

Table 3: Data File Columns

Column name	Column description
exporter_iso3	ISO 3-letter alpha code of the exporter
exporter_name	Name of the exporter
importer_iso3	ISO 3-letter alpha code of the importer
importer_name	Name of the importer
year	Year
industry_id	ITPD industry code
industry_descr	ITPD industry description
broad_sector	Broad sector
trade	Trade flows in million of current US dollars
flag_mirror	Flag indicator, 1 if trade mirror value is used
flag_zero	Flag indicator:
	'p' if positive trade
	'r' if the raw data contained zero
	'u' missing (unknown, assigned zero)

ITPD-E Code	ITPD-E Description	FCL Item Code	FCL Title
1	Wheat	15	Wheat
2	Rice (raw)	27	Rice, paddy
3	Corn	56	Maize
4	Other cereals	44	Barley
4	Other cereals	71	Rye
4	Other cereals	75	Oats
4	Other cereals	79	Millet
4	Other cereals	83	Sorghum
4	Other cereals	89	Buckwheat
4	Other cereals	92	Quinoa
4	Other cereals	94	Fonio
4	Other cereals	97	Triticale
4	Other cereals	101	Canary seed
4	Other cereals	103	Mixed grain
4	Other cereals	108	Cereals, nes
5	Cereal products	17	Bran of Wheat
5	Cereal products	59	Bran of Maize
5	Cereal products	81	Bran of Millet
5	Cereal products	85	Bran of Sorghum
5	Cereal products	91	Bran of Buckwheat
5	Cereal products	96	Bran of Fonio
6	Soybeans	236	Soybeans
7	Other oilseeds (exc. peanuts)	242	Groundnuts, in shell
7	Other oilseeds (exc. peanuts)	243	Groundnuts, Shelled
7	Other oilseeds (exc. peanuts)	249	Coconuts
7	Other oilseeds (exc. peanuts)	250	Coconuts, Desiccated
7	Other oilseeds (exc. peanuts)	251	Copra
7	Other oilseeds (exc. peanuts)	254	Oil palm fruit
7	Other oilseeds (exc. peanuts)	256	Palm kernels
7	Other oilseeds (exc. peanuts)	263	Karite Nuts (Sheanuts)
7	Other oilseeds (exc. peanuts)	265	Castor Beans
7	Other oilseeds (exc. peanuts)	267	Sunflower seed
7	Other oilseeds (exc. peanuts)	270	Rapeseed or colza seed
7	Other oilseeds (exc. peanuts)	275	Tung Nuts
7	Other oilseeds (exc. peanuts)	280	Safflower seed
7	Other oilseeds (exc. peanuts)	289	Sesame seed
7	Other oilseeds (exc. peanuts)	292	Mustard seed
7	Other oilseeds (exc. peanuts)	296	Poppy seed
7	Other oilseeds (exc. peanuts)	299	Melonseed
7	Other oilseeds (exc. peanuts)	310	Kapok fruit
7	Other oilseeds (exc. peanuts)	311	Kapokseed in shell
