The effects of international trade on structural change and CO_2 emissions

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Abstract

This article introduces a new econometric model with an innovative measure of inter-sectoral structural change. It analyzes structural con-/divergence of inter-sectoral patterns across countries (North-South or global perspective) influenced by international trade. The analysis applies panel data estimators with different types of fixed-effects to the 2019, 2016 and 2013 releases of the World Input-Output Database (WIOD) covering the periods of time 1995–2009 and 2000–2014. The results show that international trade promotes structural convergence, which is enhanced by sectoral capital use. It seems, however, that in this millennium, structural divergence has been fostered by trade-induced specialization in CO_2-intensive production.

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Keywords: structural change; international trade; CO_2 emissions; macro-econometrics; panel data; WIOD

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1 Introduction

Economic growth, particularly of large emerging economies, such as China or India, not only raises output and income but also CO_2 emissions. Because of the resulting contribution to global warming, this effect shall be mitigated. Structural change, i.e., the shift of the economy's sectoral composition, can increase or decrease CO_2 emissions. Whereas the effects of international trade on productivity gains, economic growth and international technology diffusion (including energy- and CO_2-saving technologies) have been extensively researched,[1] the effect of international trade on inter-sectoral structural change and the resulting impact on CO_2 emissions have been hardly understood.

Empirically, inter-sectoral structural change has significantly contributed to changes in energy use and CO_2 emissions.[2] Econometric evidence on the effects of *international trade* on structural change in general, and with respect to CO_2 emissions in particular, however, seems to be widely missing. Some studies examine the role of FDI (foreign direct investment) and the European market integration: In a working paper, Barrios et al. (2002) find convergence of per capita incomes and industry sector structures in the European Union supported by inward FDI. Based on sectoral indices and descriptive statistics on exports, structural similarity and structural change, Crespo & Fontoura (2007) find similar results.

Against this background, our article tries to fill this research gap by exploring the *nexus between international trade and structural change* from a conceptual and econometric point of view. It contributes to the literature by describing the economic mechanisms of structural change driven by trade conceptually, by introducing a new econometric model with a new measure of structural change with (North-South) con-/divergence, by studying sectoral CO_2 emissions (besides sectoral outputs) and by exploiting the newest version of the large bilateral, bisectoral dataset WIOD (World Input-Output Database[3]).

According to the Environmental Kuznets Curve hypothesis, during the course of economic development, the sectoral structure of an economy shifts from agriculture towards (heavy) industries, causing higher emissions. It then shifts further towards advanced knowledge-based industries and services causing lower emissions. Consequently, OECD (Organisation for Economic Co-operation and Development) countries are expected to exhibit sectoral structures that create ceteris paribus lower economy-wide CO_2 emissions

[1] See, e.g., Coe et al. (1997); Saggi (2002); Keller (2004); Cole (2006); Perkins & Neumayer (2009); Havranek & Irsova (2011); Hübler & Glas (2014).

[2] See, e.g., Schäfer (2005); IEA (2007); Kahrl & Roland-Holst (2009); Li et al. (2014); Voigt et al (2014).

[3] `http://www.wiod.org/home`.

than those of emerging countries at medium stages of development. To examine this economic transition process, we first deploy a North-South setup with OECD and emerging countries and then extend it to all countries covered by the WIOD.

Our article particularly addresses the open question whether exports from an (advanced) economy to another (emerging) economy make the two economies more similar or more different with regard to their sectoral structures and the related CO_2 emissions. We dub these two alternatives *structural convergence* and *structural divergence*. Assuming that both economies continue their economic growth process and the emerging economies catch up towards the industrialized countries, convergence decreases the average CO_2 emissions across sectors, whereas divergence increases them.

Theoretically, the role of international trade in structural change is ambiguous. On the one hand, according to the classic trade theories by Ricardo and Heckscher-Ohlin, different economies concentrate their production and exports on different sectors, resulting in *structural divergence*. Additionally, Krugman's New Economic Geography predicts agglomeration of economic activities, which supports the emergence of specialization and clustering (Midelfart et al., 2003). Induced and directed technological change (Acemoglu, 2002, 2010) may reinforce the sectoral heterogeneity across countries.

On the other hand, when knowledge, or more specifically (energy- and CO_2-saving) technologies, spread across borders supported by international trade, the use of similar technologies will result in similar productivities across sectors and similar sectoral structures within economies, resulting in *structural convergence*. Likewise, intensifying *inter-industry* trade supports the emergence of similar sectoral structures across trading partners (Midelfart et al., 2003). Eventually, in the theoretical long-run equilibrium of a fully integrated world economy, the sectoral structures will be equalized.

The overview by Herrendorf et al. (2014) (sec. 6.6.1 International Trade) reconciles the view of these two camps by arguing that in a country with high productivity growth, the development of the manufacturing sector share exhibits a hump-shape, while in a country with low productivity growth, it exhibits a downward-sloping shape (Yi & Zhang, 2010). In accordance with the outcome of the Environmental Kuznets Curve theory, this theory implies that structural con- and divergence are theoretically possible across economies depending on (sectoral) productivity growth and the phase of economic development.

Therefore, it is an empirical question, whether structural con- or divergence dominates on average across economies and sectors or in particular sectors at specific periods of time. Compared with the existing literature, our analysis is to our knowledge the first study showing econometrically that international trade in general promotes *structural convergence.* This result opposes the classical Ricardian trade theory and supports the modern view of international trade as a driver of technology diffusion. We also find indication for structural divergence in terms of specialization in more or less CO_2-intensive production that began recently in this millennium. This insight is important for policy makers because it points to outsourcing of CO_2-intensive production from industrialized to emerging economies, so-called carbon leakage, which undermines climate policy efforts.

The article proceeds as follows. Section 2 derives the conceptual framework, Section 3 describes the data, and Section 4 presents the econometric results; Section 5 discusses the results, and Section 6 concludes. The supplementary online appendix provides further statistics and robustness check results.

2 Concept

In this section, we develop the econometric model of structural change driven by international trade and further determinants, first for one economy, then for two economies connected via trade. In the next step, we will discuss the theoretical effects of international trade on structural change and spell out two alternative testable hypotheses for the effect of international trade on structural change.

Sectoral one-economy model:

In economy e and sector c at time t let the sector size be denoted by Z_{ect}. Z_{ect} can be measured as the sectoral (gross) output value Y_{ect}, as physically measured CO_2 emissions E_{ect} or, alternatively, as physically measured (gross) energy use (or in general other suitable indicators). Then the sector share in the entire economy can be defined as:

$$\frac{Z_{ect}}{\sum_c Z_{ect}} = f\left(\frac{K_{ec(t-1)}}{L_{ec(t-1)}}, \frac{M_{ec(t-1)}}{Y_{ec(t-1)}}, \sigma_{ec}, \theta_t, \varepsilon_{ect}\right) \tag{1}$$

with $\sum_c Z_{ect}$ indicating the sum of the sizes of all sectors c in economy e at time t, and $f(...)$ representing a function of the arguments explained in the following paragraphs. Expecting a time lag between changes in the determinants on the right hand side and their effect on the left hand side, for the time being, let us assume one-period time lags denoted by $(t-1)$.

$K_{ec(t-1)}$ is the value of the sectoral capital stock and $L_{ec(t-1)}$ the physically measured[4] sectoral labor input. The capital-to-labor ratio indicates capital intensity and indirectly the technology intensity of production (given that capital embodies technologies). It is ex ante unclear whether a higher capital intensity is associated with a smaller or larger sector share, because capital/technology and labor can be substitutes or complements.

$M_{ec(t-1)}$ denotes the total value of intermediate goods imports from the rest of the world. The import intensity $\frac{M_{ec(t-1)}}{Y_{ec(t-1)}}$ indicates the strength of international (trade) connections. Again, it is ex ante unclear whether a higher import intensity is associated with a smaller or larger sector share. This relation is in the spotlight of the analysis and will be explained in detail in the following paragraphs.

σ_{ec} captures any other time-invariant economy- and sector-specific determinants within the cross-section, for example, sectoral productivity growth or the economy-wide infrastructure. θ_t captures any time-variant determinants that jointly affect all economies and sectors in the same way in each time period t, for example an oil price shock or a pandemic shock. ε_{ect} captures any remaining unexplained random influences (noise).

Sectoral two-economy model:

Now we are looking at dyadic trade connections between specific sectors in specific countries and compare the two trading partners in terms of their sectoral structures and the determinants of these connections. For this purpose, let us label source countries of trade as s, source sectors as i, recipient countries of trade as r and recipient sectors as j. From this viewpoint and with this notation, our previous model is generalized to:

$$dz_{srjt} = f\left(dk_{srj(t-1)}, m_{srj(t-1)}, \sigma_{srj}, \theta_t, \varepsilon_{srjt}\right) \tag{2}$$

with $dz_{srjt} = \left|\left(\frac{Z_{rjt}}{\sum_j Z_{rjt}} - \frac{Z_{sjt}}{\sum_j Z_{sjt}}\right) / \frac{Z_{sjt}}{\sum_j Z_{sjt}}\right| = \left|\frac{Z_{rjt}}{\sum_j Z_{rjt}} / \frac{Z_{sjt}}{\sum_j Z_{sjt}} - 1\right|$ representing the relative distance (the absolute normalized difference with a positive sign) between the (output, CO_2 or energy) shares of the same sector j in the two countries s and r connected via trade, where $i = j$ is suppressed for simplicity. The division by $\frac{Z_{sjt}}{\sum_j Z_{sjt}}$ renders dz_{srjt} independent of the sector size, i.e., small and large sectors are weighted equally.

Similarly, $dk_{srj(t-1)} = \left|\left(\frac{K_{rj(t-1)}}{L_{rj(t-1)}} - \frac{K_{sj(t-1)}}{L_{sj(t-1)}}\right) / \frac{K_{sj(t-1)}}{L_{sj(t-1)}}\right| = \left|\frac{K_{rj(t-1)}}{L_{rj(t-1)}} / \frac{K_{sj(t-1)}}{L_{sj(t-1)}} - 1\right|$ represents the relative distance between the capital intensities in the sector j (with $i = j$) of the two trading partners.

[4]E.g., measured as the number of persons working in a sector.

International trade is generalized to a bilateral, bisectoral $sirj$-relation. To keep the model tractable, we sum up over source sectors i to obtain a bilateral trade relation with intermediate goods imports of sector j in r from all sectors of s. Hence, $m_{srj(t-1)} = \frac{\sum_i M_{sirj(t-1)}}{Y_{rj(t-1)}}$ is the modified central trade measure under scrutiny.

Referring to the recipient country r and sector j, the index of the time-invariant determinants is rewritten as σ_{rj}. Whereas the time-variant effects stay θ_t, the error term now reads ε_{srjt}, which completes the model setup.

Testable hypotheses on trade and structural change:

There are basically two opposite possible approaches to the explanation of structural change and structural con-/divergence in the context of international trade.

The first approach refers to the classic Ricardian and Heckscher-Ohlin trade theories. Countries specialize in the goods and hence sectors, for which they have a productivity-based comparative advantage or for which they have relatively abundant endowments with the required production factors. In this framework, sector shares and trade intensities may reflect sector-specific productivities (Eaton & Kortum, 2002). Induced factor- and sector-specific directed technological change (Acemoglu, 2002, 2010) may reinforce the heterogeneity of economic production depending on country-specific factor endowments, policies affecting sectors in different ways and other economic conditions.[5] The New Economic Geography popularized by Krugman describes the agglomeration of economic activities. Local knowledge spillovers and linkages with customers and suppliers support the emergence of local specialization and clustering (Midelfart et al., 2003; Crespo & Fontoura, 2007). It follows from this theory that over time, countries shift their production towards different sectors. This implies for structural change that countries' sectoral structures diverge, i.e., become more different over time. Intermediate goods imports (M) and capital (K) accumulation are expected to enhance this effect. In this context, capital reflects technologies, knowledge and absorptive capacity (with respect to the adoption of technologies and knowledge). In terms of the previously defined model, (Equation 2), the resulting hypothesis reads:

H1: International trade fosters structural divergence, i.e., $\frac{\partial(dz_{srjt})}{\partial(m_{srj(t-1)})} > 0$.

[5] Whereas technological change normally increases the sectoral productivity and hence the sectoral output, it can in- or decrease sectoral (factor) inputs (of labor, capital, energy or CO_2 caused by fossil fuel inputs) depending on whether technological change is factor-augmenting or factor-saving.

H1 implies that the sectoral distances become larger. In a Ricardian world with full specialization, in each economy, some or all but one sector shares will become zero, i.e., $\frac{Z_{ect}}{\sum_c Z_{ect}} = 0$ and thus the sectoral differences will diverge to the share of the sector of specialization, i.e., $dz_{srjt} = \max\{\frac{Z_{sjt}}{\sum_i Z_{sjt}}, \frac{Z_{srjt}}{\sum_j Z_{rjt}}\}$, where in practice both sector shares may become zero (no specialization in this sector among these two particular countries) and hence $dz_{srjt} = 0$.

The second approach refers to international technology (knowledge) diffusion in the course of globalization with international trade and economic development. Accordingly, over time countries' sectoral technologies and hence productivities converge, i.e., become more similar. Additionally, inter-industry trade supports the emergence of similar sectoral structures across trading partners, because it replaces the exchange of different goods produced in different sectors by trade in varieties of the same good within the same sector (Midelfart et al., 2003). This implies for structural change that countries' sectoral structures have the tendency to converge, i.e., become more similar over time. Again, intermediate goods imports (M) and capital (K) accumulation are expected to enhance this effect. Accordingly, the resulting hypothesis reads:

H2: International trade fosters structural convergence, i.e., $\frac{\partial(dz_{srjt})}{\partial(m_{srj(t-1)})} < 0$.

H2 implies that the sectoral distances become smaller. In the theoretical long-run equilibrium of a fully integrated world economy, it is $\frac{Z_{sjt}}{\sum_j Z_{sjt}} = \frac{Z_{rjt}}{\sum_j Z_{rjt}}$ $\forall(s, r, j)$ and thus $dz_{srjt} = 0$.

3 Data

In this section, we describe the data source and the aggregation of the panel data in terms of countries and sectors.

Data source and setup:

Besides using the newest 2016 release of the large dataset WIOD (World Input-Output Database)[6], we deploy the 2013 release for comparison.[7] We combine the World Input-Output Tables containing bilateral, bisectoral[8] trade (in mill. 2010-US-$, see below) data

[6]`http://www.wiod.org/home`, Timmer et al. (2015, 2016).

[7]The WIOD 2013 and 2016 do not exactly match in terms of the sectoral definitions; therefore and to keep the number of observations computationally tractable, we deploy them separately.

[8]Bilateral, bisectoral means that international trade flows from any sector in any country to any sector

with the Socio Economic Accounts containing sectoral (gross) outputs (in mill. 2010-US-\$), labor (in 1000 employment units) and capital (in mill. 2010-US-\$) data and with the environmental accounts (the 2019 release[9] for the WIOD 2016) providing sectoral CO_2 emissions (in 1000 tonnes) and sectoral energy use (in terrajoule) data. Following the model setup of the previous section, we sum up all intermediate good imports entering each sector across their sectors of origin, while keeping source-destination country dyads.

Monetary values expressed in 2010-US-\$ are measured in constant prices of the base year 2010. They are created by applying the corresponding deflator[10] and, in the case of output and capital, by converting the national currency values to US-\$ with the corresponding exchange rate contained in the WIOD. CO_2 emissions refer to direct emissions caused by fossil fuel-based energy use and process emissions released within the corresponding sector (excluding indirect emissions embodied in intermediate inputs). This allows us to study the change in production technologies in each sector. The alternative measure, (gross) energy use, refers to the total direct energy input (consumption) including electricity consumption in each sector.

We restrict the numerical setup to data sourced from WIOD[11] to keep it as consistent as possible in terms of the sector definitions and accounting methods and to keep the numerical requirements tractable. In the time dimension, where t denotes years, the 2013 release covers the time frame 1995 until 2009; the 2016 release covers the years 2000 until 2014. In the cross-section, our *North-South* setup includes 31 industrialized countries (OECD, North) in WIOD 2013 and 34 industrialized countries in WIOD 2016 versus 9 emerging countries (South) in both samples.[12] Depending on the available sectors in the original data source, we aggregate the sectors to 26 sectors f (equivalently i or j) in WIOD 2013 and 36 sectors in WIOD 2016.[13] Appendix C provides detailed sector

in any country.

[9]Corsatea et al. (2019)

[10]We apply the WIOD deflator containing price levels of intermediate inputs to discount trade values, price levels of (gross) output to deflate (gross) output values and price levels of (gross) value added to deflate capital values.

[11]This includes deflators and exchange rates.

[12]*Emerging countries (South) in WIOD 2013 and 2016:* "BRA" Brazil, "BGR" Bulgaria, "CHN" China Mainland, "MEX" Mexico, "RUS" Russia, "TWN" Taiwan, "ROU" Romania, "IND" India, "IDN" Indonesia.
Industrialized countries (North) in WIOD 2013 and 2016: "AUS" Australia, "AUT" Austria, "BEL" Belgium, "CAN" Canada, "CYP" Cyprus, "CZE" Czechia, "DEU" Germany, "DNK" Denmark, "ESP" Spain, "EST" Estonia, "FIN" Finland, "FRA" France, "GBR" Great Britain, "GRC" Greece, "HUN" Hungary, "IRL" Ireland, "ITA" Italy, "JPN" Japan, "KOR" Republic of Korea, "LTU" Lithuania, "LUX" Luxembourg, "LVA" Latvia, "MLT" Malta, "NLD" The Netherlands, "POL" Poland, "PRT" Portugal, "SVK" Slovakia, "SVN" Slovenia, "SWE" Sweden, "TUR" Turkey, "USA" United States of America.
Additional industrialized countries (North) in WIOD 2016: "CHE" Switzerland, "HRV" Croatia, "NOR" Norway.

[13]*Sectors in WIOD 2013 and 2016:* A01 Agriculture, B Mining, C10-C12 Food, C13-C15 Textile, C16 Wood, C17 Paper, C19 Refined Petr., C20 Chemicals, C22 Rubber, C23 Minerals, C24 Metal, C26

lists and mappings. This results in over 140 thousand observations in the North-South sample and about 870 thousand observations in the full sample of WIOD 2016, over 95 thousand observations in the North-South sample and over 520 thousand observations in the full sample of WIOD 2013. The *full sample* combines the emerging and industrialized countries to 40 economies (countries) e in WIOD 2013 and 43 economies in WIOD 2016.

In the full sample, each country exports to each country, i.e., all countries are once source s and once recipient r, while in the North-South setup, the industrialized (OECD) countries s export to the emerging countries r.

Descriptive statistics:

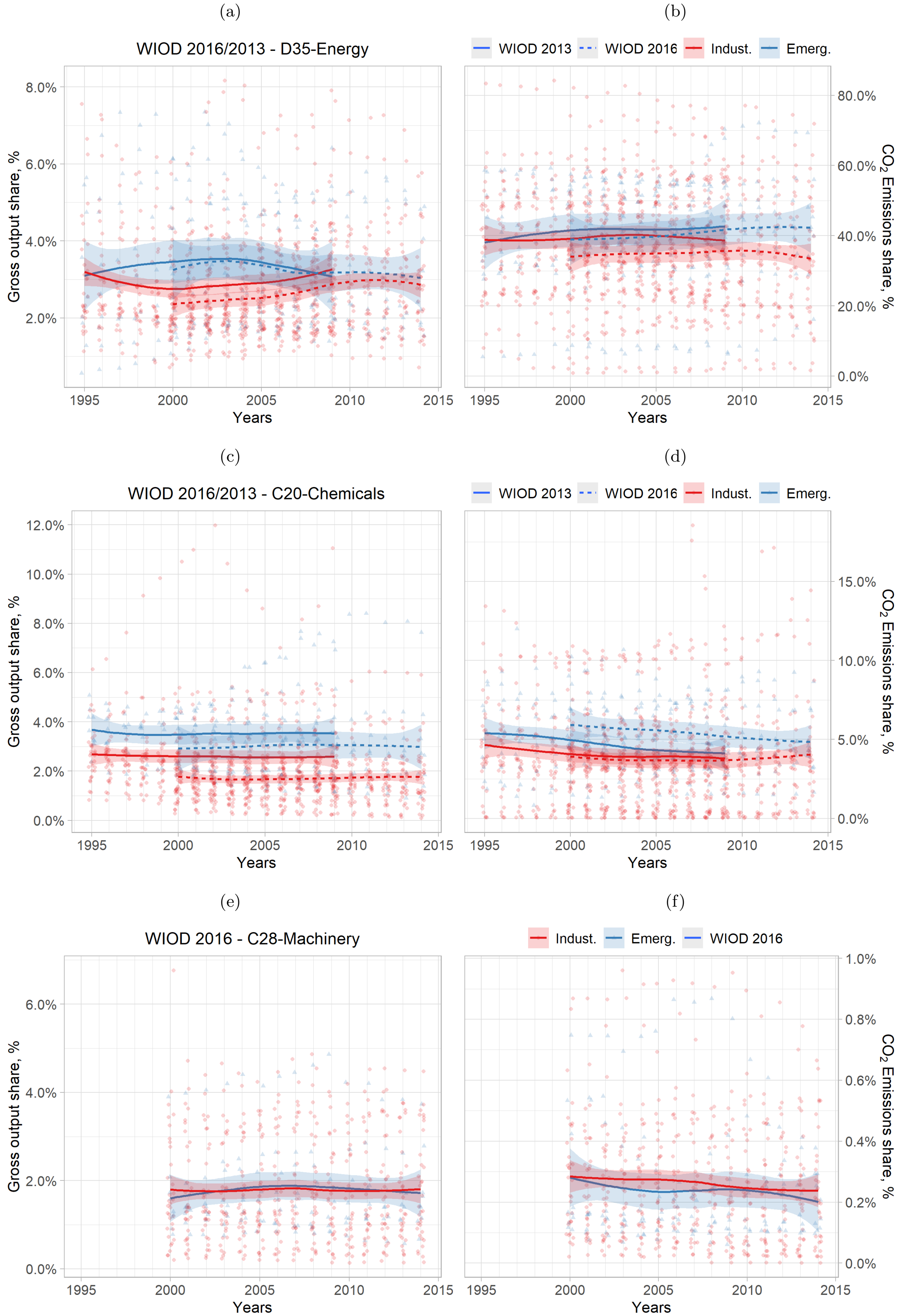
Figures 1 and 2 draw on the WIOD 2013 and 2016. They illustrate sectoral developments, computed as averages across the countries with each country group (emerging and industrialized countries or in short South and North). The sectoral developments refer to direct CO_2 emissions or (gross) output shares of each sector in the total CO_2 emissions or (gross) output of the corresponding country. Each single dot depict one observation, the solid (for WIOD 2013) or dashed (for WIOD 2016) lines depict averages, and the shaded areas indicated 95% confidence intervals. The investigation of the descriptive statistics reveals sectoral developments, including South-North con-/divergence, that suggest a detailed econometric exploration of their drivers.

Figures 1 and 2 depict selected sectors. In the energy sector (electricity, gas, water, steam and air conditioning supply, Figure 1a and 1b), the emerging countries (in blue) exhibit larger shares than the industrialized countries (in red), both, in terms of average output and CO_2 shares. While at the end of the time frame, the output shares reveal a convergence tendency, the CO_2 shares show a divergence tendency. Whereas the output shares move around 3%, the CO_2 shares exceed 40% in the emerging countries, which points to the high CO_2 intensity of the energy sector.

In the energy-intensive chemicals sector (Figure 1c and 1d), the sector shares have similar sizes in terms of output as in the energy sector and are again larger in the South. On the contrary, CO_2 shares are an order of magnitude lower than in the energy sector. The Southern CO_2 shares converge to those of the North.

