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An Account of Global Intra-industry Trade, 1962–2006

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1. INTRODUCTION

MERCHANDISE trade is by far the best documented aspect of international economic relations. Trade data therefore offer a rich source of information on patterns and shifts in the allocation of economic activity around the globe.

In this paper I describe global merchandise trade flows through the lens of intra-industry trade (IIT) indices, which quantify the extent to which bilateral imports and exports are matched within sectors. A simple description of IIT patterns is of interest for two main purposes: as a gauge of the sectoral similarity of different national economies, and as a proxy for the intensity of factor-market adjustment pressures associated with trade expansion.

It is easy to see how IIT can serve as an indicator of economic similarity: for two countries to be able to export goods of a particular sector to each other, they both need to produce this good.[1] Given the relative paucity of internationally

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[1] The link between export values and production values is provided by export propensities, which can vary considerably across sectors and destinations. Hence, trade values are a noisy measure of underlying production values. Trade and production specialisation may even diverge. Epifani (2005), for example, develops a trade model within which increasing inter-industry specialisation in production coincides with rising IIT. The present study relies on the premise that such configurations are the exception, not the rule. Moreover, actual trade data occasionally (and erroneously) report goods that merely transit a country (typically one that hosts an important port) as exports. In this case, trade flows also do not reflect production patterns. Work by Amiti and Venables (2002) and by Venables et al. (2003) supports the interpretation of IIT that motivates this study. Venables et al. (2003), for example, conclude that their results 'provide strong support for the view that the spatial pattern of IIT is merely reflecting the spatial distribution of country characteristics' (p. 2) and that 'close countries do a lot of IIT because they have similar economic structures' (Abstract).

comparable and sectorally disaggregated production and employment data, trade-based measures can provide uniquely comprehensive (though indirect) evidence on international specialisation patterns.

The link between IIT and adjustment is similarly intuitive. If tighter international trade integration leaves the sectoral composition of national economies broadly intact by fostering the two-way exchange of different 'varieties' of the same type of good, then labour and capital do not have to be reallocated from declining import-competing sectors to expanding export sectors, but simply between different product lines within a given sector. It is primarily because of this 'smooth-adjustment hypothesis' that the discovery of high IIT levels among liberalising European countries in the late 1960s generated enormous interest among policy-oriented economists and that IIT continues to be used as a diagnostic tool in impact assessments of trade reforms.[2]

The paper is organised as follows. Section 2 presents the IIT measures employed and the data on which they are computed. In Section 3, I provide a snapshot of global IIT patterns in 2006, the last year for which I have data; and in Section 4 I take a longer view by describing the evolution of IIT over the full sample period 1962–2006. The evolution of the main cross-country determinants of IIT, based on annual regression estimates, is described in Section 5. Section 6 reports measures of marginal IIT, which are more closely related to structural adjustment than the standard IIT indices. Section 7 concludes.

2. MEASUREMENT AND DATA

a. The Grubel–Lloyd Index

IIT is commonly understood as coterminous with the index proposed by Grubel and Lloyd (1975), which expresses IIT as a share of total bilateral trade in a particular industry i:

$$GL_{cd,i} = 1 - \frac{| X_{cd,i} - M_{cd,i} |}{(X_{cd,i} + M_{cd,i})}, \tag{1}$$

where $X_{cd,i}$ and $M_{cd,i}$ refer to country c's exports and imports respectively, to/from country d over one particular year (time subscripts are implied). This measure takes values between zero and one and increases in the share of IIT.

[2] The proposition that IIT entails lower adjustment costs than inter-industry trade was originally articulated by Balassa (1966) and further developed in the influential monographs on IIT by Grubel and Lloyd (1975) and Greenaway and Milner (1986). For a survey, see Brülhart (1999).

GL indices can be aggregated across N industries, as a trade-weighted (rather than simple arithmetic) average of the industry indices:

$$GL_{cd} = \sum_{i=1}^{N} w_{cd,i} GL_{cd,i} = \sum_{i=1}^{N} \left(\frac{X_{cd,i} + M_{cd,i}}{\sum_{i=1}^{N} (X_{cd,i} + M_{cd,i})} \right) GL_{cd,i} = 1 - \frac{\sum_{i=1}^{N} | X_{cd,i} - M_{cd,i} |}{\sum_{i=1}^{N} (X_{cd,i} + M_{cd,i})}.$$

Equivalent to this definition is the following expression:

$$GL_{cd} = \frac{\sum_{i=1}^{N} 2 * (\min X_{cd,i}, M_{cd,i})}{\sum_{i=1}^{N} (X_{cd,i} + M_{cd,i})}, \tag{2}$$

which is easily summed to give a country's total bilateral IIT across all trade partners:

$$GL_{c} = \sum_{d=1}^{D_c} \left(\frac{\sum_{i=1}^{N} 2 * (\min X_{cd,i}, M_{cd,i})}{\sum_{i=1}^{N} (X_{cd,i} + M_{cd,i})} \right), \tag{3}$$

where D_c is country c's number of trading partners. This can be further aggregated across countries, for a measure of IIT by group of countries C (which could mean the entire world economy):

$$GL_{countrygroup} = \sum_{c=1}^{C} \sum_{d=1}^{D_c} \left(\frac{\sum_{i=1}^{N} 2 * (\min X_{cd,i}, M_{cd,i})}{\sum_{i=1}^{N} (X_{cd,i} + M_{cd,i})} \right), \tag{4}$$

where C delineates the group of countries considered.[3]

Three variants of the index in (4) will be distinguished. First, for IIT *within* a particular country group C (say, among all low-income countries), $D_c \subseteq C \ \forall c$. Conversely, for IIT *between* country groups (say, between low-income and

[3] I let C symbolise both the number of countries in a particular group and the particular group (set) itself.

high-income countries), $D_c \not\subset C \ \forall c$. Finally, country group C's *total* IIT (say, IIT of low-income countries with all their trading partners) obtains when $D_c \subseteq \{C, C'\} \ \forall c$, where C' denotes the complement to C (i.e. all trading nations that are not part of the group C).

Note that all these indices are computed for pairs of countries. It would be simple to aggregate a country's trade flows across all (or a subset) of that country's trade partners to obtain a measure of 'multilateral IIT'. However, most of the interest in IIT measures stems from the observation of simultaneous imports and exports between a given pair of countries, and this definition of IIT also serves best to identify similarity of trade compositions among country pairs. I therefore use bilateral IIT measures as the basis for all the results reported in this paper.[4]

The GL index is highly intuitive and has found near-universal acceptance. Two additional measurement issues nonetheless merit discussion.

(i) Categorical aggregation

The definition of an 'industry' is probably the most contentious issue in applied IIT research. Grubel and Lloyd (1975, p. 86) defined IIT as 'trade in differentiated products which are close substitutes'. Over time, it has become generally accepted that the relevant criterion is substitutability in production (rather than in consumption), since this is the aspect of industries that (a) maps trade flows to production patterns and (b) lies at the heart of the link between IIT and factor-market adjustment.[5] Whilst statistical product classifications are inevitably imperfect in this respect, they are nevertheless largely guided by the correct criterion, i.e. an effort to group together goods with similar input requirements.[6] This still leaves open the question about the most appropriate level of statistical aggregation for the calculation of IIT indices. Whilst many empirical studies use data at the 3-digit level, this choice is mostly motivated by expediency rather than any *a priori* reason for favouring that level of aggregation. I opt for a narrower definition in this paper, by working mainly with 5-digit

[4] Through this bilateral definition, our IIT indices are conservative measures of the international fragmentation of production (also referred to as outward processing), as they will not capture sequential production chains that encompass more than two countries (see e.g. Hummels et al., 2001).

[5] Furthermore, it is this definition of IIT that distinguishes it from trade based on comparative advantage and that provided the impetus for economic theorists to develop the 'new trade theory' (see Helpman and Krugman, 1985, for a comprehensive statement).

[6] In the list of five similarity criteria used by the experts in charge of the third revision of the Standard International Trade Classification (SITC), an earlier version of which my calculations are based on, the first principle was 'the nature of the merchandise and the materials used in its production', while 'the uses of the product' only ranks third (United Nations, 1986, p. viii). Evidence in favour of reasonable homogeneity of statistical sectors in terms of factor requirements has been found by Elliott et al. (2000).

sectors and thus distinguishing up to 1,161 different 'industries'. This minimises the likelihood of grouping substantially different activities under the same industry heading.

(ii) Adjustment for overall trade imbalance

The upper bound of a country's mean GL index is negatively related to the size of that country's overall trade surplus or deficit relative to total trade. Hence, a larger imbalance in the trade account implies lower GL indices on average. Aquino (1978) has suggested a corresponding adjustment method for the GL index. The rationale for such an adjustment has, however, been questioned on the grounds that visible trade imbalances, both bilateral and multilateral, may well be compatible with balance of payments equilibrium (Greenaway and Milner, 1986).[7] Given the difficulty in estimating equilibrium trade imbalances, the professional consensus has been to work with unadjusted GL indices. Furthermore, if IIT measures are to be interpreted as gauges of international specialisation patterns, no modification of the basic GL index is warranted. I therefore report unadjusted indices throughout.

b. Marginal IIT

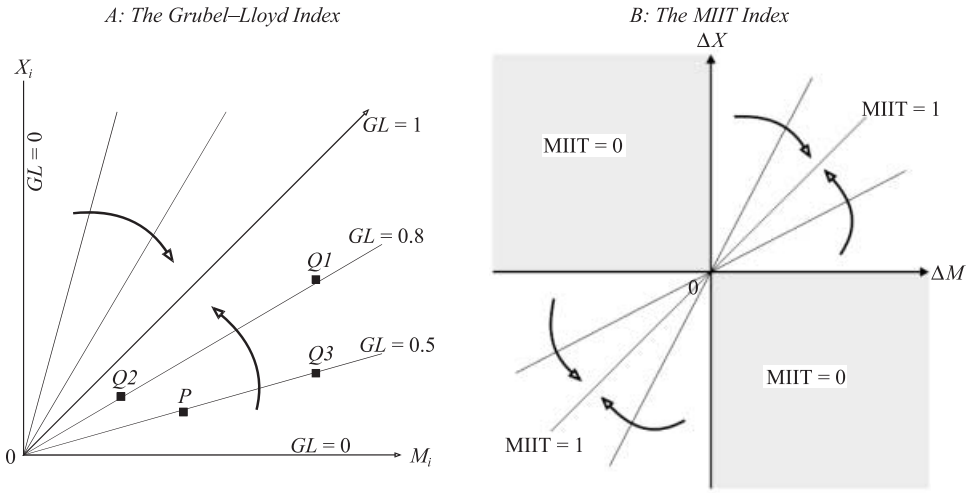
The GL index refers to the pattern of trade in one year, and in that sense it is a static measure. This is appropriate if one seeks to quantify international specialisation patterns at a particular point in time. In the context of structural adjustment, however, it is the structure of *changes* in trade patterns which is important. This insight has motivated the development of 'dynamic' measures referred to as *marginal* IIT (MIIT).[8] Hamilton and Kniest (1991) first made this distinction by pointing out that the observation of a high proportion of IIT in one particular time period does not justify *a priori* any prediction of the likely pattern of *change* in trade flows. Even an observed increase in static IIT between two periods ($GL_t - GL_{t-1} > 0$) could 'hide' a very uneven change in trade flows, concomitant with *inter*- rather than *intra*-industry adjustment.

MIIT denotes parallel increases or decreases of imports and exports in an industry. Such matched changes of sectoral trade volumes can plausibly be

[7] Egger et al. (2007) propose a similar adjustment motivated by the fact that profit repatriation of multinational firms can imply inherently unbalanced bilateral trade. This is an interesting extension of IIT measurement. However, the bulk of global merchandise trade continues to be arm's-length (OECD, 2002). Moreover, while multinational activity may cause bilateral imbalances at the sector level, this is not a necessary implication.

[8] The GL index is calculated on the basis of cross-border *flows* of goods and is thus not a static measure in the strictest sense. Yet, 'static' IIT in the sense of the GL index contrasts with 'dynamic' measures of MIIT since the latter relate to the change in these flows between two different periods.

FIGURE 1
IIT, MIIT and Trade Changes



associated with a broadly neutral effect on employment. For example, if industry *i* imports expand, domestic jobs may be threatened in that industry, but if industry *i* exports expand by a comparable amount, this may offset lost market share in the domestic market and yield a zero net change in the industry's domestic employment.[9]

An illustration of the difference between IIT and MIIT is given in Figure 1. Figure 1A graphs a hypothetical country's bilateral imports and exports in a particular industry. All points along any ray from the origin share the same GL index, since they represent equal sectoral import–export proportions. Assume that *P* represents the sectoral trade balance in the base year ($t - T$): home-country imports exceed exports by a ratio of 3:1. The industry thus exhibits a GL index of 0.5. Assume further that the GL index is higher in the end year (t). A move from *P* to both *Q1* and *Q2* would show up as an increase in the GL index from 0.5 to 0.8. However, the pattern of trade change is quite different between the two scenarios. With a shift from *P* to *Q1*, exports and imports increase at the same absolute rate, and both countries (assuming there are only two) have captured an equal share of the increased volume of trade in this sector. If this pattern appears for other industries as well, then the adjustment process is *intra*-industry, since all countries share equally in the growth (or decline) of all

[9] This conjecture evidently only holds if other relevant variables are held constant. Lovely and Nelson (2000) have shown that, in general equilibrium, MIIT can be associated with inter-industry reallocation of factors if productivity is also allowed to change.

these sectors. A move from *P* to *Q2*, however, implies that exports have declined while imports have increased. If this pattern appears also in other industries – with the home country not necessarily always on the 'losing' side – the adjustment process is *inter*-industry. A rise in the GL index can thus hide both a process of *intra*- and *inter*-industry trade change.

Several MIIT measures have been developed to quantify the 'matchedness' of trade changes. The most straightforward of these measures is a transposition of the Grubel–Lloyd index to first differences of sectoral trade flows (country subscripts implied):

$$MIIT_{it} = 1 - \frac{| \Delta X_{it} - \Delta M_{it} |}{| \Delta X_{it} | + | \Delta M_{it} |}, \tag{5}$$

where Δ stands for the difference between years t and $t - T$.[10] This index, like the GL index, varies between zero and one, where zero indicates marginal trade in the particular industry to be completely of the *inter*-industry type, and one represents marginal trade to be entirely of the *intra*-industry type.

The MIIT index is related strictly to the structure of the *change* in trading patterns – information on levels of exports or imports is not required. Hence, MIIT can be mapped onto a plane that is defined by ΔX and ΔM (Figure 1B). The possibility of such a mapping is what essentially distinguishes MIIT measures from IIT.

The MIIT index shares most of the statistical properties of the GL index.[11] In particular, it can also be summed across industries, by applying the following formula for a weighted average:

$$MIIT_t = \sum_{i=1}^{N} w_{it} MIIT_{it}, \qquad \text{where } w_{it} = \frac{| \Delta X |_{it} + | \Delta M |_{it}}{\sum_{i=1}^{N} (| \Delta X |_{it} + | \Delta M |_{it})}, \tag{6}$$

and where $MIIT_t$ is the weighted average of $MIIT_{it}$ over all sectors of the economy or over all the sub-sectors of a sector.

A number of empirical studies have established significantly negative partial correlations between MIIT and various measures of labour market adjustment pressures.[12]

[10] See Brülhart (1994).

[11] For a detailed exploration of the parallels and differences between the IIT and MIIT indices, see Oliveras and Terra (1997).

[12] See Brülhart (2002) and Azhar and Elliott (2004) for discussions of the properties of this and alternative MIIT measures. Brülhart and Elliott (2002), Brülhart et al. (2006) and Cabral and Silva (2006) describe recent empirical tests of the 'smooth adjustment hypothesis' associated with MIIT.

c. Data

All trade data used for this paper are taken from the World Integrated Trade Solution (WITS) database, jointly developed by the World Bank and UNCTAD. The underlying information source is the United Nations Statistical Division's Commodity Trade database (COMTRADE). I retain all bilateral imports and exports in value terms (current US dollars).

The definition of an 'industry' requires a choice not only about the level of statistical aggregation but also about the classification scheme to adopt. I have chosen to work with the Revision 1 version of the UN's Standard International Trade Classification (SITC). Revision 1 has the advantage of offering maximum comparability over the sample period, as trade statistics have been recorded according to this classification since 1960. The disadvantage is that some sectors which are larger and more differentiated now than they were in 1960 are still recorded as a unique 'industry'. This will imply a tendency toward higher measured IIT in sectors that have experienced product innovation relative to sectors whose traded goods have remained unchanged. Since my main focus is on the geographic pattern of IIT rather than on sector variations, however, my priority is to obtain consistent time series by country.

Most of my calculations are performed at the 5-digit level of the SITC classification, which corresponds to the finest possible definition of an 'industry' in the available data. At the 5-digit level of the SITC Revision 1, trade is categorised into 1,161 different sectors.[13] For the purpose of comparison, I also carry out some IIT computations at the SITC 3-digit level, where 177 sectors are distinguished.

Although COMTRADE offers the most comprehensive available database on international trade flows, country coverage is not uniform between 1962 and 2006. I address this issue in two ways.

One approach is to narrow down the list of countries to those for which coverage is broad enough such that I can be confident that intertemporal comparisons are not driven by variations in country coverage. I have therefore established a list of 56 countries which report trade data in at least 40 of the 45 sample years, to produce an (almost) balanced panel of consistent data.[14] I refer

[13] Four examples to illustrate the narrowness of the basic industry definition: in 2006, the smallest 5-digit sector was SITC 3324 ('residual fuel oils'), accounting for 0.000002 per cent of the value of recorded world trade; the biggest 5-digit sector was SITC 33101 ('crude petroleum'), accounting for 9.54 per cent of world trade; the median 5-digit sector was SITC 71965 ('automatic vending machines'), accounting for 0.00014 per cent of world trade; and the mean 5-digit sector was SITC 03201 ('fish, prepared or preserved'), which accounted for 0.087 per cent of world trade.

[14] In the construction of the balanced panel, I also drop four of the 1,161 5-digit sectors for which COMTRADE does not provide consistent coverage over the sample period. The 56 countries included in the 'long coverage' dataset are listed in the Appendix.

to this as the '*long coverage*' dataset. For this dataset, I retain only data reported by the importing countries, as these can be considered to be more reliable on average (customs services having a stronger incentive to monitor imports than to monitor exports).

As a second approach, I exploit the fact that country coverage is broader if one takes account of reported export data as well as of reported imports. One can take exporting country statistics to infer imports of countries that have not submitted their statistics to the UN. I therefore use exporter data to fill as many gaps as possible for four sample years: 1962, 1975, 1990 and 2006. Since the non-reporting countries are mainly from the developing world, this '*wide coverage*' dataset allows me to incorporate many low-income countries into the analysis that are not part of the 'long coverage' sample.[15]

At the 5-digit level, the 'long coverage' dataset identifies between 565,000 (1962) and 3,952,000 (2005) 5-digit bilateral trade flows.[16] Over the 45-year sample period, this dataset contains a total of some 39.6 million observations. In the 'wide coverage' dataset, the number of observations ranges from 962,000 in 1962 to 4,903,000 in 2006. The 'wide coverage' data report trade flows for 177 countries in 1962 and for 214 countries in 2006.[17]

3. GLOBAL IIT IN 2006

I begin by documenting IIT patterns in 2006, the latest available sample year.

In 2006, 27 per cent of world trade was intra-industry if measured at the 5-digit level, and fully 44 per cent if measured at the 3-digit level. These are my best estimates of the most recent IIT share, based on the 214 countries in the 'wide coverage' sample, and applying the trade-weighted aggregator of expression (4).

At the level of individual nations, Table 1 reports trade shares and GL indices, computed according to expression (3), for the 214 sample countries. Countries are sorted in decreasing order of their recorded share in world trade.

It becomes immediately apparent that IIT at the 3-digit level is higher than IIT at the 5-digit level. The unweighted IIT averages are 0.14 at the 3-digit level and 0.07 at the 5-digit level (see final row of Table 1). Table 1 also clearly shows

[15] In addition to question marks over the reliability of reported export statistics, there is a definitional inconsistency. Export values are officially measured 'free on board' (FOB), whereas import values are recorded inclusive of the cost of insurance and freight (CIF). In the actual data, this seems to be a minor concern. On average, reported imports are valued about 1 per cent higher than the corresponding exports.

[16] The data for 2006 were downloaded from WITS in January 2008. At that stage, coverage for 2005 was still slightly larger than for 2006 (3,771,754 observations).

[17] See Table 1 for a list of the 214 countries in the 2006 'wide coverage' dataset.

