

Distributive Profiles Associated with Domestic Versus International Specialization in Global Value Chains

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ABSTRACT

The present paper sets out trends in the functional income distribution implied by countries' integration in Global Value Chains (GVCs), taking account also of interregional interactions (South-South and North-South). Through the application of an innovative input-output methodology, it quantifies inter-country differences in functional income distribution by means of a novel indicator to estimate the distributive profile associated with domestic vis-à-vis international specialization. The focus is on trade flows, and the analysis carried out allows us to single out the distributive implications of alternative regional integration projects, in view of a more inclusive multilateral trade system.

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Distributive Profiles Associated with Domestic vis-à-vis International Specialization in Global Value Chains

1 Introduction

A stable labor share, i.e. the share of labor compensation in gross value added, has been a Kaldorian stylized fact of advanced capitalist development (Kaldor, 1961). It was based on the premise that productivity increases would accrue to labor through real wage increases, keeping (tendentially) constant the share of wages in net output.

However, the labor share has experienced a steady decline in advanced economies at least since the early 1980s (Karabarbounis and Neiman, 2014). Attempts to explain this decline made recourse to – at least – three channels (Riccio et al., 2022). First, institutional considerations: the decline in unionisation and dismantling of minimum wage legislation have impacted the bargaining power of workers within the labor process (Farber et al., 2021), leading to a long-winded path of ‘wage repression’ (Taylor and Ömer, 2020) and a slowdown of productivity growth (Storm, 2019; Fontanari and Palumbo, 2022).

A second identified channel has been technological change which, by being inherently labor saving, implies a latent threat of technological unemployment, especially in the context of weak effective demand (ever since Ricardo, 1821, chapter XXXI). The precise mechanism through which changes in production techniques affect distribution varied, though. One explanation is based on the declining relative price of investment goods and the mechanism of factor substitution between fixed capital and labor (Karabarbounis and Neiman, 2014), i.e., an argument based on the relative scarcity of (fully employed) production factors in a market-clearing setup. Another explanation is based on the lack of technical complementarity between certain types of human labor and capital, i.e., with the growth of ‘routinization’, labor automation has occurred in occupations highly exposed to substitution by computerized fixed capital (Dao et al., 2019). Finally, a third identified channel has been the long-standing polarization across

differing skill levels of the workforce linked to de-industrialization (Bárány and Siegel, 2018).

While all these explanations may play a role, these processes did not unfold within each country in isolation. In fact, the early 1980s coincided with the gradual consolidation of ‘hyperglobalization’ (UNCTAD, 2017, p. 21). A key component of this extensive deregulation of product, financial and currency markets was the articulation of inter-country supply schemes, that is, international production fragmentation. Under such schemes, international outsourcing — and offshoring practices more in general — became prominent, to the point of configuring global value chains (GVC, hereinafter).¹

And while GVCs are articulated by lead firms in advanced industrial economies, they rely on input suppliers from developing countries. For the latter, hyperglobalization started in the midst of structural adjustment policies in response to debt crises, which implied the dismantling of decades of import-substitution industrialization (ISI) efforts and a shift towards an export-oriented strategy based on import liberalization (UNCTAD, 2018, p. 40). These trends accelerated in the 1990s and early 2000s to the point that “GVCs killed import substitution as a viable industrialization strategy” (Taglioni and Winkler, 2016, p. xiii).

Hence, GVCs changed the nature of international specialization: in tasks of production, rather than integrated final products, with an ensuing change in the international division of labor. It is difficult to think that such a transformation of the labor process at an international scale would have left functional income distribution on a stable steady path.

However, the relationship between trade integration and wage inequality is complex and ambiguous. It may change if we refer to total wages, the wage share or wage rates (Farole et al., 2018). Even more so if we distinguish between advanced and developing economies, i.e. between the ‘global North’ and the ‘global South’.

Some perspectives suggest that the effect of GVC participation on the distribution of wages is small and it may reduce wage inequality within low-skilled segments of the workforce (Lopez Gonzalez et al., 2015). Other views acknowledge that there may be *short-run* inequality increases but that offshoring is inequality-reducing in the *long-run*

¹ The expansion of international outsourcing practices could be traced already to the 1970s, when ICT innovations allowed for headquarter-based control of a remote, low-wage labor force (Lazonick, 2009) or a corporate “move into high-profit centers of the Third World” (Ferguson and Rogers, 1986, p. 93).

for developing economies (Carpa and Martínez-Zarzoso, 2022). Finally, some perspectives are more critical, suggesting contrasting effects between developed and developing countries, with detrimental labor market effects for the latter (Szymczak and Wolszczak-Derlacz, 2022; Ndubuisi and Owusu, 2022).²

At any rate, quantifying the implications of globalization for functional income distribution is crucial to understand the steady decline in the global share of wages. And understanding such trends is of great importance, as regressive functional income distribution represents an obstacle for socially inclusive trade integration schemes.

Hence, the question is: how to study the connection between GVC participation and the wage share, at a *global* level? More precisely, what metrics can be devised to quantify the wage share implied by varying degrees of participation to GVCs?

In order to find a plausible answer, we resort to inter-country input-output techniques (Timmer et al., 2013), since they allow treating the global economy as an integrated, *closed* system. Analyzing trade integration this way allows one to map how final output translates into income via international production, rendering transparent how trade in inputs is, in the very last instance, a *redistribution of income* between industries from different countries in order to produce a given final output in the world economy.

Within the broad literature, at least three approaches may be identified. First, to compute the wage share induced by *gross* exports (Torres González and Zafra García, 2020). Such an approach has a double counting problem when computing the gross value added (GVA) induced by *intermediate* exports.

Second, to shift the unit of analysis from combinations of countries \times industries to GVCs and compute the ‘vertical labor share’ (Ricchio et al., 2022), i.e. the wage share associated with a GVC. Given that a GVC spans multiple countries, the wage share of a GVC does not only include the labor income of the country-industry of completion, but also the (weighted) participation of industry wage shares from multiple industries across countries contributing value added to that GVC. This approach might render the interpretation difficult for the purpose of studying functional income distribution *within* countries.

² Moreover, interactions between institutional, technological, compositional factors *and* globalization also play a role. For instance, international outsourcing creates a decentralized labor force with non-existent physical interactions who cannot collectively organize, further eroding labor’s bargaining power (Milanovic, 2019, p. 22).

Finally, the approach advanced in this paper is to compute the wage share activated by alternative sources of *foreign* final demand. The intuition behind this tack runs as follows. The wage share of a country is a linear combination of the wage shares of its industries. Industries produce to satisfy final demand requirements at home as well as abroad. Hence, when a foreign country demands final products which are either directly supplied by the domestic economy or require domestic inputs to be produced, it is activating output at home, which generates incomes, wages and, therefore, an associated wage share.

But this domestic output activation across industries occurs in *different proportions according to the products composing each specific foreign final demand basket*. For instance, when a country in Latin America satisfies Chinese final demand, output from primary industries will be activated in a greater proportion than if the final demand came from another Latin American country, in which case mid-to-high-tech manufacturing products are produced (and traded) in a higher proportion. Thus, if primary commodities and mid-to-high-tech manufacturing products are produced by industries with different wage shares, there are distributive implications of deepening trade integration with certain regions with respect to others.

Moreover, given that the home country is often only an upstream producer of certain inputs in a GVC, it is far from apparent what the *ultimate* distributive implications of final demand from certain foreign countries are, especially when the domestic economy does not have relevant direct trade linkages in final products with those economies, but rather mostly indirect links by exporting inputs through others.