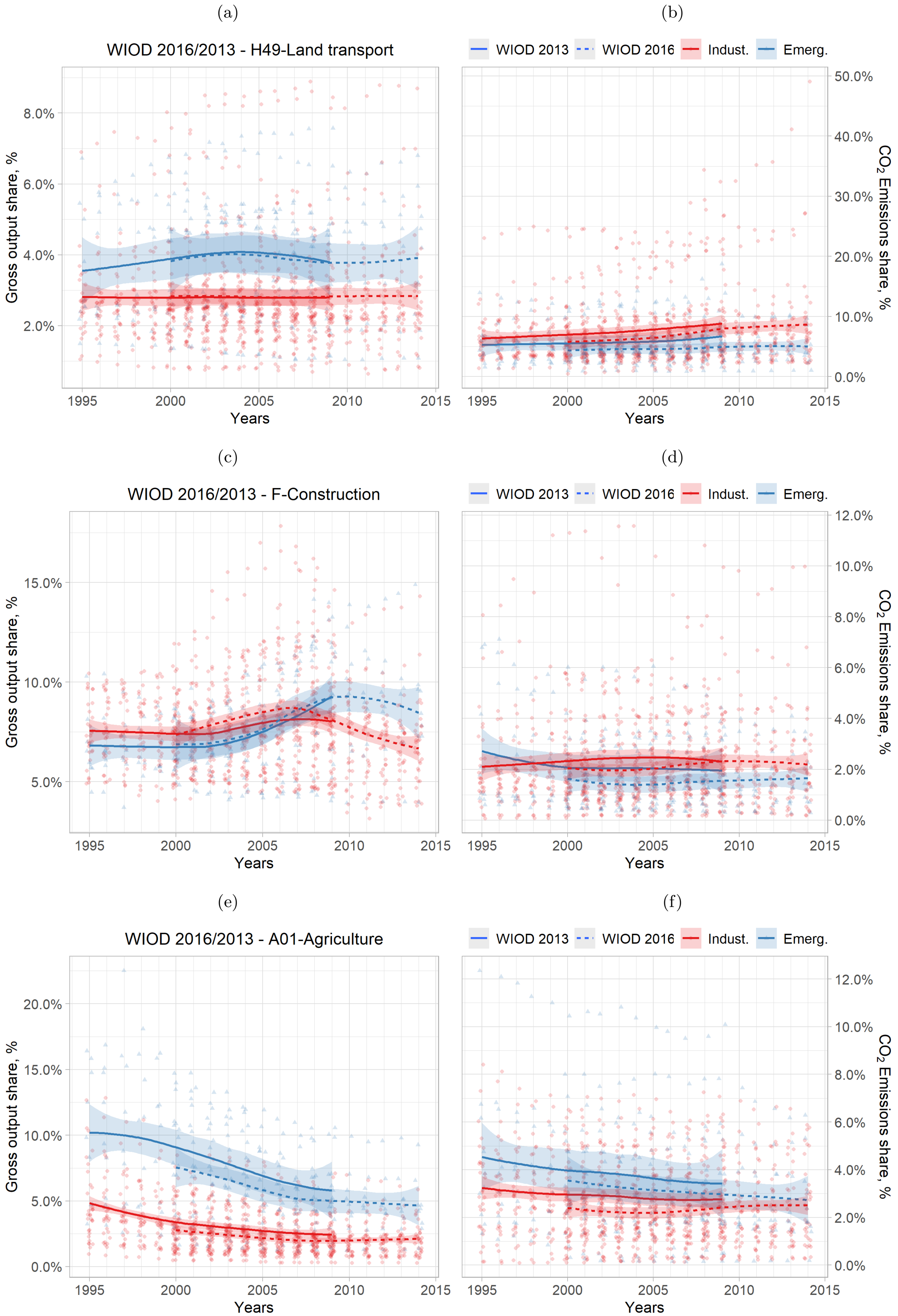
Computers, C27 Electrical equip., C30 Transport equip., C33 Repair, D35 Energy, F Construction, G Trade, H49 Land transport, H50 Water transport, H51 Air transport, H52 Warehousing, H53 Post, I Accommodation, JKLMN Private Services, OPQRS Public Services.
Additional sectors in WIOD 2016: A02 Forestry, A03 Fisheries, C18 Printing, C21 Pharma., C25 Non machinery, C28 Machinery, C29 Vehicles, C31-C32 Furniture, E36 Water, E37-E39 Waste.
The sectors T Household and U Household are discarded in both samples due to the absence of trade.

Figure 1
Average sector shares in industrialized and emerging countries over time



Source: Own illustrations based on data taken from the WIOD 2013 and 2016 releases.

Figure 2
Average sector shares in industrialized and emerging countries over time



Source: Own illustrations based on data taken from the WIOD 2013 and 2016 releases.

Compared with the energy-intensive chemical sector, the CO_2 share of machinery (Figure 1e and 1f) is another order of magnitude lower (about 0.2%). The output and CO_2 machinery sector shares of the South and the North are nearly identical and change little over time.

In the land transport sector (Figure 2a and 2b), the South exhibits larger output shares than the North, but smaller CO_2 shares (with a slightly increasing trend in both regions), which indicates an advantage of the South with regard to the CO_2 emissions intensity.

In the construction sector (Figure 2c and 2d), the emerging countries overtake the industrialized countries in terms of output shares, while the opposite occurs in terms of CO_2 shares. This indicates significant CO_2 emissions reductions in the South, although the Southern CO_2 share exhibits a slightly increasing trend.

In agriculture (Figure 2e and 2f), clearly, the Southern output shares exceed the Northern ones more than the CO_2 shares, which indicates less CO_2 emissions-intensive agricultural production in the South than in the North. Mostly the Southern output shares, but also the CO_2 shares, converge to the Northern ones over time.

The next section will explore possible drivers of these sectoral developments (in the South relative to the North) in an econometric analysis. Appendix A.1 provides summary statistics of the economic indicators in the different data samples as they appear in the econometric analysis. Appendix A.2 uses the full sample to present all available data. It shows the correlations of the indicators appearing in one regression among each other in the upper right part. Accordingly, all correlations are low, i.e., within ± 0.2. The lower left part illustrates the relation of the correlation partners by scatter-plotting each indicator as a function of its partner. The red lines sketch the non-linear relation between the correlation partners by using a non-parametric smoothing algorithm. They indicate moderate relations between the regressors and the dependent variable of the econometric model presented below. The histograms on the diagonal of the same figures depict the distributions (the density of observations covering an area with the size one) of the indicators. Accordingly, most of the logarithmic observations are located around zero.

4 Econometrics

This section first describes the econometric approach and the test procedures to implement it in the appropriate way; it then presents the regression results.

Econometric approach:

To write out Equation 2 explicitly, we assume a multiplicative model, take natural logarithms on both sides and rearrange terms. To identify the joint effect of a higher import intensity and a higher capital-to-labor ratio, we add their multiplicative interaction.

$$\begin{aligned} ln(dz_{srjt}) \quad &= \quad \alpha \cdot ln(m_{srj(t-1)}) + \beta \cdot ln(dk_{srj(t-1)}) + \gamma \cdot ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)}) \\ &\quad + \delta \cdot \sigma_{srj} + \ \eta \cdot \theta_t + \varepsilon_{srjt} \end{aligned} \tag{3}$$

with the relative distance between the sector shares of the source and the recipient, $dz_{srjt} = \left| \frac{Z_{rjt}}{\sum_j Z_{rjt}} / \frac{Z_{sjt}}{\sum_j Z_{sjt}} - 1 \right|$; the sectoral import intensity, $m_{srj(t-1)} = \frac{\sum_i M_{sirj(t-1)}}{Y_{rj(t-1)}}$, which is in the spotlight of the analysis; and the relative distance between the sectoral capital-to-labor ratios of the source and the recipient, $dk_{srj(t-1)} = \left| \frac{K_{rj(t-1)}}{L_{rj(t-1)}} / \frac{K_{sj(t-1)}}{L_{sj(t-1)}} - 1 \right|$. The interaction term $ln(dk_{srj(t-1)}) \cdot ln(m_{srj(t-1)})$ is included in the main regressions but left out in a robustness check.

These indicators are all constructed by using the WIOD. While we restrict the explicit inclusion of economic indicators to those with direct economic relevance and being covered by the WIOD with the required high bilateral and bisectoral resolution, we deploy a very large number of fixed-effects, which exploits the technical (computational) limits of the estimation procedure.

To model triadic fixed-effects, the binary variables σ_{srj} and θ_t take the value of one for each bilateral sectoral trade relation and each year. The index srj combines source country s, recipient country r and recipient sector j characteristics, while t indicates the individual time dimension. The joint use of σ_{srj} and θ_t leads to a two-way fixed effects model, which in short will be denoted by srj & t. Alternatively, either σ_{srj} or θ_t can be used to implement single fixed-effects models with cross-sectional fixed-effects, in short, srj, or time-fixed effects, in short, t.

α, β, γ, δ and η are to be estimated, while ε_{srjt} is the error term. If Hypothesis H1 holds, then $\alpha > 0$ (and $\beta > 0$), if H2 holds, then $\alpha < 0$ (and $\beta < 0$).

Test procedures:

We carry out the following standard test procedures. We check that the correlations among regressors are sufficiently low (i.e., within ± 0.2, see Appendix A.1 and the end of the previous section) to avoid multicollinearity. The standard F-tests for the null hypothesis of all estimated coefficients jointly being zero are reported for each regression (see the last row in Tables 1 to 4). In the estimations yielding significant results, the F-statistics are (very) high. The R^2 values are overall low, which hinges on the model specification with economic indicators specified as shares, ratios or intensities, measured in relative and absolute terms.

Additionally, we carry out several test procedures for panel data. We apply Fisher type Augmented Dickey-Fuller unit root tests for panel data (Dickey & Fuller, 1979; Im et al., 2003) to ensure that all data are stationary. Consequentially, we test all dependent and independent variables in all datasets (WIOD 2016 and 2013) and all subsamples (North-South and full sample) separately. We find that the unit-root null hypothesis is always clearly rejected in favor of stationarity (at the 0.00001 confidence level).

The standard Hausman test for fixed- versus random-effects clearly rejects the null hypothesis of consistent random-effects in all specifications; therefore, we restrict our analysis to the use of fixed-effects (dummy variables).

We apply F- and LM[14]-tests evaluating different types of fixed-effects against the null hypothesis of a pooled regression or reduced dimensionality (i.e., a reduced number) of fixed-effects. Appendix A.3 presents the tests results. For all specifications, the F- and LM-tests clearly reject the null hypothesis of all fixed-effects jointly being zero, i.e., the pooled regression. Similarly, the F- and LM-tests clearly reject the null hypothesis of fixed-effects with reduced dimensionality , i.e., cross-sectional fixed-effects plus time fixed-effects (two-way fixed-effects, srj & t) are preferable over cross-sectional fixed-effects only (srj) or time fixed-effects only (t).

For the choice between cross-sectional or time fixed-effects versus two-way fixed-effects, however, Kropko & Kubinec (2020) recommend the choice of a single type of fixed-effects to enable a clear-cut interpretation of the estimation results with respect to variant and invariant effects in the time and the cross-sectional dimension instead of generating a mixture of both, which is difficult to interpret. Therefore, we use and compare the three fixed-effects specifications (srj, t and srj & t). When using cross-sectional fixed-effects, the variation remaining in the data is generated within the time dimension across

[14]Lagrange Multiplier.

years. When using time fixed-effects, on the opposite, the variation remaining in the data is generated in the cross-sectional dimension via differences between countries and sectors that may be interpreted as a snapshot of the current situation or as long-term (equilibrium) effects. When using two-way fixed-effects, both types of variation overlap similar to a pooled regression (cf. Kropko & Kubinec, 2020).

Regression results:

Tables 1 to 4 present the main panel estimation results. We report heteroscedasticity- and serial correlation-robust standard errors (Arellano, 1987) clustered at the srj-level throughout the regression analysis.

Based on the WIOD 2016, Table 1 uses output shares as the dependent variable. The statistically significant and negative coefficients of the important intensity in all columns of Table 1 unequivocally confirm H2 stating structural convergence induced by international trade. The effect of the capital-to-labor intensity on structural change is significant in the full sample estimations with fixed-effects in the cross section (srj) and in the cross-section plus time (srj & t) only. In these significant cases, the coefficients also confirm H2 stating structural convergence induced by more capital-intensive production.

In Table 1, the interaction term's coefficients are significant and negative supporting H2 in all full sample estimations and in the North-South sample estimation with time (t) fixed-effects, but insignificant in the remaining two North-South sample results. Accordingly, a higher import intensity and a higher capital intensity jointly enhance structural convergence.

Table 2 shows the same estimations with output shares as the dependent variable based on WIOD 2013. WIOD 2013 provides a smaller number of observations than WIOD 2016, which potentially reduces the statistical significance of the results. Accordingly, the import intensity's coefficient turns insignificant in the North-South sample with cross sectional fixed-effects (srj) and weakly significant and negative with two-way fixed-effects (srj & t). The import intensity's coefficient turns significant and positive in the full sample with cross-sectional fixed-effects srj supporting H1 stating structural divergence. Nonetheless, the majority of the estimates (t with the North-South sample, t and srj & t with the full sample) is in favor of H2, i.e., structural convergence as before. The effect of the capital-to-labor ratio is significant with time (t) fixed-effects only. Here it is positive in favor of H1 too.

Table 1
Panel regression results with output shares using WIOD 2016

	Dep. var.: relative distance between sectoral output shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	-0.00919**	-0.08615*****	-0.02947*****	-0.00368*	-0.05888*****	-0.01815*****
$ln(m_{srj(t-1)})$	(0.00462)	(0.00521)	(0.00484)	(0.00216)	(0.00222)	(0.00229)
Capital-to-labor rat.	-0.02336	-0.03883	-0.01067	-0.02236*****	0.01650	-0.02127*****
$ln(dk_{srj(t-1)})$	(0.01739)	(0.04457)	(0.01733)	(0.00572)	(0.01103)	(0.00572)
Interaction term $ln(m_{srj(t-1)})\cdot$ $ln(dk_{srj(t-1)})$	-0.00183	-0.01759*****	-0.00095	-0.00370*****	-0.00800*****	-0.00378*****
	(0.00172)	(0.00478)	(0.00172)	(0.00071)	(0.00140)	(0.00071)
Num. of observat.	143435	143435	143435	871733	871733	871733
Degr. of freedom	133174	143418	133161	809344	871716	809331
R^2	0.00013	0.02835	0.00089	0.00020	0.01853	0.00052
F-stat.	1.901	117.103*****	12.436*****	13.333*****	487.013*****	35.522*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Robust standard errors clustered at the srj-level are reported in parentheses. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model.

Table 2
Panel regression results with output shares using WIOD 2013

	Dep. var.: relative distance between sectoral output shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.00679	-0.03892*****	-0.01090*	0.01331*****	-0.03945*****	-0.01309*****
$ln(m_{srj(t-1)})$	(0.00575)	(0.00567)	(0.00588)	(0.00272)	(0.00252)	(0.00279)
Capital-to-labor ratio	0.00426	0.02679	-0.00667	-0.00785	0.03185**	-0.01428
$ln(dk_{srj(t-1)})$	(0.03079)	(0.05910)	(0.03051)	(0.00926)	(0.01301)	(0.00919)
Interaction term $ln(m_{srj(t-1)})\cdot$ $ln(dk_{srj(t-1)})$	-0.00162	-0.01294**	-0.00245	-0.00086	-0.00455***	-0.00228**
	(0.00296)	(0.00622)	(0.00294)	(0.00113)	(0.00165)	(0.00113)
Num. of observat.	97774	97774	97774	541855	541855	541855
Degrees of freedom	90526	97757	90513	501375	541838	501362
R^2	0.00026	0.01256	0.00029	0.00016	0.01274	0.00019
F-stat.	2.042	34.316*****	2.164*	8.201*****	239.673*****	9.102*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See Table 1 for notes.

Table 3
Panel regression results with CO_2 shares using WIOD 2016

	Dep. var.: relative distance between sectoral CO_2 shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.04035*****	-0.11613*****	0.00751	0.03647*****	-0.08952*****	0.00093
$ln(m_{srj(t-1)})$	(0.00674)	(0.00590)	(0.00695)	(0.00301)	(0.00249)	(0.00320)
Capital-to-labor rat.	-0.05548**	-0.07578	-0.03318	0.00721	0.04137*****	0.01120
$ln(dk_{srj(t-1)})$	(0.02329)	(0.04877)	(0.02309)	(0.00760)	(0.01231)	(0.00758)
Interaction term $ln(m_{srj(t-1)})\cdot$ $ln(dk_{srj(t-1)})$	-0.00600**	-0.01562***	-0.00446*	0.00107	-0.00080	0.00100
	(0.00242)	(0.00557)	(0.00239)	(0.00096)	(0.00157)	(0.00095)
Num. of observat.	143241	143241	143241	869736	869736	869736
Degrees of freedom	132980	143224	132967	807351	869719	807338
R^2	0.00139	0.03885	0.00016	0.00080	0.02058	0.00001
F-stat.	15.331*****	154.797*****	2.008	49.367*****	577.997*****	1.079

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Robust standard errors clustered at the srj-level are reported in parentheses. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model.

Table 4
Panel regression results with CO_2 shares using WIOD 2013

	Dep. var.: relative distance between sectoral CO_2 shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	-0.01337**	-0.11022*****	-0.01433***	-0.00884*****	-0.11411*****	-0.01183*****
$ln(m_{srj(t-1)})$	(0.00547)	(0.00722)	(0.00554)	(0.00260)	(0.00336)	(0.00267)
Capital-to-labor ratio	0.00233	-0.08977	0.00321	-0.00388	-0.02225	-0.00480
$ln(dk_{srj(t-1)})$	(0.02695)	(0.07339)	(0.02698)	(0.00817)	(0.01835)	(0.00817)
Interaction term $ln(m_{srj(t-1)})\cdot$ $ln(dk_{srj(t-1)})$	-0.00108	-0.01630**	-0.00104	-0.00103	-0.00871*****	-0.00117
	(0.00251)	(0.00810)	(0.00251)	(0.00098)	(0.00245)	(0.00098)
Num. of observat.	95069	95069	95069	519131	519131	519131
Degrees of freedom	87920	95052	87907	479498	519114	479485
R^2	0.00031	0.03874	0.00034	0.00010	0.03558	0.00016
F-stat.	2.597*	88.327*****	2.872**	4.900****	465.869*****	7.691*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See Table 3 for notes.

Table 3 replaces the output shares used as the dependent variable by CO_2 shares (including emissions from fossil fuel use and process emissions) drawing on the WIOD 2016. Similar to the results with output shares and the WIOD 2013, the sign of the estimates depends on the choice of the fixed-effects. The cross-sectional fixed-effects (srj) allow for variation in time and exhibit a positive effect of the import intensity on structural change, i.e., divergence as expressed by H1. Time fixed-effects (t), on the contrary, allow for variation in the cross-section and result in a positive effect supporting structural convergence as expressed by H2. The combination of both types of fixed-effects (srj & t) and hence both opposing effects, not surprisingly, results in insignificant estimates. These observations apply to the North-South and the full sample.

In contrast to these estimates for trade, the capital-to-labor ratio exhibits a significant and negative effect supporting structural convergence with cross-sectional fixed-effects (srj) in the North-South sample, but a significant and positive effect supporting divergence with time fixed-effects (t) in the full sample. It exhibits insignificant effects in the remaining cases. Nonetheless, the joint effect is always (weakly) significant and negative, supporting convergence, in the North-South sample.

Table 4 deploys CO_2 shares as the dependent variable using the WIOD 2013. The results are similar to those deploying output shares using the WIOD 2016 presented in Table 1. The estimated coefficients of the import intensity are significant and negative in all estimations supporting H2 stating structural convergence. The effect of the capital-to-labor-ratio is, however, always insignificant. The joint effect of the import intensity and capital-to-labor-ratio expressed by the interaction term is always negative, but statistically significant in the specifications with time (t) fixed-effects only.

All estimated coefficients represent elasticities, describing the impact of relative changes in a driver of structural change on relative changes in the (absolute) difference between the sector shares of the recipient and source country of international trade. The estimated (absolute) magnitudes of these elasticities vary between 0.02 and 0.05 among the statistically significant coefficients of the capital-to-labor-ratio. The (absolute) magnitudes of the interaction terms are about an order of magnitude smaller. The variation of the (absolute) magnitudes of the coefficients of the import intensity is substantial; the magnitudes vary between about 0.004 and 0.116.

5 Discussion

This section interprets and compares the regression results, particularly those of the main panel regressions presented in the previous section, those of alternative robustness checks and those of supplementary sectoral estimates.

Main regression results:

Basically, the results promote the view that international trade supports the international convergence of sectoral structures via the spread of knowledge, technologies, and so forth, such that countries' sectoral structures become more similar. Likewise, more intensive utilization of capital and embodied technologies supports the international convergence of sectoral structures. Using the WIOD 2016 sample and output value shares as the dependent variable, this result holds unequivocally and significantly.

For the WIOD 2013 sample period from 1995 to 2009, however, the results provide indication that over time, international trade enhanced the international divergence of sectoral output structures. This means that, in accordance with the classical Ricardian trade theory, in the world economy, countries specialized in the production of different goods. Similarly, in the global (long-term) cross-section, more intensive capital use seems to foster sectoral divergence of output structures.

When considering CO_2 shares taken from the WIOD 2013 as the dependent variable, on the contrary, the results clearly confirm the previous finding that trade fosters structural convergence.

For the later WIOD 2016 sample period from 2000 to 2014, however, the results point to a possible regime change. From a global and a North-South perspective, the results indicate international divergence of sectoral structures occurring via Ricardian specialization in more or less CO_2-intensive production. This result points to international outsourcing of CO_2-intensive production to emerging economies or so-called carbon leakage.

Robustness check results:

The following robustness checks exclude the interaction terms used so far, explore different time lags of regressors and replace CO_2 emissions by energy use to construct the dependent variable. The robustness checks overall confirm the main panel regression results.

1. Exclusion of the interaction term: The results for WIOD 2016 are presented in Appendix B.1. The estimated coefficients of the import intensity are very robust to the exclusion of the interaction term of the import intensity with the capital-to-labor-ratio. The coefficients of the capital-to-labor-ratio, on the contrary, experience changes in the significance levels and signs; particularly, most coefficients turn statistically significant and positive, supporting structural divergence (H1). This result nevertheless fits to economic theory and intuition: More intensive capital use itself tends to result in increasing specialization in the activities that can be performed best with this capital and its embodied technologies. Once, new goods, knowledge, technologies etc. arrive from abroad, the capital will incorporate technological improvements such that production will become more similar to the production at the source of the goods, knowledge and technologies. Thus, international trade appears to be a prerequisite for international structural convergence (H1), while capital accumulation supports this trade-driven mechanisms. This is reflected by the (if statistically significant) always negative interaction terms.

2. Different time lags of regressors: The results for WIOD 2016 with the time (year) lags $t-2$ and $t-3$ instead of $t-1$ for all regressors are presented in Appendix B.2. While some significance levels change, the results are qualitatively and quantitatively hardly affected. As a notable exception, in the full sample with cross-sectional fixed-effects (srj), $t-3$ lags and output shares as the dependent variable, presented in Table B4, the effect of imports becomes significant and positive. Likewise, in the North-South and full sample with two-way fixed-effects (srj & t), $t-2$ or $t-3$ lags and CO_2 shares as the dependent variable, presented in Tables B5 and B6, the positive effect of imports becomes significant.

3. Energy shares as the dependent variable: In this robustness check presented in Appendix B.3, we replace the CO_2 emissions shares by (gross) energy input shares. Compared with CO_2 emissions, the (gross) energy use includes electricity and other non-CO_2-emitting energy inputs. In both samples, WIOD 2013 and 2016, all statistically significant coefficients of the import intensity and the interaction with the capital-to-labor ratio have a negative sign, supporting structural convergence (H2). The coefficients of the capital-to-labor ratio are always insignificant. Particularly, in WIOD 2016, the import intensity has a significant and negative effect on structural change with cross-sectional (srj) or time (t) fixed-effects, but not with two-way fixed-effects (srj & t); in WIOD 2013, the import intensity has a significant and negative effect with time (t) fixed-effects and in the full sample also a weakly significant and negative effect with two-way fixed-effects (srj & t). This means, regarding the impact of imports estimated with WIOD 2013, the energy share results are in line with the previous CO_2 share and output share results (except the single significantly positive effect of the import intensity when using output shares). With WIOD 2016, however, the energy share results confirm the previous finding of convergence (H2) driven by imports with output shares, but do not confirm the previous finding of divergence (H1) driven by imports obtained with CO_2 shares and cross-section fixed-effects (srj).