TABLE 1
Total Trade and IIT in 2006, by Country
(Sorted in decreasing order of % of world trade, 'wide coverage' dataset)

Country	*% of World Trade*	*% of 5-Digit Sectors Traded*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*World Bank Income Group**	*World Bank Region*
United States	13.20457	100.0	0.317	0.503	HIC	North America
China	9.67536	99.8	0.182	0.305	LMC	Northeast Asia
Germany	9.39718	99.7	0.419	0.570	HIC	Western Europe
Japan	6.29006	99.7	0.238	0.398	HIC	Northeast Asia
France	4.46524	99.8	0.424	0.600	HIC	Western Europe
United Kingdom	4.06561	99.8	0.362	0.525	HIC	Western Europe
Italy	3.84131	99.8	0.344	0.497	HIC	Western Europe
Korea, Rep.	3.21344	99.6	0.240	0.412	HIC	Northeast Asia
Belgium	2.94437	99.7	0.394	0.536	HIC	Western Europe
Netherlands	2.94394	99.7	0.341	0.516	HIC	Western Europe
Canada	2.86110	99.7	0.421	0.599	HIC	North America
Taiwan, China	2.77643	99.6	0.268	0.393	HIC	Northeast Asia
Spain	2.25742	99.8	0.338	0.503	HIC	Western Europe
Mexico	2.18942	99.4	0.334	0.478	UMC	Central America and Caribbean
Hong Kong, China	1.92264	99.3	0.170	0.191	HIC	Northeast Asia
Singapore	1.91887	99.4	0.317	0.442	HIC	Southeast Asia and Pacific
Switzerland	1.54548	99.6	0.396	0.561	HIC	Western Europe
Malaysia	1.44576	99.4	0.294	0.466	UMC	Southeast Asia and Pacific
Ireland	1.34739	99.4	0.221	0.250	HIC	Western Europe
Sweden	1.17785	99.2	0.330	0.511	HIC	Western Europe
Austria	1.12791	99.5	0.421	0.606	HIC	Western Europe
Thailand	1.11208	99.3	0.252	0.449	LMC	Southeast Asia and Pacific
India	1.04446	99.3	0.127	0.318	LIC	Southern Asia
Russian Federation	0.98701	99.0	0.047	0.146	UMC	Eastern Europe and Russia
Poland	0.90033	99.3	0.313	0.472	UMC	Eastern Europe and Russia
Australia	0.90003	99.7	0.093	0.198	HIC	Australia and New Zealand
Brazil	0.86601	99.2	0.137	0.373	UMC	South America
Czech Republic	0.76649	99.2	0.412	0.622	HIC	Eastern Europe and Russia
Denmark	0.70168	99.2	0.320	0.511	HIC	Western Europe

Turkey	0.69206	99.1	0.130	0.217	UMC	Central Asia, Caucasus and Turkey
Philippines	0.64283	98.8	0.305	0.428	LMC	Southeast Asia and Pacific
Indonesia	0.61715	99.7	0.117	0.291	LMC	Southeast Asia and Pacific
Hungary	0.56540	98.2	0.365	0.543	UMC	Eastern Europe and Russia
Finland	0.56044	99.1	0.225	0.403	HIC	Western Europe
Saudi Arabia	0.53762	99.2	0.011	0.070	HIC	Western Asia
South Africa	0.47888	100.0	0.092	0.294	UMC	Southern Africa
Norway	0.46957	99.1	0.133	0.342	HIC	Western Europe
Portugal	0.42791	99.3	0.292	0.485	HIC	Western Europe
Israel	0.35251	98.5	0.266	0.430	HIC	Western Asia
Romania	0.34066	98.4	0.192	0.330	UMC	Eastern Europe and Russia
Slovak Republic	0.32963	97.8	0.264	0.487	UMC	Eastern Europe and Russia
Chile	0.30348	98.1	0.025	0.095	UMC	South America
Greece	0.28415	99.2	0.121	0.210	HIC	Western Europe
Argentina	0.27734	98.3	0.156	0.313	UMC	South America
Ukraine	0.26988	98.5	0.115	0.274	LMC	Eastern Europe and Russia
Venezuela	0.17910	96.7	0.024	0.175	UMC	South America
Colombia	0.17831	97.9	0.082	0.145	LMC	South America
New Zealand	0.17333	98.8	0.133	0.298	HIC	Australia and New Zealand
Slovenia	0.16968	98.7	0.317	0.523	HIC	Western Europe
United Arab Emirates	0.16872	99.4	0.000	0.060	HIC	Western Asia
Vietnam	0.16209	98.0	0.000	0.077	LIC	Southeast Asia and Pacific
Pakistan	0.15677	97.9	0.018	0.087	LIC	Southern Asia
Morocco	0.14107	97.5	0.091	0.150	LMC	Northern Africa
Iran, Islamic Rep.	0.13437	97.2	0.007	0.106	LMC	Western Asia
Kazakhstan	0.13204	95.9	0.042	0.081	UMC	Central Asia, Caucasus and Turkey
Bulgaria	0.13088	98.1	0.140	0.287	UMC	Eastern Europe and Russia
Luxembourg	0.13031	98.4	0.245	0.407	HIC	Western Europe
Costa Rica	0.11561	95.3	0.123	0.212	UMC	Central America and Caribbean
Bangladesh	0.11347	92.6	0.000	0.016	LIC	Southern Asia
Croatia	0.10968	97.5	0.195	0.306	UMC	Eastern Europe and Russia
Algeria	0.10638	95.1	0.004	0.026	LMC	Northern Africa
Peru	0.10586	97.4	0.025	0.066	LMC	South America
Egypt, Arab Rep.	0.10025	98.5	0.030	0.107	LMC	Northern Africa

TABLE 1 *Continued*

Country	*% of World Trade*	*% of 5-Digit Sectors Traded*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*World Bank Income Group**	*World Bank Region*
Lithuania	0.09327	97.2	0.147	0.256	UMC	Eastern Europe and Russia
Qatar	0.09289	96.2	0.007	0.030	HIC	Western Asia
Belarus	0.07765	95.6	0.042	0.157	LMC	Eastern Europe and Russia
Estonia	0.06955	96.5	0.211	0.336	HIC	Eastern Europe and Russia
Yugoslavia	0.06526	97.2	0.110	0.222	UMC	Eastern Europe and Russia
Nigeria	0.06394	93.5	0.000	0.013	LIC	Western Africa
Trinidad and Tobago	0.06235	93.4	0.012	0.025	HIC	Central America and Caribbean
Guatemala	0.06132	96.2	0.067	0.103	LMC	Central America and Caribbean
Oman	0.06004	95.6	0.006	0.032	UMC	Western Asia
Tunisia	0.05985	93.7	0.000	0.072	LMC	Northern Africa
Ecuador	0.05934	95.9	0.047	0.123	LMC	South America
Latvia	0.05596	96.6	0.173	0.291	UMC	Eastern Europe and Russia
Jordan	0.05395	94.5	0.023	0.063	LMC	Western Asia
Kuwait	0.05217	93.1	0.000	0.028	HIC	Western Asia
Sri Lanka	0.05134	94.0	0.000	0.045	LMC	Southern Asia
Honduras	0.04734	93.2	0.040	0.052	LMC	Central America and Caribbean
Dominican Republic	0.04128	93.1	0.000	0.045	LMC	Central America and Caribbean
El Salvador	0.04093	94.0	0.067	0.112	LMC	Central America and Caribbean
Syrian Arab Republic	0.03846	96.4	0.014	0.048	LMC	Western Asia
Cyprus	0.03791	95.9	0.101	0.225	HIC	Western Europe
Macao	0.03753	89.6	0.090	0.144	HIC	Northeast Asia
Iraq	0.03596	81.7	0.000	0.008	LMC	Western Asia
Malta	0.03585	93.9	0.244	0.390	HIC	Western Europe
Bosnia and Herzegovina	0.03554	96.2	0.140	0.277	LMC	Eastern Europe and Russia
Angola	0.03444	93.7	0.000	0.007	LMC	Middle Africa
Sudan	0.03213	92.6	0.002	0.009	LIC	Eastern Africa
Libya	0.03212	82.9	0.000	0.015	UMC	Northern Africa
Panama	0.02883	94.7	0.047	0.116	UMC	Central America and Caribbean
Cambodia	0.02862	78.2	0.000	0.006	LIC	Southeast Asia and Pacific
Iceland	0.02816	95.0	0.039	0.097	HIC	Western Europe
Bahrain	0.02506	93.8	0.027	0.084	HIC	Western Asia

Uruguay	0.02427	94.0	0.072	0.175	UMC	South America
Jamaica	0.02388	91.7	0.022	0.086	LMC	Central America and Caribbean
Azerbaijan	0.02192	88.6	0.011	0.041	LMC	Central Asia, Caucasus and Turkey
Côte d'Ivoire	0.02164	90.9	0.005	0.022	LIC	Western Africa
Ghana	0.02142	95.9	0.008	0.016	LIC	Western Africa
Paraguay	0.02089	88.3	0.024	0.054	LMC	South America
Mauritius	0.01912	94.0	0.058	0.079	UMC	Eastern Africa
Macedonia, FYR	0.01906	93.4	0.071	0.132	LMC	Eastern Europe and Russia
Nicaragua	0.01847	90.5	0.022	0.038	LMC	Central America and Caribbean
Kenya	0.01757	94.2	0.000	0.033	LIC	Eastern Africa
Zambia	0.01737	96.5	0.008	0.016	LIC	Eastern Africa
Yemen	0.01631	91.5	0.003	0.011	LIC	Western Asia
Ethiopia (excludes Eritrea)	0.01629	94.6	0.040	0.036	LIC	Eastern Africa
Botswana	0.01622	97.7	0.012	0.007	UMC	Southern Africa
Cuba	0.01546	85.9	0.000	0.015	LMC	Central America and Caribbean
Bolivia	0.01516	94.0	0.012	0.050	LMC	South America
Namibia	0.01431	97.6	0.003	0.008	LMC	Southern Africa
Uzbekistan	0.01428	82.3	0.000	0.062	LIC	Central Asia, Caucasus and Turkey
Tanzania	0.01335	96.6	0.009	0.017	LIC	Eastern Africa
Brunei	0.01313	90.5	0.003	0.025	HIC	Southeast Asia and Pacific
Lebanon	0.01311	92.7	0.000	0.063	UMC	Western Asia
Myanmar	0.01268	86.8	0.000	0.019	LIC	Southeast Asia and Pacific
Albania	0.01251	91.7	0.139	0.268	LMC	Eastern Europe and Russia
Moldova	0.01192	90.2	0.062	0.166	LMC	Eastern Europe and Russia
Georgia	0.01131	92.5	0.020	0.062	LMC	Central Asia, Caucasus and Turkey
Madagascar	0.01113	91.1	0.017	0.024	LIC	Eastern Africa
Cameroon	0.01094	89.3	0.004	0.023	LMC	Middle Africa
Mozambique	0.01010	94.0	0.009	0.031	LIC	Eastern Africa
Senegal	0.00960	90.8	0.014	0.045	LIC	Western Africa
Bahamas, The	0.00959	81.5	0.000	0.022	HIC	Central America and Caribbean
Mongolia	0.00924	88.7	0.008	0.024	LIC	Northeast Asia
Gabon	0.00885	86.2	0.003	0.009	UMC	Middle Africa
Korea, Dem. Rep.	0.00817	87.6	0.000	0.039	LIC	Northeast Asia
Congo, Rep.	0.00806	80.9	0.000	0.009	LMC	Middle Africa
New Caledonia	0.00768	89.6	0.009	0.032	HIC	Southeast Asia and Pacific

Table 1 *Continued*

Country	*% of World Trade*	*% of 5-Digit Sectors Traded*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*World Bank Income Group**	*World Bank Region*
Benin	0.00732	71.8	0.000	0.001	LIC	Western Africa
Zimbabwe	0.00717	94.0	0.000	0.037	LIC	Eastern Africa
Uganda	0.00689	93.5	0.004	0.012	LIC	Eastern Africa
Equatorial Guinea	0.00667	63.5	0.000	0.009	UMC	Middle Africa
Netherlands Antilles	0.00658	83.2	0.000	0.036	HIC	Central America and Caribbean
Turkmenistan	0.00607	71.1	0.000	0.012	LMC	Central Asia, Caucasus and Turkey
Fiji	0.00573	91.2	0.036	0.092	LMC	Southeast Asia and Pacific
Haiti	0.00570	69.1	0.000	0.037	LIC	Central America and Caribbean
Kyrgyz Republic	0.00551	88.8	0.031	0.076	LIC	Central Asia, Caucasus and Turkey
Armenia	0.00543	87.3	0.140	0.133	LMC	Central Asia, Caucasus and Turkey
Barbados	0.00518	91.2	0.046	0.090	HIC	Central America and Caribbean
French Polynesia	0.00498	87.5	0.013	0.022	HIC	Southeast Asia and Pacific
Liberia	0.00497	66.1	0.000	0.001	LIC	Western Africa
Afghanistan	0.00470	75.6	0.000	0.012	LIC	Southern Asia
Papua New Guinea	0.00453	79.6	0.000	0.040	LIC	Southeast Asia and Pacific
Congo, Dem. Rep.	0.00451	85.8	0.000	0.011	LIC	Middle Africa
Nepal	0.00447	89.1	0.000	0.161	LIC	Southern Asia
Cayman Islands	0.00420	67.7	0.000	0.009	HIC	Central America and Caribbean
Malawi	0.00409	88.6	0.027	0.034	LIC	Eastern Africa
Togo	0.00407	74.5	0.000	0.005	LIC	Western Africa
Lao PDR	0.00365	77.1	0.000	0.016	LIC	Southeast Asia and Pacific
Aruba	0.00335	74.8	0.000	0.010	HIC	Central America and Caribbean
Bermuda	0.00313	66.5	0.000	0.013	HIC	North America
Tajikistan	0.00311	69.9	0.000	0.017	LIC	Central Asia, Caucasus and Turkey
Faeroe Islands	0.00300	89.7	0.047	0.063	HIC	Western Europe
Guyana	0.00292	86.5	0.014	0.045	LMC	South America
Mauritania	0.00281	73.0	0.001	0.008	LIC	Western Africa
Guinea	0.00273	72.5	0.000	0.011	LIC	Western Africa
Maldives	0.00269	81.5	0.005	0.009	LMC	Southern Asia
Suriname	0.00244	74.5	0.000	0.227	LMC	South America
Djibouti	0.00238	72.9	0.000	0.036	LMC	Western Asia

British Virgin Islands	0.00218	63.8	0.000	0.024	n.a.	Central America and Caribbean
Belize	0.00216	83.5	0.015	0.056	UMC	Central America and Caribbean
Marshall Islands	0.00214	49.4	0.000	0.003	LMC	Southeast Asia and Pacific
Mali	0.00212	75.6	0.000	0.023	LIC	Western Africa
Seychelles	0.00191	87.4	0.085	0.121	n.a.	n.a.
Cape Verde	0.00186	82.9	0.013	0.034	LMC	Western Africa
Chad	0.00185	55.1	0.000	0.003	LIC	Middle Africa
Lesotho	0.00172	38.2	0.000	0.001	LMC	Southern Africa
Swaziland	0.00171	63.6	0.000	0.021	LMC	Southern Africa
Burkina Faso	0.00143	65.2	0.000	0.008	LIC	Western Africa
Andorra	0.00137	74.4	0.000	0.128	HIC	Western Europe
Greenland	0.00128	81.2	0.000	0.028	HIC	North America
Antigua and Barbuda	0.00119	72.5	0.000	0.011	HIC	Central America and Caribbean
Gibraltar	0.00106	77.0	0.000	0.038	n.a.	Western Europe
Niger	0.00097	64.4	0.000	0.021	LIC	Western Africa
St. Vincent and the Grenadines	0.00092	80.4	0.007	0.020	UMC	Central America and Caribbean
St. Kitts and Nevis	0.00086	80.5	0.108	0.096	UMC	Central America and Caribbean
Turks and Caicos Isl.	0.00073	58.2	0.000	0.005	n.a.	Central America and Caribbean
Sierra Leone	0.00073	66.6	0.000	0.066	LIC	Western Africa
St. Lucia	0.00072	65.9	0.000	0.061	UMC	Central America and Caribbean
Gambia, The	0.00072	76.9	0.003	0.009	LIC	Western Africa
Dominica	0.00063	77.0	0.019	0.058	UMC	Central America and Caribbean
Rwanda	0.00060	62.0	0.000	0.007	LIC	Eastern Africa
Guam	0.00055	54.9	0.000	0.051	HIC	Southeast Asia and Pacific
Samoa	0.00043	63.0	0.000	0.042	LMC	Southeast Asia and Pacific
Somalia	0.00040	43.6	0.000	0.036	LIC	Eastern Africa
Eritrea	0.00040	54.1	0.000	0.027	LIC	Eastern Africa
Vanuatu	0.00036	63.0	0.000	0.018	LMC	Southeast Asia and Pacific
Bhutan	0.00036	38.0	0.000	0.092	LMC	Southern Asia
Grenada	0.00035	66.5	0.000	0.018	UMC	Central America and Caribbean
Solomon Islands	0.00035	57.2	0.000	0.005	LIC	Southeast Asia and Pacific
Burundi	0.00027	53.9	0.000	0.065	LIC	Eastern Africa
Tokelau	0.00024	38.7	0.000	0.032	n.a.	Southeast Asia and Pacific
Central African Republic	0.00023	50.9	0.000	0.025	LIC	Middle Africa

Table 1 *Continued*

Country	*% of World Trade*	*% of 5-Digit Sectors Traded*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*World Bank Income Group**	*World Bank Region*
Cook Islands	0.00020	65.4	0.000	0.039	n.a.	Southeast Asia and Pacific
Falkland Islands	0.00020	32.4	0.000	0.020	n.a.	South America
Guinea-Bissau	0.00020	55.5	0.000	0.023	LIC	Western Africa
São Tomé and Principe	0.00018	65.6	0.006	0.077	LIC	Middle Africa
Comoros	0.00017	49.2	0.000	0.029	LIC	Eastern Africa
Tonga	0.00016	60.6	0.000	0.032	LMC	Southeast Asia and Pacific
Saint Pierre and Miquelon	0.00015	48.6	0.000	0.012	n.a.	North America
Micronesia, Fed. Sts.	0.00015	46.4	0.000	0.004	LMC	Southeast Asia and Pacific
Anguila	0.00013	45.1	0.000	0.010	n.a.	Central America and Caribbean
Northern Mariana Islands	0.00012	38.7	0.000	0.040	UMC	Southeast Asia and Pacific
Wallis and Futura Isl.	0.00010	60.2	0.002	0.010	n.a.	Southeast Asia and Pacific
Palau	0.00010	45.8	0.000	0.018	UMC	Southeast Asia and Pacific
East Timor	0.00009	34.3	0.000	0.005	LIC	Southeast Asia and Pacific
Saint Helena	0.00007	50.5	0.000	0.023	n.a.	Western Africa
Montserrat	0.00007	57.3	0.033	0.095	n.a.	n.a.
Kiribati	0.00006	47.5	0.000	0.011	LMC	Southeast Asia and Pacific
Tuvalu	0.00004	40.2	0.000	0.004	n.a.	Southeast Asia and Pacific
Niue	0.00003	37.2	0.000	0.029	n.a.	Southeast Asia and Pacific
Nauru	0.00003	29.3	0.000	0.067	n.a.	Southeast Asia and Pacific
Pitcairn	0.00002	18.6	0.000	0.002	n.a.	Southeast Asia and Pacific
Unweighted average	*0.464*	*83.3*	*0.073*	*0.138*	*n.a.*	*n.a.*

* Taken from World Bank (2006, p. 287).

that large trading nations tend to exhibit higher IIT, which explains why these unweighted averages are significantly smaller than the aggregate IIT shares reported above. It suffices to look at the third and fourth data columns to realise that GL indices tend to increase with the size of countries' trade. The simple correlation coefficients between trade shares and GL indices are 0.58 (3-digit) and 0.52 (5-digit).

Furthermore, the second data column of Table 1 shows that larger trading countries also tend to trade in a broader set of industries. France is the country with the highest level of IIT at the 5-digit level (0.424), whereas at the 3-digit level the highest level of IIT is recorded by the Czech Republic (0.622). At the opposite end of the list, a full 85 sample countries do not engage in any discernible IIT at the 5-digit level. The largest of these 85 countries, in terms of its share in recorded world trade, is the United Arab Emirates. At the 3-digit level, however, all countries exhibit some IIT, with the lowest GL index of 0.001 observed for Benin, Lesotho and Liberia.