Hence, given the different commodity composition of each final demand basket associated with a foreign source of final demand, the wage share activated at home by each foreign country will be different. This is crucial to understanding the distributive profile of domestic *vis-à-vis* international specialization.

The sections that follow describe in detail the global input-output methodology used to devise the metrics which capture these aspects of GVC participation in relation to functional income distribution, and apply them to study the implied distributive profiles across countries and regions in the global North and global South.

Unfortunately, the data source used covers the 1995-2018 period, so it does not reflect the most recent trends resulting from the Covid-19 pandemic and the ongoing war in Ukraine. Hence, results may not be fully capturing an intensification of strategic trade

thinking currently taking place in the world economy. Such an extension is a promising direction for future research.

2 Methodology: Global Input-Output Analysis

2.1 Global Income and Expenditure

To study the distributive profile of domestic *vis-à-vis* international specialization we employ global input-output techniques (Leontief, 1986; Miller and Blair, 2009). These allow us to trace and connect the source and final destination of production and trade flows between countries. By acknowledging that each unit of gross output has income and wage requirements to be produced, we can also trace the income and wage content of final output in the global economy.

Consider a global input-output system composed of two regions, the global North (n) and global South (s), as represented by Figure 1.

Simplified scheme with m products and 2 regions (n, s):

Uses	Intermediate		Final		Tot
Res.	n	s	n	s	GO
n	Z_{nn}	Z_{ns}	f_{nn}	f_{ns}	q_n
s	Z_{sn}	Z_{ss}	f_{sn}	f_{ss}	q_s
VA	y_n^T	y_s^T	0	0	0
WAGE	y_{wn}^T	y_{ws}^T	0	0	0
SUTAX	$y_{\pi n}^T$	$y_{\pi s}^T$	0	0	0
GO	q_n^T	q_s^T	0	0	0

Derived matrix objects:

$$Z = \begin{bmatrix} Z_{nn} & Z_{ns} \\ Z_{sn} & Z_{ss} \end{bmatrix} \quad F = \begin{bmatrix} f_{nn} & f_{ns} \\ f_{sn} & f_{ss} \end{bmatrix} \quad q = \begin{bmatrix} q_n \\ q_s \end{bmatrix}$$

$$y = \begin{bmatrix} y_n \\ y_s \end{bmatrix} \quad y_w = \begin{bmatrix} y_{wn} \\ y_{ws} \end{bmatrix} \quad y_\pi = \begin{bmatrix} y_{\pi n} \\ y_{\pi s} \end{bmatrix}$$

Fig. 1. Scheme of a global input-output table for two areas of the world economy

The system can be read by rows or columns, indicating global uses and resources, respectively. The row view represents a system of global expenditure, whereas the column view captures income and cost relations in the global economy.

If we take a row view, matrices \mathbf{Z} and \mathbf{F} capture the production and trade flows between areas in intermediate and final products, respectively.³ By adding intermediate and final flows we obtain gross output vector \mathbf{q} :

$$\mathbf{q} = \mathbf{Z}\mathbf{1} + \mathbf{F}\mathbf{1} \quad (1)$$

where $\mathbf{1}$ represents a sum vector of appropriate dimension.

If, instead, we take a column view, matrix \mathbf{Z} and vector \mathbf{y} capture the costs of intermediate products and primary income, respectively. In this case, primary income is decomposed into labor costs \mathbf{y}_w and other components \mathbf{y}_π (which include operating surplus and net taxes). By adding intermediate costs and primary incomes we obtain the same gross output vector \mathbf{q} :

$$\mathbf{q}^T = \mathbf{1}^T \mathbf{Z} + \mathbf{y}^T \quad (2)$$

We can determine the production technique of each industry in the global economy by defining the cost composition of each unit of gross output from (2):

$$\mathbf{1}^T = \mathbf{q}^T \hat{\mathbf{q}}^{-1} = \mathbf{1}^T \mathbf{Z} \hat{\mathbf{q}}^{-1} + \mathbf{y}^T \hat{\mathbf{q}}^{-1} = \mathbf{1}^T \mathbf{A} + \mathbf{a}_y^T \quad (3)$$

where $\mathbf{A} = \mathbf{Z} \hat{\mathbf{q}}^{-1}$ is the matrix of global sourcing – which represents the intermediate input flows per unit of gross output in each industry – and $\mathbf{a}_y^T = \mathbf{y}^T \hat{\mathbf{q}}^{-1}$ is the vector of global income requirements – which represents the (primary) income required to produce a unit of gross output in each industry.

Using the global sourcing matrix \mathbf{A} in the row view (1), we can express output as:

$$\mathbf{q} = \mathbf{A}\mathbf{q} + \mathbf{F}\mathbf{1}$$

and solve the system for \mathbf{q} :

$$\mathbf{q} = \mathbf{B}\mathbf{F}\mathbf{1}, \text{ where } \mathbf{B} = (\mathbf{I} - \mathbf{A})^{-1} \quad (4)$$

showing that global output \mathbf{q} is *activated* by global final demand \mathbf{F} .

Matrix \mathbf{B} is the global Leontief inverse, and it captures the total (i.e. direct and indirect) intermediate input requirements per unit of final demand in the world economy.

³ As regards notation, matrices are represented using boldface upper-case letters (e.g. \mathbf{M}), vectors with boldface lower-case letters (e.g. \mathbf{v}), all vectors are column vectors, and their transposition is explicitly indicated (e.g. \mathbf{v}^T). A vector with a hat (e.g. $\hat{\mathbf{v}}$) indicates a diagonal matrix with each element of the vector on the main diagonal.

2.2 Global Value Chain (GVC) income matrix: activated value added and activating final demand

Crucially, as the vector of global income is given by $\mathbf{y} = \hat{\mathbf{a}}_y \mathbf{q}$, by using the expression for \mathbf{q} in (4) we see that global income ($Y = \mathbf{1}^T \mathbf{y}$) is also activated by global final demand \mathbf{F} :

$$Y = \mathbf{1}^T \hat{\mathbf{a}}_y \mathbf{B} \mathbf{F} \mathbf{1} \quad (5)$$

where scalar Y is the income of the world economy.

If we focus on the elements composing the expression for global income Y in (5), we may write it as:

$$Y = \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} \mathbf{a}_{yn}^T & 0 \\ 0 & \mathbf{a}_{ys}^T \end{bmatrix} \begin{bmatrix} \mathbf{B}_{nn} & \mathbf{B}_{ns} \\ \mathbf{B}_{sn} & \mathbf{B}_{ss} \end{bmatrix} \begin{bmatrix} \mathbf{f}_{nn} & \mathbf{f}_{ns} \\ \mathbf{f}_{sn} & \mathbf{f}_{ss} \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

and by performing the corresponding matrix multiplications we obtain:

$$Y = \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} (\mathbf{a}_{yn}^T \mathbf{B}_{nn} \mathbf{f}_{nn} + \mathbf{a}_{yn}^T \mathbf{B}_{ns} \mathbf{f}_{sn}) & (\mathbf{a}_{yn}^T \mathbf{B}_{nn} \mathbf{f}_{ns} + \mathbf{a}_{yn}^T \mathbf{B}_{ns} \mathbf{f}_{ss}) \\ (\mathbf{a}_{ys}^T \mathbf{B}_{sn} \mathbf{f}_{nn} + \mathbf{a}_{ys}^T \mathbf{B}_{ss} \mathbf{f}_{sn}) & (\mathbf{a}_{ys}^T \mathbf{B}_{sn} \mathbf{f}_{ns} + \mathbf{a}_{ys}^T \mathbf{B}_{ss} \mathbf{f}_{ss}) \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