7	Other oilseeds (exc. peanuts)	312	Kapokseed, shelled
7	Other oilseeds (exc. peanuts)	328	Seed Cotton
7	Other oilseeds (exc. peanuts)	329	Cottonseed
7	Other oilseeds (exc. peanuts)	333	Linseed
7	Other oilseeds (exc. peanuts)	336	Hempseed
7	Other oilseeds (exc. peanuts)	339	Oilseeds nes
8	Animal feed ingredients & pet foods	169	Beet Pulp
8	Animal feed ingredients & pet foods	628	Pulp, Waste of Fruit for Feed
8	Animal feed ingredients & pet foods	630	Cane Tops
8	Animal feed ingredients & pet foods	635	Straw & Husks
8	Animal feed ingredients & pet foods	639	Grasses nes for forage
8	Animal feed ingredients & pet foods	640	Clover for forage
8	Animal feed ingredients & pet foods	643	Legumes for silage
8	Animal feed ingredients & pet foods	646	Turnips for fodder
8	Animal feed ingredients & pet foods	651	Forage Products nes
8	Animal feed ingredients & pet foods	652	Vegetable Products for Feed nes
8	Animal feed ingredients & pet foods	846	Gluten Feed & Meal
8	Animal feed ingredients & pet foods	858	Hay (Clover, Lucerne, etc.)
8	Animal feed ingredients & pet foods	859	Hay nes
8	Animal feed ingredients & pet foods	862	Alfalfa Meal & Pellets
9	Raw & refined sugar & sugar crops	156	Sugar cane
9	Raw & refined sugar & sugar crops	157	Sugar beet
10	Other sweeteners	161	Sugar crops nes
10	Other sweeteners	1182	Honey
11	Pulses & legumes(dried, preserved)	176	Beans, dry
11	Pulses & legumes(dried, preserved)	181	Broad beans, dry
11	Pulses & legumes(dried, preserved)	187	Peas, dry
11	Pulses & legumes(dried, preserved)	191	Chick-peas, dry
11	Pulses & legumes(dried, preserved)	195	Cow peas, dry
11	Pulses & legumes(dried, preserved)	197	Pigeon peas
11	Pulses & legumes(dried, preserved)	201	Lentils, dry
11	Pulses & legumes(dried, preserved)	203	Bambara beans
11	Pulses & legumes(dried, preserved)	205	Vetches
11	Pulses & legumes(dried, preserved)	210	Lupins
11	Pulses & legumes(dried, preserved)	211	Pulses nes
12	Fresh fruit	486	Bananas
12	Fresh fruit	489	Plantains
12	Fresh fruit	490	Oranges
12	Fresh fruit	495	Tangerines, mandarins, clementines, satsumas
12	Fresh fruit	497	Lemons & limes
12	Fresh fruit	507	Grapefruit & pomelo
12	Fresh fruit	512	Citrus fruit nes
12	Fresh fruit	515	Apples
12	Fresh fruit	521	Pears
12	Fresh fruit	523	Quinces
12	Fresh fruit	526	Apricots