While *average* IIT shares differ significantly, *variations* across countries are very similar for the two levels of sectoral aggregation: the correlation coefficient across the 216 countries between the 3-digit and the 5-digit GL indices is 0.97.

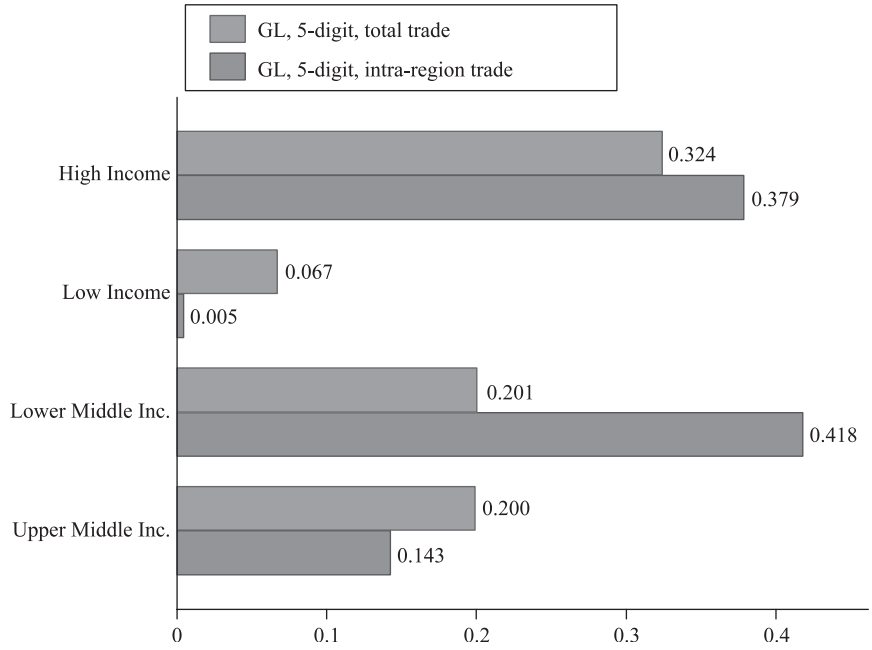
In Table 2, I slice the global trade matrix by sector rather than country, and I present trade shares as well as 5-digit and 3-digit GL indices separately for the 177 3-digit sectors. Again one can easily observe that 3-digit GL indices are higher than 5-digit GL indices (aggregated to the 3-digit level), the unweighted averages corresponding to 0.28 and 0.21, respectively. And at 0.92, the correlation between the two sets of GL indices is again very high. Sectoral disaggregation thus strongly affects observed average levels of IIT, but it is of secondary importance in a description of broad cross-sectional patterns.

The 3-digit sector with the highest level of observed 5-digit IIT (GL = 0.527) is 'Electric Power Machinery and Switchgear', whereas the only 3-digit sector for which I find a 5-digit GL index of 0.000 is 'Concentrated Uranium and Thorium Ore'.

Figure 2 shows IIT by country income groups, taking the World Bank's (2006) categorisation and applying the 'within' version of the group-level GL index defined in expression (4). Trade among high-income countries is characterised by the highest IIT shares on average. IIT among the low-income countries, in contrast, is virtually non-existent. Strikingly, however, the highest 5-digit IIT level is observed for trade among lower-middle-income countries – higher even than for trade among high-income economies. There are good reasons to believe that the high IIT among lower-middle-income countries is due to processing trade in vertically fragmented industries (the four main trading nations in this category are China, Thailand, the Philippines and Indonesia; see Table 1).

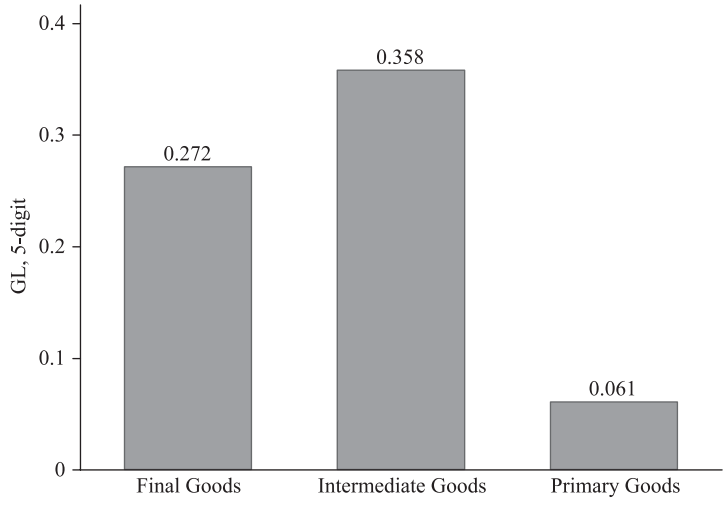
Finally, Figure 3 reports summary IIT according to a classification of 5-digit sectors by the three main stages of the production chain: primary, intermediate

FIGURE 2
IIT by Income Group, 2006



Notes:
Country grouping according to World Bank categorisation (see Table 1); 'wide coverage' dataset.

FIGURE 3
IIT by Product Group, 2006



Notes:
Product grouping according to United Nations 'Broad Economic Categories'; 'wide coverage' dataset.

TABLE 2
Total Trade and IIT in 2006, by 3-Digit Industry
(Sorted in decreasing order of % of world trade, 'wide coverage' dataset)

Sector Name	*SITC 3-Digit Code*	*% of World Trade*	*Number of Sample Countries Trading*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*BEC Product Grouping**
MACHINES NES NONELECTRIC	719	14.58087	233	0.423	0.554	Intermediate
ELECTRICAL MACHINERY NES	729	10.49781	233	0.431	0.538	Intermediate
ORGANIC CHEMICALS	512	10.25057	231	0.277	0.499	Intermediate
ROAD MOTOR VEHICLES	732	7.55329	233	0.407	0.484	Final
INSTRUMENTS, APPARATUS	861	6.97463	231	0.364	0.520	Intermediate
CLOTHING NOT OF FUR	841	6.05836	233	0.119	0.142	Final
MEDICINAL ETC PRODUCTS	541	2.87797	228	0.403	0.510	Intermediate
CHEMICALS NES	599	2.70815	233	0.394	0.559	Intermediate
OFFICE MACHINES	714	2.32375	233	0.269	0.305	Intermediate
TELECOMMUNICATIONS EQUIP	724	2.19387	233	0.237	0.288	Intermediate
METAL MANUFACTURES NES	698	1.83187	233	0.426	0.554	Intermediate
PLASTIC MATERIALS ETC	581	1.65085	231	0.458	0.516	Intermediate
POWER MACHINERY NON-ELEC	711	1.62557	231	0.499	0.656	Intermediate
SOUND RECORDERS, PRODUCRS	891	1.36538	233	0.234	0.292	Final
MACHS FOR SPCL INDUSTRYS	718	1.33521	229	0.294	0.364	Intermediate
OTHER MANUFACTURED GOODS	899	1.28000	232	0.258	0.411	Final
IRN, STL UNIV, PLATE, SHEET	674	1.11075	225	0.254	0.415	Intermediate
INORG ELEMNTS, OXIDES, ETC	513	1.01977	225	0.142	0.451	Intermediate
CRUDE PETROLEUM, ETC	331	0.99246	174	0.010	0.010	Primary
PAPER AND PAPERBOARD	641	0.96192	228	0.294	0.439	Intermediate
TOYS, SPORTING GOODS, ETC	894	0.90346	230	0.125	0.169	Final
COPPER	682	0.78289	224	0.150	0.295	Intermediate
TEXTILE YARN AND THREAD	651	0.73323	229	0.267	0.493	Intermediate
WOVEN TEXTILES NONCOTTON	653	0.69255	229	0.225	0.317	Intermediate
ALUMINIUM	684	0.63360	226	0.234	0.381	Intermediate
PRINTED MATTER	892	0.52267	232	0.414	0.509	Final
FRUIT FRSH NUTS FRSH DRY	51	0.50597	231	0.060	0.168	Primary
ELEC PWR MACH, SWITCHGEAR	722	0.50188	232	0.527	0.566	Intermediate

Table 2 *Continued*

Sector Name	*SITC 3-Digit Code*	*% of World Trade*	*Number of Sample Countries Trading*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*BEC Product Grouping**
IRON, STL PRIMARY FORMS	672	0.48074	218	0.162	0.339	Intermediate
OTHR INORGANIC CHEMICALS	514	0.47668	227	0.178	0.472	Intermediate
IRON AND STEEL SHAPES	673	0.46709	229	0.274	0.423	Intermediate
FURNITURE	821	0.43806	231	0.248	0.271	Final
NONFER BASE MTL ORE, CONC	283	0.41198	194	0.012	0.091	Primary
SPECIAL TEXTILE ETC PROD	655	0.40117	229	0.355	0.531	Intermediate
AIRCRAFT	734	0.36833	225	0.243	0.306	Final
MEAT FRESH, CHILLD, FROZEN	11	0.36792	231	0.140	0.255	Primary
VEG ETC FRSH, SMPLY PRSVD	54	0.33378	231	0.175	0.305	Primary
GLASS	664	0.33042	229	0.329	0.528	Intermediate
DOMESTIC ELECTRIC EQUIP	725	0.32606	231	0.195	0.245	Final
RUBBER ARTICLES NES	629	0.32132	233	0.414	0.477	Intermediate
GAS NATURAL AND MANUFCTD	341	0.28634	219	0.055	0.072	Primary
PEARL, PREC-, SEMI-P STONE	667	0.27258	208	0.315	0.342	Primary
FOOTWEAR	851	0.27214	230	0.097	0.102	Final
ALCOHOLIC BEVERAGES	112	0.26754	230	0.122	0.294	Final
ELECTR DISTRIBUTING MACH	723	0.26685	232	0.453	0.504	Intermediate
PIGMENTS, PAINTS, ETC	533	0.25725	230	0.344	0.445	Intermediate
WATCHES AND CLOCKS	864	0.25272	227	0.164	0.238	Intermediate
CRUDE VEG MATERIALS NES	292	0.24167	230	0.192	0.310	Primary
COAL, COKE, BRIQUETTES	321	0.22438	207	0.017	0.051	Primary
PULP AND WASTE PAPER	251	0.22071	200	0.067	0.133	Intermediate
TOOLS	695	0.21890	232	0.355	0.433	Intermediate
ANIMAL FEEDING STUFF	81	0.21698	225	0.185	0.333	Primary
PLUMBG, HEATNG, LGHTNG EQU	812	0.21507	231	0.266	0.341	Intermediate
IRON, STL TUBES, PIPES, ETC	678	0.21431	231	0.293	0.396	Intermediate
OTH NONMETAL MINERAL MFS	663	0.21123	228	0.323	0.553	Intermediate
FOOD PREPARATIONS NES	99	0.20948	231	0.386	0.488	Final
WOOD MANUFACTURES NES	632	0.20583	230	0.235	0.286	Intermediate
AGRICULTURAL MACHINERY	712	0.20296	229	0.317	0.411	Intermediate
NON-FERROUS METAL SCRAP	284	0.20261	212	0.235	0.345	Primary

SHIPS AND BOATS	735	0.20260	227	0.099	0.210	Intermediate
CEREAL ETC PREPARATIONS	48	0.19850	229	0.367	0.542	Final
FISH FRESH, SIMPLY PRESVD	31	0.18530	230	0.173	0.198	Primary
OTHER CRUDE MINERALS	276	0.17500	227	0.136	0.416	Primary
ARTICLES OF PAPER ETC	642	0.17380	230	0.413	0.522	Intermediate
METALWORKING MACHINERY	715	0.17359	224	0.293	0.324	Intermediate
TEXTILE, LEATHER MACHNRY	717	0.17231	229	0.205	0.275	Intermediate
GOLD, SILVER WARE, JEWELRY	897	0.17180	228	0.228	0.275	Final
WOOD SHAPED	243	0.16564	228	0.102	0.180	Intermediate
CEMENT ETC BUILDING PROD	661	0.15198	227	0.095	0.192	Intermediate
VENEERS, PLYWOOD, ETC	631	0.13524	226	0.160	0.270	Intermediate
PIG IRON ETC	671	0.13514	198	0.085	0.168	Intermediate
FRUIT PRESERVED, PREPARED	53	0.13487	231	0.211	0.289	Intermediate
CLAY, REFRACTORY BLDG PRD	662	0.12961	227	0.118	0.213	Intermediate
ROAD VEHICLES NON-MOTOR	733	0.12760	231	0.333	0.390	Final
PETROLEUM PRODUCTS	332	0.12514	227	0.174	0.362	Intermediate
OIL SEEDS, NUTS, KERNELS	221	0.12218	216	0.040	0.078	Primary
LEATHER	611	0.12183	206	0.161	0.221	Intermediate
TEXTILE ETC PRODUCTS NES	656	0.10784	232	0.127	0.155	Final
BASE MTL HOUSEHOLD EQUIP	697	0.10740	230	0.158	0.202	Final
RAILWAY VEHICLES	731	0.10645	217	0.275	0.458	Final
PHOTO, CINEMA SUPPLIES	862	0.10582	222	0.217	0.287	Intermediate
SILVER, PLATINUM, ETC	681	0.10513	182	0.133	0.257	Intermediate
FERTILISERS MANUFACTURED	561	0.10375	219	0.059	0.142	Intermediate
COTTON FABRICS, WOVEN	652	0.10151	227	0.217	0.298	Intermediate
OFFICE SUPPLIES NES	895	0.10115	230	0.209	0.314	Intermediate
RUBBER CRUDE, SYNTHETIC	231	0.09701	216	0.198	0.284	Primary
ARTICLES OF PLASTIC NES	893	0.09527	233	0.509	0.509	Final
GLASSWARE	665	0.08910	228	0.247	0.368	Intermediate
SUGAR AND HONEY	61	0.08771	228	0.114	0.232	Intermediate
NON-FER BASE METALS NES	689	0.08503	205	0.372	0.489	Intermediate
WORKS OF ART ETC	896	0.08197	223	0.413	0.504	Final
NICKEL	683	0.07833	186	0.092	0.138	Intermediate
FIXED VEG OILS, SOFT	421	0.07682	226	0.106	0.238	Intermediate
STL, COPPR NAILS, NUTS, ETC	694	0.07502	233	0.358	0.385	Intermediate
FIXED VEG OIL NONSOFT	422	0.07343	224	0.034	0.069	Intermediate

Table 2 *Continued*

Sector Name	*SITC 3-Digit Code*	*% of World Trade*	*Number of Sample Countries Trading*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*BEC Product Grouping**
MATERIALS OF RUBBER	621	0.07071	228	0.419	0.540	Intermediate
SOAPS, CLEANING ETC PREPS	554	0.06767	231	0.434	0.490	Intermediate
METAL TANKS, BOXES, ETC	692	0.06410	228	0.343	0.483	Intermediate
VEGTBLES ETC PRSVD, PREPD	55	0.06246	228	0.201	0.274	Intermediate
IRON ORE, CONCENTRATES	281	0.05800	144	0.017	0.026	Primary
SYNTHETIC, REGENRTD FIBRE	266	0.05745	205	0.149	0.304	Intermediate
FLOOR COVR, TAPESTRY ETC	657	0.05695	226	0.197	0.236	Final
STRUCTURES AND PARTS NES	691	0.05617	230	0.353	0.374	Intermediate
MILK AND CREAM	22	0.05566	227	0.229	0.277	Intermediate
TOBACCO MFRS	122	0.05352	225	0.108	0.176	Final
WIRE PRODUCTS NON ELECTR	693	0.05306	231	0.260	0.399	Intermediate
ELECTRO-MEDCL, XRAY EQUIP	726	0.05262	225	0.477	0.540	Intermediate
LIVE ANIMALS	1	0.05191	209	0.155	0.251	Primary
STONE, SAND AND GRAVEL	273	0.05091	224	0.136	0.290	Primary
ZINC	686	0.05058	204	0.104	0.148	Intermediate
PERFUME, COSMETICS, ETC	553	0.04267	232	0.402	0.402	Final
CRUDE ANIMAL MATTER NES	291	0.03817	218	0.242	0.391	Primary
CUTLERY	696	0.03685	228	0.148	0.213	Final
LACE, RIBBONS, TULLE, ETC	654	0.03566	227	0.199	0.275	Intermediate
RADIOACTIVE ETC MATERIAL	515	0.03534	177	0.206	0.238	Intermediate
COTTON	263	0.03397	199	0.008	0.017	Primary
COCOA	72	0.03225	204	0.033	0.053	Intermediate
COFFEE	71	0.03217	225	0.112	0.139	Intermediate
MEAT TINNED NES OR PREPD	13	0.03150	225	0.264	0.298	Final
HIDES, SKINS, UNDRESSED	211	0.03135	193	0.070	0.103	Primary
WOOD ROUGH	242	0.03086	216	0.090	0.144	Primary
WOOL AND ANIMAL HAIR	262	0.03035	171	0.059	0.126	Primary
IRON AND STEEL SCRAP	282	0.03016	214	0.170	0.170	Primary
TRAVEL GOODS, HANDBAGS	831	0.02989	229	0.110	0.110	Final
FISH ETC TINNED, PREPARED	32	0.02814	225	0.102	0.123	Final

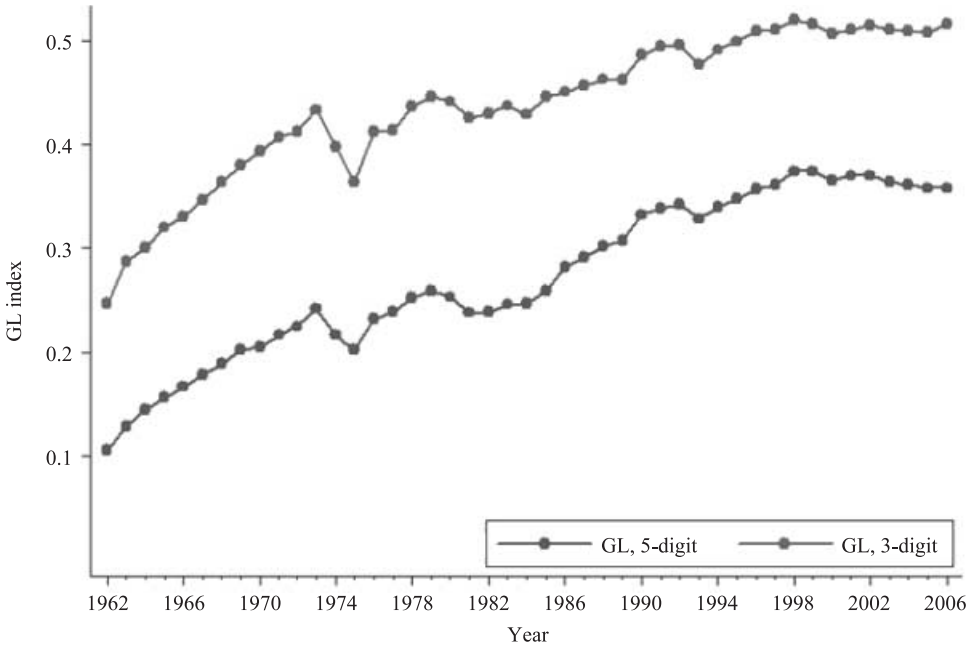
ELECTRIC ENERGY	351	0.02804	107	0.259	0.259	Intermediate
ESSENTL OIL, PERFUME, ETC	551	0.02802	221	0.184	0.252	Intermediate
LEATHER ETC MANUFACTURES	612	0.02736	218	0.339	0.395	Final
PROCESD ANML VEG OIL, ETC	431	0.02644	212	0.188	0.297	Intermediate
WAR FIREARMS, AMMUNITION	951	0.02587	203	0.136	0.206	Final
IRN, STL WIRE EXCL W ROD	677	0.02305	222	0.337	0.408	Intermediate
WHEAT ETC UNMILLED	41	0.02286	189	0.023	0.023	Primary
NON-ALC BEVERAGES NES	111	0.02186	226	0.253	0.310	Final
COAL, PETROLEUM ETC CHEMS	521	0.02122	196	0.283	0.328	Intermediate
POTTERY	666	0.02017	228	0.095	0.117	Final
SYNT DYE, NAT INDGO, LAKES	531	0.01991	223	0.414	0.437	Intermediate
SPICES	75	0.01651	227	0.080	0.150	Primary
CHEESE AND CURD	24	0.01648	226	0.301	0.301	Final
RICE	42	0.01597	224	0.015	0.022	Intermediate
LEAD	685	0.01439	190	0.090	0.145	Intermediate
IRN, STL CASTINGS UNWORKE	679	0.01421	221	0.336	0.409	Intermediate
MAIZE UNMILLED	44	0.01417	208	0.039	0.039	Primary
TIN	687	0.01328	183	0.082	0.168	Intermediate
SILVER AND PLATINUM ORES	285	0.01294	158	0.176	0.220	Primary
CHOCOLATE AND PRODUCTS	73	0.01250	225	0.413	0.413	Final
DRIED FRUIT	52	0.01007	221	0.065	0.107	Primary
ANIMAL OILS AND FATS	411	0.00940	201	0.115	0.268	Intermediate
EXPLOSIVES, PYROTECH PROD	571	0.00826	216	0.124	0.290	Intermediate
TOBACCO UNMFD	121	0.00703	190	0.064	0.064	Primary
RAILWY RAILS ETC IRN, STL	676	0.00517	196	0.151	0.182	Intermediate
CEREALS NES UNMILLED	45	0.00466	201	0.050	0.084	Primary
MEAT DRIED, SALTED, SMOKED	12	0.00456	209	0.182	0.208	Final
MARGARINE, SHORTENING	91	0.00455	220	0.191	0.256	Final
FERTILISERS, CRUDE	271	0.00454	194	0.033	0.108	Primary
NATURAL ABRASIVES	275	0.00440	204	0.151	0.295	Primary
BUTTER	23	0.00423	222	0.171	0.171	Final
TEA AND MATE	74	0.00419	225	0.046	0.061	Primary
DYES NES, TANNING PRODS	532	0.00410	197	0.184	0.297	Intermediate
BARLEY UNMILLED	43	0.00401	154	0.045	0.045	Primary
WHEAT ETC MEAL OR FLOUR	46	0.00352	226	0.115	0.165	Intermediate
WASTE OF TEXTILE FABRICS	267	0.00330	224	0.087	0.183	Primary