Sectoral regression results:

To understand how structural change actually occurs, we need to look at the sectoral level. To this end, we carry out the panel regressions separately for each sector j. As before, we use cross-sectional (sr), time (t) or two-way (sr & t) fixed-effects based on WIOD 2013 or 2016. Appendix B.4 presents selected results of the sector-specific estimations. In each table, all available sectors are included and ordered by the CO_2 intensities of the trade recipient countries r. The left columns of the tables show the sector shares in the trade recipient countries r at the beginning and the end of the sample period in terms of emissions or output. This reveals, whether the sectors were shrinking or expanding during the sample period.

Table B9, for example, indicates that the energy sector is the most CO_2-intensive sector, slightly expanded between the years 2000 and 2014 and exhibits a significantly negative effect of the imports intensity (structural convergence), but a significantly positive effect (structural divergence) of the capital-to-labor ratio and the interaction of imports with capital on the relative distance of output shares. The number of observations in this sector is 25,284, the number of fixed-effects is 1,806. Whereas the R^2 is low, the F-statistic for the null hypothesis of all estimated coefficients jointly being zero is high, clearly rejecting the null hypothesis.

The sectoral panel regression results overall confirm the cross-sectoral panel regression results. The estimates with WIOD 2016 and output value shares as the dependent variable overall confirm the hypothesis of structural convergence (H2) driven by trade. While in the estimations with cross-sectional fixed-effects, about half of the coefficients of imports are statistically significant, most of them with a negative sign, in the specification with time fixed-effects most of them are significant, all with a negative sign.

In accordance with the previous cross-sectoral results, in the WIOD 2016 sample, the use of CO_2 shares as the dependent variable leads to mostly positive coefficients of the the import intensity among the relatively small number of statistically significant results, when cross-sectional fixed-effects (sr) are included. Based on the WIOD 2013 sample, on the contrary, the significant estimates of the effect of imports are mostly negative in favor of the convergence hypothesis (H2). This result supports the previous finding of structural divergence (H1), i.e., the specialization in more or less CO_2-intensive activities starting around the year 2000. When using time (t fixed-effects), on the contrary, more coefficients of imports become statistically significant and all of them are negative in favor of the convergence hypothesis (H2) as before.

There are less significant estimates of the effect of the capital-to-labor ratio than of the import intensity. Although negative signs prevail for capital, the estimated signs are mixed. The estimates of the interaction effect of imports and capital show a similar picture as the estimates of the capital effects.

6 Conclusion

The classical Ricardian trade theory predicts differences between economic structures of countries engaged in international trade, because each country specializes in specific sectors (goods) according to comparative advantages. Our results, however, basically oppose this view. Instead, most results show that international trade leads to increasing similarity of economic structures. This mechanism can be driven by the spread of knowledge, technologies, tastes, habits, and so forth, during the course of globalization. This finding holds when sector shares are measured using output value shares or energy input shares and, for the data sample covering the time period before the turn of the millennium, it holds when using CO_2 emissions shares. Running panel regressions for the available sectors separately confirms these cross-sectoral panel regression results.

Because advanced technologies need to be embodied in capital, this mechanism is enhanced when imports are accompanied by more intensive capital use, which is visible in the results. This means, the joint effect of import- and capital-intensive production enhances sectoral convergence, whereas the sole effect of a higher capital-to-labor ratio on structural convergence appears to be ambiguous, because capital use without sufficient imports may embody old-fashioned technologies. Capital can thus be called an enhancer of structural convergence.

The finding of structural convergence driven by international trade basically means good news for climate and energy policy: over a sufficiently long time horizon, energy- and CO_2 emissions-saving inter-sectoral structural change in industrialized countries automatically spills over to emerging countries via international trade. The results, however, also provide indication for increasing international specialization in more or less CO_2-intensive production starting at the turn of the millennium. This outcome, too, is confirmed when running panel regressions for the available sectors separately. Among other possible reasons, this outcome might be driven by the international relocation of CO_2-intensive production to emerging economies, which might be fostered by climate policy measures in industrialized countries, so-called carbon leakage. However, this outcome does not hold when replacing CO_2 emissions shares by energy input shares. Energy input shares refer to gross energy use including electricity and non-emissions-relevant energy sources. They are affected by (total factor) productivity gains and energy-specific productivity gains. CO_2 emissions shares, on the contrary, capture the emissions-intensity and decarbonization of energy supply and industrial production.

Nonetheless, this insight is somewhat alarming for climate policy makers, because it implies that more stringent climate policy in industrialized countries may decrease direct CO_2 emissions in particular sectors of industrialized countries but increase them in the same sectors of emerging (or developing) countries, resulting in structural divergence. As long as no global climate policy solution is in place, this mechanism weakens the effectiveness of unilateral climate policy in the globalized world economy. Therefore, in addition to the potentially productivity-enhancing and energy-saving effects of international trade (Cole, 2006; Perkins & Neumayer, 2009; Hübler & Glas, 2014), policies should directly strengthen the international transfer of environmental-friendly and particularly CO_2 emissions-saving technologies. The ultimate goal would be a global climate policy solution that avoids carbon leakage effects.

These empirical results should, however, be treated with caution, especially because some outcomes depend on the time frame (data sample) and the choice of the exploited variation in the data (cross-section, time fixed-effects or both). Future research may study further drivers of structural change that may independently or in connection with international trade foster structural divergence or convergence. It may also study selected countries or sectors in detail. It is open to question, whether the international specialization in more or less CO_2-intensive production that our analysis has indicated for this millennium, is a temporal statistical or negligible phenomenon or the beginning of a considerable long-term process.

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Supplementary online appendix

A Descriptive statistics and test procedures

A.1 Summary statistics

Table A1

Summary statistics for output shares as the dep. var. and $t-1$ lags

Variable	Num. of obs.	Min.	Median	Mean	Std. dev.	Max.
WIOD 2016 North-South						
Gross Output relative distance between sector shares $ln(dz_{srjt})$	143 435	-16.395	-0.542	-0.477	1.564	9.349
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	143 435	-10.945	-0.207	-0.397	0.822	6.468
Import intensity $ln(m_{srj(t-1)})$	143 435	-23.115	-8.457	-8.900	2.938	-0.941
WIOD 2016 full sample						
Gross Output relative distance between sector shares $ln(dz_{srjt})$	871 733	-16.395	-0.623	-0.664	1.450	9.817
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	871 733	-13.697	-0.262	-0.164	1.484	9.073
Import intensity $ln(m_{srj(t-1)})$	871 733	-23.115	-7.569	-7.789	2.457	0.145
WIOD 2013 North-South						
Gross Output relative distance between sector shares $ln(dz_{srjt})$	97 774	-11.286	-0.636	-0.641	1.420	10.749
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	97 774	-11.642	-0.147	-0.328	0.773	9.124
Import intensity $ln(m_{srj(t-1)})$	97 774	-22.805	-7.953	-8.441	2.850	-1.027
WIOD 2013 full sample						
Gross Output relative distance between sector shares $ln(dz_{srjt})$	541 855	-13.136	-0.716	-0.803	1.357	10.749
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	541 855	-11.642	-0.184	-0.020	1.534	10.863
Import intensity $ln(m_{srj(t-1)})$	541 855	-22.805	-7.560	-7.782	2.397	0.873

Table A2

Summary statistics for CO_2 shares as the dep. var. and $t-1$ lags

Variable	Num. of obs.	Min.	Median	Mean	Std. dev.	Max.
WIOD 2016 North-South						
CO_2 emissions relative distance between sector shares $ln(dz_{srjt})$	143 241	-10.802	-0.289	-0.122	1.690	14.854
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	143 241	-10.945	-0.207	-0.397	0.822	6.468
Import intensity $ln(m_{srj(t-1)})$	143 241	-23.115	-8.456	-8.899	2.938	-0.941
WIOD 2016 full sample						
CO_2 emissions relative distance between sector shares $ln(dz_{srjt})$	869 736	-12.352	-0.267	-0.122	1.656	15.661
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	869 736	-13.697	-0.262	-0.163	1.484	9.073
Import intensity $ln(m_{srj(t-1)})$	869 736	-23.115	-7.569	-7.789	2.457	0.145
WIOD 2013 North-South						
CO_2 emissions relative distance between sector shares $ln(dz_{srjt})$	95 069	-12.177	-0.293	-0.190	1.559	10.490
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	95 069	-11.642	-0.147	-0.329	0.776	9.124
Import intensity $ln(m_{srj(t-1)})$	95 069	-22.805	-7.889	-8.386	2.843	-1.027
WIOD 2013 full sample						
CO_2 emissions relative distance between sector shares $ln(dz_{srjt})$	519 131	-12.177	-0.299	-0.197	1.564	10.998
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	519 131	-11.642	-0.183	-0.019	1.536	10.863
Import intensity $ln(m_{srj(t-1)})$	519 131	-22.805	-7.530	-7.755	2.394	0.873

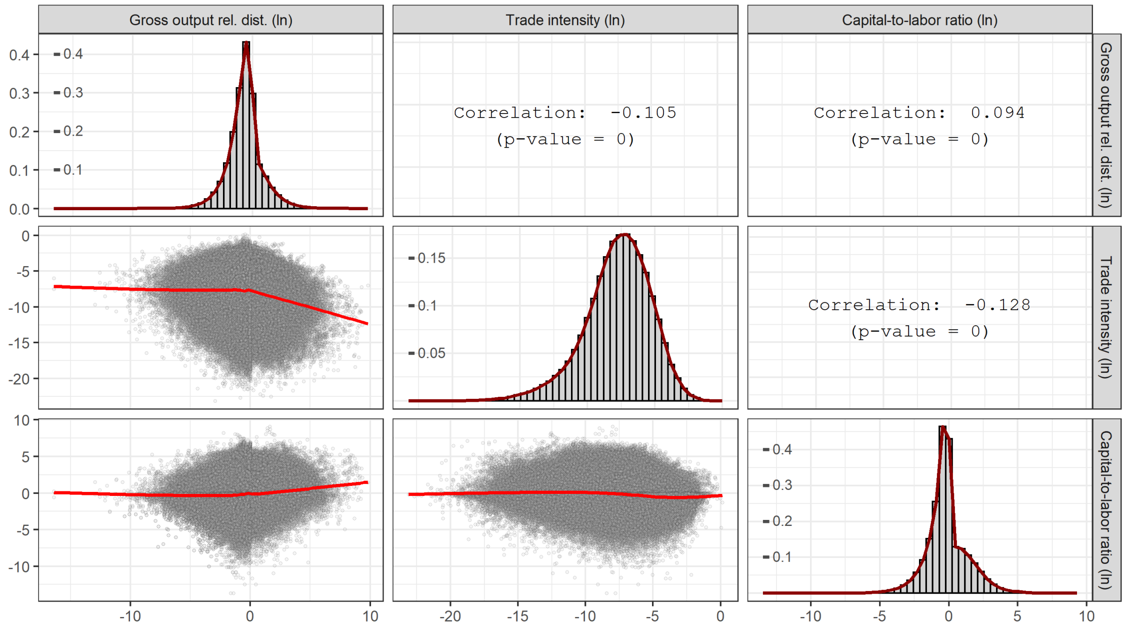
Table A3

Summary statistics for energy shares as the dep. var. and $t-1$ lags

Variable	Num. of obs.	Min.	Median	Mean	Std. dev.	Max.
WIOD 2016 North-South						
Energy relative distance between sector shares $ln(dz_{srjt})$	143 444	-12.190	-0.404	-0.312	1.628	13.421
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	143 444	-10.945	-0.207	-0.397	0.822	6.468
Import intensity $ln(m_{srj(t-1)})$	143 444	-23.115	-8.457	-8.901	2.938	-0.941
WIOD 2016 full sample						
Energy relative distance between sector shares $ln(dz_{srjt})$	871 719	-13.602	-0.411	-0.364	1.566	13.739
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	871 719	-13.697	-0.262	-0.164	1.484	9.073
Import intensity $ln(m_{srj(t-1)})$	871 719	-23.115	-7.569	-7.789	2.457	0.145
WIOD 2013 North-South						
Energy relative distance between sector shares $ln(dz_{srjt})$	97 657	-13.581	-0.534	-0.521	1.580	46.511
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	97 657	-11.642	-0.147	-0.328	0.774	9.124
Import intensity $ln(m_{srj(t-1)})$	97 657	-22.805	-7.950	-8.439	2.850	-1.027
WIOD 2013 full sample						
Energy relative distance between sector shares $ln(dz_{srjt})$	540 775	-13.583	-0.535	-0.546	1.524	47.244
Capital-to-labor ratio $ln(dk_{srj(t-1)})$	540 775	-11.642	-0.184	-0.020	1.535	10.863
Import intensity $ln(m_{srj(t-1)})$	540 775	-22.805	-7.558	-7.780	2.397	0.873

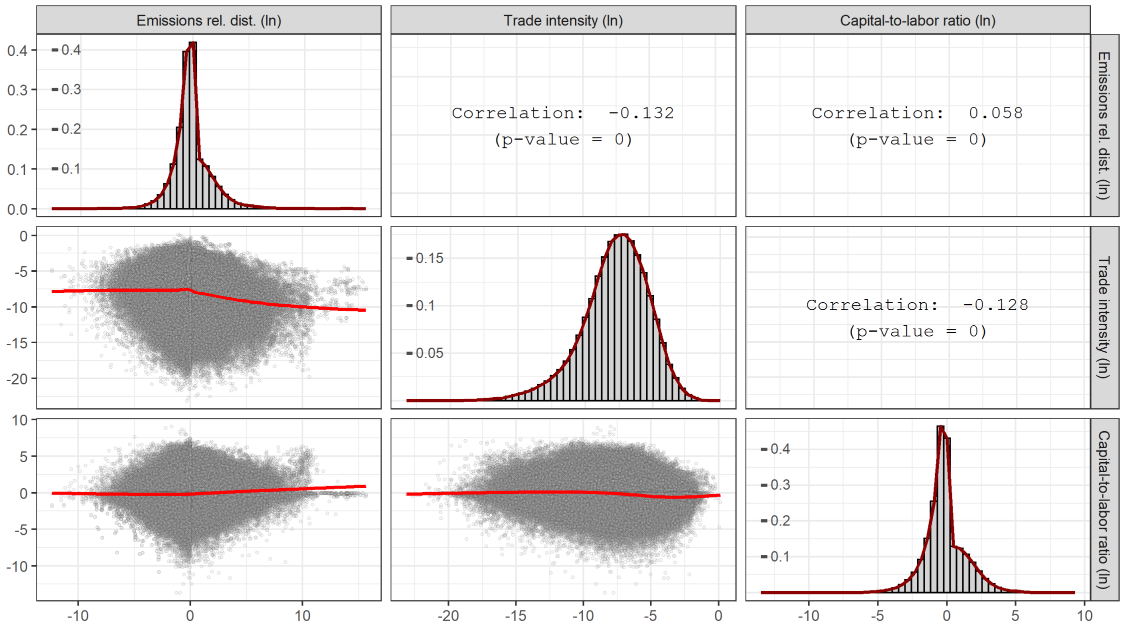
A.2 Correlations and distributions

Figure 3
Descriptive statistics with output shares using the WIOD 2016 full sample



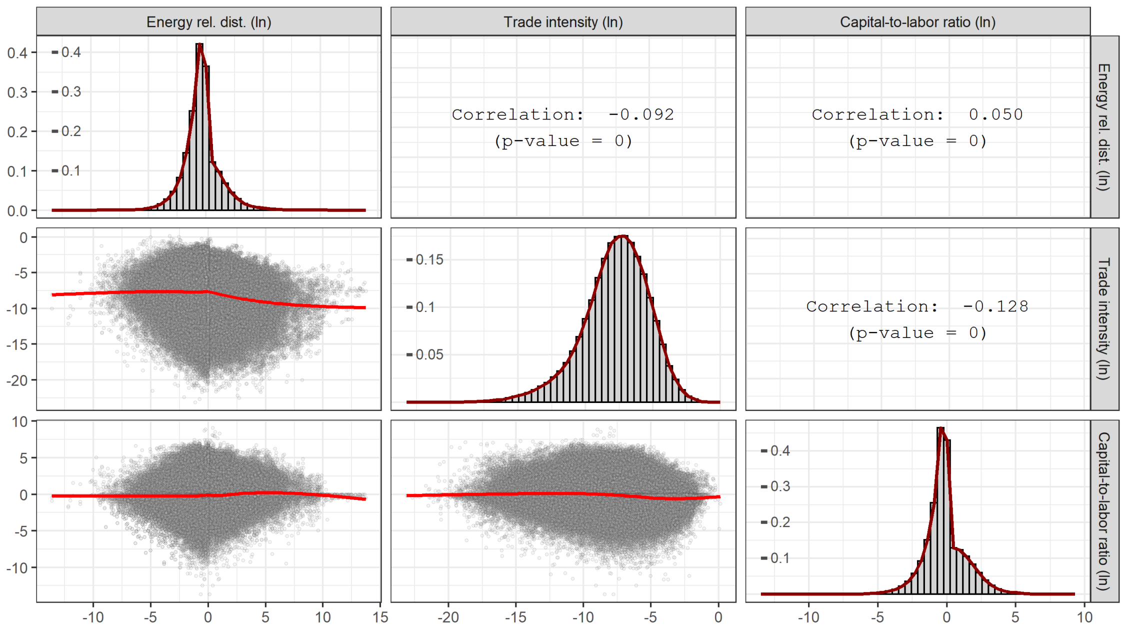
Source: Own illustrations based on data taken from the WIOD 2016 release. The numbers in the upper right area are correlations between the two indicators named on the upper horizontal and right vertical axis of the depiction matrix. The lower left area illustrates the relation of the correlation partners by scatter-plotting the indicator named on the right vertical axis as a function of the indicator named on the upper horizontal axis. The red lines in the scatter-plots in the lower left area have been created by using a non-parametric algorithm based on generalized additive models with integrated smoothness estimation procedures as suggested by Wood (2011, 2004). The histograms on the diagonal depict the distributions (density of observations covering an area with the size one) of each indicator separately.

Figure 4
Descriptive statistics with CO_2 shares using the WIOD 2016 full sample



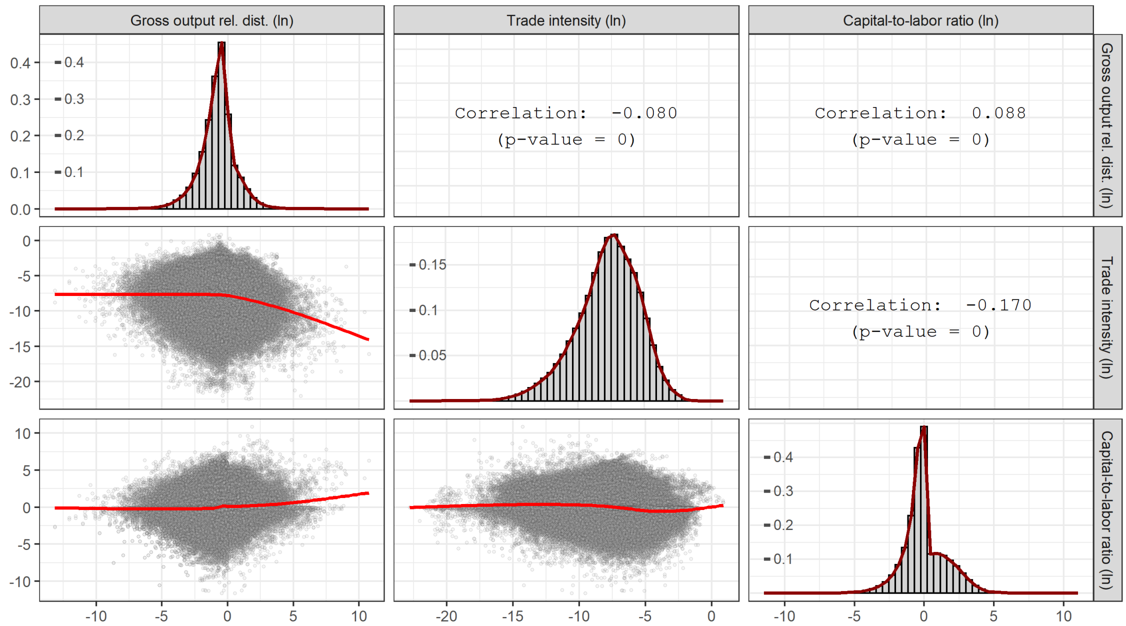
Source: Own illustrations based on data taken from the WIOD 2016 release. See before for notes.

Figure 5
Descriptive statistics with energy shares using the WIOD 2016 full sample



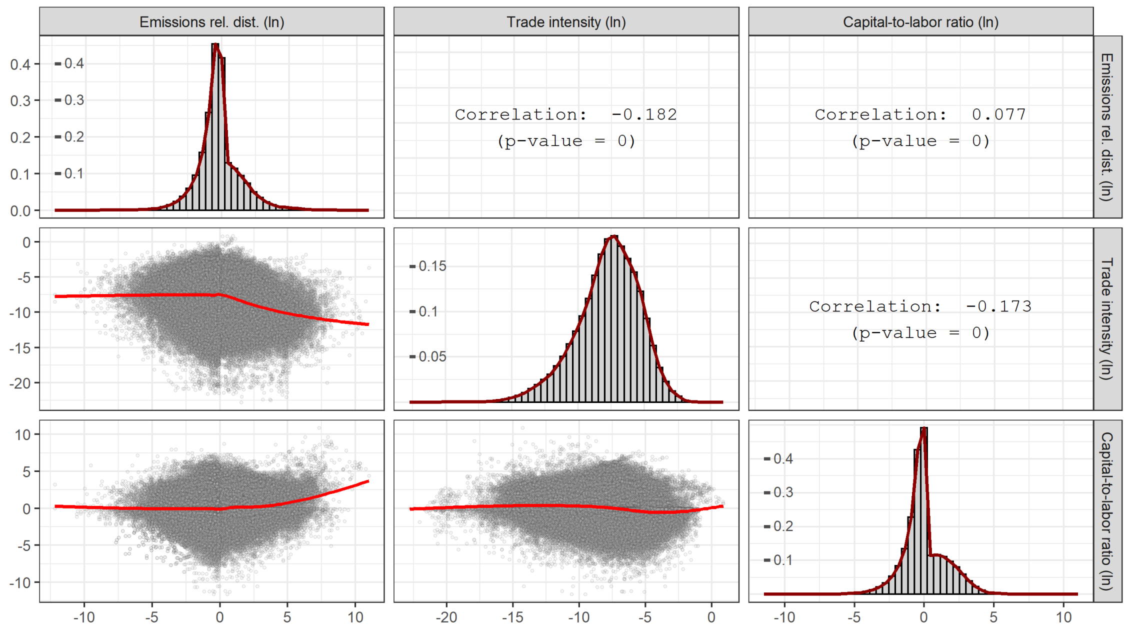
Source: Own illustrations based on data taken from the WIOD 2016 release. See before for notes.