The matrix in-between the left and right summation vectors represents a *Global Value Chain (GVC) income* matrix, as it redistributes activated income in the world economy according to the activating source of final demand.⁴ Hence, for example, the top-left element of the matrix:

$$VAD_n = \underbrace{\mathbf{a}_{yn}^T \mathbf{B}_{nn} \mathbf{f}_{nn}}_{(i)} + \underbrace{\mathbf{a}_{yn}^T \mathbf{B}_{ns} \mathbf{f}_{sn}}_{(ii)} \quad (6)$$

represents the value added in the global North (n) activated by *domestic* final demand. Note that this includes both income in the North activated by domestic final demand *produced in the North* – component (i) in (6) – as well as income in the North activated by domestic final demand *imported from the South* – component (ii) in (6), because the North sells (directly and/or indirectly) intermediate inputs to the South (\mathbf{B}_{ns}) in order to produce final products demanded by the North, \mathbf{f}_{sn} , inducing income creation in this latter area.

⁴ Our definition of Global Value Chain (GVC) income follows Timmer et al. (2013, section 2), i.e., the geographical and sectoral decomposition of value added required to produce a final product, aimed at satisfying either domestic or foreign final demand. This definition differs from other approaches (see, e.g., Wang et al., 2017, section 2), which exclude from GVC-related income domestic value added embodied in domestic final consumption and value added embodied in final product exports.

Instead, the top-right element of the matrix:

$$VAF_n = \underset{\text{(iii)}}{\mathbf{a}_{yn}^T \mathbf{B}_{nn} \mathbf{f}_{ns}} + \underset{\text{(iv)}}{\mathbf{a}_{yn}^T \mathbf{B}_{ns} \mathbf{f}_{ss}} \quad (7)$$

represents the value added in the global North (n) activated by *foreign* final demand. Note that this includes both income in the North activated by foreign final demand *exported to the South* – component (iii) in (7) – as well as income in the North activated by foreign final demand *produced in the South* – component (iv) in (7), because the North sells (directly and/or indirectly) intermediate inputs to the South (\mathbf{B}_{ns}) in order to produce final products demanded by the South, \mathbf{f}_{ss} , inducing income creation in the North.

A similar reasoning applies to the bottom-left and bottom-right elements of the GVC income matrix, respectively, obtaining a distribution of global income into:

$$Y = [1 \ 1] \mathbf{G}_y \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \text{ where: } \mathbf{G}_y = \begin{bmatrix} VAD_n & VAF_n \\ VAF_s & VAD_s \end{bmatrix}$$

GVC income matrix \mathbf{G}_y plays a crucial role in redistributing global value added into *activated* sources of income (i.e. rows) and *activating* sources of final demand (i.e. columns). For instance, by looking at the first row, the income of the global North will be:

$$VA_n = VAD_n + VAF_n \quad (8)$$

i.e. the sum of income activated by *domestic* final demand (VAD_n) and income activated by *foreign* final demand (VAF_n). Instead, by looking at the first column, the final demand by the global North will be equal to:

$$FD_n = VAD_n + VAF_s \quad (9)$$

i.e. the income content from both the North (VAD_n) and South (VAF_s) to satisfy final demand requirements from the global North.

A similar reasoning may be applied for the second row and column of matrix \mathbf{G}_y to describe the income and final demand of the global South, respectively. In fact, the following consistency relations hold:

$$\begin{aligned} VA_n &= VAD_n + VAF_n && \text{(Income in the North)} \\ VA_s &= VAF_s + VAD_s && \text{(Income in the South)} \\ FD_n &= VAD_n + VAF_s && \text{(Final demand by the North)} \\ FD_s &= VAF_n + VAD_s && \text{(Final demand by the South)} \end{aligned}$$

Hence, looking at a row we obtain the value added (i.e. income) *activated* in a given region, whereas looking at a column we obtain the final demand of an *activating* region. These relationships also imply that, at a *global* level:

$$Y = VA_n + VA_s = FD_n + FD_s = FD$$

global income Y always equals global final demand FD . The GVC matrix G_y redistributes global final demand into different income sources.

At the same time, for the purposes of understanding the comparative degree of international fragmentation, we may be interested in obtaining the global income activated by domestic and foreign demand, respectively:

$$VAD = VAD_n + VAD_s \quad (10)$$

$$VAF = VAF_n + VAF_s \quad (11)$$

as well as the relative proportions attributable to each area, in order to understand which of them appropriates relatively more global value generated by each demand source.

2.3 Wage shares by activating source of demand

An analogous reasoning to that carried out so far applies to wages activated by output and, thus, by final demand. If the vector of global wages by industry is given by $\mathbf{y}_w = \hat{\mathbf{a}}_w \mathbf{q}$, by using the expression for \mathbf{q} in (4) we see that global labor costs are also activated by global final demand F :

$$W = \mathbf{1}^T \hat{\mathbf{a}}_w \mathbf{B} \mathbf{F} \mathbf{1} \quad (12)$$

where scalar W is the wage-bill of the world economy.

By following a similar path as we did for value added (VA), we can obtain a GVC wage matrix which redistributes global wages:

$$W = [1 \ 1] \mathbf{G}_w \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \text{ where: } \mathbf{G}_w = \begin{bmatrix} WD_n & WF_n \\ WF_s & WD_s \end{bmatrix}$$

where:

WD_n = wages in the North activated by domestic final demand;

WF_n = wages in the North activated by foreign final demand;

WF_s = wages in the South activated by foreign final demand;

WD_s = wages in the South activated by domestic final demand.

In this case, GVC wage matrix G_w plays a crucial role in redistributing global wages into *activated* (i.e. rows) and *activating* (i.e. columns) sources of wages. For instance, by looking at the first row, labor costs of the global North will be equal to:

$$W_n = WD_n + WF_n \quad (13)$$

i.e. wages activated by *domestic* final demand (WD_n) and wages activated by *foreign* final demand (WF_n). A similar relationship holds for the global South:

$$W_s = WD_s + WF_s \quad (14)$$

At this point, wages and value added may be combined, to decompose the *wage share* activated by alternative sources of final demand. For instance, by combining (8) and (13), the wage share in the global North, WS_n may be written as:

$$WS_n = \frac{W_n}{VA_n} = \frac{WD_n + WF_n}{VAD_n + VAF_n} = \frac{WD_n}{VAD_n} \times \frac{VAD_n}{VA_n} + \frac{WF_n}{VAF_n} \times \frac{VAF_n}{VA_n} \quad (15)$$

(i) (ii) (iii) (iv)

where components (i) and (iii) represent wage shares associated with domestic – $WSD_n = WD_n/VAD_n$ – and foreign – $WSF_n = WF_n/VAF_n$ – activating sources of demand, respectively, whereas components (ii) and (iv) represent the weights of each VA component in total value added. Hence, expression (15), written as:

$$WS_n = WSD_n \times \frac{VAD_n}{VA_n} + WSF_n \times \frac{VAF_n}{VA_n} \quad (16)$$

shows that the wage share in the global North is a weighted average of the wage shares activated by domestic and foreign demand, respectively. Following the same logic, expression (16) may also be formulated for the global South:

$$WS_s = WSD_s \times \frac{VAD_s}{VA_s} + WSF_s \times \frac{VAF_s}{VA_s} \quad (17)$$

Decompositions (16)-(17) are the key analytical point. For instance, considering (16), given that VAD_n and VAF_n depend on the different commodity basket composing *domestic* and *foreign* final demand, respectively, then alternative sources of demand imply different wage shares as, in general, $WSD_n \neq WSF_n$.