Table 2 *Continued*

Sector Name	*SITC 3-Digit Code*	*% of World Trade*	*Number of Sample Countries Trading*	*GL Index, 5-Digit*	*GL Index, 3-Digit*	*BEC Product Grouping**
FUEL WOOD AND CHARCOAL	241	0.00315	200	0.149	0.179	Primary
FUR ETC CLOTHES, PROD	842	0.00312	182	0.102	0.114	Final
CORK MANUFACTURES	633	0.00281	209	0.120	0.130	Intermediate
SULPHUR ETC	274	0.00277	160	0.025	0.042	Primary
EGGS	25	0.00242	217	0.218	0.218	Primary
VEG FIBRE, EXCL COTN JUTE	265	0.00226	182	0.090	0.145	Primary
FUR SKINS UNDRESSED	212	0.00198	136	0.113	0.113	Primary
FUR SKINS TANNED, DRESSED	613	0.00171	152	0.200	0.200	Intermediate
MEAL AND FLOUR NON-WHEAT	47	0.00128	217	0.155	0.245	Intermediate
SILK	261	0.00094	130	0.009	0.017	Primary
ZOO ANIMALS, PETS	941	0.00066	199	0.219	0.219	Primary
URANIUM, THORIUM ORE, CONC	286	0.00053	39	0.000	0.000	Primary
CORK RAW AND WASTE	244	0.00042	147	0.326	0.345	Primary
COIN NONGOLD, NONCURRENT	961	0.00019	170	0.151	0.151	Final
JUTE	264	0.00014	147	0.009	0.009	Primary
URANIUM, THORIUM, ALLOYS	688	0.00003	89	0.252	0.252	Intermediate
Unweighted average	*n.a.*	*0.56497*	*214*	*0.205*	*0.282*	*n.a.*

* Product grouping according to United Nations 'Broad Economic Categories'; most prevalent (unweighted) 5-digit group within each 3-digit sector.

FIGURE 4
Evolution of Global IIT, 1962–2006 (‘Long Coverage’ Sample)



and final goods.[18] Not surprisingly, primary goods are found to exhibit by far the lowest average IIT. It is interesting, however, to observe that average IIT in intermediate goods is considerably higher than IIT in final goods. This again suggests that vertical fragmentation of production processes across country borders might be as important (or even more important) in explaining global IIT patterns as international product differentiation and consumer tastes for variety.

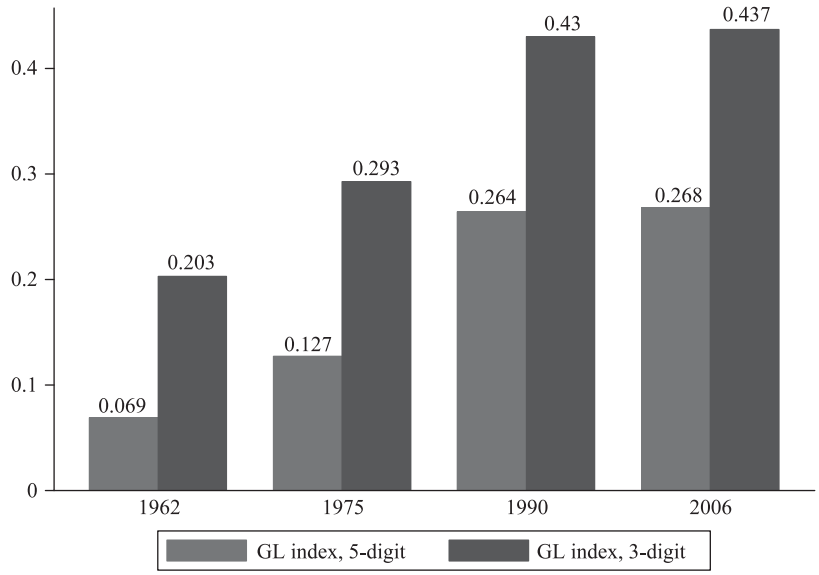
4. THE EVOLUTION OF GLOBAL IIT, 1962–2006

a. Aggregate IIT

I now turn to the description of changes in IIT over time, based on the ‘long coverage’ sample, which offers comparable data over the full sample period. Figure 4 provides the main picture. It shows how, irrespective of the level of

[18] The classification at the 5-digit level is taken from the United Nations’ Broad Economic Categories, concorded to the SITC, Rev. 1. Table 2 shows this grouping at the 3-digit level. The full (5-digit) classification can be provided on request.

FIGURE 5
Global IIT in 1962, 1975, 1990 and 2006 ('Wide Coverage' Sample)

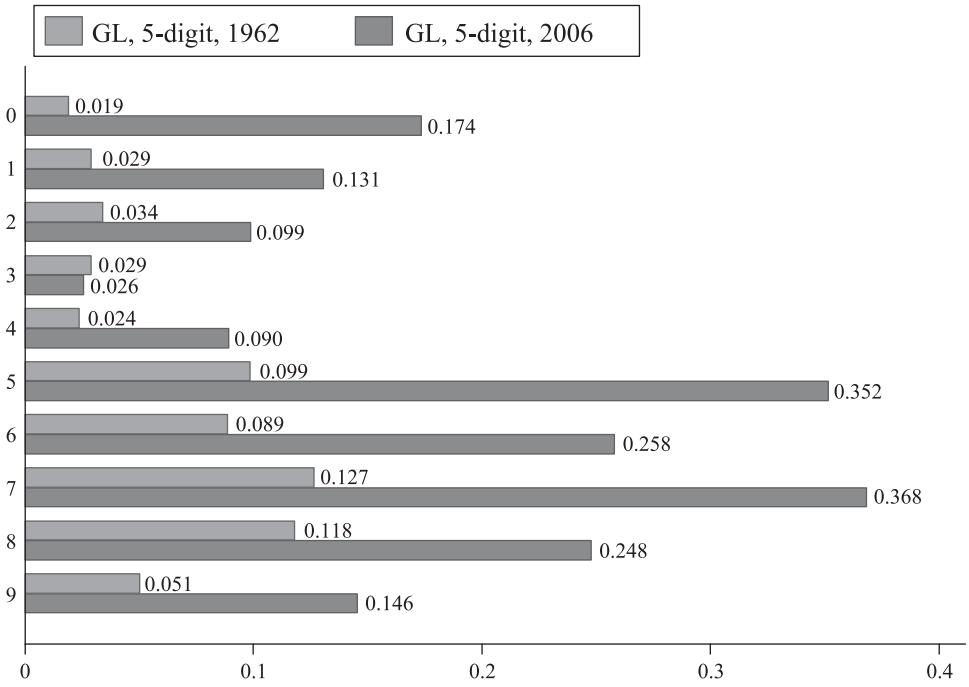


categorical aggregation, global IIT has exhibited a secular upward trend that levelled out in the mid-1990s.[19] In this narrower country sample, more than a third of global trade is now IIT if measured at the 5-digit level, and more than half if measured at the 3-digit level. The upward trend in IIT suggests a process of worldwide structural convergence: economies are becoming more similar over time in terms of their sectoral compositions.

As a complement to the time series of Figure 4, which is based on data for the 46 predominantly higher-income countries for which consistent import data are available, I show aggregate IIT levels for the 'wide coverage' dataset in Figure 5. It is unsurprising that IIT shares are lower in Figure 5 than in Figure 4, as the latter omits most low-income countries. Nonetheless, the broadly increasing share of IIT in world trade is as evident in Figure 5 as in Figure 4. Since the 'wide coverage' dataset is my most comprehensive sample, it provides my preferred estimates for the current (i.e. 2006) shares of IIT in world trade: 27 per cent if measured at the 5-digit level, and 44 per cent if measured at the 3-digit level.

[19] Measured IIT in 2004 and 2005 is somewhat biased downward due to the fact that in those years COMTRADE data attribute a significant share of EU imports to the EU as a whole rather than to the individual destination countries. This reduces observed import volumes of EU member states in those two years.

FIGURE 6
Global IIT by SITC 1-Digit Sector, 1962 and 2006

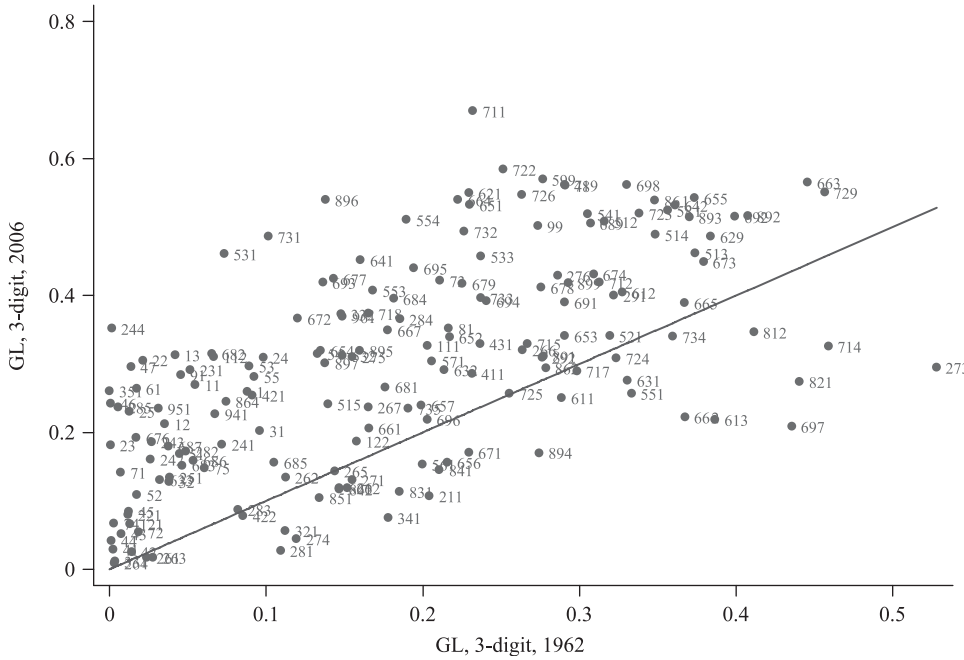


Notes:
'wide coverage' dataset; SITC 1-digit sectors: 0 – Food and Live Animals, 1 – Beverages and Tobacco, 2 – Crude Materials Excluding Fuels, 3 – Mineral Fuels Etc., 4 – Animal & Vegetable Oils & Fats, 5 – Chemicals, 6 – Basic Manufactures, 7 – Machines & Transport Equipment, 8 – Misc. Manufactures, 9 – Goods Not Classified by Kind.

b. IIT by Sector

Figure 6 illustrates that the rise in global IIT has been broadly shared across sectors. Over our sample period, the average 5-digit GL index has increased in nine out of the ten 1-digit sectors. The only exception is the Mineral Fuels sector (SITC sector 3), where, for obvious reasons, inter-industry trade has remained highly dominant. Proportionally the largest rise in IIT is observed in the 'Food and Live Animals' sector (SITC sector 0), which exhibits a nine-fold rise from a GL index of 0.02 in 1962 to a GL index of 0.17 in 2006. Clearly, with the increasing sophistication and differentiation of food products, even agricultural goods are now subject to considerable IIT. The 1-digit sector with consistently the highest recorded level of 5-digit IIT, however, is 'Machines and Transport Equipment' (SITC sector 7).

FIGURE 7
Global by SITC 3-Digit Sector, 1962 and 2006



Note:
'wide coverage' dataset; for sector names see Table 2.

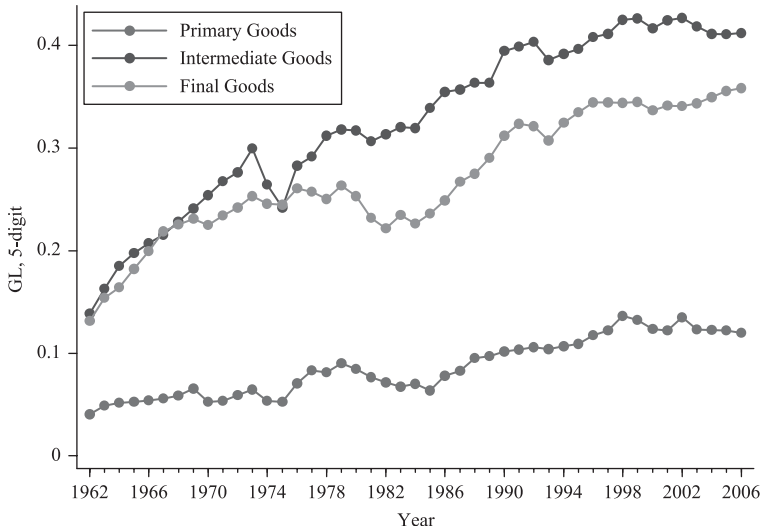
In Figure 7, I show changes in IIT separately for 3-digit sectors. While there are now more cases of declining IIT between 1962 and 2006, it again appears that the rise in IIT is a pervasive phenomenon. Only 29 of the 177 3-digit sectors experienced a decrease in IIT over the sample period.

Figure 8 tracks the evolution of IIT separately for primary, intermediate and final goods. Again, it becomes apparent that the rise in IIT has been a very general phenomenon, as it is observed for all three product groups. Primary products, not surprisingly, have consistently exhibited the lowest IIT shares and also recorded the slowest increase. Average IIT levels in intermediate and final goods were very similar until around 1975, after which IIT in intermediate goods has consistently exceeded IIT in final goods. This could again be taken as evidence that outward processing is the dominant driver of rises in IIT over the last three decades.

c. IIT by Country and Country Group

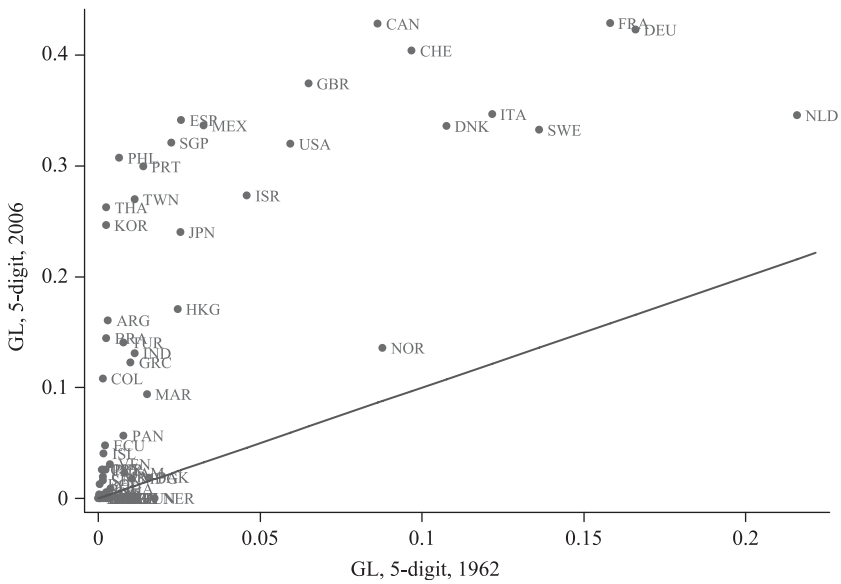
Long-run changes in average IIT levels of individual countries are illustrated in Figures 9 and 10, for the full sample period 1962–2006, and in Figures 11 and 12,

FIGURE 8
Evolution of Global IIT by Product Group, 1962–2006



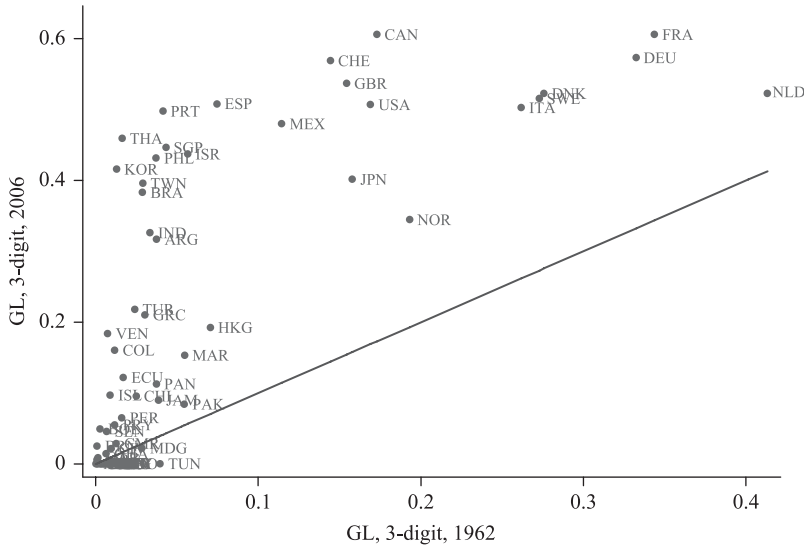
Notes:
Product grouping according to United Nations 'Broad Economic Categories'; 'long coverage' dataset.

FIGURE 9
Global IIT by Country, SITC 5-Digit, 1962 and 2006



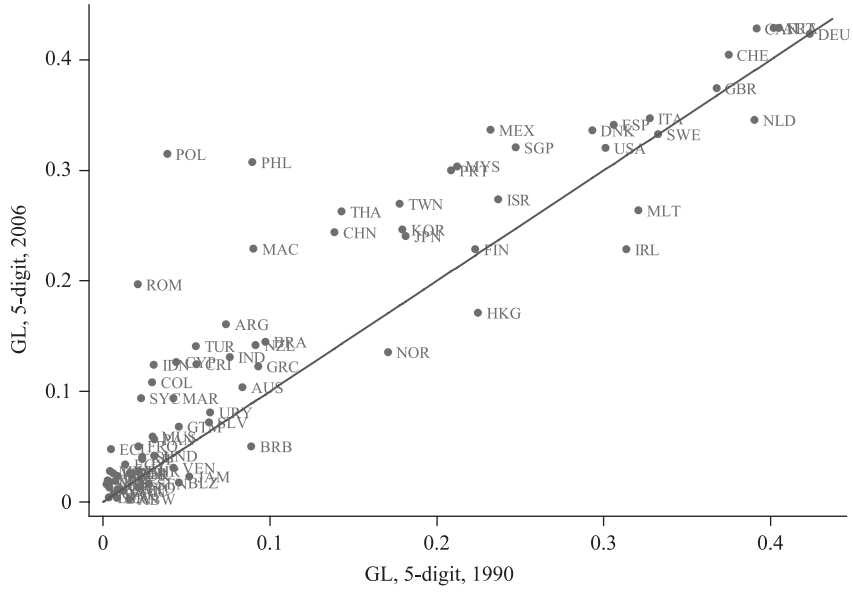
Note:
'wide coverage' dataset.