Continued on next page

ITPD-E Code	ITPD-E Description	FCL Item Code	FCL Title
12	Fresh fruit	530	Sour cherries
12	Fresh fruit	531	Cherries
12	Fresh fruit	534	Peaches & nectarines
12	Fresh fruit	536	Plums
12	Fresh fruit	541	Stone fruit, fresh nes
12	Fresh fruit	542	Pome fruit nes
12	Fresh fruit	544	Strawberries
12	Fresh fruit	547	Raspberries
12	Fresh fruit	549	Gooseberries
12	Fresh fruit	550	Currants
12	Fresh fruit	552	Blueberries
12	Fresh fruit	554	Cranberries
12	Fresh fruit	558	Berries nes
12	Fresh fruit	560	Grapes
12	Fresh fruit	561	Raisins
12	Fresh fruit	567	Watermelons
12	Fresh fruit	568	Melons, Cantaloupes
12	Fresh fruit	569	Figs
12	Fresh fruit	571	Mangoes
12	Fresh fruit	572	Avocados
12	Fresh fruit	574	Pineapples
12	Fresh fruit	577	Dates
12	Fresh fruit	587	Persimmons
12	Fresh fruit	591	Cashewapple
12	Fresh fruit	592	Kiwi fruit
12	Fresh fruit	600	Papayas
12	Fresh fruit	603	Fruit, tropical (fresh) nes
12	Fresh fruit	619	Fruit, fresh nes
13	Fresh vegetables	116	Potatoes
13	Fresh vegetables	122	Sweet potatoes
13	Fresh vegetables	125	Cassava
13	Fresh vegetables	135	Yautia (Cocoyam)
13	Fresh vegetables	136	Taro (Cocoyam)
13	Fresh vegetables	137	Yams
13	Fresh vegetables	149	Roots & tubers nes
13	Fresh vegetables	260	Olives
13	Fresh vegetables	358	Cabbages
13	Fresh vegetables	366	Artichokes
13	Fresh vegetables	367	Asparagus
13	Fresh vegetables	372	Lettuce & chicory
13	Fresh vegetables	373	Spinach
13	Fresh vegetables	388	Tomatoes, fresh
13	Fresh vegetables	393	Cauliflowers & broccoli
13	Fresh vegetables	394	Pumpkins, squash & gourds
13	Fresh vegetables	397	Cucumbers & gherkins
13	Fresh vegetables	399	Eggplants
13	Fresh vegetables	401	Chillies & peppers (green)
13	Fresh vegetables	402	Onions, shallots (green)
13	Fresh vegetables	403	Onions, dry
13	Fresh vegetables	406	Garlic
13	Fresh vegetables	407	Leeks & other alliaceous vegetables
13	Fresh vegetables	414	Beans, green
13	Fresh vegetables	417	Peas, green
13	Fresh vegetables	420	Broad Beans, Green
13	Fresh vegetables	423	String Beans
13	Fresh vegetables	426	Carrot
13	Fresh vegetables	430	Okra
13	Fresh vegetables	446	Green Corn (Maize)
13	Fresh vegetables	449	Mushrooms
13	Fresh vegetables	459	Chicory roots
13	Fresh vegetables	463	Vegetables, Fresh n.e.s.
14	Prepared fruits, fruit juices	527	Apricots, Dried
14	Prepared fruits, fruit juices	537	Plums, dried
14	Prepared fruits, fruit juices	570	Figs, Dried
14	Prepared fruits, fruit juices	620	Fruit, dried nes
15	Prepared vegetables	120	Potato Offals
15	Prepared vegetables	128	Cassava, Dried
16	Nuts	216	Brazil nuts
16	Nuts	217	Cashew nuts
16	Nuts	220	Chestnuts
16	Nuts	221	Almonds
16	Nuts	222	Walnuts
16	Nuts	223	Pistachios
16	Nuts	224	Kolanuts
16	Nuts	225	Hazelnuts (Filberts)
16	Nuts	226	Areca nuts
16	Nuts	229	Brazil Nuts, Shelled
16	Nuts	230	Cashew Nuts, Shelled
16	Nuts	231	Almonds, Shelled
16	Nuts	232	Walnuts, Shelled
16	Nuts	233	Hazelnuts, Shelled
16	Nuts	234	Nuts nes
17	Live Cattle	866	Cattle
17	Live Cattle	946	Buffaloes
18	Live Swine	1034	Pigs
19	Eggs	1062	Hen eggs
19	Eggs	1091	Eggs, exc. hen eggs
20	Other meats, livest. pr. live animals	976	Sheep
20	Other meats, livest. pr. live animals	987	Wool, Greasy
20	Other meats, livest. pr. live animals	1009	Wool, Hair Waste