If the global North has a commodity composition of domestically demanded final products biased towards higher wages than those exported, we will have $WSD_n > WSF_n$. By

contrast, if this area is exporting products with higher wages relative to the products composing domestic final demand $WSD_n < WSF_n$. And the (changing) relative weights between value added activated by domestic (VAD_n/VA_n) and foreign (VAF_n/VA_n) final demand will define the relative importance of WSD_n and WSF_n , respectively, in determining WS_n . A similar reasoning applies to (17). Hence, quantifying these differences across countries, regions and global areas of the world economy may clarify the distributive profiles associated with domestic *vis-à-vis* international specialization.

To simplify the exposition, the analysis so far has been carried out for two areas, the global North and South. However, it may be formulated at the level of individual countries and geographical regions of the world economy. Based on (8) and (13), we may write for a generic country c :

$$VA_c = VAD_c + VAF_c = VAD_c + \sum_{f \neq c} VAF_c^{(f)} \quad (18)$$

$$W_c = WD_c + WF_c = WD_c + \sum_{f \neq c} WF_c^{(f)} \quad (19)$$

where $VAF_c^{(f)}$ and $WF_c^{(f)}$ represent the value added (i.e. income) and wages in country c activated by foreign final demand from country f . Hence, based on (16), the wage share for country c may be decomposed as:

$$\begin{aligned} WS_c &= \frac{W_c}{VA_c} = \frac{WD_c + WF_c}{VAD_c + VAF_c} = \frac{WD_c}{VAD_c} \times \frac{VAD_c}{VA_c} + \frac{WF_c}{VAF_c} \times \frac{VAF_c}{VA_c} = \\ &= WSD_c \times \frac{VAD_c}{VA_c} + WSF_c \times \frac{VAF_c}{VA_c} = \\ &= WSD_c \times \frac{VAD_c}{VA_c} + \left(\sum_{f \neq c} WSF_c^{(f)} \times \frac{VAF_c^{(f)}}{VAF_c} \right) \times \frac{VAF_c}{VA_c} \end{aligned} \quad (20)$$

where:

$$WSF_c = \sum_{f \neq c} WSF_c^{(f)} \times \frac{VAF_c^{(f)}}{VAF_c} \quad (21)$$

and $WSF_c^{(f)}$ represents the wage share in country c activated by foreign final demand from country f .

Individual country magnitudes may be aggregated into regional indicators, either at the level of the region activating final demand or at the level of the region whose income is being activated.

In what follows, the country-level metrics just introduced are conveniently aggregated into regional blocs or global areas, in order to study the distributive profiles associated with domestic *vis-à-vis* international specialization.

3 An empirical view of distributive profiles activated by domestic and foreign final demand

The details of the empirical dataset used for this analysis can be found in Appendix [A](#).

3.1 Global trends

To begin with, Figure [2](#) depicts the decline of the global wage share (in %):

$$\frac{W}{VA} = \frac{\sum_c W_c}{\sum_c VA_c}$$

and the concurrent increase in international production fragmentation, as measured by the share of domestic income activated by foreign final demand (in %):

$$\frac{VAF}{VA} = \frac{\sum_c VAF_c}{\sum_c VA_c}$$

This stylized trend may be seen at an aggregate (and therefore, implicitly weighted average) level – in the left panel – but also at a granular level – in the right panel – where a regression line through the origin has been fitted to unweighted country-industry data for 1995 (*x*-axis) and 2018 (*y*-axis): the slope for the wage share line is lower than 1, whereas the slope for the *VAF/VA* ratio is greater than 1.

However, the trend and co-movement between these two variables seems to have switched regimes since the Global Financial Crisis (GFC, hereinafter) of 2008/09. During the latest phase of hyper-globalization (1995-2007), the steep trend decline in the wage share was mirrored by a notorious increase in trade integration in value-added terms. By contrast, from 2008/09 onwards, the path of the *VAF/VA* ratio became more erratic: its steep decline in 2008/09 reflects the ‘great trade collapse’ during the GFC, with a speedy recovery which was, nevertheless, again subject to a sharp contraction during 2014-16. What remains striking is that, in the aftermath of the GFC, the

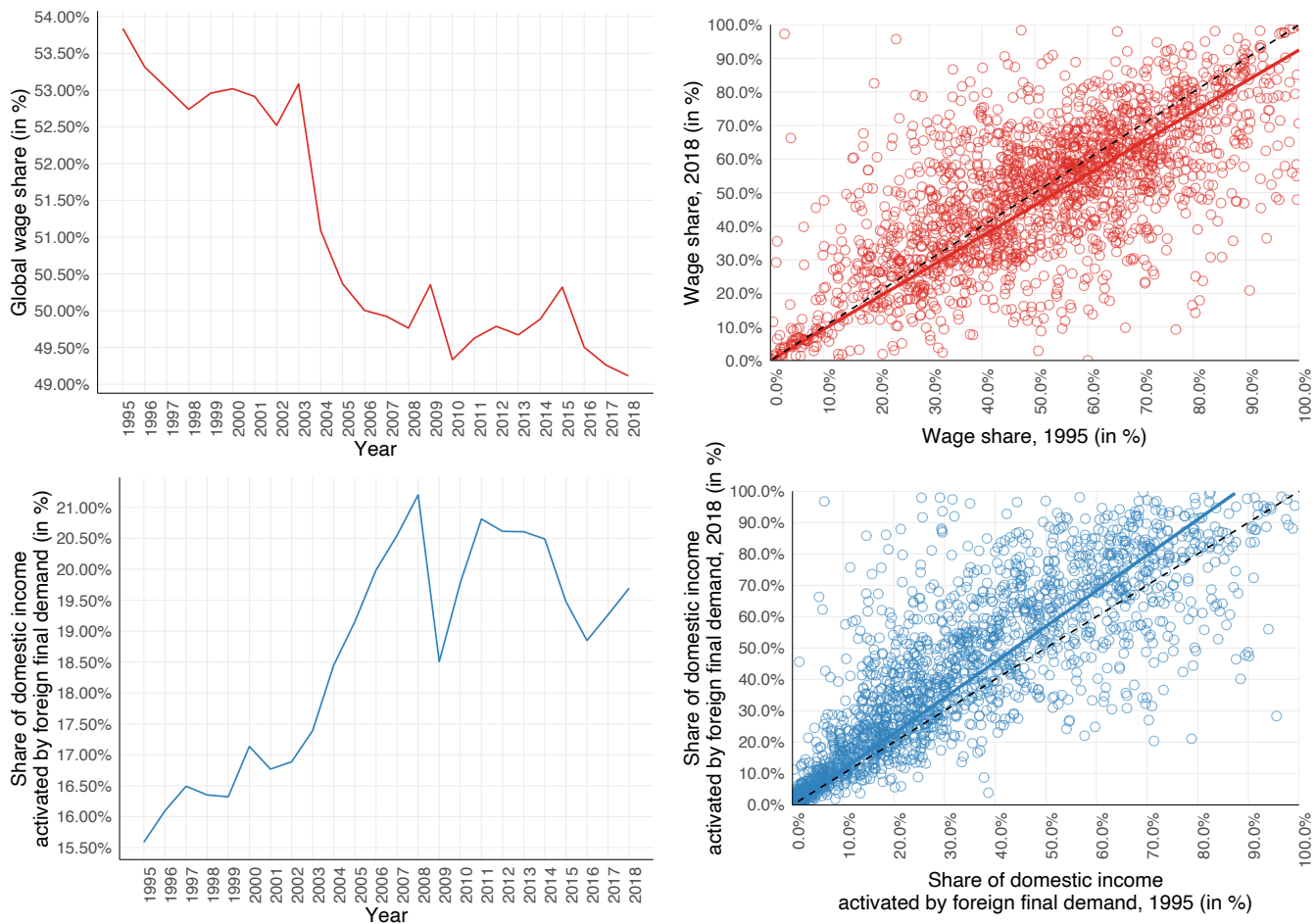


Fig. 2. Decline of the global wage share and expansion of domestic income activated by foreign final demand.