FIGURE 10
Global IIT by Country, SITC 3-Digit, 1962 and 2006



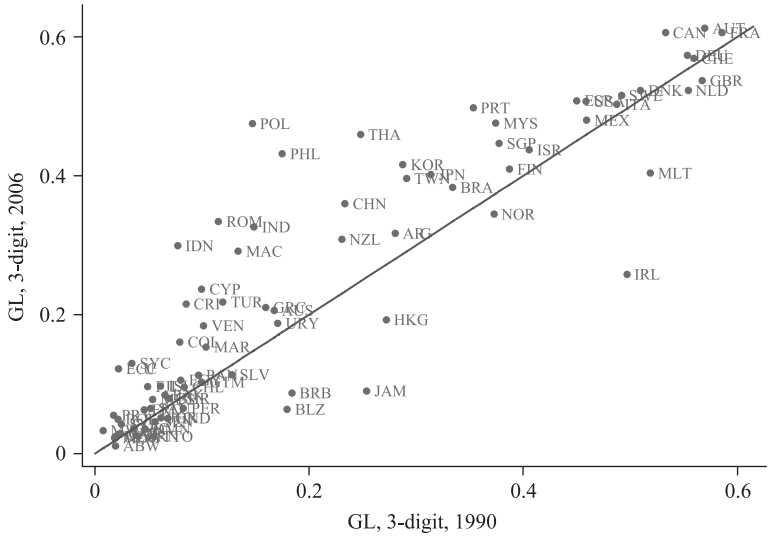
Note:
'wide coverage' dataset.

FIGURE 11
Global IIT by Country, SITC 5-Digit, 1990 and 2006



Note:
'wide coverage' dataset.

FIGURE 12
Global IIT by Country, SITC 3-Digit, 1990 and 2006

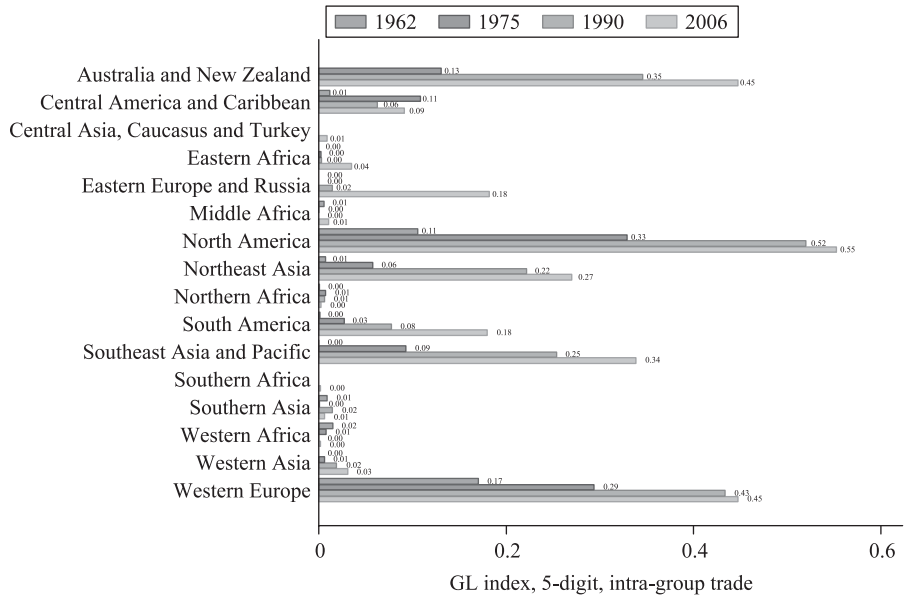


Note:
'wide coverage' dataset.

for the more recent time interval 1990–2006. These plots show that IIT has been increasing in virtually all countries over the past 45 years. Some countries, however, have experienced declines in their IIT levels since 1990. These include advanced economies such as Norway, which experienced a boom in primary exports, and Ireland, which specialised heavily in high-tech exports. Both these countries have experienced strong economic growth over that period, and their example shows that the positive association between IIT and income is not universal and may well be relevant only up to some critical income level.

Figures 13 to 17 document IIT patterns and trends within and between world regions and income-based country groups. In Figure 13, I show IIT levels for trade within 16 world regions commonly distinguished by the World Bank. IIT among industrialised economies dwarfs IIT among developing countries. While, by 2006, roughly half of internal trade in Western Europe, North America and Australia–New Zealand was intra-industry (at the 5-digit level!), the corresponding shares are below 5 per cent for Western Asia and Eastern Africa and well below 1 per cent for trade among Southern and Central Asian as well as among all other African nations. The increase in IIT observed at the global level is a phenomenon that was largely confined to Europe, North America, East Asia and Australia–New Zealand. Figure 14, which shows IIT levels for trade between as well as within the seven broader world regions in 2006 confirms this summary

FIGURE 13
IIT within World Regions; 1962, 1975, 1990 and 2006



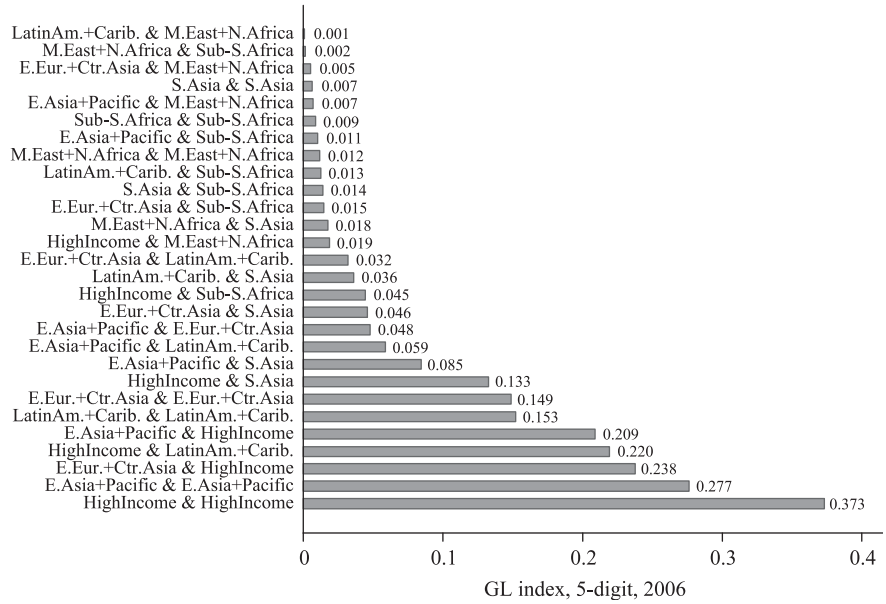
Notes:
Country grouping according to World Bank categorisation (see Table 1); 'wide coverage' dataset.

view: no trading relationship involving Africa exhibits an IIT share above 5 per cent, and, with the exception of its trade with high-income countries, the same is true for South Asia.

Detailed results on IIT and trade shares within and between the 16 world regions for 1962 and 2006 are reported in Table 3. A striking feature of this table is again the low IIT levels for the African regions. None of the cells of this matrix pertaining to East Africa, Middle Africa, Northern Africa and Western Africa show an IIT share exceeding 5 per cent. Table 3 also shows that Africa's share of world trade has fallen over the sample period in a majority of the country combinations considered. While Africa stands out with uniquely low IIT as well as trade shares, very low IIT is also observed for Western Asia (mainly Middle Eastern countries), whose IIT share reaches 10 per cent only for trade with Western Europe.

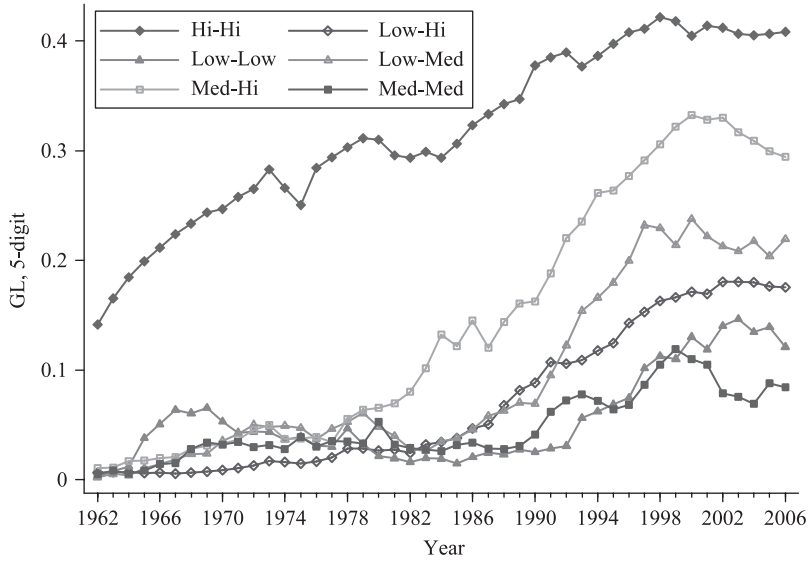
Figure 15 illustrates the evolution of IIT within and between country income groups. Because the poorest countries are under-represented in the 'long coverage' dataset (see the Appendix), I combine the World Bank's 'low-income' and 'lower-middle-income' categories into a single 'low' group. Again a positive correlation between income levels and IIT is clearly apparent, with IIT among

FIGURE 14
IIT between World Regions, 2006



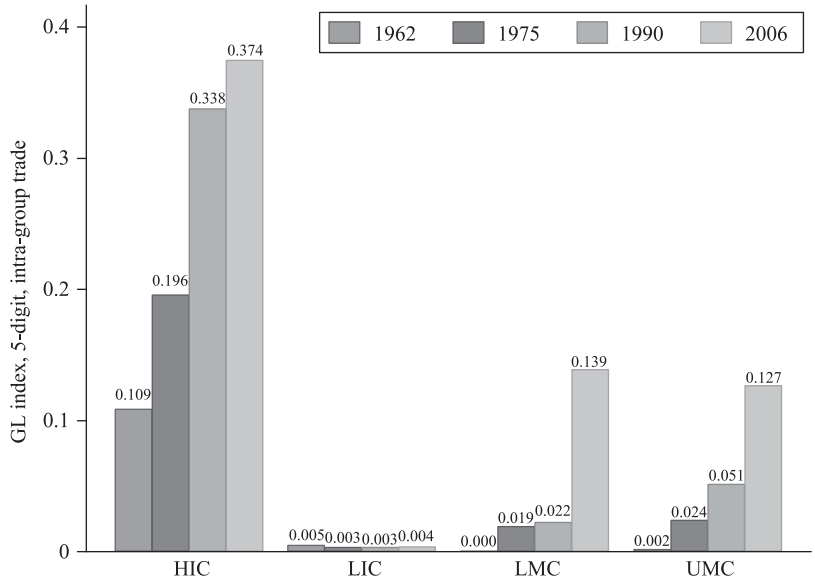
Notes:
Country grouping according to World Bank categorisation (see Table 1); 'wide coverage' dataset.

FIGURE 15
Evolution of Global IIT by Income Group, 1962–2006



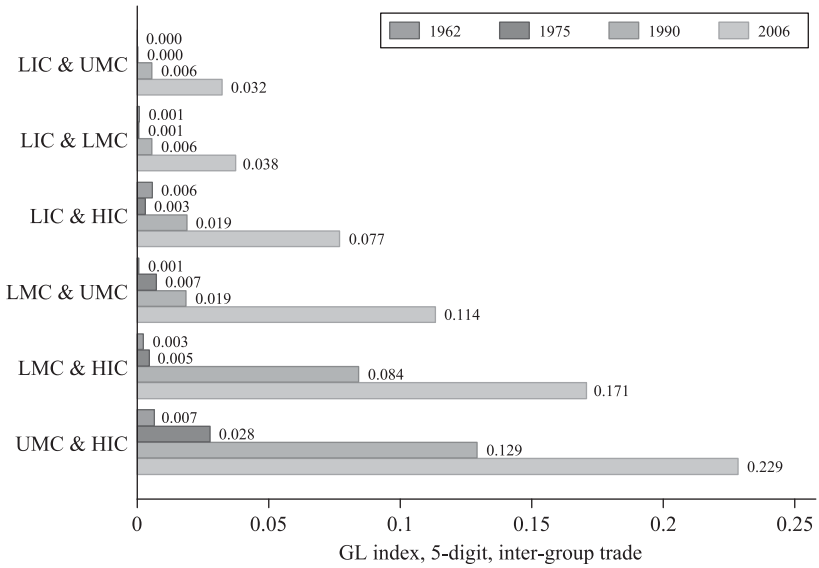
Notes:
Country grouping according to World Bank categorisation (see Table 1); 'long coverage' dataset.

FIGURE 16
IIT within Income Groups; 1962, 1975, 1990 and 2006



Notes:
Country grouping according to World Bank categorisation (see Table 1); 'wide coverage' dataset.

FIGURE 17
IIT between Income Groups; 1962, 1975, 1990 and 2006



Notes:
Country grouping according to World Bank categorisation (see Table 1); 'wide coverage' dataset.

TABLE 3
Total Trade and IIT within and among World Regions, 1962 and 2006
('wide coverage' dataset)

Organisation of cells:
1st row: *% share in world trade, 1962*
2nd row: *% share in world trade, 2006*
3rd row: **GL index, 5-digit, 1962**
4th row: **GL index, 5-digit, 2006**

	AUS	*CAC*	*CACT*	*EAF*	*EEUR*	*MAF*	*NAF*	*NAM*	*NEAS*	*SAF*	*SAM*	*SAS*	*SEAP*	*WAF*	*WAS*	*WEUR*
AUS	*n.a.*															
	0.0882															
	n.a.															
	0.448															
CAC	*0.0009*	*0.0060*														
	0.0117	*0.0753*														
	0.000	**0.029**														
	0.128	**0.118**														
CACT	*0.0003*	*0.0000*	*n.a.*													
	0.0024	*0.0013*	*0.0291*													
	0.000	**0.000**	**n.a.**													
	0.008	**0.037**	**0.012**													
EAF	*0.0000*	*0.0000*	*0.0000*	*0.0013*												
	0.0013	*0.0000*	*0.0012*	*0.0066*												
	0.000	**0.000**	**0.000**	**0.000**												
	0.005	**0.004**	**0.002**	**0.027**												
EEUR	*0.0003*	*0.0001*	*0.0062*	*0.0002*	*0.0064*											
	0.0078	*0.0131*	*0.3610*	*0.0011*	*1.3765*											
	0.000	**0.000**	**0.000**	**0.000**	**0.000**											
	0.047	**0.119**	**0.080**	**0.006**	**0.204**											
MAF	*0.0000*	*0.0001*	*0.0000*	*0.0012*	*0.0000*	*0.0015*										
	0.0000	*0.0000*	*0.0001*	*0.0006*	*0.0003*	*0.0005*										
	0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.007**										
	0.001	**0.001**	**0.000**	**0.000**	**0.001**	**0.022**										

Table 3 *Continued*

	AUS	*CAC*	*CACT*	*EAF*	*EEUR*	*MAF*	*NAF*	*NAM*	*NEAS*	*SAF*	*SAM*	*SAS*	*SEAP*	*WAF*	*WAS*	*WEUR*
NAF	*0.0000*	*0.0014*	*0.0001*	*0.0008*	*0.0049*	*0.0010*	*0.0082*									
	0.0018	*0.0010*	*0.0147*	*0.0043*	*0.0178*	*0.0002*	*0.0074*									
	0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.003**	**0.001**									
	0.007	**0.016**	**0.018**	**0.004**	**0.005**	**0.000**	**0.003**									
NAM	*0.4776*	*3.0835*	*0.2414*	*0.0416*	*0.1514*	*0.0831*	*0.2016*	*5.9391*								
	0.3579	*4.0709*	*0.1125*	*0.0115*	*0.4171*	*0.0753*	*0.1699*	*5.0239*								
	0.000	**0.034**	**0.001**	**0.000**	**0.008**	**0.000**	**0.001**	**0.107**								
	0.194	**0.381**	**0.073**	**0.017**	**0.142**	**0.001**	**0.004**	**0.553**								
NEAS	*0.5474*	*0.1630*	*0.0080*	*0.0222*	*0.0042*	*0.0028*	*0.0128*	*5.5298*	*0.7203*							
	1.0750	*0.5709*	*0.1764*	*0.0685*	*0.8971*	*0.0977*	*0.0716*	*8.5216*	*9.0246*							
	0.000	**0.001**	**0.001**	**0.000**	**0.000**	**0.000**	**0.000**	**0.044**	**0.010**							
	0.042	**0.110**	**0.022**	**0.003**	**0.053**	**0.000**	**0.014**	**0.208**	**0.270**							
SAF	*n.a.*	*0.0001*	*0.0000*	*0.0000*	*0.0000*	*0.0007*	*0.0002*	*0.2785*	*0.1106*	*n.a.*						
	0.0246	*0.0028*	*0.0033*	*0.0539*	*0.0087*	*0.0107*	*0.0016*	*0.1399*	*0.2234*	*0.0550*						
	n.a.	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**n.a.**						
	0.142	**0.092**	**0.021**	**0.021**	**0.054**	**0.000**	**0.011**	**0.149**	**0.092**	**0.002**						
SAM	*0.0004*	*0.1013*	*0.0000*	*0.0000*	*0.0074*	*0.0000*	*0.0002*	*5.6383*	*0.3211*	*0.0010*	*0.1632*					
	0.0121	*0.2032*	*0.0058*	*0.0006*	*0.0464*	*0.0106*	*0.0152*	*1.4266*	*0.7171*	*0.0170*	*0.5344*					
	0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.003**	**0.001**	**0.000**	**0.002**					
	0.050	**0.119**	**0.033**	**0.002**	**0.028**	**0.000**	**0.001**	**0.101**	**0.024**	**0.062**	**0.202**					

SAS	*0.0148*	*0.0002*	*0.0002*	*0.0047*	*0.0066*	*0.0000*	*0.0028*	*0.8909*	*0.2838*	*0.0018*	*0.0017*	*0.0198*				
	0.0556	*0.0165*	*0.0143*	*0.0168*	*0.0530*	*0.0022*	*0.0180*	*0.4649*	*0.5541*	*0.0255*	*0.0405*	*0.0364*				
	0.000	**0.000**	**0.001**	**0.000**	**0.000**	**0.000**	**0.000**	**0.006**	**0.001**	**0.000**	**0.000**	**0.010**				
	0.049	**0.054**	**0.070**	**0.005**	**0.056**	**0.000**	**0.010**	**0.153**	**0.119**	**0.083**	**0.045**	**0.006**				
SEAP	*0.0388*	*0.0004*	*0.0000*	*0.0003*	*0.0020*	*0.0000*	*0.0002*	*1.0881*	*1.1692*	*0.0037*	*0.0011*	*0.0358*	*0.3988*			
	0.3244	*0.0599*	*0.0113*	*0.0052*	*0.0578*	*0.0014*	*0.0083*	*1.8110*	*4.3765*	*0.0282*	*0.0525*	*0.2454*	*1.1904*			
	0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.008**	**0.005**	**0.000**	**0.000**	**0.020**	**0.000**			
	0.114	**0.128**	**0.029**	**0.010**	**0.059**	**0.001**	**0.026**	**0.251**	**0.305**	**0.046**	**0.038**	**0.134**	**0.357**			
WAF	*0.0003*	*0.0001*	*0.0000*	*0.0001*	*0.0015*	*0.0010*	*0.0045*	*0.1501*	*0.0375*	*0.0001*	*0.0003*	*0.0012*	*0.0001*	*0.0106*		
	0.0006	*0.0002*	*0.0005*	*0.0000*	*0.0019*	*0.0009*	*0.0008*	*0.1876*	*0.0480*	*0.0150*	*0.0140*	*0.0572*	*0.0043*	*0.0096*		
	0.000	**0.000**	**0.000**	**0.000**	**0.000**	**0.005**	**0.001**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.014**		
	0.001	**0.002**	**0.000**	**0.003**	**0.000**	**0.001**	**0.003**	**0.000**	**0.000**	**0.001**	**0.000**	**0.000**	**0.001**	**0.003**		
WAS	*0.0002*	*0.0001*	*0.0083*	*0.0003*	*0.0050*	*0.0001*	*0.0000*	*0.5702*	*0.2610*	*0.0018*	*0.0008*	*0.0098*	*0.0047*	*0.0013*	*0.0000*	
	0.0342	*0.0047*	*0.0530*	*0.0224*	*0.0450*	*0.0001*	*0.0352*	*0.8809*	*1.5932*	*0.0387*	*0.0338*	*0.4296*	*0.2754*	*0.0012*	*0.1536*	
	0.000	**0.001**	**0.003**	**0.000**	**0.003**	**0.000**	**0.000**	**0.066**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	
	0.010	**0.024**	**0.024**	**0.005**	**0.035**	**0.000**	**0.037**	**0.087**	**0.016**	**0.009**	**0.007**	**0.030**	**0.017**	**0.000**	**0.033**	
WEUR	*1.0555*	*0.8341*	*0.4949*	*0.4778*	*1.0902*	*0.6354*	*2.9560*	*13.7417*	*1.3188*	*0.6390*	*4.0897*	*0.8955*	*0.8431*	*1.3374*	*1.7037*	*38.9570*
	0.4075	*0.4139*	*0.8525*	*0.0788*	*5.9979*	*0.0777*	*0.7301*	*6.2707*	*6.1474*	*0.4119*	*0.9011*	*0.6332*	*1.2810*	*0.1629*	*0.9705*	*24.9703*
	0.000	**0.004**	**0.012**	**0.006**	**0.012**	**0.002**	**0.008**	**0.088**	**0.047**	**0.000**	**0.003**	**0.013**	**0.003**	**0.004**	**0.004**	**0.190**
	0.112	**0.157**	**0.182**	**0.032**	**0.308**	**0.003**	**0.049**	**0.405**	**0.229**	**0.126**	**0.097**	**0.201**	**0.208**	**0.006**	**0.103**	**0.457**

Abbreviations (World Bank geographic regions)

AUS: Australia & New Zealand; **CAC**: Central America & Caribbean; **CACT**: Central Asia, Caucasus & Turkey; **EAF**: Eastern Africa; **EEUR**: Eastern Europe & Russia; **MAF**: Middle Africa; **NAF**: Northern Africa; **NAM**: North America; **NEAS**: Northeast Asia; **SAF**: Southern Africa; **SAM**: South America; **SAS**: Southern Asia; **SEAP**: Southeast Asia & Pacific; **WAF**: Western Africa; **WAS**: Western Asia; **WEUR**: Western Europe.

high-income countries far outstripping IIT among all other country groups. There has, however, been some marked convergence in global IIT patterns, with IIT shares among all country groups trending upwards since around 1980, and IIT shares involving middle-income and low-income countries growing more rapidly than IIT among high-income countries.