Figure 6
Descriptive statistics with output shares using the WIOD 2013 full sample



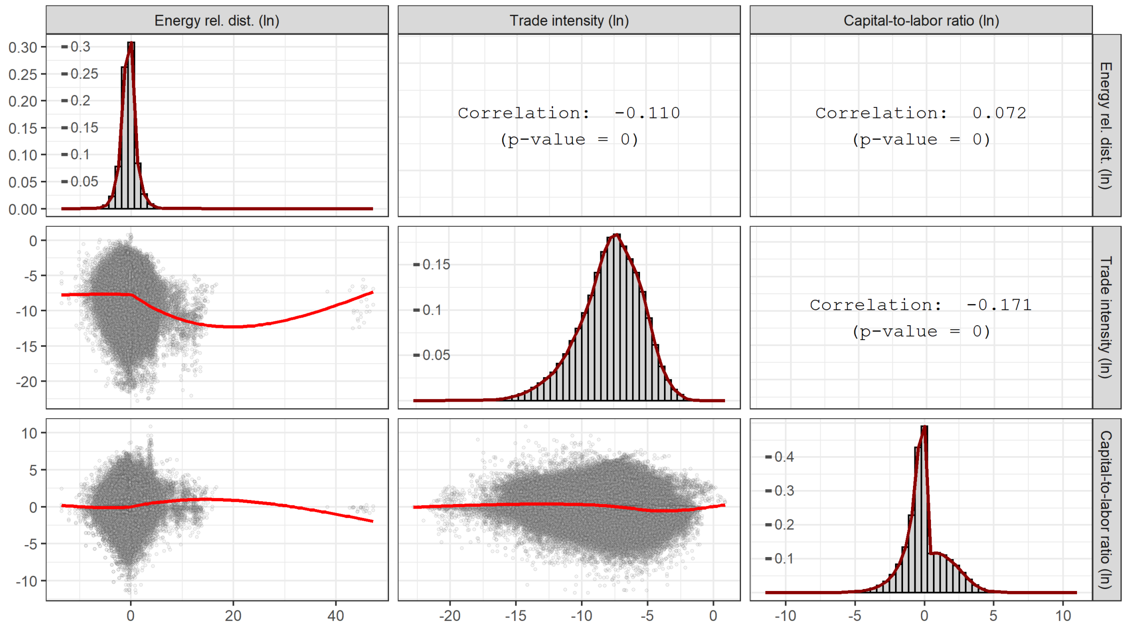
Source: Own illustrations based on data taken from the WIOD 2013 release. See before for notes.

Figure 7
Descriptive statistics with CO_2 shares using the WIOD 2013 full sample



Source: Own illustrations based on data taken from the WIOD 2013 release. See before for notes.

Figure 8
Descriptive statistics with energy shares using the WIOD 2013 full sample



Source: Own illustrations based on data taken from the WIOD 2013 release. See before for notes.

A.3 Tests for panel specifications

Table A4
F-tests for fixed-effects (H1) vs. pooled or restricted fix.-e. (H0), output shares

Dataset	Sample	Interaction term	Method	H0 model	H1 model	Statistics
WIOD 2016	North-South	present	F-test for individual effects	pooled	srj	58.962***** ($df = 10258; 133174$)
WIOD 2016	North-South	present	F-test for two-way effects	pooled	srj & t	59.234***** ($df = 10271; 133161$)
WIOD 2016	North-South	present	F-test for time effects	pooled	t	502.930***** ($df = 14; 143418$)
WIOD 2016	North-South	present	F-test for two-way effects	t	srj & t	55.932***** ($df = 10257; 133161$)
WIOD 2016	North-South	present	F-test for two-way effects	srj	srj & t	50.332***** ($df = 13; 133161$)
WIOD 2016	Full sample	present	F-test for individual effects	pooled	srj	52.972***** ($df = 62386; 809344$)
WIOD 2016	Full sample	present	F-test for two-way effects	pooled	srj & t	53.086***** ($df = 62399; 809331$)
WIOD 2016	Full sample	present	F-test for time effects	pooled	t	3 184.077***** ($df = 14; 871716$)
WIOD 2016	Full sample	present	F-test for two-way effects	t	srj & t	49.883***** ($df = 62385; 809331$)
WIOD 2016	Full sample	present	F-test for two-way effects	srj	srj & t	119.087***** ($df = 13; 809331$)
WIOD 2013	North-South	present	F-test for individual effects	pooled	srj	47.240***** ($df = 7245; 90526$)
WIOD 2013	North-South	present	F-test for two-way effects	pooled	srj & t	47.635***** ($df = 7258; 90513$)
WIOD 2013	North-South	present	F-test for time effects	pooled	t	274.826***** ($df = 14; 97757$)
WIOD 2013	North-South	present	F-test for two-way effects	t	srj & t	45.447***** ($df = 7244; 90513$)
WIOD 2013	North-South	present	F-test for two-way effects	srj	srj & t	56.770***** ($df = 13; 90513$)
WIOD 2013	Full sample	present	F-test for individual effects	pooled	srj	41.858***** ($df = 40477; 501375$)
WIOD 2013	Full sample	present	F-test for two-way effects	pooled	srj & t	42.319***** ($df = 40490; 501362$)
WIOD 2013	Full sample	present	F-test for time effects	pooled	t	2 282.117***** ($df = 14; 541838$)
WIOD 2013	Full sample	present	F-test for two-way effects	t	srj & t	39.286***** ($df = 40476; 501362$)
WIOD 2013	Full sample	present	F-test for two-way effects	srj	srj & t	337.959***** ($df = 13; 501362$)
WIOD 2016	North-South	absent	F-test for individual effects	pooled	srj	59.216***** ($df = 10258; 133175$)
WIOD 2016	North-South	absent	F-test for two-way effects	pooled	srj & t	59.491***** ($df = 10271; 133162$)
WIOD 2016	North-South	absent	F-test for time effects	pooled	t	531.514***** ($df = 14; 143419$)
WIOD 2016	North-South	absent	F-test for two-way effects	t	srj & t	55.993***** ($df = 10257; 133162$)
WIOD 2016	North-South	absent	F-test for two-way effects	srj	srj & t	50.502***** ($df = 13; 133162$)
WIOD 2016	Full sample	absent	F-test for individual effects	pooled	srj	52.984***** ($df = 62386; 809345$)
WIOD 2016	Full sample	absent	F-test for two-way effects	pooled	srj & t	53.098***** ($df = 62399; 809332$)
WIOD 2016	Full sample	absent	F-test for time effects	pooled	t	3 178.550***** ($df = 14; 871717$)
WIOD 2016	Full sample	absent	F-test for two-way effects	t	srj & t	49.900***** ($df = 62385; 809332$)
WIOD 2016	Full sample	absent	F-test for two-way effects	srj	srj & t	118.767***** ($df = 13; 809332$)

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Independent variables are included with t–1 lags. df means degrees of freedom, where the first number is the difference of the df between $H0$ and $H1$, whereas the second number is the df in the model $H1$. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model. Alternative fixed-effects specifications (H1) are tested against a pooled or a fixed-effects specification with reduced dimensionality (a reduced number of fixed-effects) (H0).

Table A5
LM-tests for fixed-effects (H1) vs. pooled (H0), output shares

Dataset	Sample	Interaction term	H1 model	Honda (1985)	Breusch & Pagan (1980)	King & Wu (1997)	Gourieroux et al. (1982)
WIOD 2016	North-South	Present	srj	767.437*****	588 958.987*****	767.437*****	
WIOD 2016	North-South	Present	t	116.676*****	13 613.205*****	116.676*****	
WIOD 2016	North-South	Present	srj & t	625.162*****	602 572.192*****	143.915*****	602 572.192*****
WIOD 2016	Full sample	Present	srj	1 859.242*****	3 456 781.342*****	1 859.242*****	
WIOD 2016	Full sample	Present	t	710.500*****	504 809.627*****	710.500*****	
WIOD 2016	Full sample	Present	srj & t	1 817.082*****	3 961 590.969*****	737.275*****	3 961 590.969*****
WIOD 2013	North-South	Present	srj	599.445*****	359 334.853*****	599.445*****	
WIOD 2013	North-South	Present	t	86.353*****	7 456.829*****	86.353*****	
WIOD 2013	North-South	Present	srj & t	484.933*****	366 791.681*****	111.459*****	366 791.681*****
WIOD 2013	Full sample	Present	srj	1 370.589*****	1 878 513.841*****	1 370.589*****	
WIOD 2013	Full sample	Present	t	665.840*****	443 342.355*****	665.840*****	
WIOD 2013	Full sample	Present	srj & t	1 439.972*****	2 321 856.196*****	689.979*****	2 321 856.196*****
WIOD 2016	North-South	Absent	srj	769.744*****	592 505.474*****	769.744*****	
WIOD 2016	North-South	Absent	t	138.165*****	19 089.525*****	138.165*****	
WIOD 2016	North-South	Absent	srj & t	641.988*****	611 594.999*****	165.472*****	611 594.999*****
WIOD 2016	Full sample	Absent	srj	1 860.158*****	3 460 186.762*****	1 860.158*****	
WIOD 2016	Full sample	Absent	t	728.472*****	530 671.539*****	728.472*****	
WIOD 2016	Full sample	Absent	srj & t	1 830.438*****	3 990 858.301*****	755.258*****	3 990 858.301*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. LM means Lagrange Multiplier. Independent variables are included with t–1 lags. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model. All alternative fixed-effects specifications (H1) are tested against a pooled specification (H0).

Table A6

F-tests for fixed-effects (H1) vs. pooled or restricted fix.-e. (H0), CO_2 shares

Dataset	Sample	Interaction term	Method	H0 model	H1 model	Statistics
WIOD 2016	North-South	present	F-test for individual effects	pooled	srj	35.205***** ($df = 10258; 132980$)
WIOD 2016	North-South	present	F-test for two-way effects	pooled	srj & t	35.576***** ($df = 10271; 132967$)
WIOD 2016	North-South	present	F-test for time effects	pooled	t	413.170***** ($df = 14; 143224$)
WIOD 2016	North-South	present	F-test for two-way effects	t	srj & t	33.738***** ($df = 10257; 132967$)
WIOD 2016	North-South	present	F-test for two-way effects	srj	srj & t	89.175***** ($df = 13; 132967$)
WIOD 2016	Full sample	present	F-test for individual effects	pooled	srj	34.321***** ($df = 62382; 807351$)
WIOD 2016	Full sample	present	F-test for two-way effects	pooled	srj & t	34.593***** ($df = 62395; 807338$)
WIOD 2016	Full sample	present	F-test for time effects	pooled	t	1 406.484***** ($df = 14; 869719$)
WIOD 2016	Full sample	present	F-test for two-way effects	t	srj & t	33.548***** ($df = 62381; 807338$)
WIOD 2016	Full sample	present	F-test for two-way effects	srj	srj & t	366.870***** ($df = 13; 807338$)
WIOD 2013	North-South	present	F-test for individual effects	pooled	srj	60.958***** ($df = 7146; 87920$)
WIOD 2013	North-South	present	F-test for two-way effects	pooled	srj & t	60.927***** ($df = 7159; 87907$)
WIOD 2013	North-South	present	F-test for time effects	pooled	t	314.811***** ($df = 14; 95052$)
WIOD 2013	North-South	present	F-test for two-way effects	t	srj & t	57.796***** ($df = 7145; 87907$)
WIOD 2013	North-South	present	F-test for two-way effects	srj	srj & t	8.173***** ($df = 13; 87907$)
WIOD 2013	Full sample	present	F-test for individual effects	pooled	srj	63.633***** ($df = 39630; 479498$)
WIOD 2013	Full sample	present	F-test for two-way effects	pooled	srj & t	63.635***** ($df = 39643; 479485$)
WIOD 2013	Full sample	present	F-test for time effects	pooled	t	1 566.370***** ($df = 14; 519114$)
WIOD 2013	Full sample	present	F-test for two-way effects	t	srj & t	60.587***** ($df = 39629; 479485$)
WIOD 2013	Full sample	present	F-test for two-way effects	srj	srj & t	12.282***** ($df = 13; 479485$)
WIOD 2016	North-South	absent	F-test for individual effects	pooled	srj	35.333***** ($df = 10258; 132981$)
WIOD 2016	North-South	absent	F-test for two-way effects	pooled	srj & t	35.709***** ($df = 10271; 132968$)
WIOD 2016	North-South	absent	F-test for time effects	pooled	t	436.582***** ($df = 14; 143225$)
WIOD 2016	North-South	absent	F-test for two-way effects	t	srj & t	33.763***** ($df = 10257; 132968$)
WIOD 2016	North-South	absent	F-test for two-way effects	srj	srj & t	89.830***** ($df = 13; 132968$)
WIOD 2016	Full sample	absent	F-test for individual effects	pooled	srj	34.345***** ($df = 62382; 807352$)
WIOD 2016	Full sample	absent	F-test for two-way effects	pooled	srj & t	34.617***** ($df = 62395; 807339$)
WIOD 2016	Full sample	absent	F-test for time effects	pooled	t	1 438.606***** ($df = 14; 869720$)
WIOD 2016	Full sample	absent	F-test for two-way effects	t	srj & t	33.548***** ($df = 62381; 807339$)
WIOD 2016	Full sample	absent	F-test for two-way effects	srj	srj & t	366.912***** ($df = 13; 807339$)

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Independent variables are included with t–1 lags. df means degrees of freedom, where the first number is the difference of the df between $H0$ and $H1$, whereas the second number is the df in the model $H1$. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model. Alternative fixed-effects specifications (H1) are tested against a pooled or a fixed-effects specification with reduced dimensionality (a reduced number of fixed-effects) (H0).

Table A7
LM-tests for fixed-effects (H1) vs. pooled (H0), CO_2 shares

Dataset	Sample	Interaction term	H1 model	Honda (1985)	Breusch & Pagan (1980)	King & Wu (1997)	Gourieroux et al. (1982)
WIOD 2016	North-South	Present	srj	670.558*****	449 647.635*****	670.558*****	
WIOD 2016	North-South	Present	t	150.747*****	22 724.547*****	150.747*****	
WIOD 2016	North-South	Present	srj & t	580.750*****	472 372.182*****	174.521*****	472 372.182*****
WIOD 2016	Full sample	Present	srj	1 652.904*****	2 732 092.600*****	1 652.904*****	
WIOD 2016	Full sample	Present	t	554.596*****	307 576.277*****	554.596*****	
WIOD 2016	Full sample	Present	srj & t	1 560.938*****	3 039 668.876*****	578.416*****	3 039 668.876*****
WIOD 2013	North-South	Present	srj	618.833*****	382 954.497*****	618.833*****	
WIOD 2013	North-South	Present	t	80.231*****	6 436.942*****	80.231*****	
WIOD 2013	North-South	Present	srj & t	494.313*****	389 391.439*****	106.438*****	389 391.439*****
WIOD 2013	Full sample	Present	srj	1 462.229*****	2 138 115.094*****	1 462.229*****	
WIOD 2013	Full sample	Present	t	365.754*****	133 776.123*****	365.754*****	
WIOD 2013	Full sample	Present	srj & t	1 292.580*****	2 271 891.217*****	392.000*****	2 271 891.217*****
WIOD 2016	North-South	Absent	srj	673.602*****	453 739.490*****	673.602*****	
WIOD 2016	North-South	Absent	t	163.710*****	26 801.069*****	163.710*****	
WIOD 2016	North-South	Absent	srj & t	592.069*****	480 540.558*****	187.585*****	480 540.558*****
WIOD 2016	Full sample	Absent	srj	1 653.949*****	2 735 546.616*****	1 653.949*****	
WIOD 2016	Full sample	Absent	t	571.463*****	326 570.123*****	571.463*****	
WIOD 2016	Full sample	Absent	srj & t	1 573.604*****	3 062 116.739*****	595.297*****	3 062 116.739*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. LM means Lagrange Multiplier. Independent variables are included with t–1 lags. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model. All alternative fixed-effects specifications (H1) are tested against a pooled specification (H0)

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B Robustness checks and sectoral regressions

B.1 Robustness: no interaction term

Table B1
Results excluding the interaction term with output shares using WIOD 2016

	Dep. var.: relative distance between sectoral output shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	-0.00856*	-0.07970*****	-0.02916*****	-0.00422*	-0.05733*****	-0.01868*****
$ln(m_{srj(t-1)})$	(0.00457)	(0.00480)	(0.00478)	(0.00216)	(0.00218)	(0.00229)
Capital-to-labor ratio	-0.00564	0.13310*****	-0.00141	0.00711*****	0.08094*****	0.00879*****
$ln(dk_{srj(t-1)})$	(0.00573)	(0.01516)	(0.00570)	(0.00193)	(0.00320)	(0.00192)
Num. of observat.	143435	143435	143435	871733	871733	871733
Degrees of freedom	133175	143419	133162	809345	871717	809332
R^2	0.00010	0.02748	0.00088	0.00008	0.01814	0.00039
F-stat.	2.279	171.688*****	18.603*****	8.627*****	723.199*****	43.524*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Robust standard errors clustered at the srj-level are reported in parentheses. srj indicates the combined dimensions of fixed-effects for source country s, recipient country r and recipient sector j characteristics; t denotes the dimension of the individual time fixed-effects; srj & t indicates the two-way fixed effects model.

Table B2
Results excluding the interaction term with CO_2 shares using WIOD 2016

	Dep. var.: relative distance between sectoral CO_2 shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.04244*****	-0.11040*****	0.00896	0.03662*****	-0.08937*****	0.00108
$ln(m_{srj(t-1)})$	(0.00670)	(0.00520)	(0.00691)	(0.00302)	(0.00243)	(0.00321)
Capital-to-labor ratio	0.00273	0.07693*****	0.01013	-0.00130	0.04783*****	0.00321
$ln(dk_{srj(t-1)})$	(0.00836)	(0.01550)	(0.00826)	(0.00260)	(0.00356)	(0.00260)
Num. of observat.	143241	143241	143241	869736	869736	869736
Degrees of freedom	132981	143225	132968	807352	869720	807339
R^2	0.00125	0.03826	0.00008	0.00080	0.02058	0.00001
F-stat.	20.171*****	228.727*****	1.667	74.030*****	826.150*****	0.824

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See above for notes.

B.2 Robustness: different time lags

Table B3
Results with $t-2$ time lags and output shares using WIOD 2016

	Dep. var.: relative distance between sectoral output shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	-0.00111	-0.08419*****	-0.02144*****	0.00263	-0.05774*****	-0.01237*****
$ln(m_{srj(t-2)})$	(0.00464)	(0.00521)	(0.00482)	(0.00215)	(0.00222)	(0.00228)
Capital-to-labor ratio	-0.02926	-0.03768	-0.01727	-0.01809****	0.02093*	-0.01664****
$ln(dk_{srj(t-2)})$	(0.01856)	(0.04511)	(0.01852)	(0.00574)	(0.01106)	(0.00573)
Interaction term $ln(m_{srj(t-2)})\cdot$	-0.00193	-0.01717*****	-0.00114	-0.00307*****	-0.00722*****	-0.00312*****
$ln(dk_{srj(t-2)})$	(0.00185)	(0.00479)	(0.00185)	(0.00071)	(0.00139)	(0.00071)
Num. of observat.	133190	133190	133190	809491	809491	809491
Degrees of freedom	122929	133174	122917	747102	809475	747090
R^2	0.00009	0.02719	0.00050	0.00013	0.01791	0.00031
F-stat.	1.533	111.298*****	6.917*****	9.594*****	467.532*****	21.335*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B4
Results with $t-3$ time lags and output shares using WIOD 2016

	Dep. var.: relative distance between sectoral output shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.00553	-0.08322*****	-0.01429****	0.00764*****	-0.05711*****	-0.00772*****
$ln(m_{srj(t-3)})$	(0.00470)	(0.00527)	(0.00488)	(0.00214)	(0.00224)	(0.00228)
Capital-to-labor ratio	-0.02173	-0.04191	-0.01048	-0.01814****	0.02209**	-0.01622****
$ln(dk_{srj(t-3)})$	(0.01856)	(0.04661)	(0.01854)	(0.00567)	(0.01123)	(0.00566)
Interaction term $ln(m_{srj(t-3)})\cdot$	-0.00081	-0.01762*****	-0.00008	-0.00241*****	-0.00679*****	-0.00240*****
$ln(dk_{srj(t-3)})$	(0.00177)	(0.00494)	(0.00177)	(0.00069)	(0.00141)	(0.00069)
Num. of observat.	122945	122945	122945	747249	747249	747249
Degrees of freedom	112684	122930	112673	684860	747234	684849
R^2	0.00017	0.02675	0.00028	0.00011	0.01737	0.00012
F-stat.	2.407*	106.163*****	3.811***	8.155*****	444.959*****	8.462*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B5
Results with $t-2$ time lags and CO_2 shares using WIOD 2016

	Dep. var.: relative distance between sectoral CO_2 shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.04982*****	-0.11596*****	0.01596**	0.04280*****	-0.08967*****	0.00735**
$ln(m_{srj(t-2)})$	(0.00709)	(0.00590)	(0.00725)	(0.00316)	(0.00249)	(0.00333)
Capital-to-labor ratio	-0.06480***	-0.07718	-0.04314*	0.01248	0.04174*****	0.01739**
$ln(dk_{srj(t-2)})$	(0.02444)	(0.05012)	(0.02425)	(0.00777)	(0.01241)	(0.00775)
Interaction term $ln(m_{srj(t-2)})\cdot$ $ln(dk_{srj(t-2)})$	-0.00658***	-0.01522***	-0.00510**	0.00122	-0.00073	0.00125
	(0.00255)	(0.00566)	(0.00253)	(0.00098)	(0.00157)	(0.00097)
Num. of observat.	132987	132987	132987	807418	807418	807418
Degrees of freedom	122726	132971	122714	745033	807402	745021
R^2	0.00208	0.03859	0.00031	0.00109	0.02072	0.00006
F-stat.	20.026*****	152.480*****	3.329**	61.609*****	576.981*****	5.248****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B6
Results with $t-3$ time lags and CO_2 shares using WIOD 2016

	Dep. var.: relative distance between sectoral CO_2 shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.06004*****	-0.11657*****	0.02328****	0.05258*****	-0.09003*****	0.01473*****
$ln(m_{srj(t-3)})$	(0.00721)	(0.00599)	(0.00725)	(0.00326)	(0.00250)	(0.00339)
Capital-to-labor ratio	-0.07812****	-0.08330	-0.05871**	0.01794**	0.04097****	0.02269****
$ln(dk_{srj(t-3)})$	(0.02533)	(0.05227)	(0.02507)	(0.00803)	(0.01273)	(0.00802)
Interaction term $ln(m_{srj(t-3)})\cdot$ $ln(dk_{srj(t-3)})$	-0.00723***	-0.01564***	-0.00599**	0.00147	-0.00093	0.00150
	(0.00264)	(0.00589)	(0.00261)	(0.00101)	(0.00161)	(0.00101)
Num. of observat.	122751	122751	122751	745260	745260	745260
Degrees of freedom	112490	122736	112479	682875	745245	682864
R^2	0.00303	0.03890	0.00054	0.00165	0.02106	0.00017
F-stat.	28.153*****	150.476*****	5.933*****	87.668*****	577.039*****	12.792*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

B.3 Robustness: energy shares

Table B7
Results with energy shares using WIOD 2016

	Dep. var.: Relative distance between sectoral energy shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	-0.00855*	-0.09061*****	0.00029	-0.01569*****	-0.05603*****	0.00390
$ln(m_{srj(t-1)})$	(0.00471)	(0.00551)	(0.00499)	(0.00216)	(0.00243)	(0.00238)
Capital-to-labor ratio	-0.00133	0.02186	-0.00097	0.00555	0.00292	0.00441
$ln(dk_{srj(t-1)})$	(0.01920)	(0.04341)	(0.01916)	(0.00588)	(0.01157)	(0.00588)
Interaction term $ln(m_{srj(t-1)})\cdot$ $ln(dk_{srj(t-1)})$	-0.00054	-0.00611	-0.00044	0.00159**	-0.00469****	0.00158**
	(0.00191)	(0.00480)	(0.00191)	(0.00072)	(0.00145)	(0.00072)
Num. of observat.	143444	143444	143444	871719	871719	871719
Degrees of freedom	133183	143427	133170	809334	871702	809321
R^2	0.00008	0.02724	0.00001	0.00024	0.00979	0.00009
F-stat.	1.225	111.384*****	0.111	22.283*****	249.368*****	7.909*****

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B8
Results with energy shares using WIOD 2013