VAF/VA ratio has had a volatile path whereas the global wage share kept a trend decline (with a temporary increase between 2010 and 2015). Hence, we now live in a world of declining global wage share with faltering globalization.

Key to the methodology of section 2 was the differing industry composition of domestic and foreign final demand. Essentially, at the basis of differences in distributive profiles by activating source of demand are the different proportions with which industries participate in each of them. For instance, if domestic final demand is biased towards higher-wage industries, the wage share of domestic specialization will be relatively higher. At the same time, this distinction is also crucial for comparing alternative foreign destinations: if the final exports from country c to country s consist of industries paying higher-wages, the activated wage share will be higher than when country c exports final products to another destination.

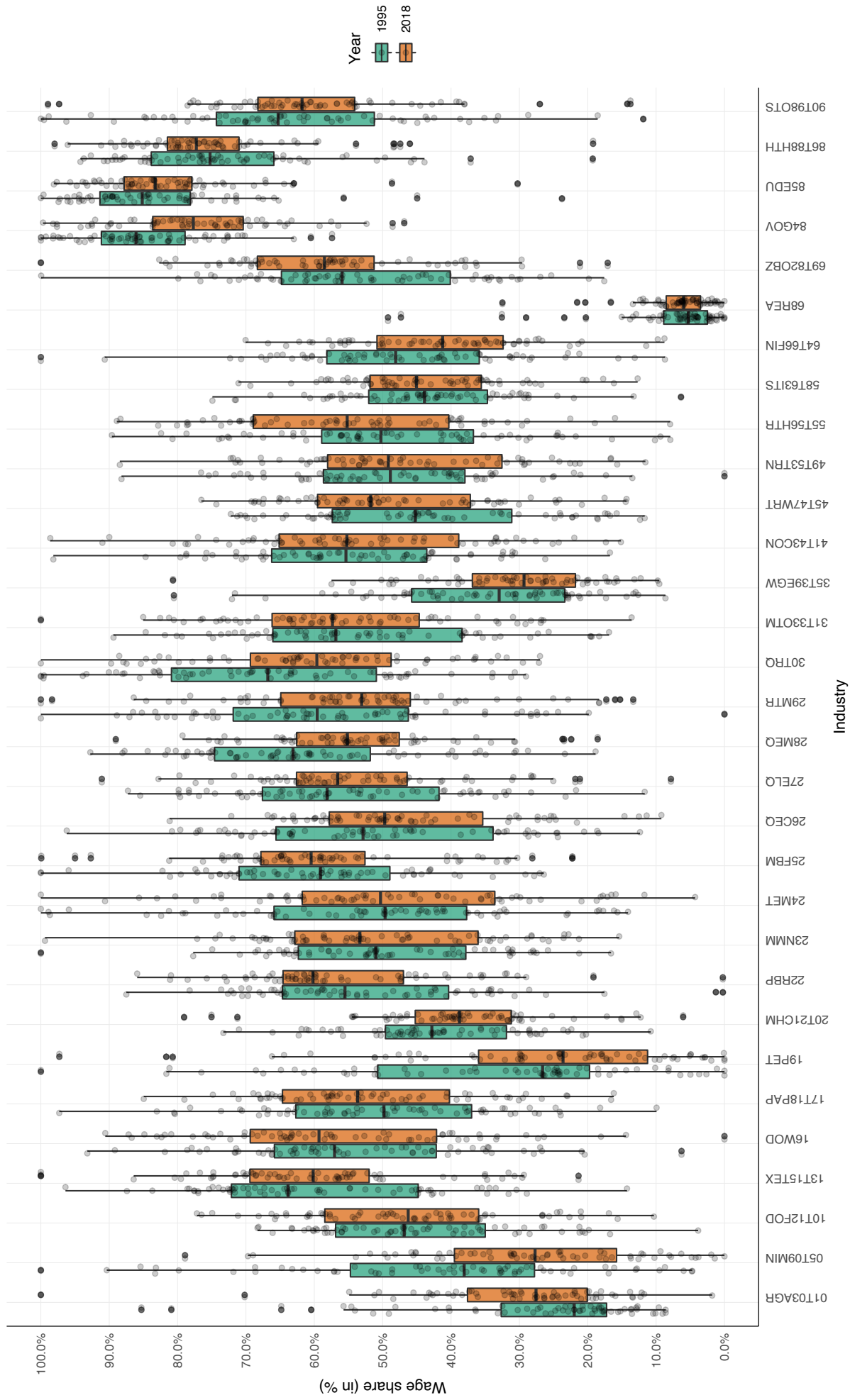


Fig. 3. Wage shares by industry across countries (in % of industry value added).
 Industry descriptors may be found in Table A2 of Appendix A

Hence, to understand what might explain the underlying differences in wage shares by activating source of demand presented below, it is important to have a glimpse of industry wage shares in the global economy. To this end, Figure 3 depicts wage shares by industry across countries in 1995 and 2018. Each data point in the graph represents the wage share of industry j in country c at time t . The box-plot representation displays the entire distribution of wage shares across countries for each industry. Industries are shown from left to right (along the x -axis) following the standard presentation of industry classifications, i.e. from primary products (on the leftmost part) to services (on the rightmost part).

Figure 3 suggests an industry wage share ‘roller coaster’. Relatively lower wage shares are observed for natural-resource-based and energy-related industries (01T03AGR, 05T09MIN, 19PET, 20T21CHM, 35T39EGW), whereas relatively higher (though declining) wage shares are found in service industries – especially ‘non-market’ services (from 84GOV to 90T98OTS) – where also the highest share of employment lies.

When it comes to the evolution between 1995 and 2018, a generalized decline in the wage share across the high-tech manufacturing core of the economy (20T21CHM and from 26CEQ to 30TRQ) was accompanied by mild increases in the median wage share for diffused intermediate inputs (16WOD, 17T18PAP, and from 22RBP to 25FBM). Moreover, there have been considerable wage share increases in agriculture (01T03AGR), logistics (45T47WRT), food and accommodation services (55T56HTR) and business services (69T82OBZ). Instead, the industries which experienced sharpest wage share decreases during the period were machinery and transport equipment sectors (28MEQ, 29MTR, 30TRQ), public administration (84GOV) and mining (05T09MIN).