One conspicuous pattern in Figure 15 is a levelling-off in all IIT series, coinciding roughly with the turn of the millennium. A similar, though less pronounced, trend break is also visible in the aggregate IIT time paths shown in Figure 3. Figure 15 shows that the recent stagnation in aggregate IIT growth is not due to the increased integration into world trade of emerging economies and an associated inter-industry 're-specialisation', because all country groups exhibit slowdowns.[20] One possibility is that IIT has levelled off because of the recent increase in the share of primary goods in the value of world trade. Only some 6 per cent of global trade in primary goods were intra-industry in 2006 (see Figure 2).

Being based on the 'long coverage' sample, Figure 15 offers a continuous time series, but it does not take account of most of the world's poorest countries. Figures 16 and 17, being based on the 'wide coverage' dataset, address this issue. The exclusion from global IIT of the poorest countries emerges starkly from Figure 16. Among countries categorised as 'low-income' by the World Bank, the intra-group IIT share has remained stuck below a derisory 0.5 per cent since 1962. The convergence in global IIT levels is clearly a middle-income country phenomenon. The surge in IIT among the lower-middle-income countries from 2.2 per cent in 1990 to 13.9 per cent in 2006 is particularly striking.

The polarised global geography of IIT is also apparent in Figure 17, where I report the evolution of IIT *between* income groups: everybody's average IIT is highest with the high-income countries and lowest with the low-income countries.

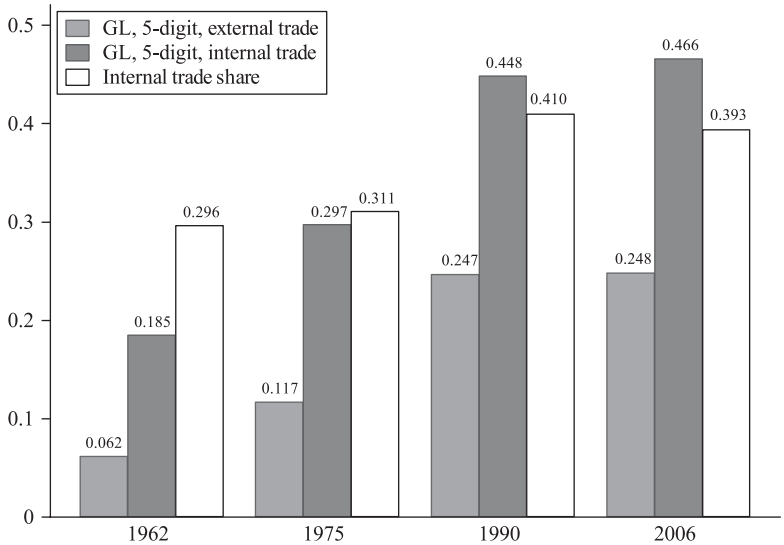
d. IIT and Regional Integration

In light of the ongoing proliferation of regional integration agreements (RIAs), I report some relevant evidence for the EU and for four Sub-Saharan African RIAs.

Figures 18 and 19 show the evolution of IIT and of intra-RIA trade shares for the EU-15 and for the EU-27, respectively. The internal trade share has been increasing steadily since the early 1960s, and intra-EU IIT has risen in parallel. Thus, European integration has gone hand-in-hand with significant strengthening of intra-European trading relations as well as with increasing structural similarity of the participating economies. The coexistence of trade

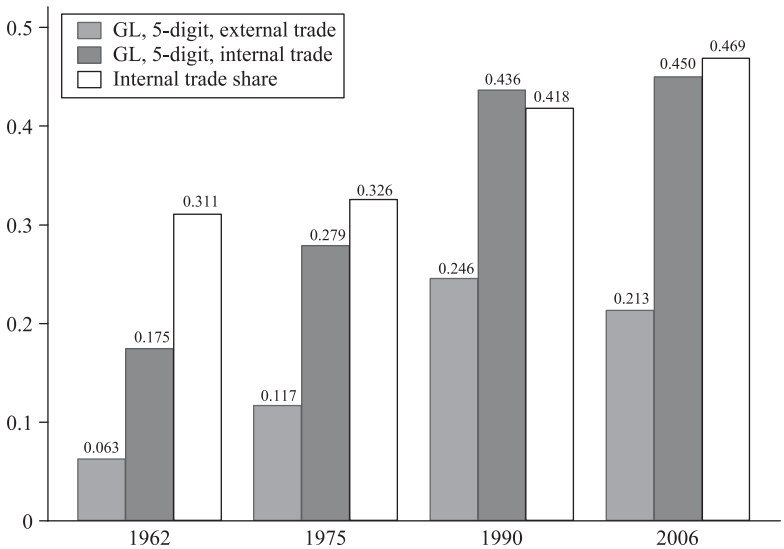
[20] Note, furthermore, that China does not feature in the 'long coverage' dataset (see the Appendix). Its economic ascent cannot therefore explain the observed patterns.

FIGURE 18
IIT of the EU-15; 1962, 1975, 1990 and 2006



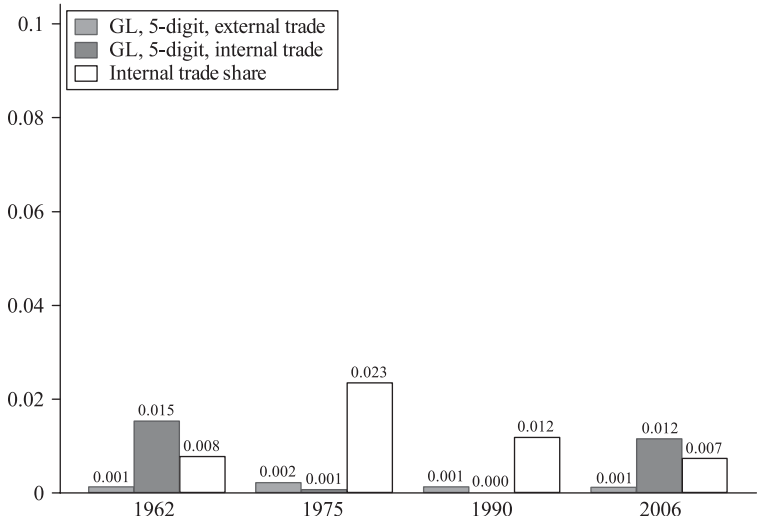
Notes:
'wide coverage' dataset; EU-15 (since 1995): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

FIGURE 19
IIT of the EU-27; 1962, 1975, 1990 and 2006



Notes:
'wide coverage' dataset; EU-27 (since 2007): EU-15 + Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

FIGURE 20
IIT of the Central African Economic and Monetary Community (CEMAC), 1962, 1975, 1990 and 2006



Notes:
'wide coverage' dataset; CEMAC (since 1999): Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon.

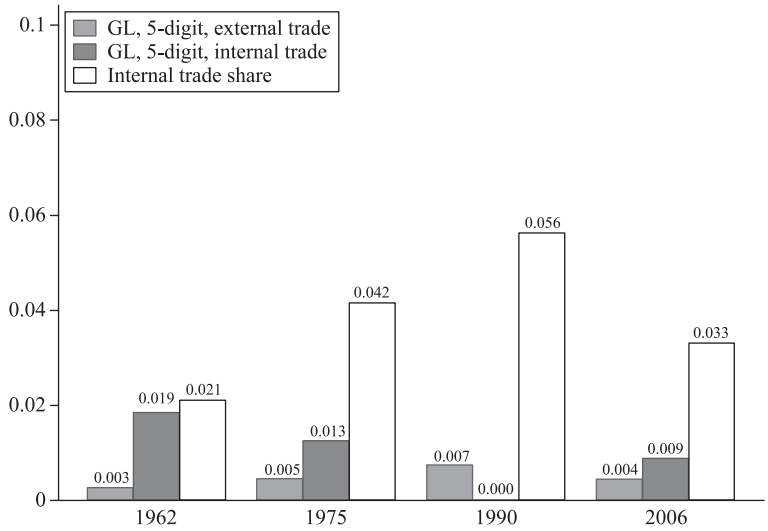
expansion and increasing sectoral similarity across member states that surprised researchers in the early years of European integration (e.g. Balassa, 1966) thus continued to mark the evolution of the European economy over the subsequent four decades.

Figures 20 to 23 show comparable statistics for four African RIAs. These integration schemes differ substantially in terms of age and institutional depth, but my calculations show that they resemble each other in two fundamental respects. First, both intra-RIA trade shares and average levels of IIT are extremely low in those RIAs compared to the EU. In Africa, intra-RIA IIT in no case exceeds 2 per cent, whereas in the EU-15 it reached 46 per cent in 2006. Second, in Africa neither intra-RIA trade shares nor intra-RIA IIT show any clear time trends. On the basis of these (rather rough) computations, there is evidence of African RIAs having stimulated neither substantial regional trade nor structural convergence.

5. SOME SIMPLE REGRESSIONS: IIT, INCOME AND DISTANCE OVER FOUR DECADES

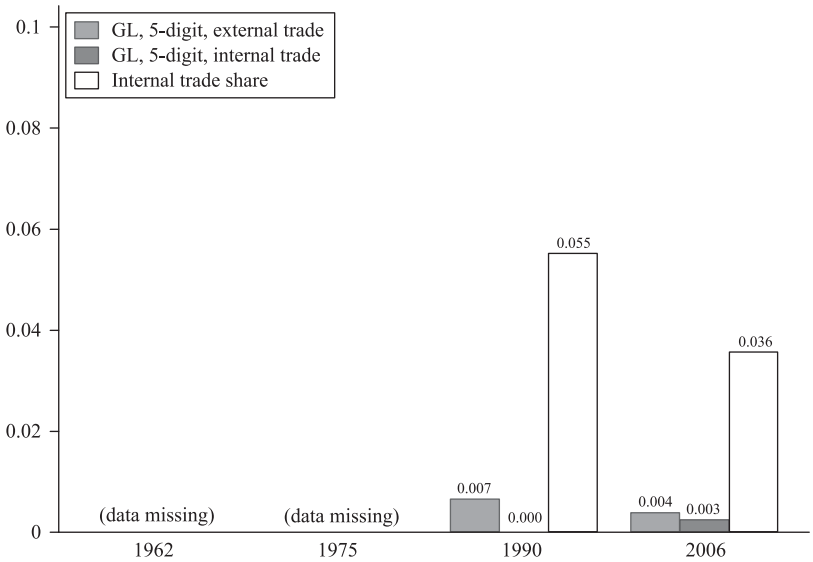
As a complement to the descriptive statistics that represent the main contribution of this paper, I report some simple regression results to quantify the

FIGURE 21
IIT of the West African Economic and Monetary Union (WAEMU); 1962, 1975, 1990 and 2006



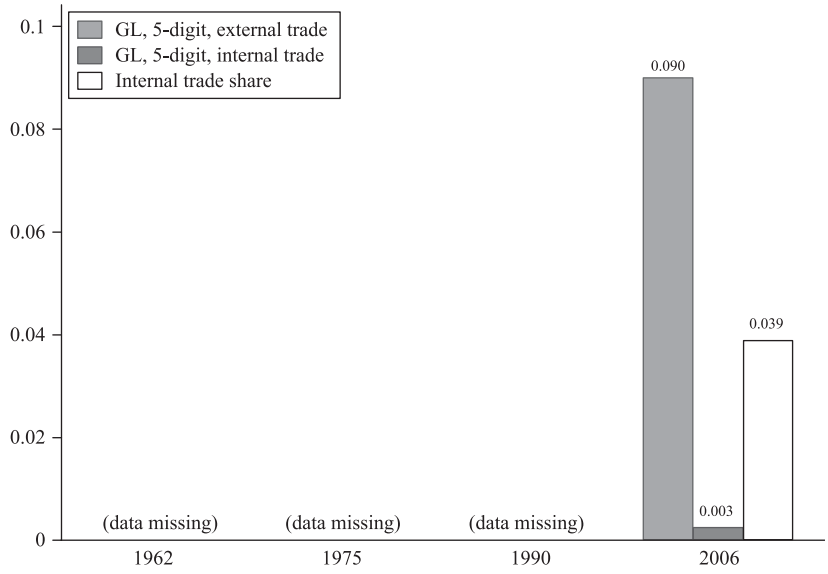
Notes:
'wide coverage' dataset; WAEMU (since 1997): Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo.

FIGURE 22
IIT of the East African Community (EAC); 1962, 1975, 1990 and 2006



Notes:
'wide coverage' dataset; EAC (since 2007): Burundi, Kenya, Rwanda, Tanzania, Uganda.

FIGURE 23
IIT of the Southern African Customs Union (SACU); 1962, 1975, 1990 and 2006



Notes:
'wide coverage' dataset; SACU (since 1990): Botswana, Lesotho, Namibia, South Africa, Swaziland.

sensitivity of IIT to bilateral distance as well as its relation to per-capita income levels. The main value added here is that I can trace how these parameters have evolved over time, and that I run the regression separately for primary, intermediate and final goods sectors.

I estimate the following regression equation separately by sample year:

$$\ln\left(\frac{GL_{cd}}{1-GL_{cd}}\right) = \beta_0 + \beta_1 \ln\left(\frac{pcGDP_c + pcGDP_d}{2}\right) + \beta_2 \ln \mid pcGDP_c - pcGDP_d \mid + \beta_3 \ln(dist_{cd}) + \beta_4 \ln(contig_{cd}) + \varepsilon_{cd}, \quad (7)$$

where GL_{cd} is the aggregate bilateral GL index between countries c and d as defined in (2), *pcGDP* is per-capita GDP, *dist* is the geodesic distance between the two countries' main cities, and *contig* is a dummy variable set to one for countries that share a common land border. The dependent variable is a log transformation of the GL index, which centres it symmetrically around zero and makes it unbounded.[21] Specification (7) contains the main variables featuring in

[21] In order not to lose bilateral observations with no IIT, I have set $GL_{cd} = 0.0001$ for all country pairs with zero recorded IIT, this number being slightly lower than the smallest observed non-zero bilateral GL index. The qualitative results are fairly robust to the particular choice of this number.

most cross-country IIT regressions: the joint income level of the country pair, which is commonly associated with high IIT; the difference in income levels, which is associated with low IIT; and distance measures, which are also associated with low IIT.[22]

Table 5 reports full regression results for three sample years, 1965, 1990 and 2006. The model explains between 27 and 41 per cent of the sample variance in bilateral IIT, and the findings of numerous previous papers (as well as of the previous two sections of this paper) are confirmed: high-income and proximate country pairs have higher IIT than low-income and/or distant country pairs. This applies across all three types of goods. Only the difference in per-capita GDP does not seem to affect bilateral IIT shares systematically: while there are instances of statistically significant positive as well as negative coefficients, the large majority of estimates are statistically not significantly different from zero.

The main output from this exercise is Figure 24, which traces the annual estimated coefficients on distance and on average GDP per capita over the sample period. Two tendencies are apparent. First, the estimated coefficients on per-capita incomes were generally increasing until around 1982 but have been falling steadily since. This implies that, while IIT continues to be largely confined to high-income countries, this link has been weakening somewhat over the last quarter of a century. In 1982, the estimated elasticity of bilateral IIT with respect to average per-capita GDP ($\hat{\beta}_1$) stood at 2.47, whereas by 2006 it had fallen to 1.62. IIT thus seems to be increasingly characterising trade involving middle-income and low-income countries as well.

The coefficients on distance, shown in the lower part of Figure 24, have gradually shrunk in absolute magnitude. While the elasticity of IIT with respect to distance stood at −1.46 in 1965, it had reached a value of −0.70 – still highly statistically significant, but only half as large as some 40 years earlier. The reduction in the distance sensitivity of aggregate bilateral IIT has been driven mainly by IIT in intermediate goods. This could be taken as another piece of indicative evidence for the growing weight of intermediate (outward processing) trade in global IIT, and it suggests that two-way intermediates trade on average stretches over larger distances than two-way trade in primary and final goods.

6. MARGINAL IIT

Figures 25 to 29 illustrate the broad patterns of global MIIT, computed using definitions (5) and (6), and Table 4 lists MIIT indices by country. All trade values underlying the reported indices are converted into constant prices using the US GDP deflator.

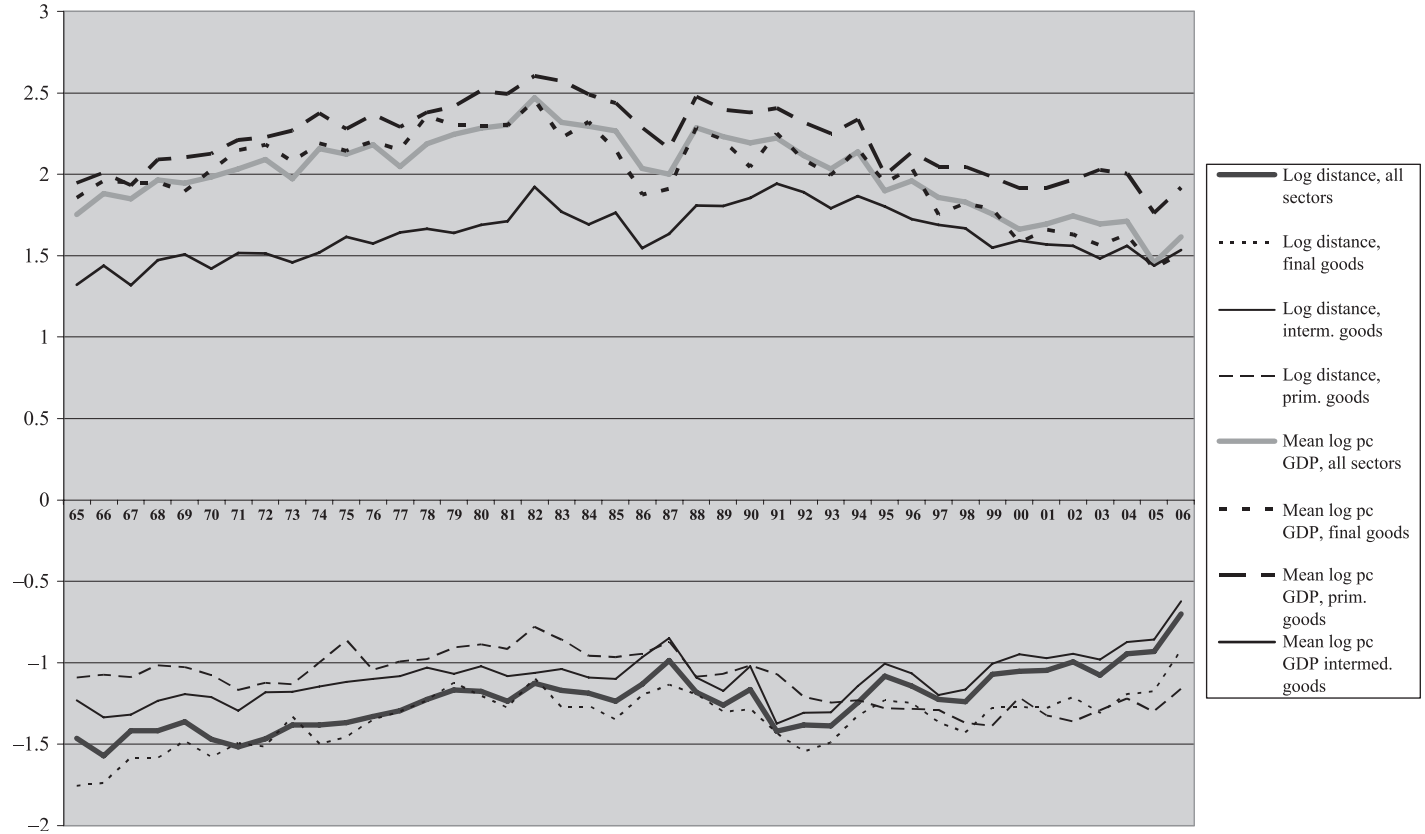
[22] See e.g. Hummels and Levinsohn (1995) and Bergstrand and Egger (2006).