ITPD-E Code	ITPD-E Description	FCL Item Code	FCL Title
20	Other meats, livest. pr. live animals	1016	Goats
20	Other meats, livest. pr. live animals	1026	Skins, Wet-Salted (Goats)
20	Other meats, livest. pr. live animals	1031	Coarse goat hair
20	Other meats, livest. pr. live animals	1057	Chickens
20	Other meats, livest. pr. live animals	1068	Ducks
20	Other meats, livest. pr. live animals	1079	Turkeys
20	Other meats, livest. pr. live animals	1083	Pigeons and other birds
20	Other meats, livest. pr. live animals	1096	Horses
20	Other meats, livest. pr. live animals	1107	Asses
20	Other meats, livest. pr. live animals	1110	Mules
20	Other meats, livest. pr. live animals	1126	Camels
20	Other meats, livest. pr. live animals	1134	Hides, Wet-Salted (Camels)
20	Other meats, livest. pr. live animals	1136	Hides nes, Camels
20	Other meats, livest. pr. live animals	1140	Rabbits
20	Other meats, livest. pr. live animals	1150	Other rodents
20	Other meats, livest. pr. live animals	1157	Other camelids
20	Other meats, livest. pr. live animals	1169	Live animals, non food nes
20	Other meats, livest. pr. live animals	1171	Live animals nes
20	Other meats, livest. pr. live animals	1181	Bees
20	Other meats, livest. pr. live animals	1183	Beeswax
20	Other meats, livest. pr. live animals	1185	Cocoons, reelable
20	Other meats, livest. pr. live animals	1216	Hides nes
20	Other meats, livest. pr. live animals	1218	Hair, fine
21	Cocoa and cocoa products	661	Cocoa beans
22	Beverages, nec	656	Coffee green
22	Beverages, nec	667	Tea
22	Beverages, nec	671	Mate
23	Cotton	767	Cotton Lint
23	Cotton	769	Cotton Waste
24	Tobacco leaves & cigarettes	826	Tobacco leaves
25	Spices	687	Pepper
25	Spices	689	Pimento
25	Spices	692	Vanilla
25	Spices	693	Cinnamon (canella)
25	Spices	698	Cloves
25	Spices	702	Nutmeg, mace, cardamoms
25	Spices	711	Anise, badian, fennel
25	Spices	720	Ginger
25	Spices	723	Spices nes
26	Other ag. products, nec	460	Vegetable products, fresh or dry nes
26	Other ag. products, nec	461	Carobs
26	Other ag. products, nec	654	Dregs from brewing, distillation
26	Other ag. products, nec	677	Hops
26	Other ag. products, nec	748	Peppermint, Spearmint
26	Other ag. products, nec	754	Pyrethrum, dried flowers
26	Other ag. products, nec	755	Pyrethrum Extract
26	Other ag. products, nec	771	Flax, raw or retted
26	Other ag. products, nec	777	Hemp fibre and tow
26	Other ag. products, nec	778	Kapok fibre
26	Other ag. products, nec	780	Jute
26	Other ag. products, nec	782	Jute-like fibres
26	Other ag. products, nec	788	Ramie
26	Other ag. products, nec	789	Sisal
26	Other ag. products, nec	800	Agave fibres nes
26	Other ag. products, nec	809	Abaca manila hemp
26	Other ag. products, nec	813	Coir
26	Other ag. products, nec	821	Fibre crops nes
26	Other ag. products, nec	836	Natural rubber
26	Other ag. products, nec	837	Rubber, Natural (Dry)
26	Other ag. products, nec	839	Natural gums
26	Other ag. products, nec	1293	Crude Organic Materials nes

Notes: This table presents the concordance that we created between the ITPD-E agriculture classification and the FCL classification.

Table 5: Mining: ITPD-E Classification and Concordances

ITPD-E Code	ITPD-E Description	ISIC3	ISIC rev. 3 Description	ISIC4	ISIC rev. 4 Description
27	Mining of hard coal	101	Mining and agglomeration of hard coal	51	Mining of hard coal
28	Mining of lignite	102	Mining and agglomeration of lignite	52	Mining of lignite
29	Extraction crude oil and gas	111	Extraction crude oil and gas	6	Extraction of crude oil and gas
30	Mining of iron ores	131	Iron ores	71	Mining of iron ores
31	Other mining and quarring	190	C-(101+102+111+131)	90	B-(051+052+61+62+071)
32	Electricity prodcn, collcn, and distr.	401	Electricity prodcn, collcn, and distr.	351	Electric power generation, transmission
33	Gas production and distribution	402	Gas production and distribution	352	Manufacture of gas

Notes: This table presents the concordance that we created between the ITPD-E mining classification, the ISIC rev. 3 and ISIC rev. 4 classifications.