	Dep. var. relative distance between sectoral energy shares $ln(dz_{srjt})$					
	North-South			Full sample		
Fixed-effects	srj	t	srj & t	srj	t	srj & t
Import intensity	0.00079	-0.08180*****	-0.01053	0.00204	-0.06467*****	-0.00689**
$ln(m_{srj(t-1)})$	(0.00676)	(0.00656)	(0.00723)	(0.00309)	(0.00308)	(0.00329)
Capital-to-labor ratio	0.00773	-0.08222	0.00332	-0.00930	0.00702	-0.01176
$ln(dk_{srj(t-1)})$	(0.03324)	(0.06247)	(0.03318)	(0.00948)	(0.01547)	(0.00947)
Interaction term $ln(m_{srj(t-1)})\cdot$ $ln(dk_{srj(t-1)})$	0.00123	-0.01684***	0.00089	-0.00003	-0.00590****	-0.00052
	(0.00310)	(0.00649)	(0.00310)	(0.00117)	(0.00201)	(0.00117)
Num. of observat.	97657	97657	97657	540775	540775	540775
Degrees of freedom	90418	97640	90405	500373	540758	500360
R^2	0.00001	0.02154	0.00011	0.00004	0.01529	0.00006
F-stat.	0.125	55.675*****	0.954	2.356*	244.154*****	3.356**

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

B.4 Sectoral regression results

Table B9

Sectoral results with output shares, sr-fixed-effects, WIOD 2016 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	41.67% and 41.90%	2.36% and 2.38%	3.5285	-0.05641***** (0.00966)	0.10927**** (0.03356)	0.00874** (0.00357)	25284	0.0054	1806	15.051***** <0.001
C23-Minerals	7.63% and 11.04%	0.92% and 1.19%	1.8512	0.03798** (0.01647)	0.03845 (0.03799)	0.01032** (0.00511)	25284	0.0029	1806	6.120***** <0.001
H51-Air transport	3.62% and 2.42%	0.61% and 0.47%	1.0354	0.00770 (0.01037)	-0.04147 (0.02572)	-0.00769** (0.00311)	25284	0.0011	1806	3.646** 0.012
H50-Water transport	2.92% and 1.96%	0.42% and 0.41%	0.9648	0.00141 (0.00981)	-0.01228 (0.02854)	-0.00630* (0.00369)	25284	0.0027	1806	6.393***** <0.001
C24-Metal	8.31% and 10.33%	2.28% and 2.86%	0.7235	-0.02312*** (0.00856)	-0.00339 (0.01986)	-0.00462* (0.00245)	25284	0.0040	1806	9.618***** <0.001
C20-Chemicals	5.01% and 5.20%	2.34% and 2.71%	0.3844	0.02280 (0.01683)	-0.09182** (0.03658)	-0.02020***** (0.00506)	25284	0.0069	1806	11.533***** <0.001
E37-E39-Waste	0.46% and 0.55%	0.45% and 0.36%	0.3075	0.02415 (0.01776)	-0.11023** (0.05068)	-0.00780 (0.00529)	19684	0.0027	1406	2.898** 0.034
B-Mining	3.36% and 3.84%	2.22% and 2.50%	0.3066	-0.00162 (0.00877)	-0.01702 (0.02715)	-0.00507 (0.00335)	25284	0.0017	1806	3.224** 0.022
H49-Land transport	3.74% and 3.62%	2.49% and 2.37%	0.3057	-0.02917**** (0.00932)	0.10086*** (0.03638)	0.01052*** (0.00400)	25284	0.0027	1806	5.734***** <0.001
A02-Forestry	0.19% and 0.25%	0.24% and 0.19%	0.2612	-0.01257 (0.00968)	0.03307 (0.03099)	0.00314 (0.00343)	22960	0.0004	1640	0.901 0.440
C19-Refined Petr.	3.42% and 2.79%	2.42% and 2.41%	0.2318	-0.00758 (0.01122)	0.02842 (0.02469)	0.00265 (0.00309)	22728	0.0002	1722	0.653 0.581
C17-Paper	0.94% and 0.60%	0.83% and 0.69%	0.1749	0.00271 (0.01269)	-0.07327** (0.03027)	-0.01324**** (0.00407)	25284	0.0020	1806	4.726**** 0.003
C22-Rubber	0.25% and 0.88%	1.11% and 1.14%	0.1543	0.04954***** (0.01461)	-0.04295 (0.03222)	-0.00281 (0.00434)	25284	0.0022	1806	5.987***** <0.001
A01-Agriculture	2.22% and 1.87%	2.74% and 2.43%	0.1538	-0.03007***** (0.00884)	-0.01064 (0.02691)	-0.00197 (0.00318)	25284	0.0016	1806	4.284*** 0.005
E36-Water	0.20% and 0.13%	0.23% and 0.18%	0.1432	-0.00226 (0.01348)	-0.09009** (0.03895)	-0.00402 (0.00423)	22960	0.0030	1640	6.745***** <0.001
A03-Fisheries	0.15% and 0.13%	0.20% and 0.20%	0.1309	-0.00304 (0.00769)	-0.02037 (0.02393)	-0.00159 (0.00289)	22960	0.0001	1640	0.517 0.670
C31-C32-Furniture	0.20% and 0.33%	1.06% and 0.82%	0.0811	-0.00736 (0.01703)	-0.10274** (0.04226)	-0.01596**** (0.00546)	25284	0.0019	1806	3.206** 0.022
C16-Wood	0.25% and 0.22%	0.53% and 0.58%	0.0747	0.02448** (0.00961)	0.01142 (0.02436)	0.00350 (0.00313)	25284	0.0014	1806	4.216*** 0.006
H52-Warehousing	0.37% and 0.37%	0.98% and 1.06%	0.0701	-0.04308***** (0.01129)	-0.08582* (0.04455)	-0.00694 (0.00526)	25284	0.0033	1806	7.219***** <0.001
H53-Post	0.10% and 0.08%	0.36% and 0.25%	0.0605	-0.10666***** (0.01455)	0.05054 (0.04383)	0.00250 (0.00469)	19684	0.0145	1406	20.727***** <0.001
I-Accommodation	0.80% and 0.64%	2.75% and 2.40%	0.0539	0.00232 (0.01282)	-0.07985* (0.04446)	-0.01286** (0.00517)	25284	0.0017	1806	3.796*** 0.010
C13-C15-Textile	0.76% and 0.44%	1.45% and 1.63%	0.0535	0.05015***** (0.01286)	-0.00636 (0.03716)	-0.00049 (0.00493)	25284	0.0032	1806	5.710***** <0.001
C10-C12-Food	1.37% and 1.15%	4.05% and 4.35%	0.0528	0.02568** (0.01291)	-0.00759 (0.03587)	0.00178 (0.00460)	25284	0.0013	1806	2.824** 0.037
C25-Non machinery	0.37% and 0.43%	1.80% and 1.65%	0.0515	-0.03843** (0.01529)	-0.10442*** (0.03753)	-0.01042** (0.00487)	24108	0.0021	1722	5.113**** 0.002
OPQRS-Public Services	4.35% and 3.64%	16.12% and 14.56%	0.0500	0.16850***** (0.01608)	0.12116* (0.06449)	0.01375* (0.00704)	25284	0.0268	1806	37.267***** <0.001
F-Construction	1.30% and 1.17%	7.37% and 6.95%	0.0336	0.11834***** (0.01607)	-0.09621** (0.04601)	-0.00997* (0.00562)	25284	0.0082	1806	20.023***** <0.001
C18-Printing	0.17% and 0.05%	0.49% and 0.35%	0.0314	-0.03159** (0.01566)	-0.05187 (0.03312)	-0.00859** (0.00417)	24108	0.0010	1722	2.396* 0.066
C28-Machinery	0.44% and 0.35%	1.89% and 2.27%	0.0310	0.02388* (0.01434)	-0.01628 (0.03761)	-0.00604 (0.00469)	25284	0.0015	1806	2.973** 0.031
G-Trade	2.30% and 1.43%	9.86% and 9.24%	0.0309	-0.08608***** (0.01602)	-0.01120 (0.05227)	-0.00453 (0.00604)	25284	0.0061	1806	11.105***** <0.001
C30-Transport equip.	0.16% and 0.12%	0.67% and 0.97%	0.0239	-0.03916***** (0.00952)	0.01349 (0.02354)	0.00293 (0.00298)	24026	0.0019	1722	6.220***** <0.001
C27-Electrical equip.	0.18% and 0.17%	1.06% and 1.47%	0.0230	-0.05994***** (0.01698)	-0.10154*** (0.03915)	-0.01318** (0.00512)	24108	0.0039	1722	6.043***** <0.001
C33-Repair	0.04% and 0.02%	0.28% and 0.23%	0.0196	-0.09223***** (0.01777)	0.01825 (0.04428)	0.00195 (0.00539)	14656	0.0058	1056	9.530***** <0.001
JKLMN-Private Services	2.15% and 1.54%	22.51% and 22.07%	0.0140	0.01590* (0.00947)	-0.02957 (0.04190)	-0.00514 (0.00441)	25284	0.0012	1806	2.424* 0.064
C29-Vehicles	0.33% and 0.20%	2.49% and 3.02%	0.0136	0.00371 (0.01266)	-0.05204** (0.02393)	-0.00955**** (0.00327)	25284	0.0014	1806	4.049*** 0.007
C26-Computers	0.23% and 0.13%	1.53% and 2.66%	0.0096	-0.01368 (0.01903)	-0.06396* (0.03362)	-0.01071** (0.00468)	25284	0.0014	1806	2.333* 0.072
C21-Pharma.	0.04% and 0.03%	0.72% and 0.84%	0.0078	0.05409***** (0.01294)	0.01805 (0.02897)	0.00158 (0.00342)	22880	0.0031	1640	6.045***** <0.001

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Robust standard errors clustered at the sr-level are reported in parentheses. sr indicates the combined dimensions of fixed-effects for source country s and recipient country r.

Table B10
Sectoral results with output shares, t-fixed-effects, WIOD 2016 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	41.67% and 41.90%	2.36% and 2.38%	3.5285	-0.04334***** (0.00763)	0.09905** (0.03926)	0.01101*** (0.00411)	25284	0.0098	14	11.141***** <0.001
C23-Minerals	7.63% and 11.04%	0.92% and 1.19%	1.8512	0.01467 (0.00897)	0.02108 (0.04539)	0.00514 (0.00572)	25284	0.0011	14	1.578 0.193
H51-Air transport	3.62% and 2.42%	0.61% and 0.47%	1.0354	-0.04797***** (0.00880)	0.24485***** (0.04264)	0.01561**** (0.00517)	25284	0.0373	14	43.633***** <0.001
H50-Water transport	2.92% and 1.96%	0.42% and 0.41%	0.9648	0.00223 (0.01231)	0.39265***** (0.06959)	0.03989***** (0.00769)	25284	0.0133	14	10.756***** <0.001
C24-Metal	8.31% and 10.33%	2.28% and 2.86%	0.7235	-0.22146***** (0.01551)	-0.02754 (0.05655)	-0.01910** (0.00742)	25284	0.1488	14	89.863***** <0.001
C20-Chemicals	5.01% and 5.20%	2.34% and 2.71%	0.3844	-0.17223***** (0.01096)	-0.00867 (0.04630)	-0.00116 (0.00645)	25284	0.1027	14	89.846***** <0.001
E37-E39-Waste	0.46% and 0.55%	0.45% and 0.36%	0.3075	-0.09170***** (0.01172)	-0.03951 (0.06362)	-0.01292* (0.00766)	19684	0.0303	14	23.086***** <0.001
B-Mining	3.36% and 3.84%	2.22% and 2.50%	0.3066	-0.10911***** (0.01405)	0.07089 (0.07077)	-0.00462 (0.00791)	25284	0.0470	14	34.682***** <0.001
H49-Land transport	3.74% and 3.62%	2.49% and 2.37%	0.3057	-0.05739***** (0.01058)	0.13736*** (0.05034)	0.01656**** (0.00541)	25284	0.0163	14	13.635***** <0.001
A02-Forestry	0.19% and 0.25%	0.24% and 0.19%	0.2612	-0.02508* (0.01349)	-0.15543*** (0.05815)	-0.01353** (0.00658)	22960	0.0042	14	5.018**** 0.002
C19-Refined Petr.	3.42% and 2.79%	2.42% and 2.41%	0.2318	-0.13351***** (0.01473)	-0.01596 (0.05778)	-0.02669***** (0.00675)	22728	0.1067	14	71.461***** <0.001
C17-Paper	0.94% and 0.60%	0.83% and 0.69%	0.1749	-0.10016***** (0.01148)	0.04704 (0.06046)	-0.00279 (0.00771)	25284	0.0446	14	34.881***** <0.001
C22-Rubber	0.25% and 0.88%	1.11% and 1.14%	0.1543	-0.06882***** (0.00958)	0.14147***** (0.04229)	0.02706***** (0.00556)	25284	0.0304	14	30.640***** <0.001
A01-Agriculture	2.22% and 1.87%	2.74% and 2.43%	0.1538	-0.04839***** (0.01210)	0.16024***** (0.03862)	0.01868***** (0.00506)	25284	0.0120	14	10.238***** <0.001
E36-Water	0.20% and 0.13%	0.23% and 0.18%	0.1432	0.00557 (0.01056)	-0.00243 (0.05006)	0.00513 (0.00528)	22960	0.0046	14	5.505***** <0.001
A03-Fisheries	0.15% and 0.13%	0.20% and 0.20%	0.1309	-0.06044***** (0.01605)	-0.19152**** (0.06094)	-0.01260 (0.00795)	22960	0.0201	14	23.648***** <0.001
C31-C32-Furniture	0.20% and 0.33%	1.06% and 0.82%	0.0811	-0.05137***** (0.01115)	0.12221** (0.05620)	0.01112 (0.00743)	25284	0.0126	14	12.856***** <0.001
C16-Wood	0.25% and 0.22%	0.53% and 0.58%	0.0747	-0.05957***** (0.01152)	0.07876 (0.05260)	0.01623** (0.00717)	25284	0.0147	14	10.883***** <0.001
H52-Warehousing	0.37% and 0.37%	0.98% and 1.06%	0.0701	-0.01767** (0.00881)	0.32972***** (0.05690)	0.01112* (0.00639)	25284	0.0881	14	84.879***** <0.001
H53-Post	0.10% and 0.08%	0.36% and 0.25%	0.0605	-0.03249**** (0.00992)	0.06042 (0.04539)	0.00251 (0.00505)	19684	0.0062	14	6.103***** <0.001
I-Accommodation	0.80% and 0.64%	2.75% and 2.40%	0.0539	-0.04907***** (0.01086)	-0.05217 (0.06993)	-0.00189 (0.00791)	25284	0.0091	14	8.399***** <0.001
C13-C15-Textile	0.76% and 0.44%	1.45% and 1.63%	0.0535	-0.05297***** (0.01105)	0.03393 (0.04405)	0.01413** (0.00604)	25284	0.0157	14	13.558***** <0.001
C10-C12-Food	1.37% and 1.15%	4.05% and 4.35%	0.0528	-0.05353***** (0.01125)	-0.09155* (0.05485)	-0.01312* (0.00676)	25284	0.0087	14	7.788***** <0.001
C25-Non machinery	0.37% and 0.43%	1.80% and 1.65%	0.0515	-0.06579***** (0.00921)	-0.01658 (0.04567)	0.00218 (0.00587)	24108	0.0191	14	18.784***** <0.001
OPQRS-Public Services	4.35% and 3.64%	16.12% and 14.56%	0.0500	-0.00005 (0.00979)	0.41014***** (0.06465)	0.02631***** (0.00708)	25284	0.0594	14	57.385***** <0.001
F-Construction	1.30% and 1.17%	7.37% and 6.95%	0.0336	-0.01093 (0.00920)	-0.00033 (0.05052)	-0.00063 (0.00628)	25284	0.0004	14	0.529 0.663
C18-Printing	0.17% and 0.05%	0.49% and 0.35%	0.0314	-0.07195***** (0.00949)	-0.10609** (0.04776)	-0.01301** (0.00573)	24108	0.0157	14	19.364***** <0.001
C28-Machinery	0.44% and 0.35%	1.89% and 2.27%	0.0310	-0.12850***** (0.01220)	0.03849 (0.05538)	-0.00031 (0.00751)	25284	0.0576	14	44.412***** <0.001
G-Trade	2.30% and 1.43%	9.86% and 9.24%	0.0309	0.01568 (0.01012)	0.35655***** (0.06102)	0.03522***** (0.00694)	25284	0.0130	14	13.236***** <0.001
C30-Transport equip.	0.16% and 0.12%	0.67% and 0.97%	0.0239	-0.16225***** (0.01423)	0.00903 (0.06325)	-0.00868 (0.00846)	24026	0.0798	14	58.545***** <0.001
C27-Electrical equip.	0.18% and 0.17%	1.06% and 1.47%	0.0230	-0.11263***** (0.01183)	0.02180 (0.04401)	0.01123* (0.00618)	24108	0.0444	14	34.478***** <0.001
C33-Repair	0.04% and 0.02%	0.28% and 0.23%	0.0196	-0.07785***** (0.01386)	0.03693 (0.06270)	0.01172 (0.00743)	14656	0.0180	14	11.219***** <0.001
JKLMN-Private Services	2.15% and 1.54%	22.51% and 22.07%	0.0140	-0.00049 (0.01142)	0.33077***** (0.07599)	0.00969 (0.00852)	25284	0.0796	14	66.143***** <0.001
C29-Vehicles	0.33% and 0.20%	2.49% and 3.02%	0.0136	-0.24186***** (0.01247)	-0.20807***** (0.05651)	-0.02784***** (0.00761)	25284	0.1307	14	131.440***** <0.001
C26-Computers	0.23% and 0.13%	1.53% and 2.66%	0.0096	-0.16018***** (0.01368)	-0.04529 (0.05217)	-0.00240 (0.00739)	25284	0.0673	14	45.834***** <0.001
C21-Pharma.	0.04% and 0.03%	0.72% and 0.84%	0.0078	-0.05188***** (0.01224)	-0.02398 (0.06773)	-0.01128 (0.00817)	22880	0.0143	14	9.936***** <0.001

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Robust standard errors clustered at the sr-level are reported in parentheses. t denotes the dimension of the individual time fixed-effects.

Table B11
Sectoral results with output shares, sr & t-fixed-eff., WIOD 2016 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. sr-fix.-ef.	Num. t-fix.-ef.	F-stat. p-value
D35-Energy	41.67% and 41.90%	2.36% and 2.38%	3.5285	-0.02781*** (0.01028)	0.10498**** (0.03307)	0.00879** (0.00351)	25284	0.0021	1806	14	6.034***** <0.001
C23-Minerals	7.63% and 11.04%	0.92% and 1.19%	1.8512	0.02257 (0.01713)	0.03662 (0.03819)	0.00989* (0.00513)	25284	0.0021	1806	14	4.568**** 0.003
H51-Air transport	3.62% and 2.42%	0.61% and 0.47%	1.0354	-0.01744 (0.01081)	-0.02928 (0.02544)	-0.00684** (0.00309)	25284	0.0018	1806	14	5.364**** 0.001
H50-Water transport	2.92% and 1.96%	0.42% and 0.41%	0.9648	0.00346 (0.01044)	-0.01167 (0.02864)	-0.00590 (0.00370)	25284	0.0023	1806	14	5.531***** <0.001
C24-Metal	8.31% and 10.33%	2.28% and 2.86%	0.7235	-0.02986***** (0.00904)	-0.00363 (0.01987)	-0.00483** (0.00245)	25284	0.0044	1806	14	11.602***** <0.001
C20-Chemicals	5.01% and 5.20%	2.34% and 2.71%	0.3844	-0.02411 (0.01722)	-0.09719*** (0.03537)	-0.02071***** (0.00491)	25284	0.0071	1806	14	13.246***** <0.001
E37-E39-Waste	0.46% and 0.55%	0.45% and 0.36%	0.3075	0.01525 (0.02016)	-0.10283** (0.05024)	-0.00758 (0.00526)	19684	0.0018	1406	14	2.164* 0.090
B-Mining	3.36% and 3.84%	2.22% and 2.50%	0.3066	-0.01382 (0.00919)	-0.01946 (0.02716)	-0.00556* (0.00335)	25284	0.0023	1806	14	4.507**** 0.004
H49-Land transport	3.74% and 3.62%	2.49% and 2.37%	0.3057	-0.00458 (0.00988)	0.08819** (0.03584)	0.00956** (0.00396)	25284	0.0010	1806	14	2.191* 0.087
A02-Forestry	0.19% and 0.25%	0.24% and 0.19%	0.2612	0.00743 (0.01053)	0.02577 (0.03048)	0.00276 (0.00337)	22960	0.0002	1640	14	0.480 0.696
C19-Refined Petr.	3.42% and 2.79%	2.42% and 2.41%	0.2318	-0.02452** (0.01163)	0.03399 (0.02492)	0.00285 (0.00310)	22728	0.0009	1722	14	2.245* 0.081
C17-Paper	0.94% and 0.60%	0.83% and 0.69%	0.1749	-0.03550*** (0.01272)	-0.08624**** (0.02966)	-0.01457***** (0.00401)	25284	0.0033	1806	14	7.490***** <0.001
C22-Rubber	0.25% and 0.88%	1.11% and 1.14%	0.1543	-0.02359 (0.01555)	-0.03485 (0.03273)	-0.00292 (0.00441)	25284	0.0005	1806	14	1.460 0.224
A01-Agriculture	2.22% and 1.87%	2.74% and 2.43%	0.1538	-0.01376 (0.00918)	-0.00364 (0.02713)	-0.00131 (0.00320)	25284	0.0003	1806	14	0.937 0.422
E36-Water	0.20% and 0.13%	0.23% and 0.18%	0.1432	0.00014 (0.01431)	-0.08879** (0.03904)	-0.00411 (0.00423)	22960	0.0027	1640	14	6.102***** <0.001
A03-Fisheries	0.15% and 0.13%	0.20% and 0.20%	0.1309	0.00104 (0.00836)	-0.01804 (0.02378)	-0.00115 (0.00288)	22960	0.0001	1640	14	0.529 0.662
C31-C32-Furniture	0.20% and 0.33%	1.06% and 0.82%	0.0811	-0.06082***** (0.01822)	-0.08383** (0.04205)	-0.01472*** (0.00542)	25284	0.0042	1806	14	6.621***** <0.001
C16-Wood	0.25% and 0.22%	0.53% and 0.58%	0.0747	-0.04219***** (0.01034)	0.02151 (0.02378)	0.00328 (0.00303)	25284	0.0018	1806	14	5.634***** <0.001
H52-Warehousing	0.37% and 0.37%	0.98% and 1.06%	0.0701	-0.00934 (0.01252)	-0.09354** (0.04434)	-0.00771 (0.00525)	25284	0.0013	1806	14	2.830** 0.037
H53-Post	0.10% and 0.08%	0.36% and 0.25%	0.0605	-0.02895* (0.01661)	0.03802 (0.04274)	0.00104 (0.00461)	19684	0.0018	1406	14	2.914** 0.033
I-Accommodation	0.80% and 0.64%	2.75% and 2.40%	0.0539	-0.00124 (0.01409)	-0.07731* (0.04441)	-0.01275** (0.00517)	25284	0.0018	1806	14	3.873*** 0.009
C13-C15-Textile	0.76% and 0.44%	1.45% and 1.63%	0.0535	0.00854 (0.01302)	-0.02211 (0.03769)	-0.00263 (0.00497)	25284	0.0002	1806	14	0.230 0.875
C10-C12-Food	1.37% and 1.15%	4.05% and 4.35%	0.0528	-0.02119 (0.01303)	-0.01071 (0.03523)	0.00092 (0.00451)	25284	0.0008	1806	14	1.913 0.125
C25-Non machinery	0.37% and 0.43%	1.80% and 1.65%	0.0515	-0.04185*** (0.01600)	-0.09964*** (0.03752)	-0.01045** (0.00489)	24108	0.0020	1722	14	4.354**** 0.005
OPQRS-Public Services	4.35% and 3.64%	16.12% and 14.56%	0.0500	0.08491***** (0.01762)	0.13514** (0.06545)	0.01444** (0.00706)	25284	0.0055	1806	14	8.911***** <0.001
F-Construction	1.30% and 1.17%	7.37% and 6.95%	0.0336	0.04583** (0.01786)	-0.09847** (0.04574)	-0.00993* (0.00560)	25284	0.0016	1806	14	4.001*** 0.007
C18-Printing	0.17% and 0.05%	0.49% and 0.35%	0.0314	-0.01946 (0.01589)	-0.05257 (0.03311)	-0.00887** (0.00418)	24108	0.0007	1722	14	2.088* 0.100
C28-Machinery	0.44% and 0.35%	1.89% and 2.27%	0.0310	-0.00845 (0.01535)	-0.01041 (0.03751)	-0.00605 (0.00469)	25284	0.0016	1806	14	3.144** 0.024
G-Trade	2.30% and 1.43%	9.86% and 9.24%	0.0309	-0.01418 (0.01801)	-0.04072 (0.05171)	-0.00454 (0.00601)	25284	0.0002	1806	14	0.401 0.752
C30-Transport equip.	0.16% and 0.12%	0.67% and 0.97%	0.0239	-0.05481***** (0.01023)	0.01918 (0.02349)	0.00321 (0.00294)	24026	0.0030	1722	14	10.127***** <0.001
C27-Electrical equip.	0.18% and 0.17%	1.06% and 1.47%	0.0230	-0.09451***** (0.01865)	-0.09797** (0.03907)	-0.01347*** (0.00511)	24108	0.0066	1722	14	10.378***** <0.001
C33-Repair	0.04% and 0.02%	0.28% and 0.23%	0.0196	-0.02549 (0.01882)	0.00358 (0.04324)	0.00235 (0.00531)	14656	0.0005	1056	14	1.142 0.331
JKLMN-Private Services	2.15% and 1.54%	22.51% and 22.07%	0.0140	-0.00206 (0.01107)	-0.02800 (0.04195)	-0.00501 (0.00442)	25284	0.0005	1806	14	1.252 0.289
C29-Vehicles	0.33% and 0.20%	2.49% and 3.02%	0.0136	-0.03197** (0.01396)	-0.04424* (0.02388)	-0.00867*** (0.00326)	25284	0.0023	1806	14	5.302**** 0.001
C26-Computers	0.23% and 0.13%	1.53% and 2.66%	0.0096	-0.04718** (0.01865)	-0.07261** (0.03368)	-0.01208*** (0.00467)	25284	0.0033	1806	14	5.433**** 0.001
C21-Pharma.	0.04% and 0.03%	0.72% and 0.84%	0.0078	0.04443***** (0.01345)	0.01290 (0.02890)	0.00127 (0.00342)	22880	0.0018	1640	14	3.731** 0.011

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. Robust standard errors clustered at the sr-level are reported in parentheses. sr & t indicates the two-way fixed effects model.