TABLE 4
Cross-Country Determinants of IIT, 1965, 1990 and 2006
(Dependent variable = log transformed GL index, estimation by OLS)

	1965				*1990*				*2006*			
	All Sectors	*Primary*	*Intermed.*	*Final*	*All Sectors*	*Primary*	*Intermed.*	*Final*	*All Sectors*	*Primary*	*Intermed.*	*Final*
log mean per-cap. GDP	1.753***	1.322***	1.944***	1.854***	2.193***	1.855***	2.378***	2.045***	1.617***	1.534***	1.918***	1.513***
	(0.09)	(0.11)	(0.11)	(0.12)	(0.09)	(0.10)	(0.10)	(0.10)	(0.08)	(0.10)	(0.08)	(0.08)
log diff per-cap. GDP	–0.0811	0.018	–0.133	–0.210**	0.0890	0.00854	0.140*	–0.132	0.0444	–0.097	0.189***	–0.0668
	(0.08)	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.08)	(0.09)	(0.07)	(0.09)	(0.07)	(0.07)
log distance	–1.464***	–1.092***	–1.231***	–1.754***	–1.163***	–1.019***	–1.021***	–1.285***	–0.700***	–1.161***	–0.622***	–0.923***
	(0.10)	(0.11)	(0.11)	(0.11)	(0.10)	(0.10)	(0.11)	(0.11)	(0.09)	(0.11)	(0.09)	(0.09)
contiguity	1.330***	1.827***	1.464***	0.890*	1.486***	1.801***	1.812***	0.969*	1.571***	1.672***	2.006***	1.327***
	(0.47)	(0.50)	(0.51)	(0.53)	(0.48)	(0.50)	(0.51)	(0.52)	(0.41)	(0.53)	(0.45)	(0.44)
constant	–9.555***	–10.500***	–13.500***	–7.902***	–14.730***	–15.180***	–17.591***	–12.263***	–12.570***	–10.361***	–16.150***	–9.665***
	(1.23)	(1.35)	(1.35)	(1.43)	(1.26)	(1.34)	(1.36)	(1.40)	(1.12)	(1.44)	(1.21)	(1.20)
Observations	1,196	1,090	1,101	1,069	1,411	1,340	1,373	1,354	1,375	1,354	1,374	1,373
R^2	0.41	0.27	0.37	0.39	0.41	0.32	0.39	0.36	0.33	0.28	0.34	0.31

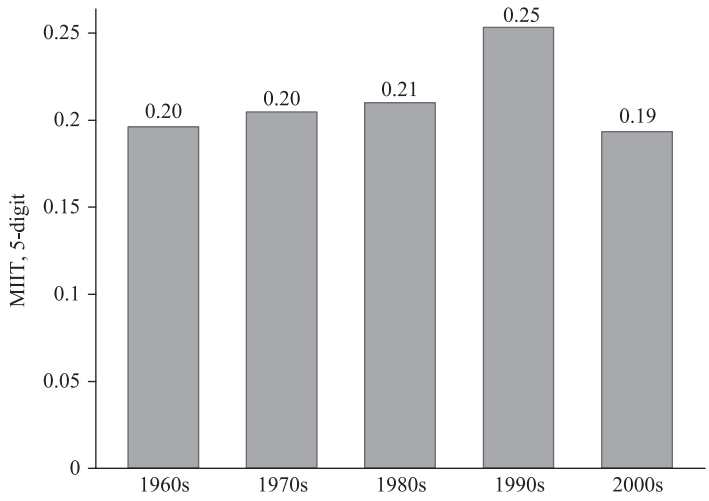
***, ** and * indicate statistical significance at the 1 per cent, 5 per cent and 10 per cent levels, respectively. Numbers in parentheses are standard errors.

FIGURE 24
Sensitivity of IIT to Distance and Income, 1965–2006



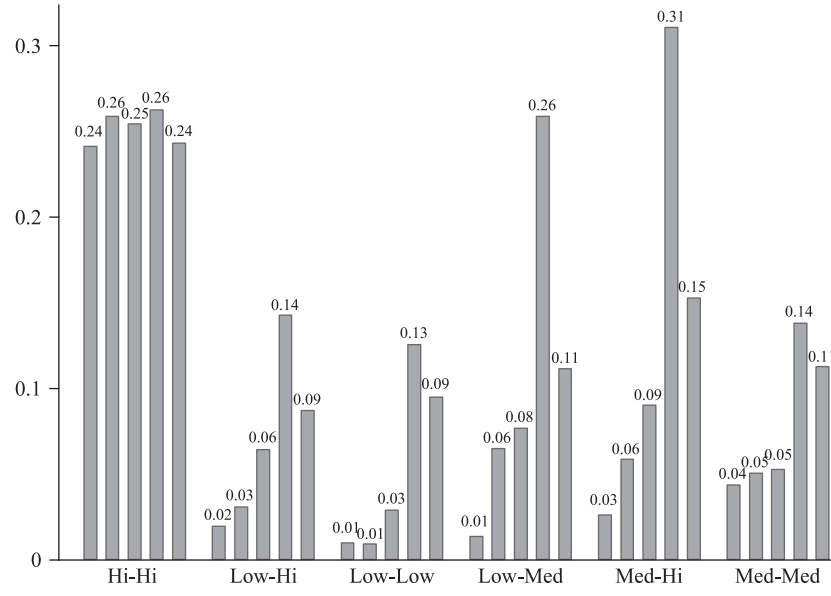
Note:
Coefficients from annual cross-section regressions analogous to those reported in Table 4.

FIGURE 25
Global MIIT over Five Decades



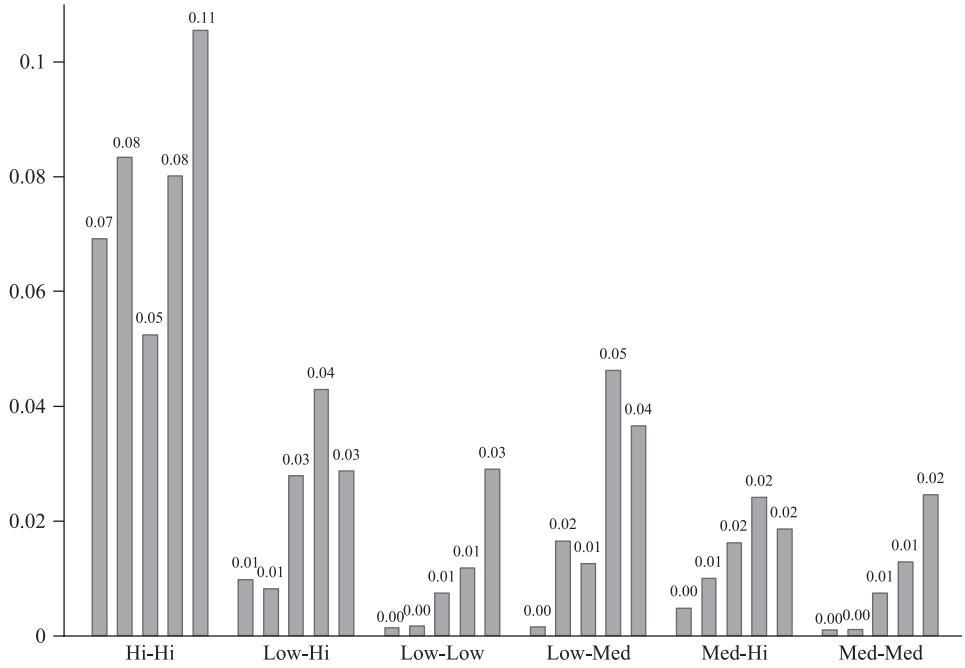
Notes:
'long coverage' dataset; data converted into constant prices using US GDP deflator; base and end periods are averages of three adjacent years.

FIGURE 26
MIIT by Income Group



Notes:
Country grouping according to World Bank categorisation (see Table 1, 'Low' category is combination of LIC and LMC); 'long coverage' dataset; data converted into constant prices using US GDP deflator; base and end periods are averages of three adjacent years.

FIGURE 27
MIIT by Income Group, Primary Goods

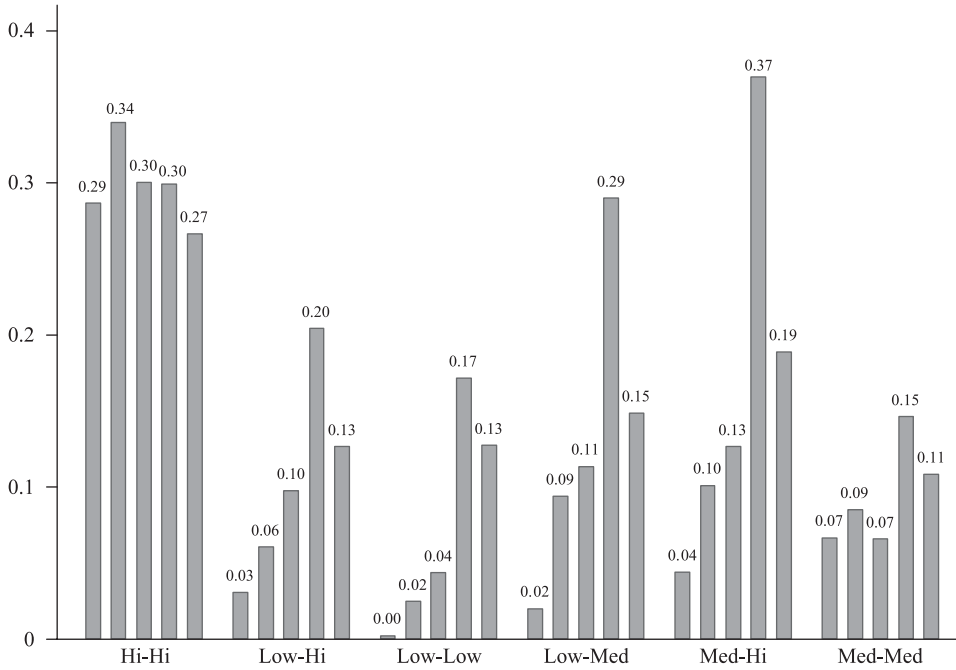


Notes:
Country grouping according to World Bank categorisation (see Table 1, 'Low' category = LIC + LMC); product grouping according to United Nations 'Broad Economic Categories'; 'long coverage' dataset; data converted into constant prices using US GDP deflator; base and end periods are averages of three adjacent years.

First, I report aggregate MIIT indices for each of my five sample decades (the '1960s' starting in 1962 and the '2000s' ending in 2006), taking three adjacent years for the base and end periods in order to smooth out any year-specific variations. What emerges in Figure 25 is a remarkably stable level of MIIT. On average, about one-fifth of trade expansion was in the form of bilaterally matched import and export changes at the 5-digit level. Hence, the bulk of trade changes involve inter-industry adjustments. The observed secular increase in IIT therefore was not accompanied by an equivalent rise in MIIT. While static IIT has been increasing strongly, the pressures for intersectoral factor reallocations implied by this trade expansion do not appear to have lessened proportionally over time.[23]

[23] It does, however, appear that MIIT was considerably higher in the 1990s than in the three previous decades, and the apparent drop in MIIT in the 2000s could be due to the shorter time interval considered. This may therefore suggest that MIIT is on the rise too, but with a certain lag compared to the increases in IIT.

FIGURE 28
MIIT by Income Group, Intermediate Goods



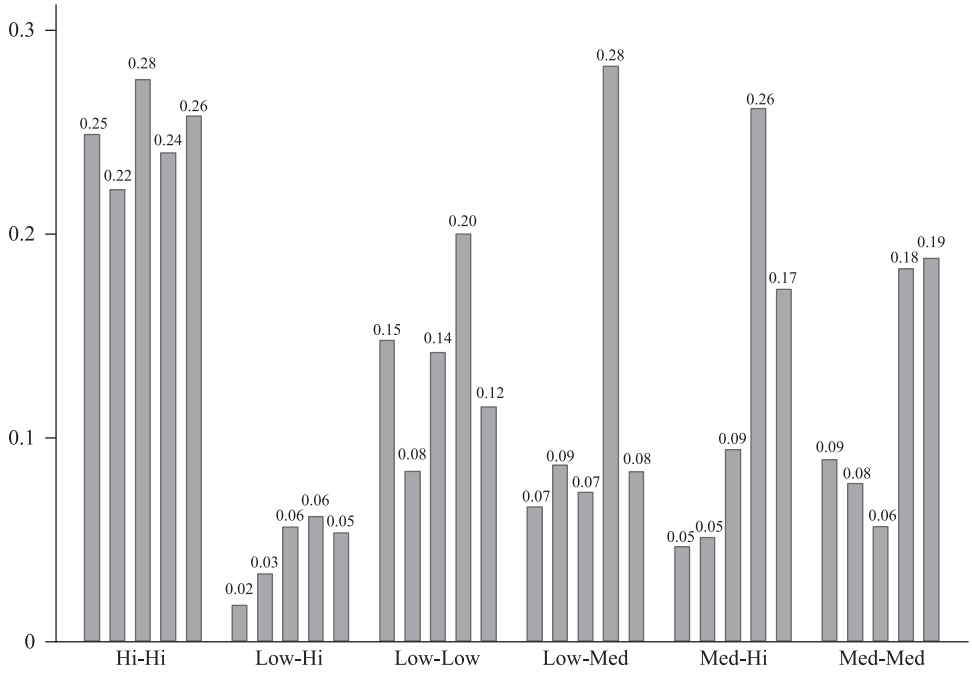
Notes:
Country grouping according to World Bank categorisation (see Table 1, 'Low' category = LIC + LMC); product grouping according to United Nations 'Broad Economic Categories'; 'long coverage' dataset; data converted into constant prices using US GDP deflator; base and end periods are averages of three adjacent years.

In Figures 26 to 29, decade-by-decade MIIT is shown separately for country groups by income level and for sector groups by processing stage. Two patterns emerge very clearly: averaged across product groups, MIIT is highest among the high-income countries; and averaged across countries, MIIT is highest in the intermediate goods category. Adjustment to trade expansion is thus likely to be smoother for trade among high-income countries and in intermediate good sectors.

Of all the cases distinguished in Figures 26 to 29, the highest level of MIIT (0.37) is observed for trade between middle-income and high-income countries in intermediate goods in the 1990s. Once again, this evidence suggests that outward processing trade is the main driving force towards higher observed increases in IIT and MIIT in recent years.

Table 5 shows MIIT measures country-by-country for three long periods of some 15 years each, using the 'wide coverage' sample. Countries are sorted in decreasing order of their share in average gross changes in global trade volumes

FIGURE 29
MIIT by Income Group, Final Goods



Notes:
Country grouping according to World Bank categorisation (see Table 1, 'Low' category = LIC + LMC); product grouping according to United Nations 'Broad Economic Categories'; 'long coverage' dataset; data converted into constant prices using US GDP deflator; base and end periods are averages of three adjacent years.

over the total 1962–2006 interval. I find that the large industrialised countries again feature at the top of the list. The most sectorally balanced trade expansion over the full interval is recorded for Austria (MIIT index of 0.45). In the 1990–2006 sub-period the highest value is obtained for Hungary (MIIT index of 0.51), followed by Austria (0.49) and Canada (0.45). For most countries, however, MIIT is tiny. Over the 1990–2006 sub-period, 141 of the 190 sample countries have an MIIT index below 0.1, suggesting that more than 90 per cent of their trade changes (generally in the form of expansion) implied reallocations between rather than within 5-digit industries.[24] For most countries, therefore, trade expansion continues to entail primarily inter-industry adjustments.

[24] I can compute MIIT for only 190 of the 214 countries in the 'wide coverage' dataset, because I need to observe trade for both the base and the end year.

TABLE 5
MIIT by Country, 1962–75, 1975–90 and 1990–2006
(Sorted in decreasing order of % of world trade, 'wide coverage' dataset)

Country	*MIIT 1962–75*	*MIIT 1975–90*	*MIIT 1990–2006*	*MIIT Average*	*% of Total Tr. Change, 1962–75*	*% of Total Tr. Change, 1975–90*	*% of Total Tr. Change, 1990–2006*	*% of Total Tr. Change, Average*
United States	0.226	0.353	0.343	*0.307*	21.974	19.327	21.282	*20.861*
Germany	0.335	0.484	0.437	*0.419*	18.329	15.838	11.428	*15.198*
France	0.227	0.481	0.420	*0.376*	9.624	9.887	5.413	*8.308*
Japan	0.103	0.230	0.270	*0.201*	8.749	9.306	6.213	*8.089*
United Kingdom	0.326	0.435	0.337	*0.366*	7.921	8.986	5.301	*7.403*
Italy	0.239	0.399	0.361	*0.333*	7.267	6.629	4.030	*5.975*
Netherlands	0.345	0.439	0.281	*0.355*	6.895	4.592	3.154	*4.880*
China	0.028	0.227	0.252	*0.169*	0.088	1.017	11.326	*4.143*
Belgium-Luxembourg	0.411	0.503	n.a.	*0.457*	4.401	3.597	n.a.	*3.999*
Canada	0.356	0.453	0.445	*0.418*	2.531	2.475	3.167	*2.724*
Spain	0.190	0.400	0.398	*0.329*	0.598	1.925	2.599	*1.707*
Sweden	0.322	0.377	0.340	*0.346*	2.130	1.249	0.869	*1.416*
Switzerland	0.332	0.458	0.409	*0.400*	1.106	1.859	1.131	*1.365*
Hong Kong, China	0.141	0.293	0.130	*0.188*	0.488	1.580	1.921	*1.330*
Korea, Rep.	0.200	0.254	0.307	*0.253*	0.069	0.789	2.749	*1.202*
Taiwan, China	0.050	0.262	0.321	*0.211*	0.079	0.887	2.304	*1.090*
Singapore	0.134	0.320	0.335	*0.263*	0.345	0.931	1.525	*0.933*
Denmark	0.299	0.347	0.321	*0.322*	1.115	0.770	0.599	*0.828*
Malaysia	n.a.	0.278	0.343	*0.310*	n.a.	0.396	1.108	*0.752*
Australia	0.060	0.125	0.116	*0.100*	0.358	0.800	1.094	*0.751*
Mexico	0.171	0.311	0.391	*0.291*	0.236	0.357	1.596	*0.730*
Austria	0.364	0.487	0.488	*0.447*	0.332	0.978	0.812	*0.707*
Brazil	0.071	0.120	0.205	*0.132*	0.489	0.411	0.862	*0.587*
India	0.029	0.117	0.183	*0.110*	0.198	0.280	1.107	*0.528*
Norway	0.283	0.195	0.139	*0.205*	0.597	0.440	0.475	*0.504*
Thailand	0.041	0.221	0.328	*0.197*	0.103	0.342	1.030	*0.492*
Saudi Arabia	0.003	0.021	0.017	*0.014*	0.261	0.373	0.666	*0.434*
Ireland	0.377	0.393	0.265	*0.345*	0.070	0.268	0.570	*0.303*