Table 6: Manufacturing: ITPD-E Classification and Concordances

ITPD-E Code	ITPD-E Description	ISIC3	ISIC4
34	Processing/preserving of meat	1511	1010
35	Processing/preserving of fish	1512	1020
36	Processing/preserving of fruit & vegetables	1513	1030
37	Vegetable and animal oils and fats	1514	1040
38	Dairy products	1520	1050
39	Grain mill products	1531	1061
40	Starches and starch products	1532	1062
41	Prepared animal feeds	1533	1080
42	Bakery products	1541	1071
43	Sugar	1542	1072
44	Cocoa chocolate and sugar confectionery	1543	1073
45	Macaroni noodles & similar products	1544	1074
46	Other food products n.e.c.	1549	1075+1079
47	Distilling rectifying & blending of spirits	1551	1101
48	Wines	1552	1102
49	Malt liquors and malt	1553	1103
50	Soft drinks; mineral waters	1554	1104
51	Tobacco products	1600	1200
52	Textile fibre preparation; textile weaving	1711	1311+1312
53	Made-up textile articles except apparel	1721	1392
54	Carpets and rugs	1722	1393
55	Cordage rope twine and netting	1723	1394
56	Other textiles n.e.c.	1729	1399
57	Knitted and crocheted fabrics and articles	1730	1430+1391
58	Wearing apparel except fur apparel	1810	1410
59	Dressing & dyeing of fur; processing of fur	1820	1420
60	Tanning and dressing of leather	1911	1511
61	Luggage handbags etc.; saddlery & harness	1912	1512
62	Footwear	1920	1520
63	Sawmilling and planing of wood	2010	1610
64	Veneer sheets plywood particle board etc.	2021	1621
65	Builders' carpentry and joinery	2022	1622
66	Wooden containers	2023	1623
67	Other wood products; articles of cork/straw	2029	1629
68	Pulp paper and paperboard	2101	1701
69	Corrugated paper and paperboard	2102	1702
70	Other articles of paper and paperboard	2109	1709
71	Publishing of books and other publications	2211	
72	Publishing of newspapers journals etc.	2212	
73	Publishing of recorded media	2213	
74	Other publishing	2219	
75	Printing	2221	1811
76	Service activities related to printing	2222	1812
77	Reproduction of recorded media	2230	1820
78	Coke oven products	2310	1910
79	Refined petroleum products	2320	1920
80	Processing of nuclear fuel	2330	
81	Basic chemicals except fertilizers	2411	2011
82	Fertilizers and nitrogen compounds	2412	2012
83	Plastics in primary forms; synthetic rubber	2413	2013
84	Pesticides and other agro-chemical products	2421	2021
85	Paints varnishes printing ink and mastics	2422	2022
86	Pharmaceuticals medicinal chemicals etc.	2423	2100
87	Soap cleaning & cosmetic preparations	2424	2023
88	Other chemical products n.e.c.	2429	2029+2680
89	Man-made fibers	2430	2030
90	Rubber tires and tubes	2511	2211
91	Other rubber products	2519	2219
92	Plastic products	2520	2220
93	Glass and glass products	2610	2310
94	Pottery china and earthenware	2691	2393
95	Refractory ceramic products	2692	2391
96	Struct.non-refractory clay; ceramic products	2693	2392
97	Cement lime and plaster	2694	2394
98	Articles of concrete cement and plaster	2695	2395
99	Cutting shaping & finishing of stone	2696	2396
100	Other non-metallic mineral products n.e.c.	2699	2399
101	Basic iron and steel	2710	2410
102	Basic precious and non-ferrous metals	2720	2420
103	Casting of iron and steel	2731	2431
104	Structural metal products	2811	2511
105	Tanks reservoirs and containers of metal	2812	2512
106	Steam generators	2813	2513
107	Cutlery hand tools and general hardware	2893	2593
108	Other fabricated metal products n.e.c.	2899	2599
109	Engines & turbines (not for transport equipment)	2911	2811
110	Pumps compressors taps and valves	2912	2812+2813
111	Bearings gears gearing & driving elements	2913	2814
112	Ovens furnaces and furnace burners	2914	2815
113	Lifting and handling equipment	2915	2816
114	Other general purpose machinery	2919	2819
115	Agricultural and forestry machinery	2921	2821
116	Machine tools	2922	2818+2822
117	Machinery for metallurgy	2923	2823
118	Machinery for mining & construction	2924	2824
119	Food/beverage/tobacco processing machinery	2925	2825
120	Machinery for textile apparel and leather	2926	2826