While it is not surprising that natural-resource-based industries have a lower wage share, due to their predominant location in the global South and highly concentrated market structure (which diminishes labor’s bargaining power), the fact that the high-tech manufacturing core of the economy experienced sharp wage share declines alerts on the potential limits of technological upgrading: it has traditionally been argued that industrial transformation towards high-tech manufacturing is a crucial pathway to inclusive economic upgrading. A sharp decline in the wage share of key industries such as electrical and mechanical machinery (27ELQ, 28MEQ) and motor vehicles (29MTR) represents a challenge to such arguments, and it would be important to investigate fur-

ther the reasons behind this decline.⁵ Especially to what extent it may be related to trade integration and/or to the pace of technological change (and ongoing automation).

A further aspect to note is that the wage share distribution across countries for each industry has become *more equally unequal* between 1995 and 2018. That is, with respect to 1995, data points in 2018 seem to be more concentrated around a lower median wage share for the majority of industries, and especially for the high-tech manufacturing core of the economy (20T21CHM and from 26CEQ to 30TRQ). This may suggest that the prevalent mode of international competition has become one based on labor cost reductions, with a disconnect between real wage and productivity increases.

Finally, the fact that the wage share is relatively higher for service industries, which are less tradable than primary-*cum*-manufacturing sectors and also have a greater weight in domestic final demand, already hints that domestic specialization is bound to activate a combination of industries with higher wage share than foreign specialization. The extent to which this happens across countries is explored below.

Starting from a broad perspective, Table 1 reports the global income and wage shares activated by alternative sources of final demand (total, domestic, foreign) in the global North and global South.

As regards the indicators reported in the table, the shares of global income for each activating source of final demand (in %) are obtained as:

$$\begin{aligned}
 1 &= \frac{\sum_{c \in N} VA_c}{VA} + \frac{\sum_{c \in S} VA_c}{VA} && \text{(Total)} \\
 1 &= \frac{\sum_{c \in N} VAD_c}{VAD} + \frac{\sum_{c \in S} VAD_c}{VAD} && \text{(Domestic)} \\
 1 &= \frac{\sum_{c \in N} VAF_c}{VAF} + \frac{\sum_{c \in S} VAF_c}{VAF} && \text{(Foreign)}
 \end{aligned}$$

Instead, the wage share activated by each final demand source in the Global North (in %) is given by:

⁵ Note that the wage share in industry j can be written as:

$$\frac{W_j}{VA_j} = \frac{w_j}{p_j} \times \frac{L_j}{\bar{y}_j} \tag{22}$$

i.e. the product of a ‘real’ wage (measured in terms of product j) — w_j/p_j — and the reciprocal of productivity — L_j/\bar{y}_j . Hence, if productivity increases do not translate into real wage increases, then the wage share is bound to decline.

$$(\text{Total, Domestic, Foreign}) = \left(\frac{\sum_{c \in N} W_c}{\sum_{c \in N} VA_c}, \frac{\sum_{c \in N} WD_c}{\sum_{c \in N} VAD_c}, \frac{\sum_{c \in N} WF_c}{\sum_{c \in N} VAF_c} \right)$$

whereas in the Global South we have:

$$(\text{Total, Domestic, Foreign}) = \left(\frac{\sum_{c \in S} W_c}{\sum_{c \in S} VA_c}, \frac{\sum_{c \in S} WD_c}{\sum_{c \in S} VAD_c}, \frac{\sum_{c \in S} WF_c}{\sum_{c \in S} VAF_c} \right)$$

Table 1. Income and wage share activated by sources of final demand – Global North & Global South

(years 1995 and 2018)

Area	Source	Income activated by final demand (in 10 ⁹ USD)			Global income share by activating final demand (in %)			Wage-share activated by final demand (in %)		
		1995	2018	95-18	1995	2018	95-18	1995	2018	95-18
Global North	Total	23,785.2	48,513.1	24,727.9	80.70	59.44	-21.26	57.06	52.95	-4.11
	<i>Domestic</i>	20,318.1	39,219.7	18,901.6	81.67	59.84	-21.83	57.10	53.46	-3.64
	<i>Foreign</i>	3,467.0	9,293.4	5,826.3	75.47	57.82	-17.65	56.86	50.79	-6.07
Global South	Total	5,687.8	33,100.8	27,413.0	19.30	40.56	21.26	40.36	43.50	3.14
	<i>Domestic</i>	4,560.9	26,320.6	21,759.6	18.33	40.16	21.83	41.84	45.80	3.96
	<i>Foreign</i>	1,126.9	6,780.3	5,653.4	24.53	42.18	17.65	34.34	34.57	0.23

Source: Own computations based on OECD-ICIO and OECD-Input-Output Databases (2021, 2018, 2015 Ed.)

The most salient feature of the table is the catch-up of the global South in terms of appropriated income shares for both domestic and foreign sources of activating demand. Interestingly, the increasing share of global income (i.e. relative growth) went hand-in-hand with an increasing wage share (i.e. changing functional income distribution) and *vice-versa* for the global North. However, it should be noted that: (i) in the global South this growth-distribution nexus has been mostly for the income share activated by *domestic* — rather than foreign — demand; (ii) in the global North losses were sharper for the wage share activated by *foreign* final demand, pointing to a cost-cutting mode of international competition.

At any rate, due to the high weight of certain global players — North America (NAM) and Western Europe (WEUR) in the global North, China (CHN) in the global South — results at a global level may not necessarily be confirmed when we look at country-level evidence.

From Table 1 we see that the global South has increased the share of global income it *appropriates*. Equally important is the fact that the global South has also been catching

up in terms of the share of global income it *activates*. In fact, Figure 4 depicts the inter/intra global area shares activated by foreign final demand (in %):

$$S/N = \frac{\sum_{c \in S} \sum_{f \in N} VAF_c^{(f)}}{VAF}; S/S = \frac{\sum_{c \in S} \sum_{f \in S} VAF_c^{(f)}}{VAF}$$

$$N/S = \frac{\sum_{c \in N} \sum_{f \in S} VAF_c^{(f)}}{VAF}; N/N = \frac{\sum_{c \in S} \sum_{f \in S} VAF_c^{(f)}}{VAF}$$

where, for instance, S/N stands for income in the global South (countries c in S) activated by the global North (countries f in N). Analogously for S/S, N/S and N/N.