Table B12
Sectoral results with output shares, sr-fixed-effects, WIOD 2013 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	39.77% and 46.58%	2.43% and 2.21%	5.6674	-0.04843***** (0.01462)	-0.01088 (0.05289)	0.00213 (0.00587)	20918	0.0025	1560	4.200*** 0.006
C23-Minerals	7.05% and 7.09%	1.14% and 1.05%	1.8039	0.04468**** (0.01363)	0.03955 (0.06233)	0.00678 (0.00654)	20917	0.0018	1560	4.499**** 0.004
H51-Air transport	2.64% and 2.86%	0.53% and 0.45%	1.7024	-0.04567***** (0.01196)	0.01705 (0.04487)	0.00781 (0.00555)	20905	0.0041	1560	7.339***** <0.001
H50-Water transport	1.71% and 2.19%	0.33% and 0.44%	1.3342	-0.01453 (0.01102)	0.03569 (0.03730)	-0.00130 (0.00481)	20895	0.0024	1560	4.067*** 0.007
B-Mining	3.43% and 4.02%	1.14% and 0.94%	1.1501	-0.05823***** (0.01254)	-0.00384 (0.04504)	0.00061 (0.00540)	20914	0.0040	1560	7.529***** <0.001
C19-Refined Petr.	3.90% and 3.51%	1.21% and 1.39%	0.6808	0.01342 (0.01328)	0.01809 (0.04621)	0.00115 (0.00530)	18990	0.0002	1477	0.467 0.705
H49-Land transport	4.08% and 4.00%	2.40% and 2.11%	0.5103	0.06031***** (0.01139)	0.02879 (0.04920)	0.00560 (0.00538)	20895	0.0048	1560	11.343***** <0.001
C24-Metal	8.43% and 7.56%	4.19% and 4.03%	0.5040	-0.01839 (0.01185)	-0.09081** (0.03703)	-0.01040** (0.00486)	20916	0.0010	1560	2.387* 0.067
C20-Chemicals	4.98% and 3.92%	3.01% and 3.08%	0.3421	-0.01015 (0.01342)	-0.02934 (0.03719)	0.00360 (0.00503)	20912	0.0026	1560	6.066***** <0.001
A01-Agriculture	3.02% and 2.24%	3.23% and 2.76%	0.2175	-0.02449** (0.01174)	0.03537 (0.03913)	0.00287 (0.00426)	20917	0.0009	1560	1.818 0.142
C17-Paper	1.40% and 1.00%	2.29% and 1.74%	0.1546	-0.00992 (0.01448)	-0.05505 (0.04352)	-0.01091** (0.00528)	20918	0.0015	1560	3.119** 0.025
H52-Warehousing	0.43% and 0.67%	1.14% and 1.16%	0.1543	0.00673 (0.01159)	0.04602 (0.03960)	0.00264 (0.00442)	20918	0.0006	1560	1.545 0.201
C16-Wood	0.29% and 0.28%	0.76% and 0.61%	0.1252	0.04516***** (0.01257)	0.04943 (0.03862)	0.00898** (0.00411)	20896	0.0035	1560	9.025***** <0.001
C10-C12-Food	1.88% and 1.65%	4.56% and 4.03%	0.1100	0.02367** (0.01192)	-0.11534**** (0.04022)	-0.01099** (0.00477)	20920	0.0015	1560	4.384**** 0.004
OPQRS-Public Services	4.42% and 3.04%	9.74% and 8.78%	0.0929	0.10322***** (0.01646)	-0.00730 (0.06607)	0.00173 (0.00775)	20920	0.0093	1560	14.288***** <0.001
I-Accommodation	1.04% and 0.79%	2.78% and 2.37%	0.0892	0.03441*** (0.01293)	0.01208 (0.03913)	-0.00153 (0.00427)	20922	0.0016	1560	3.447** 0.016
C13-C15-Textile	1.05% and 0.62%	2.01% and 1.87%	0.0887	-0.00599 (0.01461)	-0.00465 (0.04362)	-0.00432 (0.00597)	20916	0.0006	1560	0.785 0.502
F-Construction	1.52% and 1.35%	7.24% and 5.78%	0.0627	0.08427***** (0.01638)	0.06261 (0.05580)	0.00114 (0.00665)	20918	0.0047	1560	10.680***** <0.001
C33-Repair	0.29% and 0.16%	0.89% and 0.77%	0.0571	0.05728**** (0.01803)	-0.02890 (0.05635)	-0.01110 (0.00723)	20921	0.0044	1560	6.404***** <0.001
C22-Rubber	0.42% and 0.28%	1.27% and 1.34%	0.0561	-0.02994 (0.02067)	-0.15750*** (0.05613)	-0.02051** (0.00829)	20915	0.0018	1560	3.124** 0.025
G-Trade	2.57% and 1.65%	10.94% and 10.00%	0.0443	0.01044 (0.01563)	0.09027 (0.05606)	0.00875 (0.00654)	20919	0.0005	1560	1.035 0.376
C26-Computers	0.65% and 0.42%	2.58% and 2.67%	0.0425	0.07022***** (0.01306)	-0.03635 (0.03653)	-0.00496 (0.00513)	20918	0.0051	1560	10.360***** <0.001
H53-Post	0.33% and 0.37%	1.77% and 2.87%	0.0346	0.03083* (0.01597)	0.01249 (0.05855)	0.00767 (0.00650)	20917	0.0023	1560	3.884*** 0.009
C30-Transport equip.	0.56% and 0.47%	3.84% and 3.93%	0.0325	0.01151 (0.01224)	-0.14641***** (0.04029)	-0.01934***** (0.00484)	20917	0.0030	1560	5.748***** <0.001
JKLMN-Private Services	3.64% and 2.96%	24.83% and 26.42%	0.0301	0.09347***** (0.01238)	-0.09671** (0.04893)	-0.00811 (0.00570)	20920	0.0125	1560	21.175***** <0.001
C27-Electrical equip.	0.49% and 0.33%	3.75% and 7.21%	0.0121	-0.01260 (0.01168)	-0.00153 (0.03410)	-0.00133 (0.00456)	20921	0.0003	1560	0.528 0.663

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B13
Sectoral results with output shares, t-fixed-effects, WIOD 2013 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	39.77% and 46.58%	2.43% and 2.21%	5.6674	-0.00286 (0.00850)	0.08579** (0.03818)	0.00311 (0.00409)	20918	0.0069	14	8.931***** <0.001
C23-Minerals	7.05% and 7.09%	1.14% and 1.05%	1.8039	0.02941**** (0.00981)	0.07637 (0.04685)	0.01335** (0.00547)	20917	0.0059	14	7.579***** <0.001
H51-Air transport	2.64% and 2.86%	0.53% and 0.45%	1.7024	-0.03630***** (0.00974)	0.27343***** (0.05380)	0.02018***** (0.00596)	20905	0.0264	14	22.885***** <0.001
H50-Water transport	1.71% and 2.19%	0.33% and 0.44%	1.3342	-0.01418 (0.01378)	0.01129 (0.08292)	-0.00828 (0.01046)	20895	0.0069	14	4.233*** 0.005
B-Mining	3.43% and 4.02%	1.14% and 0.94%	1.1501	-0.04110*** (0.01464)	0.17399*** (0.06742)	0.01612** (0.00809)	20914	0.0087	14	6.710***** <0.001
C19-Refined Petr.	3.90% and 3.51%	1.21% and 1.39%	0.6808	-0.12802***** (0.01595)	-0.14875**** (0.04918)	-0.02852***** (0.00601)	18990	0.0841	14	50.718***** <0.001
H49-Land transport	4.08% and 4.00%	2.40% and 2.11%	0.5103	-0.03521**** (0.01127)	0.13107** (0.05754)	0.00994 (0.00666)	20895	0.0109	14	9.253***** <0.001
C24-Metal	8.43% and 7.56%	4.19% and 4.03%	0.5040	-0.12426***** (0.01176)	0.09708* (0.05500)	0.01843** (0.00733)	20916	0.0630	14	44.550***** <0.001
C20-Chemicals	4.98% and 3.92%	3.01% and 3.08%	0.3421	-0.12816***** (0.01193)	-0.10473 (0.06424)	-0.00627 (0.00872)	20912	0.0570	14	41.305***** <0.001
A01-Agriculture	3.02% and 2.24%	3.23% and 2.76%	0.2175	0.02377** (0.01207)	0.09459** (0.04299)	0.00884* (0.00514)	20917	0.0034	14	4.623**** 0.003
C17-Paper	1.40% and 1.00%	2.29% and 1.74%	0.1546	-0.02981** (0.01175)	0.13391* (0.07204)	0.00559 (0.00874)	20918	0.0158	14	10.624***** <0.001
H52-Warehousing	0.43% and 0.67%	1.14% and 1.16%	0.1543	0.00472 (0.01036)	0.33342***** (0.06345)	0.02916***** (0.00711)	20918	0.0187	14	12.465***** <0.001
C16-Wood	0.29% and 0.28%	0.76% and 0.61%	0.1252	-0.07481***** (0.01300)	0.04254 (0.05649)	0.01407* (0.00738)	20896	0.0210	14	14.228***** <0.001
C10-C12-Food	1.88% and 1.65%	4.56% and 4.03%	0.1100	-0.01908* (0.01105)	-0.01693 (0.06299)	-0.00232 (0.00795)	20920	0.0012	14	1.033 0.377
OPQRS-Public Services	4.42% and 3.04%	9.74% and 8.78%	0.0929	-0.01898* (0.00987)	0.37286***** (0.06191)	0.02000*** (0.00733)	20920	0.0925	14	73.815***** <0.001
I-Accommodation	1.04% and 0.79%	2.78% and 2.37%	0.0892	-0.05756***** (0.01169)	-0.05339 (0.07535)	-0.01021 (0.00827)	20922	0.0126	14	9.275***** <0.001
C13-C15-Textile	1.05% and 0.62%	2.01% and 1.87%	0.0887	0.02230** (0.01109)	0.08020* (0.04201)	0.01496*** (0.00551)	20916	0.0045	14	6.821***** <0.001
F-Construction	1.52% and 1.35%	7.24% and 5.78%	0.0627	-0.01627* (0.00925)	-0.12078** (0.05062)	-0.01222* (0.00642)	20918	0.0029	14	3.268** 0.021
C33-Repair	0.29% and 0.16%	0.89% and 0.77%	0.0571	-0.02776*** (0.01002)	-0.06014 (0.04199)	-0.00733 (0.00526)	20921	0.0030	14	3.819*** 0.010
C22-Rubber	0.42% and 0.28%	1.27% and 1.34%	0.0561	-0.06928***** (0.00919)	0.11078** (0.04400)	0.01616*** (0.00591)	20915	0.0235	14	22.793***** <0.001
G-Trade	2.57% and 1.65%	10.94% and 10.00%	0.0443	0.01316 (0.00998)	0.33565***** (0.06490)	0.02908***** (0.00763)	20919	0.0211	14	16.520***** <0.001
C26-Computers	0.65% and 0.42%	2.58% and 2.67%	0.0425	-0.13279***** (0.01208)	0.12740** (0.05817)	0.01751** (0.00779)	20918	0.0677	14	45.474***** <0.001
H53-Post	0.33% and 0.37%	1.77% and 2.87%	0.0346	-0.00974 (0.00849)	0.50399***** (0.04943)	0.03359***** (0.00553)	20917	0.0820	14	105.330***** <0.001
C30-Transport equip.	0.56% and 0.47%	3.84% and 3.93%	0.0325	-0.21758***** (0.01353)	-0.23680***** (0.05228)	-0.02339***** (0.00708)	20917	0.1293	14	90.727***** <0.001
JKLMN-Private Services	3.64% and 2.96%	24.83% and 26.42%	0.0301	0.00559 (0.01055)	0.31611***** (0.06511)	-0.00099 (0.00705)	20920	0.1606	14	137.155***** <0.001
C27-Electrical equip.	0.49% and 0.33%	3.75% and 7.21%	0.0121	-0.18146***** (0.01373)	-0.11920** (0.05390)	-0.00813 (0.00770)	20921	0.1004	14	58.781***** <0.001

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B14
Sectoral results with output shares, $sr\&t$-fixed-eff., WIOD 2013 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. sr-fix.-ef.	Num. t-fix.-ef.	F-stat. p-value
D35-Energy	39.77% and 46.58%	2.43% and 2.21%	5.6674	-0.03640** (0.01461)	-0.01436 (0.05315)	0.00272 (0.00591)	20918	0.0016	1560	14	2.856** 0.036
C23-Minerals	7.05% and 7.09%	1.14% and 1.05%	1.8039	0.02767** (0.01408)	0.03170 (0.06110)	0.00467 (0.00641)	20917	0.0006	1560	14	1.610 0.185
H51-Air transport	2.64% and 2.86%	0.53% and 0.45%	1.7024	-0.05561***** (0.01225)	0.01645 (0.04455)	0.00776 (0.00555)	20905	0.0048	1560	14	9.403***** <0.001
H50-Water transport	1.71% and 2.19%	0.33% and 0.44%	1.3342	-0.02468** (0.01115)	0.04845 (0.03688)	0.00026 (0.00473)	20895	0.0030	1560	14	5.663***** <0.001
B-Mining	3.43% and 4.02%	1.14% and 0.94%	1.1501	-0.05679***** (0.01235)	0.00028 (0.04490)	0.00071 (0.00539)	20914	0.0031	1560	14	7.341***** <0.001
C19-Refined Petr.	3.90% and 3.51%	1.21% and 1.39%	0.6808	-0.04001**** (0.01341)	0.04695 (0.04544)	0.00168 (0.00521)	18990	0.0021	1477	14	4.270*** 0.005
H49-Land transport	4.08% and 4.00%	2.40% and 2.11%	0.5103	0.02486** (0.01158)	0.01513 (0.04924)	0.00261 (0.00538)	20895	0.0007	1560	14	1.869 0.133
C24-Metal	8.43% and 7.56%	4.19% and 4.03%	0.5040	-0.01232 (0.01116)	-0.09452** (0.03726)	-0.01041** (0.00485)	20916	0.0009	1560	14	2.340* 0.072
C20-Chemicals	4.98% and 3.92%	3.01% and 3.08%	0.3421	-0.02360* (0.01342)	-0.01171 (0.03586)	0.00417 (0.00495)	20912	0.0020	1560	14	4.623**** 0.003
A01-Agriculture	3.02% and 2.24%	3.23% and 2.76%	0.2175	-0.01407 (0.01186)	0.04639 (0.03931)	0.00441 (0.00429)	20917	0.0004	1560	14	0.873 0.455
C17-Paper	1.40% and 1.00%	2.29% and 1.74%	0.1546	-0.01086 (0.01463)	-0.05724 (0.04334)	-0.01100** (0.00528)	20918	0.0015	1560	14	3.024** 0.029
H52-Warehousing	0.43% and 0.67%	1.14% and 1.16%	0.1543	0.00300 (0.01162)	0.04433 (0.03989)	0.00226 (0.00445)	20918	0.0006	1560	14	1.557 0.198
C16-Wood	0.29% and 0.28%	0.76% and 0.61%	0.1252	0.02212* (0.01290)	0.03922 (0.03907)	0.00716* (0.00415)	20896	0.0012	1560	14	3.186** 0.023
C10-C12-Food	1.88% and 1.65%	4.56% and 4.03%	0.1100	-0.01189 (0.01170)	-0.12345**** (0.03896)	-0.01545***** (0.00463)	20920	0.0011	1560	14	3.958*** 0.008
OPQRS-Public Services	4.42% and 3.04%	9.74% and 8.78%	0.0929	0.00988 (0.01829)	-0.03505 (0.06274)	-0.00249 (0.00742)	20920	0.0002	1560	14	0.306 0.821
I-Accommodation	1.04% and 0.79%	2.78% and 2.37%	0.0892	0.01855 (0.01329)	-0.00313 (0.03878)	-0.00424 (0.00425)	20922	0.0013	1560	14	2.956** 0.031
C13-C15-Textile	1.05% and 0.62%	2.01% and 1.87%	0.0887	-0.02933** (0.01442)	-0.06231 (0.04312)	-0.00894 (0.00581)	20916	0.0012	1560	14	2.186* 0.088
F-Construction	1.52% and 1.35%	7.24% and 5.78%	0.0627	-0.00433 (0.01721)	0.06697 (0.05685)	0.00010 (0.00673)	20918	0.0018	1560	14	3.505** 0.015
C33-Repair	0.29% and 0.16%	0.89% and 0.77%	0.0571	0.02569 (0.01916)	-0.05807 (0.05622)	-0.01429** (0.00722)	20921	0.0030	1560	14	3.822*** 0.010
C22-Rubber	0.42% and 0.28%	1.27% and 1.34%	0.0561	-0.05081** (0.02148)	-0.17336**** (0.05517)	-0.02497**** (0.00820)	20915	0.0034	1560	14	4.710**** 0.003
G-Trade	2.57% and 1.65%	10.94% and 10.00%	0.0443	-0.01172 (0.01637)	0.08187 (0.05629)	0.00741 (0.00653)	20919	0.0005	1560	14	1.040 0.374
C26-Computers	0.65% and 0.42%	2.58% and 2.67%	0.0425	0.01923 (0.01349)	-0.04543 (0.03678)	-0.00777 (0.00517)	20918	0.0009	1560	14	1.714 0.162
H53-Post	0.33% and 0.37%	1.77% and 2.87%	0.0346	-0.00398 (0.01671)	-0.01001 (0.05821)	0.00472 (0.00647)	20917	0.0011	1560	14	2.008 0.111
C30-Transport equip.	0.56% and 0.47%	3.84% and 3.93%	0.0325	-0.02139* (0.01280)	-0.13171***** (0.03922)	-0.01860***** (0.00474)	20917	0.0033	1560	14	6.384***** <0.001
JKLMN-Private Services	3.64% and 2.96%	24.83% and 26.42%	0.0301	0.04672***** (0.01247)	-0.09209* (0.04903)	-0.00937 (0.00574)	20920	0.0031	1560	14	5.440**** 0.001
C27-Electrical equip.	0.49% and 0.33%	3.75% and 7.21%	0.0121	-0.06203***** (0.01185)	-0.02043 (0.03288)	-0.00349 (0.00442)	20921	0.0047	1560	14	9.159***** <0.001