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ITPD-E Code	ITPD-E Description	ISIC3	ISIC4
121	Weapons and ammunition	2927	2520+3040
122	Other special purpose machinery	2929	2829
123	Domestic appliances n.e.c.	2930	2750
124	Office accounting and computing machinery	3000	2620+2817
125	Electric motors generators and transformers	3110	2710
126	Electricity distribution & control apparatus	3120	2733
127	Insulated wire and cable	3130	2731+2732
128	Accumulators primary cells and batteries	3140	2720
129	Lighting equipment and electric lamps	3150	2740
130	Other electrical equipment n.e.c.	3190	2790
131	Electronic valves tubes etc.	3210	2610
132	TV/radio transmitters; line comm. apparatus	3220	2630
133	TV and radio receivers and associated goods	3230	2640
134	Medical surgical and orthopedic equipment	3311	2660+3250
135	Measuring/testing/navigating appliances and equipment	3312+3313	2651
136	Optical instruments & photographic equipment	3320	2670
137	Watches and clocks	3330	2652
138	Motor vehicles	3410	2910
139	Automobile bodies trailers & semi-trailers	3420	2920
140	Parts/accessories for automobiles	3430	2930
141	Building and repairing of ships	3511	3011
142	Building/repairing of pleasure/sport. boats	3512	3012
143	Railway/tramway locomotives & rolling stock	3520	3020
144	Aircraft and spacecraft	3530	3030
145	Motorcycles	3591	3091
146	Bicycles and invalid carriages	3592	3092
147	Other transport equipment n.e.c.	3599	3099
148	Furniture	3610	3100
149	Jewelery and related articles	3691	3211+3212
150	Musical instruments	3692	3220
151	Sports goods	3693	3230
152	Games and toys	3694	3240
153	Other manufacturing n.e.c.	3699	3290

Notes: This table presents the concordance that we created between the ITPD-E manufacturing classification, the ISIC rev. 3 and ISIC rev. 4 classifications.

Table 7: Services: EBOPS–ISIC–ITPD Concordance

ITPD-E Code	ITPD-E Description	EBOPS 2002	EBOPS 2010	ISIC Rev. 4
154	Manufacturing services on physical inputs owned by others		SA	–
155	Maintenance and repair services n.i.e.		SB	–
156	Transport	205, 246	SC	H
157	Travel	237, 243	SDA + SDB3	I
158	Construction	249	SE	F
159	Insurance and pension services	253	SF	K (60%)
160	Financial services	260	SG	K (40%)
161	Charges for the use of intellectual property n.i.e.	266	SH	–
162	Telecommunications, computer, and information services	247, 262, 288	SI + SK1	J
163	Other business services	272, 273	SJ excl SJ34	M + N
164	Heritage and recreational services	–	SK23[a]	R
165	Health services	241, 896	SDB1 + SK21	Q
166	Education services	242, 895	SDB2 + SK22	P
167	Government goods and services n.i.e.	291	SL	–
168	Services not allocated	982	SN	–
169	Trade-related services	271	SJ34	G
170	Other personal services	–	SK24[a]	S

[a] EBOPS codes SK23 and SK24 are new to BPM6 and have no backwards correspondence in BPM5. The concordance in this table differs from (Wettstein et al., 2019, Table 14) in three respects:

(1) ISIC industry L is not concorded to 'other business services' (EBOPS SJ);

(2) Rather than aggregating financial services and insurance services, respectively, we keep these two services products separate and split ISIC category K according to a fixed fraction;

(3) We do not include EBOPS SW (trade margins of wholesalers and retailers) as part of SJ34 because this code is not included in the WTO-UNCTAD-ITC annual trade in services dataset.

Table 8: Coverage of joint WTO-UN services trade flow dataset

Year	UN TSD only	UN TSD updated	WTO only	Total
2000	7,448	0	0	7,448
2001	7,945	0	0	7,945
2002	10,164	0	0	10,164
2003	11,045	0	0	11,045
2004	21,075	0	0	21,075
2005	21,297	10	3,970	25,277
2006	22,387	33	5,235	27,655
2007	22,403	39	6,254	28,696
2008	19,671	82	11,271	31,024
2009	18,009	87	15,255	33,351
2010	7,316	46	30,019	37,381
2011	6,741	39	32,616	39,396
2012	3,542	35	34,831	38,408
2013	1,580	3	37,891	39,474
2014	2,602	3	39,073	41,678
2015	2,140	5	40,691	42,836
2016	0	0	39,481	39,481
Total	185,365	382	296,587	482,334