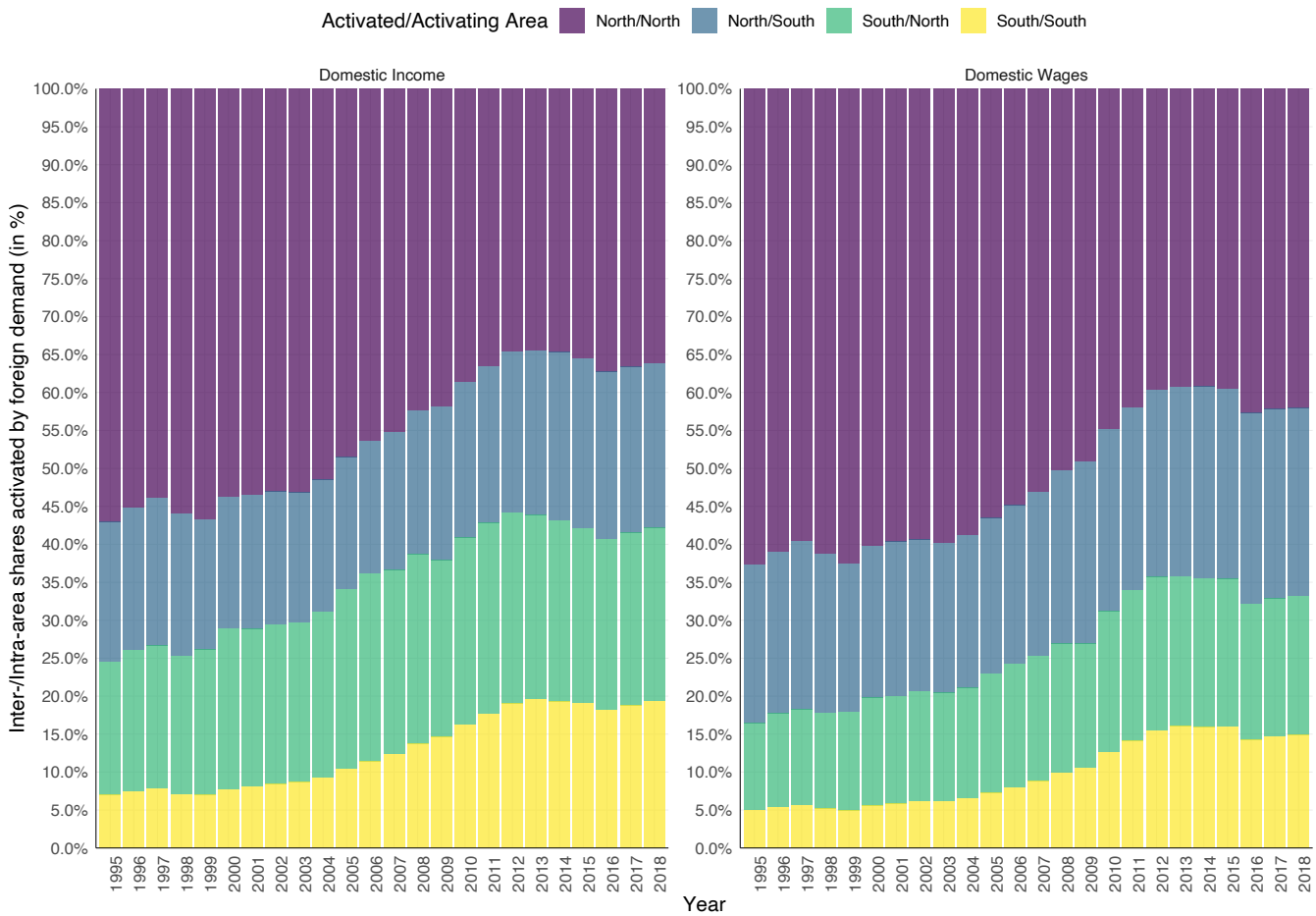


Fig. 4. Share of value added activated by foreign final demand attributable to countries in the global North and global South.

The left panel of the figure shows that the global South went from 25% to over 40% of appropriated income activated by foreign final demand. More interestingly, for income in the global South, while in 1995 the global North activated almost 20% (of the total

25%), in 2018 the share activated by the global South almost equaled that activated by the global North, hinting to an important South-South trade integration through GVCs. Moreover, the global South notoriously increased the share of income it activates in the North. This supports the evidence arguing that the “decline [in share of world exports for advanced economies] was almost entirely due to the relative decline of North–North trade” (UNCTAD, 2018, p. 41).

This notwithstanding, the right panel of Figure 4 shows that the catch-up of the global South in terms of appropriated wages has been considerably slower than that in terms of income. Productivity differences probably play an important role in explaining this, but also the market structure of GVCs may contribute to this result: lead firms in global North articulate the GVC such that for firms in the global South “participation has been confined to a very narrow set of links in these chains and has rarely allowed them to diversify into higher productivity activities, whether through technological upgrading or positive spillovers from the lead firm” (UNCTAD, 2020, p. 122). In fact, this is consistent with the evidence suggesting that labor markets of middle-income countries have been adversely affected by GVCs with respect to high-income countries (e.g. Szymczak and Wolszczak-Derlacz, 2022).

The importance of South-South interactions in global trade is not something quantitatively explained due to only a few key players in the South — such as BRICS — but rather a generalized phenomenon, as Figure 5 shows.

For a given country c , Figure 5 reports the country income shares activated by foreign final demand from each global area (in %):

$$1 = \frac{\sum_{f \in N} VAF_c^{(f)}}{VAF_c} + \frac{\sum_{f \in S} VAF_c^{(f)}}{VAF_c}$$

For each country in the global North, the upper-panel of the figure depicts two points, each corresponding to the income share activated by a global area (adding up to 100%). Analogously, the lower panel of the figure depicts the situation for countries in the global South.

The contrast between the upper and lower panels is striking. While for countries in the global North almost 75% of income activated by foreign final demand was from the global North (and 25% from the global South, in terms of the median of the distribution in 2018), for countries in the global South the distribution since 1995 has clearly shifted,