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B15

Sectoral results with CO_2 shares, sr-fixed-effects, WIOD 2016 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	41.67% and 41.90%	2.36% and 2.38%	3.5285	0.02540** (0.01005)	0.05273* (0.03015)	0.00723** (0.00328)	25284	0.0017	1806	4.755**** 0.003
C23-Minerals	7.63% and 11.04%	0.92% and 1.19%	1.8512	0.02904** (0.01216)	0.01011 (0.03161)	0.00321 (0.00414)	25284	0.0011	1806	2.675** 0.046
H51-Air transport	3.62% and 2.42%	0.61% and 0.47%	1.0354	0.16105***** (0.01992)	0.13417**** (0.04088)	0.02282***** (0.00558)	25284	0.0219	1806	32.321***** <0.001
H50-Water transport	2.92% and 1.96%	0.42% and 0.41%	0.9648	0.08934***** (0.01844)	-0.01214 (0.03991)	0.00033 (0.00494)	25284	0.0067	1806	9.169***** <0.001
C24-Metal	8.31% and 10.33%	2.28% and 2.86%	0.7235	0.03513** (0.01432)	-0.03669 (0.02892)	-0.00500 (0.00382)	25284	0.0016	1806	2.490* 0.059
C20-Chemicals	5.01% and 5.20%	2.34% and 2.71%	0.3844	0.07891***** (0.01334)	-0.12236***** (0.03287)	-0.01853***** (0.00441)	25284	0.0066	1806	16.929***** <0.001
E37-E39-Waste	0.46% and 0.55%	0.45% and 0.36%	0.3075	0.17033***** (0.02484)	-0.03490 (0.05447)	-0.00592 (0.00677)	19684	0.0143	1406	16.389***** <0.001
B-Mining	3.36% and 3.84%	2.22% and 2.50%	0.3066	0.03819**** (0.01272)	0.06835** (0.03029)	0.00904** (0.00366)	25284	0.0030	1806	5.522***** <0.001
H49-Land transport	3.74% and 3.62%	2.49% and 2.37%	0.3057	0.01794 (0.01467)	-0.02463 (0.04384)	-0.00205 (0.00494)	25284	0.0004	1806	0.658 0.578
A02-Forestry	0.19% and 0.25%	0.24% and 0.19%	0.2612	-0.04636*** (0.01719)	0.06975 (0.05749)	0.00644 (0.00588)	22960	0.0012	1640	2.682** 0.045
C19-Refined Petr.	3.42% and 2.79%	2.42% and 2.41%	0.2318	-0.02504** (0.01082)	0.08483*** (0.03080)	0.00995*** (0.00362)	22572	0.0020	1722	4.191*** 0.006
C17-Paper	0.94% and 0.60%	0.83% and 0.69%	0.1749	0.03341** (0.01483)	-0.07164* (0.03969)	-0.01062** (0.00540)	25284	0.0013	1806	2.736** 0.042
C22-Rubber	0.25% and 0.88%	1.11% and 1.14%	0.1543	-0.00550 (0.02156)	-0.03567 (0.04485)	-0.00603 (0.00610)	25284	0.0002	1806	0.402 0.752
A01-Agriculture	2.22% and 1.87%	2.74% and 2.43%	0.1538	0.02509* (0.01474)	-0.00983 (0.04568)	0.00506 (0.00543)	25284	0.0020	1806	4.478**** 0.004
E36-Water	0.20% and 0.13%	0.23% and 0.18%	0.1432	0.09296***** (0.01782)	0.23379***** (0.06299)	0.02094**** (0.00700)	22960	0.0088	1640	13.269***** <0.001
A03-Fisheries	0.15% and 0.13%	0.20% and 0.20%	0.1309	-0.14218***** (0.02239)	-0.10159* (0.05676)	-0.01098* (0.00650)	22960	0.0100	1640	16.580***** <0.001
C31-C32-Furniture	0.20% and 0.33%	1.06% and 0.82%	0.0811	0.13782***** (0.01877)	-0.05385 (0.04732)	-0.01120* (0.00628)	25284	0.0066	1806	18.089***** <0.001
C16-Wood	0.25% and 0.22%	0.53% and 0.58%	0.0747	0.04383*** (0.01621)	0.00943 (0.04768)	-0.00720 (0.00621)	25284	0.0030	1806	7.546***** <0.001
H52-Warehousing	0.37% and 0.37%	0.98% and 1.06%	0.0701	0.09663***** (0.02249)	0.00066 (0.06529)	0.00056 (0.00789)	25284	0.0041	1806	6.223***** <0.001
H53-Post	0.10% and 0.08%	0.36% and 0.25%	0.0605	-0.01155 (0.01555)	-0.02356 (0.04129)	-0.00117 (0.00457)	19388	0.0002	1406	0.601 0.614
I-Accommodation	0.80% and 0.64%	2.75% and 2.40%	0.0539	-0.00137 (0.01825)	-0.19628*** (0.07116)	-0.02290*** (0.00862)	25284	0.0016	1806	2.541* 0.055
C13-C15-Textile	0.76% and 0.44%	1.45% and 1.63%	0.0535	0.03046 (0.02249)	0.22294***** (0.05066)	0.03246***** (0.00741)	25284	0.0052	1806	7.570***** <0.001
C10-C12-Food	1.37% and 1.15%	4.05% and 4.35%	0.0528	-0.01288 (0.01208)	0.00420 (0.03126)	-0.00257 (0.00375)	25284	0.0007	1806	2.345* 0.071
C25-Non machinery	0.37% and 0.43%	1.80% and 1.65%	0.0515	0.05753***** (0.01566)	-0.01581 (0.03956)	-0.00029 (0.00488)	24108	0.0021	1722	5.182**** 0.001
OPQRS-Public Services	4.35% and 3.64%	16.12% and 14.56%	0.0500	0.00498 (0.01794)	-0.16771** (0.07367)	-0.01592* (0.00823)	25284	0.0011	1806	2.180* 0.088
F-Construction	1.30% and 1.17%	7.37% and 6.95%	0.0336	0.05428**** (0.01903)	-0.02648 (0.05524)	-0.00146 (0.00672)	25284	0.0017	1806	2.981** 0.030
C18-Printing	0.17% and 0.05%	0.49% and 0.35%	0.0314	0.03732* (0.01912)	0.01018 (0.04841)	0.00427 (0.00568)	24108	0.0009	1722	1.971 0.116
C28-Machinery	0.44% and 0.35%	1.89% and 2.27%	0.0310	0.03367* (0.01981)	0.07391* (0.04386)	0.00925 (0.00625)	25284	0.0008	1806	1.816 0.142
G-Trade	2.30% and 1.43%	9.86% and 9.24%	0.0309	0.03619** (0.01680)	-0.05278 (0.05207)	-0.00675 (0.00600)	24696	0.0011	1806	2.565* 0.053
C30-Transport equip.	0.16% and 0.12%	0.67% and 0.97%	0.0239	-0.01299 (0.01401)	-0.00034 (0.03600)	-0.00121 (0.00499)	23862	0.0002	1722	0.491 0.689
C27-Electrical equip.	0.18% and 0.17%	1.06% and 1.47%	0.0230	0.03927** (0.01646)	0.01661 (0.03606)	0.00173 (0.00490)	23534	0.0007	1722	2.093* 0.099
C33-Repair	0.04% and 0.02%	0.28% and 0.23%	0.0196	0.08656***** (0.02489)	0.15354** (0.07165)	0.01818** (0.00924)	14656	0.0037	1056	5.063**** 0.002
JKLMN-Private Services	2.15% and 1.54%	22.51% and 22.07%	0.0140	0.00468 (0.01530)	-0.04032 (0.05355)	-0.00664 (0.00616)	25284	0.0004	1806	0.820 0.483
C29-Vehicles	0.33% and 0.20%	2.49% and 3.02%	0.0136	0.02172 (0.02156)	-0.01531 (0.04605)	-0.00290 (0.00636)	25284	0.0003	1806	0.442 0.723
C26-Computers	0.23% and 0.13%	1.53% and 2.66%	0.0096	0.06488*** (0.02468)	-0.11658** (0.05021)	-0.02001*** (0.00741)	25200	0.0032	1806	4.124*** 0.006
C21-Pharma.	0.04% and 0.03%	0.72% and 0.84%	0.0078	-0.02848 (0.02513)	-0.13915** (0.05614)	-0.01166* (0.00692)	22800	0.0015	1640	3.847*** 0.009

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B16
Sectoral results with CO_2 shares, t-fixed-effects, WIOD 2016 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	41.67% and 41.90%	2.36% and 2.38%	3.5285	0.01912* (0.01085)	-0.13671** (0.05803)	-0.00888 (0.00586)	25284	0.0055	14	5.507***** <0.001
C23-Minerals	7.63% and 11.04%	0.92% and 1.19%	1.8512	-0.04952*** (0.01779)	0.05066 (0.06488)	0.02162** (0.00916)	25284	0.0188	14	14.097***** <0.001
H51-Air transport	3.62% and 2.42%	0.61% and 0.47%	1.0354	-0.09240***** (0.01410)	0.63658***** (0.05739)	0.05335***** (0.00649)	25284	0.0640	14	78.938***** <0.001
H50-Water transport	2.92% and 1.96%	0.42% and 0.41%	0.9648	-0.05583**** (0.01760)	0.46506***** (0.08023)	0.05239***** (0.00984)	25284	0.0146	14	13.433***** <0.001
C24-Metal	8.31% and 10.33%	2.28% and 2.86%	0.7235	-0.34499***** (0.01872)	-0.23350***** (0.06803)	-0.04744***** (0.00908)	25284	0.2114	14	139.411***** <0.001
C20-Chemicals	5.01% and 5.20%	2.34% and 2.71%	0.3844	-0.24028***** (0.01727)	0.04803 (0.06442)	0.01898** (0.00920)	25284	0.1138	14	66.483***** <0.001
E37-E39-Waste	0.46% and 0.55%	0.45% and 0.36%	0.3075	-0.09278***** (0.01264)	0.00463 (0.05971)	-0.00492 (0.00701)	19684	0.0223	14	20.824***** <0.001
B-Mining	3.36% and 3.84%	2.22% and 2.50%	0.3066	-0.20805***** (0.01357)	-0.05923 (0.05837)	-0.01006 (0.00680)	25284	0.1103	14	87.529***** <0.001
H49-Land transport	3.74% and 3.62%	2.49% and 2.37%	0.3057	-0.02410*** (0.00899)	0.04315 (0.05673)	0.00547 (0.00615)	25284	0.0026	14	3.266** 0.021
A02-Forestry	0.19% and 0.25%	0.24% and 0.19%	0.2612	0.03600** (0.01543)	-0.18870** (0.07580)	-0.01437* (0.00826)	22960	0.0061	14	5.794***** <0.001
C19-Refined Petr.	3.42% and 2.79%	2.42% and 2.41%	0.2318	-0.20515***** (0.01849)	-0.00385 (0.07949)	-0.01619 (0.01043)	22572	0.0962	14	56.604***** <0.001
C17-Paper	0.94% and 0.60%	0.83% and 0.69%	0.1749	-0.16389***** (0.01488)	0.09357 (0.07918)	-0.00468 (0.01043)	25284	0.0835	14	63.606***** <0.001
C22-Rubber	0.25% and 0.88%	1.11% and 1.14%	0.1543	-0.10215***** (0.01047)	-0.05983 (0.04444)	-0.00397 (0.00634)	25284	0.0276	14	32.361***** <0.001
A01-Agriculture	2.22% and 1.87%	2.74% and 2.43%	0.1538	-0.04711***** (0.01136)	0.00664 (0.04665)	0.00906 (0.00585)	25284	0.0127	14	11.698***** <0.001
E36-Water	0.20% and 0.13%	0.23% and 0.18%	0.1432	-0.03464**** (0.01214)	0.14156** (0.06292)	0.01488** (0.00657)	22960	0.0039	14	4.333**** 0.005
A03-Fisheries	0.15% and 0.13%	0.20% and 0.20%	0.1309	-0.09388***** (0.02093)	-0.09552 (0.08849)	-0.00328 (0.01156)	22960	0.0120	14	12.445***** <0.001
C31-C32-Furniture	0.20% and 0.33%	1.06% and 0.82%	0.0811	-0.05278***** (0.01106)	-0.14210**** (0.05047)	-0.01446** (0.00645)	25284	0.0073	14	9.199***** <0.001
C16-Wood	0.25% and 0.22%	0.53% and 0.58%	0.0747	-0.06029***** (0.01148)	0.10926** (0.05194)	0.01626** (0.00704)	25284	0.0104	14	10.105***** <0.001
H52-Warehousing	0.37% and 0.37%	0.98% and 1.06%	0.0701	0.03613***** (0.01047)	0.19838**** (0.07064)	0.01533* (0.00782)	25284	0.0074	14	7.802***** <0.001
H53-Post	0.10% and 0.08%	0.36% and 0.25%	0.0605	-0.03886**** (0.01218)	0.05080 (0.04716)	0.01270** (0.00543)	19388	0.0084	14	7.230***** <0.001
I-Accommodation	0.80% and 0.64%	2.75% and 2.40%	0.0539	-0.11174***** (0.01195)	0.07752 (0.07292)	0.00899 (0.00857)	25284	0.0327	14	38.491***** <0.001
C13-C15-Textile	0.76% and 0.44%	1.45% and 1.63%	0.0535	-0.12280***** (0.01188)	0.22558***** (0.04662)	0.04411***** (0.00653)	25284	0.0557	14	47.761***** <0.001
C10-C12-Food	1.37% and 1.15%	4.05% and 4.35%	0.0528	-0.03708**** (0.01226)	0.13055** (0.06100)	0.01888** (0.00770)	25284	0.0092	14	8.014***** <0.001
C25-Non machinery	0.37% and 0.43%	1.80% and 1.65%	0.0515	-0.05627***** (0.01129)	0.05480 (0.05613)	0.01393** (0.00704)	24108	0.0138	14	12.105***** <0.001
OPQRS-Public Services	4.35% and 3.64%	16.12% and 14.56%	0.0500	-0.04212***** (0.01183)	0.13601** (0.06870)	0.00268 (0.00768)	25284	0.0201	14	18.393***** <0.001
F-Construction	1.30% and 1.17%	7.37% and 6.95%	0.0336	0.00902 (0.01063)	0.31232***** (0.06055)	0.02944***** (0.00725)	25284	0.0142	14	14.087***** <0.001
C18-Printing	0.17% and 0.05%	0.49% and 0.35%	0.0314	-0.07136***** (0.01095)	0.11838** (0.05601)	0.00396 (0.00718)	24108	0.0243	14	32.076***** <0.001
C28-Machinery	0.44% and 0.35%	1.89% and 2.27%	0.0310	-0.15145***** (0.01143)	0.09788* (0.05054)	0.00535 (0.00702)	25284	0.0686	14	72.338***** <0.001
G-Trade	2.30% and 1.43%	9.86% and 9.24%	0.0309	-0.00895 (0.01155)	0.42747***** (0.07334)	0.04134***** (0.00841)	24696	0.0199	14	18.858***** <0.001
C30-Transport equip.	0.16% and 0.12%	0.67% and 0.97%	0.0239	-0.18409***** (0.01429)	-0.06565 (0.06449)	-0.01049 (0.00870)	23862	0.0749	14	60.505***** <0.001
C27-Electrical equip.	0.18% and 0.17%	1.06% and 1.47%	0.0230	-0.18005***** (0.01232)	0.01111 (0.04937)	0.01326* (0.00695)	23534	0.0816	14	76.816***** <0.001
C33-Repair	0.04% and 0.02%	0.28% and 0.23%	0.0196	-0.05238***** (0.01316)	0.20647**** (0.06629)	0.02847***** (0.00754)	14656	0.0114	14	12.787***** <0.001
JKLMN-Private Services	2.15% and 1.54%	22.51% and 22.07%	0.0140	-0.01591 (0.01093)	0.18917*** (0.06772)	0.00722 (0.00772)	25284	0.0219	14	20.773***** <0.001
C29-Vehicles	0.33% and 0.20%	2.49% and 3.02%	0.0136	-0.18687***** (0.01151)	-0.12839** (0.05212)	-0.02613***** (0.00678)	25284	0.0899	14	97.291***** <0.001
C26-Computers	0.23% and 0.13%	1.53% and 2.66%	0.0096	-0.19911***** (0.01265)	-0.15341**** (0.05004)	-0.01088 (0.00711)	25200	0.0831	14	84.220***** <0.001
C21-Pharma.	0.04% and 0.03%	0.72% and 0.84%	0.0078	-0.02985** (0.01409)	0.21212** (0.08288)	0.00651 (0.00970)	22800	0.0182	14	15.923***** <0.001

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B17
Sectoral results with CO_2 shares, *sr* & *t*-fixed-effects, WIOD 2016 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. *sr*-fix.-ef.	Num. *t*-fix.-ef.	*F*-stat. *p*-value
D35-Energy	41.67% and 41.90%	2.36% and 2.38%	3.5285	-0.00236 (0.01080)	0.06290** (0.02964)	0.00774** (0.00323)	25284	0.0006	1806	14	1.973 0.116
C23-Minerals	7.63% and 11.04%	0.92% and 1.19%	1.8512	0.01979 (0.01261)	0.01125 (0.03168)	0.00310 (0.00415)	25284	0.0005	1806	14	1.443 0.228
H51-Air transport	3.62% and 2.42%	0.61% and 0.47%	1.0354	0.12209***** (0.01896)	0.16151***** (0.04030)	0.02506***** (0.00546)	25284	0.0134	1806	14	23.306***** <0.001
H50-Water transport	2.92% and 1.96%	0.42% and 0.41%	0.9648	0.04348** (0.01804)	-0.01734 (0.03974)	-0.00052 (0.00490)	25284	0.0014	1806	14	2.565* 0.053
C24-Metal	8.31% and 10.33%	2.28% and 2.86%	0.7235	0.03290** (0.01464)	-0.03764 (0.02879)	-0.00549 (0.00379)	25284	0.0013	1806	14	2.275* 0.078
C20-Chemicals	5.01% and 5.20%	2.34% and 2.71%	0.3844	0.01023 (0.01350)	-0.12017***** (0.03108)	-0.01856***** (0.00416)	25284	0.0027	1806	14	6.972***** <0.001
E37-E39-Waste	0.46% and 0.55%	0.45% and 0.36%	0.3075	0.05818** (0.02737)	0.00906 (0.05401)	-0.00453 (0.00662)	19684	0.0021	1406	14	3.255** 0.021
B-Mining	3.36% and 3.84%	2.22% and 2.50%	0.3066	0.01247 (0.01298)	0.06617** (0.03036)	0.00833** (0.00367)	25284	0.0009	1806	14	2.062 0.103
H49-Land transport	3.74% and 3.62%	2.49% and 2.37%	0.3057	-0.01157 (0.01629)	-0.00576 (0.04375)	-0.00065 (0.00492)	25284	0.0001	1806	14	0.175 0.914
A02-Forestry	0.19% and 0.25%	0.24% and 0.19%	0.2612	0.00027 (0.01809)	0.04882 (0.05700)	0.00534 (0.00588)	22960	0.0001	1640	14	0.294 0.830
C19-Refined Petr.	3.42% and 2.79%	2.42% and 2.41%	0.2318	-0.03838***** (0.01056)	0.08394*** (0.03097)	0.00947*** (0.00363)	22572	0.0026	1722	14	6.369***** <0.001
C17-Paper	0.94% and 0.60%	0.83% and 0.69%	0.1749	0.00584 (0.01612)	-0.08240** (0.03926)	-0.01149** (0.00534)	25284	0.0007	1806	14	1.562 0.197
C22-Rubber	0.25% and 0.88%	1.11% and 1.14%	0.1543	0.00528 (0.02240)	-0.03835 (0.04475)	-0.00647 (0.00608)	25284	0.0002	1806	14	0.450 0.717
A01-Agriculture	2.22% and 1.87%	2.74% and 2.43%	0.1538	0.02783* (0.01519)	-0.00968 (0.04543)	0.00509 (0.00541)	25284	0.0020	1806	14	4.611**** 0.003
E36-Water	0.20% and 0.13%	0.23% and 0.18%	0.1432	0.04270** (0.02001)	0.23158***** (0.06192)	0.02074**** (0.00686)	22960	0.0039	1640	14	7.308***** <0.001
A03-Fisheries	0.15% and 0.13%	0.20% and 0.20%	0.1309	-0.01391 (0.02157)	-0.08516 (0.05441)	-0.00784 (0.00628)	22960	0.0005	1640	14	1.240 0.294
C31-C32-Furniture	0.20% and 0.33%	1.06% and 0.82%	0.0811	-0.04338** (0.02081)	0.02236 (0.04500)	-0.00638 (0.00586)	25284	0.0032	1806	14	7.800***** <0.001
C16-Wood	0.25% and 0.22%	0.53% and 0.58%	0.0747	-0.00596 (0.01762)	0.02355 (0.04726)	-0.00622 (0.00611)	25284	0.0030	1806	14	7.521***** <0.001
H52-Warehousing	0.37% and 0.37%	0.98% and 1.06%	0.0701	0.07795**** (0.02499)	0.00175 (0.06583)	0.00038 (0.00792)	25284	0.0019	1806	14	3.247** 0.021
H53-Post	0.10% and 0.08%	0.36% and 0.25%	0.0605	-0.00688 (0.01883)	-0.02301 (0.04168)	-0.00063 (0.00461)	19388	0.0003	1406	14	0.752 0.521
I-Accommodation	0.80% and 0.64%	2.75% and 2.40%	0.0539	-0.00222 (0.02026)	-0.18996*** (0.07075)	-0.02227*** (0.00858)	25284	0.0015	1806	14	2.406* 0.066
C13-C15-Textile	0.76% and 0.44%	1.45% and 1.63%	0.0535	-0.03578 (0.02529)	0.19871***** (0.04980)	0.02921***** (0.00719)	25284	0.0040	1806	14	6.177***** <0.001
C10-C12-Food	1.37% and 1.15%	4.05% and 4.35%	0.0528	0.02915** (0.01311)	0.00591 (0.03065)	-0.00205 (0.00367)	25284	0.0009	1806	14	3.076** 0.027
C25-Non machinery	0.37% and 0.43%	1.80% and 1.65%	0.0515	0.00280 (0.01672)	-0.00859 (0.03947)	-0.00201 (0.00486)	24108	0.0000	1722	14	0.190 0.903
OPQRS-Public Services	4.35% and 3.64%	16.12% and 14.56%	0.0500	-0.00954 (0.02013)	-0.16464** (0.07363)	-0.01584* (0.00822)	25284	0.0010	1806	14	2.020 0.109
F-Construction	1.30% and 1.17%	7.37% and 6.95%	0.0336	-0.01295 (0.02071)	-0.04541 (0.05502)	-0.00380 (0.00666)	25284	0.0003	1806	14	0.578 0.629
C18-Printing	0.17% and 0.05%	0.49% and 0.35%	0.0314	-0.02037 (0.02053)	-0.00283 (0.04865)	0.00235 (0.00569)	24108	0.0004	1722	14	1.204 0.307
C28-Machinery	0.44% and 0.35%	1.89% and 2.27%	0.0310	-0.03789* (0.02113)	0.08698** (0.04301)	0.00915 (0.00612)	25284	0.0011	1806	14	3.005** 0.029
G-Trade	2.30% and 1.43%	9.86% and 9.24%	0.0309	-0.00142 (0.01830)	-0.03617 (0.05282)	-0.00665 (0.00605)	24696	0.0004	1806	14	0.785 0.502
C30-Transport equip.	0.16% and 0.12%	0.67% and 0.97%	0.0239	-0.06222***** (0.01492)	0.01648 (0.03506)	-0.00037 (0.00475)	23862	0.0025	1722	14	6.959***** <0.001
C27-Electrical equip.	0.18% and 0.17%	1.06% and 1.47%	0.0230	-0.07258***** (0.01802)	0.03020 (0.03572)	0.00118 (0.00480)	23534	0.0026	1722	14	6.495***** <0.001
C33-Repair	0.04% and 0.02%	0.28% and 0.23%	0.0196	-0.07025*** (0.02707)	0.18843*** (0.06802)	0.01681* (0.00878)	14656	0.0043	1056	14	6.213***** <0.001
JKLMN-Private Services	2.15% and 1.54%	22.51% and 22.07%	0.0140	-0.02083 (0.01679)	-0.03848 (0.05299)	-0.00670 (0.00610)	25284	0.0006	1806	14	1.062 0.364
C29-Vehicles	0.33% and 0.20%	2.49% and 3.02%	0.0136	-0.03549 (0.02415)	-0.00466 (0.04545)	-0.00170 (0.00625)	25284	0.0005	1806	14	0.761 0.516
C26-Computers	0.23% and 0.13%	1.53% and 2.66%	0.0096	-0.00408 (0.02453)	-0.12565** (0.04914)	-0.02214**** (0.00710)	25200	0.0029	1806	14	3.845*** 0.009
C21-Pharma.	0.04% and 0.03%	0.72% and 0.84%	0.0078	-0.04600* (0.02469)	-0.14167** (0.05610)	-0.01208* (0.00689)	22800	0.0018	1640	14	4.430**** 0.004