Figure 1: OLS Gravity Estimates
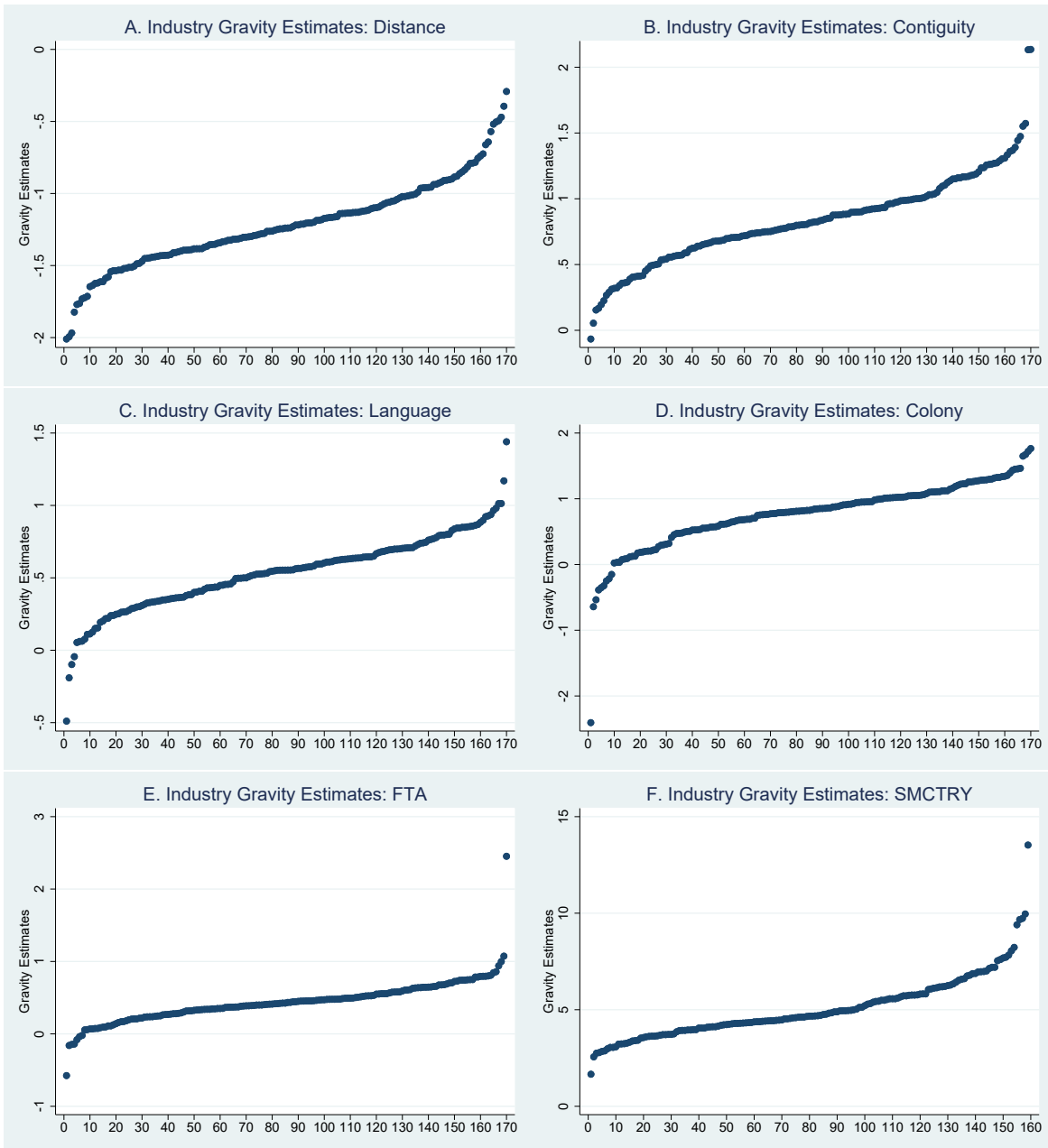
Notes: Each panel of this figure reports estimates of the effects of a standard gravity covariate across the 170 industries of the ITPD-E. The estimates are obtained with the OLS estimator and the dependent variable is the logarithm of bilateral trade. All estimates are obtained with exporter-time and importer-time fixed effects. Each dot in each panel represents an estimate for a particular industry and the estimates are ordered from the smallest to the largest. See text for further details.