Indonesia	0.011	0.057	0.148	*0.072*	0.137	0.235	0.456	*0.276*
Finland	0.207	0.313	0.247	*0.256*	0.121	0.329	0.329	*0.260*
Portugal	0.178	0.314	0.308	*0.267*	0.107	0.280	0.299	*0.228*
Turkey	0.029	0.110	0.191	*0.110*	0.105	0.148	0.401	*0.218*
Unspecified	0.005	0.007	0.015	*0.009*	0.113	0.330	0.198	*0.214*
Greece	0.094	0.133	0.149	*0.126*	0.214	0.201	0.205	*0.207*
Venezuela	0.008	0.055	0.042	*0.035*	0.285	0.103	0.206	*0.198*
Yugoslavia, FR	0.139	0.239	n.a.	*0.189*	0.182	0.190	n.a.	*0.186*
Poland	0.086	0.086	0.435	*0.202*	0.084	0.061	0.408	*0.184*
Philippines	0.036	0.144	0.372	*0.184*	0.098	0.088	0.299	*0.162*
Israel	0.118	0.321	0.284	*0.241*	0.153	0.133	0.183	*0.156*
South Africa	0.052	0.032	0.207	*0.097*	0.173	0.091	0.198	*0.154*
Argentina	0.063	0.091	0.214	*0.123*	0.162	0.091	0.198	*0.150*
Iran, Islamic Rep.	0.008	0.006	0.022	*0.012*	0.277	0.077	0.072	*0.142*
Chile	0.025	0.051	0.049	*0.041*	0.052	0.057	0.224	*0.111*
Soviet Union	0.036	0.028	n.a.	*0.032*	0.159	0.168	0.000	*0.109*
New Zealand	0.034	0.145	0.192	*0.124*	0.038	0.115	0.123	*0.092*
Hungary	0.157	0.058	0.506	*0.241*	0.022	0.025	0.215	*0.087*
United Arab Emirates	n.a.	0.010	0.013	*0.012*	0.000	0.052	0.206	*0.086*
Nigeria	0.006	0.003	0.003	*0.004*	0.117	0.043	0.057	*0.073*
Algeria	0.012	0.009	0.007	*0.009*	0.078	0.057	0.076	*0.070*
Pakistan	0.050	0.033	0.043	*0.042*	0.034	0.051	0.096	*0.060*
Kuwait	0.004	0.008	0.005	*0.006*	0.057	0.048	0.071	*0.058*
Morocco	0.018	0.079	0.135	*0.077*	0.077	0.040	0.055	*0.058*
Colombia	0.042	0.066	0.130	*0.080*	0.033	0.048	0.089	*0.057*
Libya	0.006	0.005	0.004	*0.005*	0.108	0.033	0.028	*0.056*
Egypt, Arab Rep.	0.017	0.039	0.056	*0.038*	0.032	0.061	0.070	*0.054*
Romania	0.095	0.060	0.298	*0.151*	0.018	0.023	0.118	*0.053*
Peru	0.012	0.044	0.049	*0.035*	0.061	0.022	0.057	*0.047*
Czechoslovakia	0.108	0.112	n.a.	*0.110*	0.041	0.047	n.a.	*0.044*
Iraq	0.003	0.003	0.003	*0.003*	0.054	0.035	0.022	*0.037*
Qatar	0.008	0.011	0.011	*0.010*	0.003	0.009	0.081	*0.031*
Tunisia	0.054	0.148	0.026	*0.076*	0.022	0.025	0.022	*0.023*
Oman	0.029	0.032	0.014	*0.025*	0.001	0.009	0.054	*0.022*
Ecuador	0.016	0.021	0.082	*0.040*	0.019	0.013	0.032	*0.021*

Table 5 *Continued*

Country	*MIIT 1962–75*	*MIIT 1975–90*	*MIIT 1990–2006*	*MIIT Average*	*% of Total Tr. Change, 1962–75*	*% of Total Tr. Change, 1975–90*	*% of Total Tr. Change, 1990–2006*	*% of Total Tr. Change, Average*
Costa Rica	0.027	0.076	0.175	*0.093*	0.006	0.012	0.042	*0.020*
Panama	0.023	0.036	0.076	*0.045*	0.021	0.018	0.019	*0.019*
Syrian Arab Republic	0.022	0.007	0.031	*0.020*	0.010	0.023	0.019	*0.017*
Trinidad and Tobago	0.024	0.039	0.024	*0.029*	0.016	0.009	0.024	*0.017*
German Democratic Republic	0.103	0.047	n.a.	*0.075*	0.016	0.017	n.a.	*0.017*
Netherlands Antilles	0.012	0.014	0.027	*0.018*	0.029	0.011	0.005	*0.015*
Sri Lanka	0.008	0.061	0.028	*0.032*	0.012	0.015	0.018	*0.015*
Jordan	0.013	0.050	0.041	*0.035*	0.003	0.011	0.030	*0.015*
Bulgaria	0.106	0.066	0.255	*0.142*	0.006	0.005	0.031	*0.014*
Côte d'Ivoire	0.015	0.007	0.012	*0.012*	0.027	0.008	0.006	*0.014*
Cyprus	0.057	0.071	0.136	*0.088*	0.003	0.012	0.023	*0.013*
Guatemala	0.015	0.065	0.094	*0.058*	0.007	0.009	0.021	*0.013*
Jamaica	0.086	0.115	0.077	*0.093*	0.015	0.009	0.008	*0.011*
Bahrain	0.032	0.029	0.055	*0.039*	0.005	0.012	0.015	*0.011*
Bangladesh	n.a.	0.026	0.014	*0.020*	0.000	0.007	0.024	*0.010*
Ghana	0.034	0.013	0.027	*0.025*	0.021	0.004	0.005	*0.010*
Lebanon	0.016	0.012	0.028	*0.019*	0.015	0.008	0.006	*0.010*
Iceland	0.032	0.035	0.065	*0.044*	0.008	0.010	0.011	*0.010*
Angola	0.008	0.002	0.001	*0.004*	0.006	0.007	0.015	*0.009*
Cameroon	0.012	0.026	0.007	*0.015*	0.011	0.007	0.007	*0.009*
Bolivia	0.010	0.009	0.034	*0.018*	0.015	0.005	0.005	*0.008*
Uruguay	0.043	0.108	0.113	*0.088*	0.007	0.008	0.010	*0.008*
Dominican Republic	0.045	0.012	0.031	*0.030*	0.009	0.008	0.008	*0.008*
Malta	0.115	0.405	0.300	*0.273*	0.004	0.009	0.011	*0.008*
Kenya	0.031	0.027	0.016	*0.025*	0.007	0.007	0.008	*0.007*
Congo, Dem. Rep.	0.014	0.009	0.005	*0.009*	0.016	0.005	0.001	*0.007*
Liberia	0.018	0.027	0.015	*0.020*	0.009	0.007	0.004	*0.007*
Senegal	0.019	0.059	0.047	*0.042*	0.010	0.006	0.004	*0.007*

Vietnam	n.a.	0.024	0.049	*0.036*	0.000	0.001	0.018	*0.006*
El Salvador	0.023	0.067	0.095	*0.062*	0.005	0.004	0.010	*0.006*
Honduras	0.030	0.038	0.067	*0.045*	0.003	0.004	0.011	*0.006*
Paraguay	0.028	0.013	0.039	*0.027*	0.004	0.005	0.008	*0.006*
Brunei	0.016	0.013	0.008	*0.012*	0.002	0.007	0.007	*0.005*
Mauritius	0.014	0.067	0.070	*0.051*	0.001	0.008	0.006	*0.005*
Cuba	0.009	0.009	0.012	*0.010*	0.007	0.004	0.003	*0.005*
Sudan	0.012	0.012	0.012	*0.012*	0.007	0.002	0.005	*0.005*
Special Categories	0.130	0.076	0.040	*0.082*	0.006	0.005	0.001	*0.004*
Gabon	0.006	0.003	0.004	*0.005*	0.007	0.003	0.002	*0.004*
Macao	0.000	0.136	0.099	*0.078*	0.000	0.004	0.008	*0.004*
Nicaragua	0.015	0.041	0.043	*0.033*	0.004	0.002	0.004	*0.004*
Madagascar	0.014	0.030	0.021	*0.022*	0.005	0.002	0.003	*0.003*
Myanmar	0.008	0.010	0.012	*0.010*	0.005	0.001	0.002	*0.003*
Bahamas, The	0.043	0.015	0.019	*0.026*	0.003	0.002	0.003	*0.003*
Papua New Guinea	0.007	0.015	0.006	*0.009*	0.001	0.003	0.003	*0.002*
Mozambique	0.010	0.009	0.005	*0.008*	0.003	0.001	0.003	*0.002*
Ethiopia (includes Eritrea)	0.011	0.020	n.a.	*0.016*	0.003	0.003	0.000	*0.002*
Congo, Rep.	0.007	0.004	0.002	*0.004*	0.002	0.002	0.002	*0.002*
Zambia	n.a.	0.007	0.003	*0.005*	0.000	0.003	0.003	*0.002*
Guadeloupe	0.053	0.027	n.a.	*0.040*	0.001	0.003	n.a.	*0.002*
New Caledonia	0.002	0.004	0.021	*0.009*	0.003	0.001	0.001	*0.002*
Togo	0.009	0.012	0.004	*0.008*	0.003	0.001	0.001	*0.002*
Fiji	0.006	0.044	0.057	*0.036*	0.000	0.002	0.002	*0.002*
Bunkers	0.020	0.001	0.000	*0.007*	0.003	0.001	0.000	*0.002*
Martinique	0.066	0.030	n.a.	*0.048*	0.000	0.003	n.a.	*0.002*
Tanzania	n.a.	0.013	0.011	*0.012*	0.000	0.002	0.003	*0.002*
Barbados	0.104	0.095	0.050	*0.083*	0.001	0.002	0.002	*0.001*
Réunion	0.024	0.017	n.a.	*0.020*	0.001	0.003	0.000	*0.001*
Zimbabwe	n.a.	0.056	0.017	*0.036*	0.000	0.000	0.004	*0.001*
Guyana	0.026	0.025	0.022	*0.025*	0.002	0.001	0.000	*0.001*
Afghanistan	0.012	0.011	0.009	*0.011*	0.002	0.000	0.000	*0.001*
Korea, Dem. Rep.	0.003	0.027	0.028	*0.019*	0.000	0.001	0.002	*0.001*
Suriname	0.110	0.016	0.026	*0.051*	0.002	0.001	0.000	*0.001*
Mali	0.049	0.018	0.008	*0.025*	0.001	0.001	0.001	*0.001*

Table 5 *Continued*

Country	*MIIT 1962–75*	*MIIT 1975–90*	*MIIT 1990–2006*	*MIIT Average*	*% of Total Tr. Change, 1962–75*	*% of Total Tr. Change, 1975–90*	*% of Total Tr. Change, 1990–2006*	*% of Total Tr. Change, Average*
Bermuda	0.018	0.022	0.004	*0.015*	0.000	0.001	0.002	*0.001*
Haiti	0.055	0.034	0.040	*0.043*	0.001	0.001	0.001	*0.001*
Malawi	n.a.	0.006	0.020	*0.013*	0.000	0.002	0.001	*0.001*
Benin	0.002	0.004	0.001	*0.002*	0.001	0.000	0.001	*0.001*
Nepal	0.019	0.028	0.036	*0.027*	0.000	0.001	0.001	*0.001*
Burkina Faso	0.005	0.004	0.003	*0.004*	0.001	0.000	0.000	*0.001*
Sierra Leone	0.007	0.005	0.016	*0.009*	0.001	0.000	0.000	*0.001*
Guinea	0.001	0.006	0.005	*0.004*	0.000	0.001	0.001	*0.001*
Uganda	0.003	0.004	0.009	*0.005*	0.000	0.000	0.001	*0.001*
French Polynesia	0.015	0.014	0.020	*0.016*	0.000	0.001	0.001	*0.000*
Albania	0.027	0.031	0.249	*0.102*	0.000	0.000	0.001	*0.000*
Mauritania	0.000	0.002	0.009	*0.004*	0.000	0.000	0.000	*0.000*
Yemen Democratic	0.003	0.014	n.a.	*0.009*	0.001	0.001	0.000	*0.000*
Faeroe Islands	n.a.	0.040	0.053	*0.046*	0.000	0.000	0.001	*0.000*
Niger	0.012	0.005	0.009	*0.008*	0.001	0.000	0.000	*0.000*
St. Lucia	n.a.	0.090	0.058	*0.074*	0.000	0.001	0.000	*0.000*
Seychelles	n.a.	0.021	0.088	*0.054*	0.000	0.000	0.001	*0.000*
Yemen	0.001	0.004	0.013	*0.006*	0.000	0.000	0.001	*0.000*
Andorra	n.a.	0.041	0.040	*0.041*	n.a.	0.000	0.000	*0.000*
Central African Republic	0.004	0.003	0.008	*0.005*	0.001	0.000	0.000	*0.000*
Chad	0.010	0.003	0.007	*0.007*	0.001	0.000	0.000	*0.000*
Cambodia	0.007	0.001	0.002	*0.004*	0.000	0.000	0.001	*0.000*
Somalia	0.005	0.004	0.010	*0.006*	0.001	0.000	0.000	*0.000*
French Guiana	0.001	0.025	n.a.	*0.013*	0.000	0.001	0.000	*0.000*
Belize	0.000	0.048	0.028	*0.025*	0.000	0.000	0.000	*0.000*
Djibouti	0.004	0.015	0.006	*0.008*	0.000	0.000	0.000	*0.000*
Mongolia	0.000	0.021	0.014	*0.012*	0.000	0.000	0.001	*0.000*
Greenland	n.a.	0.014	0.012	*0.013*	0.000	0.000	0.000	*0.000*
Cayman Islands	n.a.	0.009	0.004	*0.006*	0.000	0.000	0.000	*0.000*
Lao PDR	0.001	0.039	0.010	*0.017*	0.000	0.000	0.000	*0.000*

Gibraltar	0.001	0.040	0.009	*0.017*	0.000	0.000	0.000	*0.000*
Aruba	n.a.	n.a.	0.008	*0.008*	0.000	0.000	0.000	*0.000*
Us Msc. Pac. I	0.005	0.009	n.a.	*0.007*	0.000	0.000	0.000	*0.000*
Gambia, The	0.002	0.008	0.006	*0.005*	0.000	0.000	0.000	*0.000*
Maldives	n.a.	0.029	0.008	*0.019*	0.000	0.000	0.000	*0.000*
Burundi	0.004	0.010	0.010	*0.008*	0.000	0.000	0.000	*0.000*
Antigua and Barbuda	n.a.	0.015	0.003	*0.009*	0.000	0.000	0.000	*0.000*
Vanuatu	0.001	0.004	0.010	*0.005*	0.000	0.000	0.000	*0.000*
Cape Verde	0.000	0.008	0.030	*0.013*	0.000	0.000	0.000	*0.000*
St. Vincent and the Grenadines	n.a.	0.037	0.015	*0.026*	0.000	0.000	0.000	*0.000*
Rwanda	n.a.	0.004	0.004	*0.004*	0.000	0.000	0.000	*0.000*
Equatorial Guinea	0.001	0.010	0.007	*0.006*	0.000	0.000	0.000	*0.000*
Samoa	0.005	0.037	0.027	*0.023*	0.000	0.000	0.000	*0.000*
Free Zones	0.001	0.000	0.001	*0.001*	0.000	0.000	0.000	*0.000*
Fm Panama Cz	0.002	n.a.	n.a.	*0.002*	0.000	0.000	0.000	*0.000*
Guinea-Bissau	0.009	0.016	0.008	*0.011*	0.000	0.000	0.000	*0.000*
Dominica	n.a.	0.017	0.035	*0.026*	0.000	0.000	0.000	*0.000*
Solomon Islands	n.a.	0.010	0.006	*0.008*	0.000	0.000	0.000	*0.000*
Grenada	n.a.	0.046	0.021	*0.033*	0.000	0.000	0.000	*0.000*
St. Kitts and Nevis	n.a.	n.a.	0.155	*0.155*	0.000	0.000	0.000	*0.000*
British Virgin Islands	n.a.	0.026	0.028	*0.027*	0.000	0.000	0.000	*0.000*
Tonga	n.a.	0.020	0.010	*0.015*	0.000	0.000	0.000	*0.000*
Comoros	0.000	0.004	0.002	*0.002*	0.000	0.000	0.000	*0.000*
Saint Pierre and Miquelon	0.000	0.008	0.003	*0.004*	0.000	0.000	0.000	*0.000*
Montserrat	n.a.	0.006	0.025	*0.015*	0.000	0.000	0.000	*0.000*
Turks and Caicos Isl.	n.a.	0.108	0.003	*0.055*	0.000	0.000	0.000	*0.000*
Kiribati	n.a.	0.004	0.012	*0.008*	0.000	0.000	0.000	*0.000*
Bhutan	n.a.	0.008	0.022	*0.015*	0.000	0.000	0.000	*0.000*
Falkland Islands	n.a.	0.157	0.012	*0.084*	0.000	0.000	0.000	*0.000*
São Tomé and Principe	n.a.	0.009	0.025	*0.017*	0.000	0.000	0.000	*0.000*
Cook Islands	n.a.	0.002	0.011	*0.007*	0.000	0.000	0.000	*0.000*
Nauru	n.a.	0.000	0.000	*0.000*	0.000	0.000	0.000	*0.000*
East Timor	0.003	0.000	0.000	*0.001*	0.000	0.000	0.000	*0.000*
Anguila	n.a.	n.a.	0.007	*0.007*	0.000	0.000	0.000	*0.000*

Table 5 *Continued*

Country	*MIIT 1962–75*	*MIIT 1975–90*	*MIIT 1990–2006*	*MIIT Average*	*% of Total Tr. Change, 1962–75*	*% of Total Tr. Change, 1975–90*	*% of Total Tr. Change, 1990–2006*	*% of Total Tr. Change, Average*
Saint Helena	n.a.	0.031	0.005	*0.018*	0.000	0.000	0.000	*0.000*
Wallis and Futura Isl.	n.a.	0.000	0.004	*0.002*	0.000	0.000	0.000	*0.000*
Christmas Island	n.a.	0.000	0.005	*0.003*	0.000	0.000	0.000	*0.000*
Norfolk Island	n.a.	0.007	0.008	*0.007*	0.000	0.000	0.000	*0.000*
Cocos (Keeling) Islands	n.a.	0.018	0.046	*0.032*	0.000	0.000	0.000	*0.000*
Tuvalu	n.a.	n.a.	0.007	*0.007*	0.000	0.000	0.000	*0.000*
Neutral Zone	n.a.	0.000	n.a.	*0.000*	0.000	0.000	0.000	*0.000*
Niue	n.a.	0.040	0.030	*0.035*	0.000	0.000	0.000	*0.000*
Tokelau	n.a.	n.a.	0.023	*0.023*	0.000	0.000	0.000	*0.000*
British Indian Ocean Ter.	n.a.	0.003	0.000	*0.001*	0.000	0.000	0.000	*0.000*
Fr. So. Ant. Tr	n.a.	n.a.	0.000	*0.000*	0.000	0.000	0.000	*0.000*
Pitcairn	n.a.	0.000	0.006	*0.003*	0.000	0.000	0.000	*0.000*
Western Sahara	n.a.	n.a.	0.000	*0.000*	0.000	0.000	0.000	*0.000*
Unweighted average	*0.061*	*0.080*	*0.087*	*0.072*	*0.498*	*0.493*	*0.508*	*0.501*

7. CONCLUDING COMMENTS

This paper provides a comprehensive description of global IIT patterns. A number of broad results emerge:

- The share of IIT is on a secular upward trend, suggesting a gradual convergence of the sector composition of national economies worldwide.
- The increase in IIT and the implied structural convergence are a high-income and middle-income phenomenon: while some, mainly Asian, lower-income countries exhibit rapidly increasing IIT shares, Africa has largely been excluded from this trend.
- Many indications point towards the importance of outward processing trade in explaining recent rises in IIT.
- The observed increase in IIT does not necessarily imply lower adjustment costs to trade expansion. MIIT is significantly lower than IIT, and no clear time trend is discernible for MIIT.

The richness and detail of global trade data open the door to many conceivable extensions of this work. One potential avenue would be to explore not just bilateral IIT, but trilateral or more generally multilateral trade flows within the same industry. This is of particular relevance for an analysis of the global dispersion of product chains via outward processing trade. Another possibly fruitful extension would be to explore the link between (M)IIT and factor reallocation in developing-country settings, all of the existing evidence on the 'smooth-adjustment hypothesis' being based on data for developed economies.

APPENDIX

Countries Included in the 'Long Coverage' Dataset (by World Bank Income Group)

Low-income and lower-middle income:
Bolivia, Brazil, Colombia, Ecuador, Egypt, Guatemala, Honduras, Indonesia, India, Jordan, Morocco, Nicaragua, Pakistan, Peru, Philippines, Paraguay, El Salvador, Thailand, Tunisia.

Upper-middle income:
Argentina, Barbados, Chile, Costa Rica, Hungary, Mexico, Malaysia, Panama, Turkey, Venezuela.

High income:
Australia, Austria, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Hong Kong, Ireland, Iceland, Israel,

Italy, Japan, Korea, Malta, Netherlands, Norway, New Zealand, Portugal, Singapore, Sweden, United States.

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