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B18
Sectoral results with CO_2 shares, *sr*-fixed-effects, WIOD 2013 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	*F*-stat. *p*-value
D35-Energy	39.77% and 46.58%	2.43% and 2.21%	5.6674	0.01765 (0.01367)	-0.02196 (0.04971)	-0.00345 (0.00528)	20918	0.0004	1560	0.608 0.610
C23-Minerals	7.05% and 7.09%	1.14% and 1.05%	1.8039	-0.02516** (0.01182)	-0.11995***** (0.02860)	-0.01260***** (0.00318)	20917	0.0022	1560	6.723***** <0.001
H51-Air transport	2.64% and 2.86%	0.53% and 0.45%	1.7024	-0.00593 (0.01297)	0.13938**** (0.04345)	0.01193** (0.00518)	19116	0.0033	1482	4.426**** 0.004
H50-Water transport	1.71% and 2.19%	0.33% and 0.44%	1.3342	-0.01202 (0.01068)	-0.02626 (0.03264)	-0.00190 (0.00401)	17731	0.0005	1406	0.940 0.421
B-Mining	3.43% and 4.02%	1.14% and 0.94%	1.1501	-0.03852**** (0.01205)	0.00991 (0.04429)	0.00018 (0.00496)	20914	0.0019	1560	3.537** 0.014
C19-Refined Petr.	3.90% and 3.51%	1.21% and 1.39%	0.6808	0.04373***** (0.01017)	0.09410**** (0.03198)	-0.00037 (0.00320)	18486	0.0142	1476	28.618***** <0.001
H49-Land transport	4.08% and 4.00%	2.40% and 2.11%	0.5103	0.03474*** (0.01316)	-0.03256 (0.04611)	-0.00083 (0.00559)	20143	0.0023	1560	3.131** 0.025
C24-Metal	8.43% and 7.56%	4.19% and 4.03%	0.5040	-0.00480 (0.00946)	-0.06771** (0.03286)	-0.00591 (0.00439)	20164	0.0006	1560	2.192* 0.087
C20-Chemicals	4.98% and 3.92%	3.01% and 3.08%	0.3421	0.02101* (0.01165)	0.03653 (0.03963)	0.00354 (0.00433)	20912	0.0004	1560	1.282 0.279
A01-Agriculture	3.02% and 2.24%	3.23% and 2.76%	0.2175	-0.00149 (0.01281)	0.03330 (0.04339)	0.00000 (0.00523)	20165	0.0007	1560	1.338 0.261
C17-Paper	1.40% and 1.00%	2.29% and 1.74%	0.1546	0.02917** (0.01415)	0.02898 (0.04689)	0.01050* (0.00623)	20166	0.0036	1560	4.311**** 0.005
H52-Warehousing	0.43% and 0.67%	1.14% and 1.16%	0.1543	0.00610 (0.01557)	-0.06122 (0.05059)	-0.00749 (0.00574)	17168	0.0004	1332	0.671 0.570
C16-Wood	0.29% and 0.28%	0.76% and 0.61%	0.1252	0.00340 (0.01339)	0.04569 (0.03495)	0.00611 (0.00438)	20068	0.0002	1560	0.698 0.553
C10-C12-Food	1.88% and 1.65%	4.56% and 4.03%	0.1100	0.01035 (0.01363)	0.05033 (0.04936)	0.01081* (0.00577)	20168	0.0012	1560	2.872** 0.035
OPQRS-Public Services	4.42% and 3.04%	9.74% and 8.78%	0.0929	-0.07828***** (0.01438)	-0.03368 (0.06064)	-0.00192 (0.00670)	20920	0.0067	1560	10.389***** <0.001
I-Accommodation	1.04% and 0.79%	2.78% and 2.37%	0.0892	-0.01585 (0.01340)	-0.08786** (0.04456)	-0.01073** (0.00492)	18870	0.0010	1406	1.968 0.117
C13-C15-Textile	1.05% and 0.62%	2.01% and 1.87%	0.0887	-0.02716* (0.01482)	-0.00213 (0.03817)	-0.00098 (0.00499)	20166	0.0007	1560	1.156 0.325
F-Construction	1.52% and 1.35%	7.24% and 5.78%	0.0627	-0.05327***** (0.01467)	-0.04900 (0.04016)	0.00010 (0.00479)	20918	0.0037	1560	8.779***** <0.001
C33-Repair	0.29% and 0.16%	0.89% and 0.77%	0.0571	0.04531*** (0.01731)	0.09038* (0.04909)	0.01226* (0.00628)	20169	0.0024	1560	3.332** 0.019
C22-Rubber	0.42% and 0.28%	1.27% and 1.34%	0.0561	-0.07670***** (0.01524)	0.01269 (0.04142)	0.00229 (0.00547)	20915	0.0037	1560	8.454***** <0.001
G-Trade	2.57% and 1.65%	10.94% and 10.00%	0.0443	-0.02402 (0.01677)	0.17378**** (0.05722)	0.01829**** (0.00647)	20919	0.0022	1560	4.362**** 0.005
C26-Computers	0.65% and 0.42%	2.58% and 2.67%	0.0425	-0.05198***** (0.01191)	-0.03423 (0.03885)	-0.00562 (0.00494)	20918	0.0024	1560	7.082***** <0.001
H53-Post	0.33% and 0.37%	1.77% and 2.87%	0.0346	-0.02605** (0.01273)	-0.05438 (0.04537)	-0.01246** (0.00568)	18110	0.0041	1406	4.764**** 0.003
C30-Transport equip.	0.56% and 0.47%	3.84% and 3.93%	0.0325	-0.03571*** (0.01386)	0.03104 (0.03250)	0.00228 (0.00409)	20165	0.0013	1560	2.871** 0.035
JKLMN-Private Services	3.64% and 2.96%	24.83% and 26.42%	0.0301	-0.01123 (0.01462)	-0.11143** (0.05298)	-0.01326* (0.00680)	19856	0.0009	1482	1.578 0.193
C27-Electrical equip.	0.49% and 0.33%	3.75% and 7.21%	0.0121	-0.01307 (0.01184)	-0.05490 (0.03874)	-0.00463 (0.00445)	20169	0.0007	1560	1.473 0.220

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B19

Sectoral results with CO_2 shares, t-fixed-effects, WIOD 2013 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. of fix.-ef.	F-stat. p-value
D35-Energy	39.77% and 46.58%	2.43% and 2.21%	5.6674	0.01036 (0.01026)	-0.10077** (0.04682)	-0.00862* (0.00506)	20918	0.0025	14	2.242* 0.082
C23-Minerals	7.05% and 7.09%	1.14% and 1.05%	1.8039	-0.08122***** (0.01968)	0.04043 (0.06985)	0.01647* (0.00944)	20917	0.0235	14	8.953***** <0.001
H51-Air transport	2.64% and 2.86%	0.53% and 0.45%	1.7024	-0.28787***** (0.02272)	0.42161***** (0.10175)	0.01618 (0.01323)	19116	0.1903	14	125.701***** <0.001
H50-Water transport	1.71% and 2.19%	0.33% and 0.44%	1.3342	-0.23350***** (0.02121)	-0.04756 (0.11840)	-0.04510**** (0.01457)	17731	0.1561	14	92.568***** <0.001
B-Mining	3.43% and 4.02%	1.14% and 0.94%	1.1501	-0.22062***** (0.01648)	-0.37469***** (0.07562)	-0.05371***** (0.00942)	20914	0.1464	14	100.226***** <0.001
C19-Refined Petr.	3.90% and 3.51%	1.21% and 1.39%	0.6808	-0.16660***** (0.01750)	-0.01463 (0.07881)	-0.03448***** (0.01008)	18486	0.1410	14	56.602***** <0.001
H49-Land transport	4.08% and 4.00%	2.40% and 2.11%	0.5103	0.03190**** (0.01132)	0.09831 (0.06289)	0.00562 (0.00707)	20143	0.0066	14	4.883**** 0.002
C24-Metal	8.43% and 7.56%	4.19% and 4.03%	0.5040	-0.19313***** (0.01526)	-0.32847***** (0.07811)	-0.04869***** (0.01134)	20164	0.0983	14	54.207***** <0.001
C20-Chemicals	4.98% and 3.92%	3.01% and 3.08%	0.3421	-0.26937***** (0.01998)	-0.09421 (0.07681)	0.00081 (0.01070)	20912	0.1308	14	60.650***** <0.001
A01-Agriculture	3.02% and 2.24%	3.23% and 2.76%	0.2175	-0.10810***** (0.01588)	0.00217 (0.06338)	0.00617 (0.00813)	20165	0.0349	14	17.394***** <0.001
C17-Paper	1.40% and 1.00%	2.29% and 1.74%	0.1546	-0.13638***** (0.01625)	0.19471** (0.08754)	0.00439 (0.01078)	20166	0.0815	14	54.005***** <0.001
H52-Warehousing	0.43% and 0.67%	1.14% and 1.16%	0.1543	-0.08001***** (0.01581)	-0.13031 (0.07993)	-0.02339** (0.01002)	17168	0.0261	14	12.308***** <0.001
C16-Wood	0.29% and 0.28%	0.76% and 0.61%	0.1252	-0.12208***** (0.01624)	0.21556***** (0.06482)	0.04116***** (0.00893)	20068	0.0525	14	23.677***** <0.001
C10-C12-Food	1.88% and 1.65%	4.56% and 4.03%	0.1100	-0.12534***** (0.01679)	-0.01286 (0.08546)	0.00400 (0.01144)	20168	0.0368	14	19.262***** <0.001
OPQRS-Public Services	4.42% and 3.04%	9.74% and 8.78%	0.0929	-0.15293***** (0.01709)	0.13651 (0.09097)	0.00619 (0.01154)	20920	0.0654	14	41.650***** <0.001
I-Accommodation	1.04% and 0.79%	2.78% and 2.37%	0.0892	-0.21179***** (0.01801)	-0.18068* (0.09669)	-0.02580** (0.01187)	18870	0.1025	14	48.385***** <0.001
C13-C15-Textile	1.05% and 0.62%	2.01% and 1.87%	0.0887	-0.16270***** (0.01637)	0.16837*** (0.06172)	0.03633***** (0.00904)	20166	0.0803	14	36.005***** <0.001
F-Construction	1.52% and 1.35%	7.24% and 5.78%	0.0627	-0.03790*** (0.01443)	0.09141 (0.07402)	0.01132 (0.00969)	20918	0.0051	14	3.502** 0.015
C33-Repair	0.29% and 0.16%	0.89% and 0.77%	0.0571	0.04598***** (0.01119)	-0.03229 (0.05788)	-0.00186 (0.00710)	20169	0.0064	14	6.134***** <0.001
C22-Rubber	0.42% and 0.28%	1.27% and 1.34%	0.0561	-0.07837***** (0.01447)	0.10156 (0.06980)	0.02228** (0.00993)	20915	0.0222	14	12.398***** <0.001
G-Trade	2.57% and 1.65%	10.94% and 10.00%	0.0443	-0.11875***** (0.01421)	0.33660***** (0.08752)	0.02187** (0.01064)	20919	0.0782	14	58.545***** <0.001
C26-Computers	0.65% and 0.42%	2.58% and 2.67%	0.0425	-0.11074***** (0.01277)	0.03898 (0.05178)	0.00749 (0.00694)	20918	0.0346	14	25.802***** <0.001
H53-Post	0.33% and 0.37%	1.77% and 2.87%	0.0346	-0.16077***** (0.01712)	-0.09130 (0.09371)	-0.01538 (0.01111)	18110	0.0727	14	34.995***** <0.001
C30-Transport equip.	0.56% and 0.47%	3.84% and 3.93%	0.0325	-0.09231***** (0.01173)	0.09674* (0.05577)	0.02268**** (0.00719)	20165	0.0311	14	24.773***** <0.001
JKLMN-Private Services	3.64% and 2.96%	24.83% and 26.42%	0.0301	-0.05089***** (0.01263)	0.19248** (0.07858)	-0.00031 (0.00890)	19856	0.0649	14	35.920***** <0.001
C27-Electrical equip.	0.49% and 0.33%	3.75% and 7.21%	0.0121	-0.05913***** (0.01257)	0.06190 (0.05155)	0.02198**** (0.00682)	20169	0.0185	14	16.100***** <0.001

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

Table B20

Sectoral results with CO_2 shares, sr & t-fixed-effects, WIOD 2013 full sample

Sector	CO_2 share 2000 and 2014	Output share 2000 and 2014	CO_2 intensity in 2014	Import intensity $ln(m_{srj(t-1)})$	Capital-to-labor ratio $ln(dk_{srj(t-1)})$	Interaction term $ln(m_{srj(t-1)}) \cdot ln(dk_{srj(t-1)})$	Num. of obs.	R^2	Num. sr-fix.-ef.	Num. t-fix.-ef.	F-stat. p-value
D35-Energy	39.77% and 46.58%	2.43% and 2.21%	5.6674	0.03489** (0.01518)	-0.01701 (0.04933)	-0.00179 (0.00521)	20918	0.0013	1560	14	1.780 0.149
C23-Minerals	7.05% and 7.09%	1.14% and 1.05%	1.8039	-0.02538** (0.01197)	-0.11893***** (0.02871)	-0.01241***** (0.00321)	20917	0.0021	1560	14	6.538***** <0.001
H51-Air transport	2.64% and 2.86%	0.53% and 0.45%	1.7024	-0.01908 (0.01368)	0.13750**** (0.04393)	0.01168** (0.00529)	19116	0.0035	1482	14	4.666**** 0.003
H50-Water transport	1.71% and 2.19%	0.33% and 0.44%	1.3342	-0.02606** (0.01099)	-0.01685 (0.03175)	-0.00051 (0.00395)	17731	0.0013	1406	14	2.467* 0.061
B-Mining	3.43% and 4.02%	1.14% and 0.94%	1.1501	-0.04276***** (0.01270)	0.00796 (0.04430)	0.00011 (0.00496)	20914	0.0019	1560	14	3.889*** 0.009
C19-Refined Petr.	3.90% and 3.51%	1.21% and 1.39%	0.6808	0.01905** (0.00969)	0.10794***** (0.03149)	-0.00015 (0.00311)	18486	0.0149	1476	14	30.157***** <0.001
H49-Land transport	4.08% and 4.00%	2.40% and 2.11%	0.5103	-0.01756 (0.01296)	-0.04216 (0.04406)	-0.00356 (0.00534)	20143	0.0006	1560	14	1.063 0.364
C24-Metal	8.43% and 7.56%	4.19% and 4.03%	0.5040	-0.00750 (0.00954)	-0.06727** (0.03261)	-0.00596 (0.00437)	20164	0.0006	1560	14	2.247* 0.081
C20-Chemicals	4.98% and 3.92%	3.01% and 3.08%	0.3421	0.01085 (0.01186)	0.02794 (0.03978)	0.00278 (0.00434)	20912	0.0001	1560	14	0.401 0.752
A01-Agriculture	3.02% and 2.24%	3.23% and 2.76%	0.2175	-0.00799 (0.01342)	0.02964 (0.04360)	-0.00063 (0.00526)	20165	0.0008	1560	14	1.605 0.186
C17-Paper	1.40% and 1.00%	2.29% and 1.74%	0.1546	0.02132 (0.01414)	0.02104 (0.04660)	0.00991 (0.00619)	20166	0.0036	1560	14	3.985*** 0.008
H52-Warehousing	0.43% and 0.67%	1.14% and 1.16%	0.1543	0.01164 (0.01583)	-0.05913 (0.05049)	-0.00707 (0.00573)	17168	0.0004	1332	14	0.761 0.516
C16-Wood	0.29% and 0.28%	0.76% and 0.61%	0.1252	-0.02088 (0.01350)	0.03732 (0.03452)	0.00437 (0.00431)	20068	0.0004	1560	14	1.099 0.348
C10-C12-Food	1.88% and 1.65%	4.56% and 4.03%	0.1100	-0.01329 (0.01379)	0.04428 (0.04891)	0.00843 (0.00566)	20168	0.0007	1560	14	1.885 0.130
OPQRS-Public Services	4.42% and 3.04%	9.74% and 8.78%	0.0929	-0.03646** (0.01521)	-0.02181 (0.05875)	-0.00005 (0.00655)	20920	0.0015	1560	14	2.408* 0.065
I-Accommodation	1.04% and 0.79%	2.78% and 2.37%	0.0892	0.01773 (0.01303)	-0.05795 (0.04272)	-0.00494 (0.00462)	18870	0.0006	1406	14	1.435 0.231
C13-C15-Textile	1.05% and 0.62%	2.01% and 1.87%	0.0887	-0.03254** (0.01461)	-0.01362 (0.03856)	-0.00187 (0.00500)	20166	0.0010	1560	14	1.684 0.168
F-Construction	1.52% and 1.35%	7.24% and 5.78%	0.0627	-0.05915***** (0.01643)	-0.04518 (0.04021)	-0.00004 (0.00479)	20918	0.0036	1560	14	7.802***** <0.001
C33-Repair	0.29% and 0.16%	0.89% and 0.77%	0.0571	0.00834 (0.01734)	0.07068 (0.04884)	0.00981 (0.00624)	20169	0.0006	1560	14	0.887 0.447
C22-Rubber	0.42% and 0.28%	1.27% and 1.34%	0.0561	-0.05886***** (0.01501)	0.01314 (0.04101)	0.00270 (0.00542)	20915	0.0022	1560	14	5.205**** 0.001
G-Trade	2.57% and 1.65%	10.94% and 10.00%	0.0443	-0.02095 (0.01701)	0.17459**** (0.05724)	0.01850**** (0.00646)	20919	0.0021	1560	14	4.137*** 0.006
C26-Computers	0.65% and 0.42%	2.58% and 2.67%	0.0425	-0.03646**** (0.01171)	-0.02997 (0.03889)	-0.00411 (0.00490)	20918	0.0010	1560	14	3.497** 0.015
H53-Post	0.33% and 0.37%	1.77% and 2.87%	0.0346	0.00779 (0.01305)	-0.04988 (0.04459)	-0.01100** (0.00553)	18110	0.0021	1406	14	2.922** 0.033
C30-Transport equip.	0.56% and 0.47%	3.84% and 3.93%	0.0325	-0.01067 (0.01389)	0.03284 (0.03200)	0.00268 (0.00400)	20165	0.0003	1560	14	0.789 0.500
JKLMN-Private Services	3.64% and 2.96%	24.83% and 26.42%	0.0301	0.01176 (0.01518)	-0.11076** (0.05272)	-0.01235* (0.00676)	19856	0.0008	1482	14	1.937 0.122
C27-Electrical equip.	0.49% and 0.33%	3.75% and 7.21%	0.0121	-0.03715**** (0.01207)	-0.06007 (0.03828)	-0.00501 (0.00441)	20169	0.0021	1560	14	4.746**** 0.003

Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.005$; ***** $p < 0.001$. See before for notes.

C WIOD sector mappings

Table C1
Sector mapping of the WIOD 2016 and 2013 datasets

Sector codes		WIOD 2016		Sector codes		WIOD 2013	
Trade	Non-trade	Definition	Aggregate	Trade	Non-trade	Definition	Aggregate
r1	A01	Crop and animal production. . .	A01-Agriculture	c1	secAtB	Agriculture, Hunting, Forestry and Fishing	A01-Agriculture
r2	A02	Forestry and logging	A02-Forestry	-	-	-	-
r3	A03	Fishing and aquaculture	A03-Fisheries	-	-	-	-
r4	B	Mining and quarrying	B-Mining	c2	secC	Mining and Quarrying	B-Mining
r5	C10-C12	Man. food, beverages and tobacco	C10-C12-Food	c3	sec15t16	Food, Beverages and Tobacco	C10-C12-Food
r6	C13-C15	Man. textiles, wearing apparel and leather products	C13-C15-Textile	c4	sec17t18	Textiles and Textile Products	C13-C15-Textile
-	-	-	-	c5	sec19	Leather, Leather and Footwear	C13-C15-Textile
r7	C16	Man. wood and of products of wood and cork, except furniture	C16-Wood	c6	sec20	Wood and Products of Wood and Cork	C16-Wood
r8	C17	Man. paper and paper products	C17-Paper	c7	sec21t22	Pulp, Paper, Paper , Printing and Publishing	C17-Paper
r9	C18	Printing and reproduction of recorded media	C18-Printing	-	-	-	-
r10	C19	Man. coke and refined petroleum products	C19-Refined Petr.	c8	sec23	Coke, Refined Petroleum and Nuclear Fuel	C19-Refined Petr.
r11	C20	Man. chemicals and chemical products	C20-Chemicals	c9	sec24	Chemicals and Chemical Products	C20-Chemicals
r12	C21	Man. basic pharmaceutical products	C21-Pharma.	-	-	-	-
r13	C22	Man. rubber and plastic products	C22-Rubber	c10	sec25	Rubber and Plastics	C22-Rubber
r14	C23	Man. other non-metallic mineral products	C23-Minerals	c11	sec26	Other Non-Metallic Mineral	C23-Minerals
r15	C24	Man. basic metals	C24-Metal	c12	sec27t28	Basic Metals and Fabricated Metal	C24-Metal
r16	C25	Man. fabricated metal products	C25-Non machinery	-	-	-	-
r17	C26	Man. computer, electronic and optical products	C26-Computers	c13	sec29	Machinery, Nec	C26-Computers
r18	C27	Man. electrical equipment	C27-Electrical equip.	c14	sec30t33	Electrical and Optical Equipment	C27-Electrical equip.
r19	C28	Man. machinery and equipment n.e.c.	C28-Machinery	-	-	-	-
r20	C29	Man. motor vehicles, trailers and semi-trailers	C29-Vehicles	-	-	-	-
r21	C30	Man. other transport equipment	C30-Transport equip.	c15	sec34t35	Transport Equipment	C30-Transport equip.
r22	C31_C32	Man. furniture; other manufacturing	C31_C32-Furniture	-	-	-	-
r23	C33	Repair and installation of machinery and equipment	C33-Repair	c16	sec36t37	Manufacturing, Nec; Recycling	C33-Repair
r24	D35	Electricity, gas, steam and air conditioning supply	D35-Energy	c17	secE	Electricity, Gas and Water Supply	D35-Energy
r25	E36	Water collection, treatment and supply	E36-Water	-	-	-	-
r26	E37-E39	Sewerage; waste collection, treatment and disposal activities	E37-E39-Waste	-	-	-	-
r27	F	Construction	F-Construction	c18	secF	Construction	F-Construction
r28	G45	Wholesale and retail trade of motor vehicles	G-Trade	c19	sec50	Sale, mainten. repair of motor vehicles	G-Trade
r29	G46	Wholesale trade, except of motor vehicles and motorcycles	G-Trade	c20	sec51	Wholesale trade, except of motor vehicles	G-Trade
r30	G47	Retail trade, except of motor vehicles and motorcycles	G-Trade	c21	sec52	Retail Trade, Except of Motor Vehicles	G-Trade
r31	H49	Land transport and transport via pipelines	H49-Land transport	c23	sec60	Inland Transport	H49-Land transport
r32	H50	Water transport	H50-Water transport	c24	sec61	Water Transport	H50-Water transport
r33	H51	Air transport	H51-Air transport	c25	sec62	Air Transport	H51-Air transport
r34	H52	Warehousing and support activities for transportation	H52-Warehousing	c26	sec63	Other Supporting and Auxiliary Transport Activities	H52-Warehousing
r35	H53	Postal and courier activities	H53-Post	c27	sec64	Post and Telecommunications	H53-Post
r36	I	Accommodation and food service activities	I-Accommodation	c22	secH	Hotels and Restaurants	I-Accommodation
r37	J58	Publishing activities	JKLMN-Private Services	c28	secJ	Financial Intermediation	JKLMN-Private Services
r38	J59_J60	Motion picture, video and television programme . . .	JKLMN-Private Services	c29	sec70	Real Estate Activities	JKLMN-Private Services
r39	J61	Telecommunications	JKLMN-Private Services	c30	sec71t74	Renting of M&Eq and Other Business Activities	JKLMN-Private Services
r40	J62_J63	Computer programming, consultancy and related activities	JKLMN-Private Services	-	-	-	-
r41	K64	Financial service activities	JKLMN-Private Services	-	-	-	-
r42	K65	Insurance, reinsurance and pension funding	JKLMN-Private Services	-	-	-	-
r43	K66	Activities auxiliary to financial services	JKLMN-Private Services	-	-	-	-
r44	L68	Real estate activities	JKLMN-Private Services	-	-	-	-
r45	M69_M70	Legal and accounting activities	JKLMN-Private Services	-	-	-	-
r46	M71	Architectural and engineering activities	JKLMN-Private Services	-	-	-	-
r47	M72	Scientific research and development	JKLMN-Private Services	-	-	-	-
r48	M73	Advertising and market research	JKLMN-Private Services	-	-	-	-
r49	M74_M75	Other professional, scientific and technical activities	JKLMN-Private Services	-	-	-	-
r50	N	Administrative and support service activities	JKLMN-Private Services	-	-	-	-
r51	O84	Public administration and defence; compulsory social security	OPQRS-Public Services	c31	secL	Public Admin and Defence, Social Security	OPQRS-Public Services
r52	P85	Education	OPQRS-Public Services	c32	secM	Education	OPQRS-Public Services
-	-	-	-	c35	secP	Private Households with Employed Persons	OPQRS-Public Services
r53	Q	Human health and social work activities	OPQRS-Public Services	c33	secN	Health and Social Work	OPQRS-Public Services
r54	R_S	Other service activities	OPQRS-Public Services	c34	secO	Other Community, Social and Personal Services	OPQRS-Public Services
(r55	T	Activities of households as employers	-	-	FC_HH	Final consumption expenditure by households	-)
(r56	U	Activities of extraterritorial organizations and bodies	-	-	secQ	Extra-territorial organizations and bodies	-)