Figure 2: OLS Gravity Estimates, No Mirrored Data
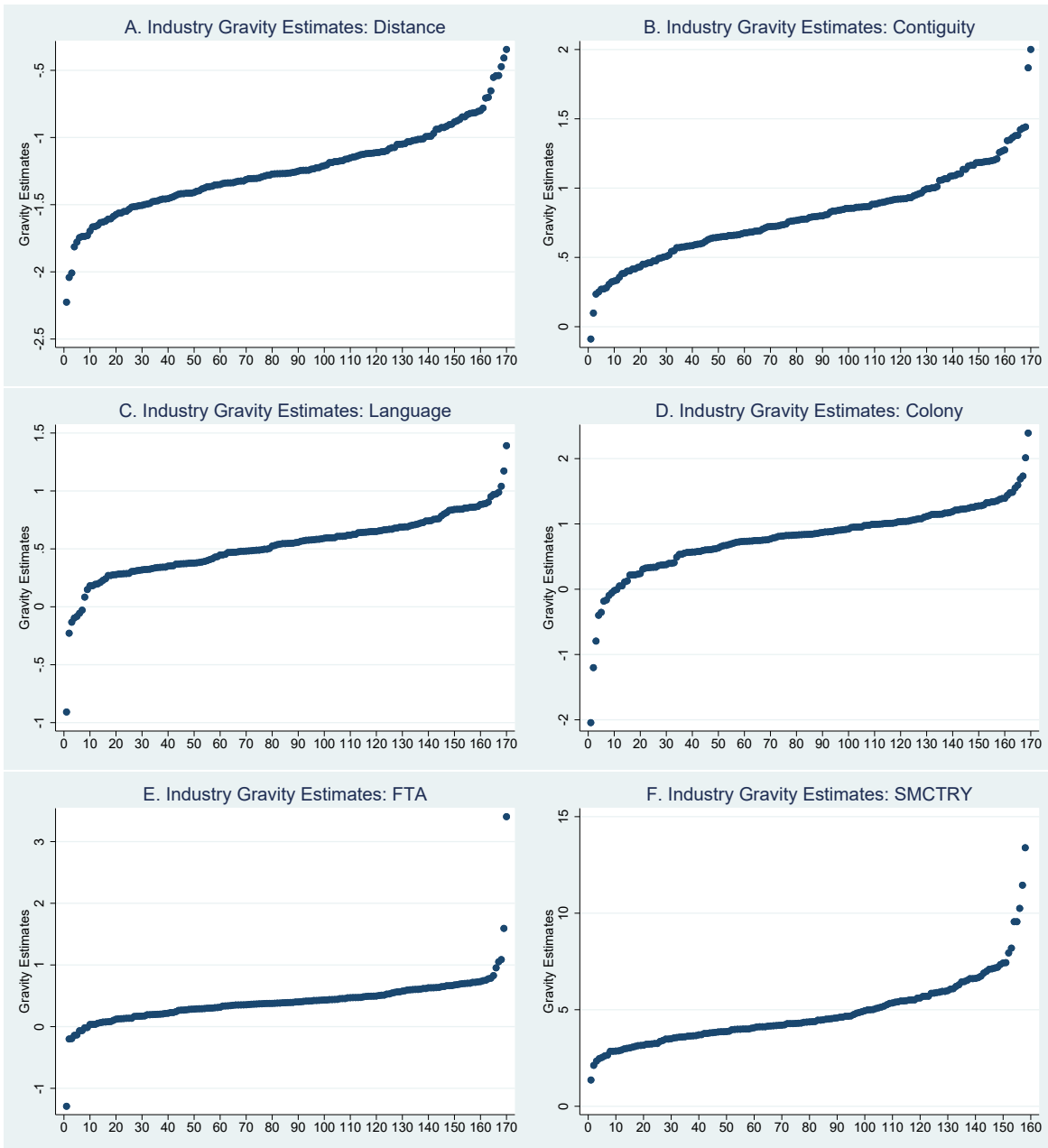
Notes: Each panel of this figure reports estimates of the effects of a standard gravity covariate across the 170 industries of the ITPD-E. The estimating sample does not include observations that were obtained after mirroring the underlying data, as described in the main text. The estimates are obtained with the OLS estimator and the dependent variable is the logarithm of bilateral trade. All estimates are obtained with exporter-time and importer-time fixed effects. Each dot in each panel represents an estimate for a particular industry and the estimates are ordered from the smallest to the largest. See text for further details.