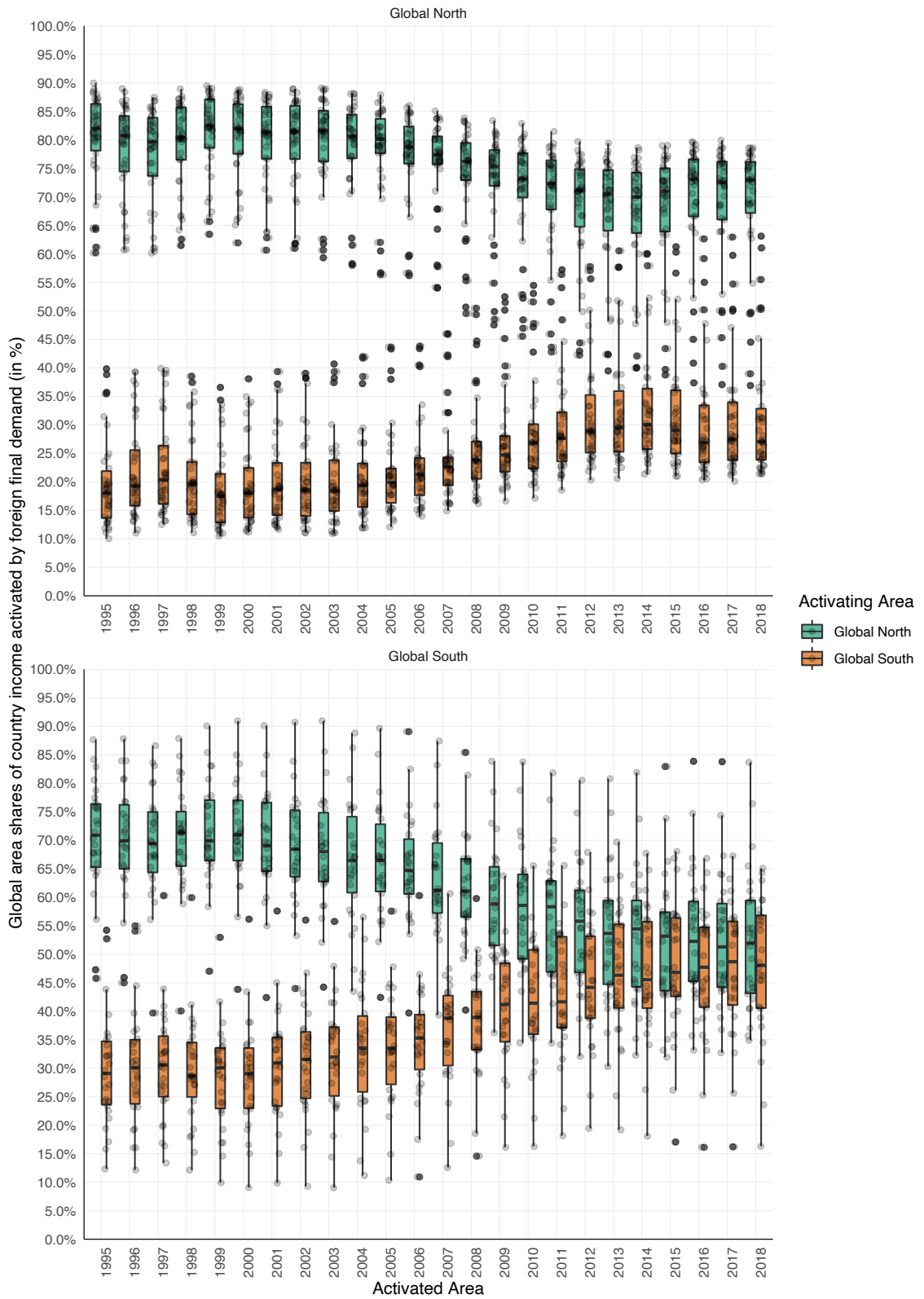


Fig. 5. Global area shares of country income activated by foreign final demand.

to the point that both shares revolve around 50%. This implies that the countries in the global South are now almost equally reliant on foreign final demand from both global areas.

This unweighted result paves the way for a more granular, country-level analysis of the shifts in the wage share activated by alternative sources of final demand.

3.2 Trends at the country level

Table 2 reports the level (for 1995 and 2018) and changes throughout the period in the wage share activated by alternative sources of final demand. The columns ‘Total’, ‘Domestic’ and ‘Foreign’ for each year correspond to WS_c , WSD_c and WSF_c in equation (20).

The structural decomposition of the foreign component of the wage share — WSF_c — in the last three columns of Table 2 may be understood by recalling its definition in (21):

$$WSF_c = \frac{WF_c}{VAF_c} = \sum_{f \neq c} WSF_c^{(f)} \times \frac{VAF_c^{(f)}}{VAF_c}$$

i.e. a weighted average of wage shares activated by different foreign final demand sources — $WSF_c^{(f)}$ — weighted by their share in a country’s total value added activated by foreign final demand — $VAF_c^{(f)}/VAF_c$.

Changes between $t = 0$ and $t = 1$ in WSF_c — ΔWSF_c — can be decomposed into ‘within’ and ‘between’ components as follows:

$$\Delta WSF_c = \sum_{f \neq c} \Delta WSF_c^{(f)} \times \frac{1}{2} \left(\frac{VAF_c^{(f)}(0)}{VAF_c(0)} + \frac{VAF_c^{(f)}(1)}{VAF_c(1)} \right) + \quad (\text{Within})$$

$$\sum_{f \neq c} \frac{1}{2} \left(WSF_c^{(f)}(0) + WSF_c^{(f)}(1) \right) \times \Delta \left(\frac{VAF_c^{(f)}}{VAF_c} \right) \quad (\text{Between})$$

i.e. the ‘within’ effect captures the intrinsic change in the activated wage shares, for a given set of trade partners, whereas the ‘between’ component captures the changes in the weight of each trade partner in a country’s VAF , for a given set of activated wage shares.

Table 2. Wage share activated by sources of final demand – Country-level breakdown and structural decomposition of foreign component

(years 1995 and 2018)

Region		Area	Country	1995 (in %)			2018 (in %)			1995-2018 (in %-points)				
				Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	= Within	+ Between
NAM	North America	N	Canada	56.02	57.84	50.96	45.48	45.77	44.51	-10.54	-12.08	-6.45	-6.49	0.04
		N	United States	62.19	62.04	63.77	54.57	54.96	50.78	-7.61	-7.08	-12.99	-13.03	0.04
LAC	Latin America & Caribbean	S	Chile	49.29	50.82	45.02	41.22	45.14	29.79	-8.07	-5.68	-15.23	-14.93	-0.30
		S	Mexico	29.91	30.63	27.11	28.26	30.76	21.63	-1.65	0.14	-5.48	-5.46	-0.02
		S	Argentina	49.72	50.14	45.79	51.88	53.18	44.28	2.15	3.04	-1.51	-1.30	-0.20
		S	Brazil	46.86	47.27	41.33	51.84	52.94	44.59	4.98	5.68	3.26	4.65	-1.40
		S	Colombia	36.53	36.93	33.65	38.73	40.86	25.91	2.20	3.93	-7.74	-7.40	-0.35
		S	Costa Rica	44.12	47.17	36.93	53.00	54.92	48.00	8.88	7.75	11.07	10.72	0.35
		S	Peru	30.75	30.51	32.51	37.67	41.32	25.05	6.92	10.81	-7.46	-7.43	-0.02
WEUR	Western Europe	N	Austria	60.37	60.08	61.13	51.28	52.06	49.96	-9.08	-8.03	-11.17	-11.40	0.22
		N	Belgium	57.59	57.38	58.00	56.11	57.54	53.88	-1.48	0.16	-4.12	-4.19	0.07
		N	France	57.54	56.82	60.68	59.00	58.01	62.40	1.46	1.19	1.72	1.54	0.17
		N	Germany	61.08	59.90	66.76	54.88	55.01	54.59	-6.20	-4.89	-12.17	-12.31	0.14
		N	Luxembourg	54.37	57.03	52.33	54.94	63.11	50.73	0.58	6.08	-1.60	-1.33	-0.28
		N	Netherlands	54.33	57.02	49.06	54.74	55.92	52.97	0.41	-1.10	3.90	3.62	0.29
		N	Switzerland	49.38	50.34	47.08	53.18	54.10	51.71	3.80	3.76	4.63	4.60	0.03
NEUR	Northern Europe	N	Denmark	57.73	58.92	54.54	62.58	64.67	58.36	4.86	5.75	3.82	3.95	-0.13
		N	Estonia	60.76	61.42	59.71	52.69	54.41	50.40	-8.07	-7.01	-9.31	-9.22	-0.09
		N	Finland	57.40	59.39	52.45	56.77	56.62	57.19	-0.62	-2.77	4.74	4.34	0.40
		N	Iceland	34.49	40.14	21.84	55.62	55.44	55.98	21.12	15.30	34.13	33.06	1.07
		N	Ireland	50.91	56.55	43.38	40.13	55.12	34.03	-10.79	-1.43	-9.35	-9.07	-0.28
		N	Norway	54.93	62.24	39.36	51.47	59.93	33.37	-3.46	-2.31	-5.99	-7.26	1.27
		N	Sweden	59.60	60.76	56.78	53.77	54.64	51.83	-5.83	-6.12	-4.95	-5.21	0.26
		N	United Kingdom	52.49	50.90	58.37	57.68	56.52	61.99	5.19	5.62	3.62	3.50	0.12
		N	Lithuania	44.07	45.98	37.97	46.61	50.51	41.00	2.54	4.53	3.02	3.00	0.03
		N	Latvia	48.94	50.53	44.29	49.21	49.78	48.14	0.26	-0.75	3.84	3.81	0.03
		N	Greece	36.67	36.99	34.40	39.98	41.01	36.90	3.31	4.02	2.50	2.04	0.47
SEUR	Southern Europe	N	Italy	47.17	47.18	47.16	44.68	43.80	47.42	-2.49	-3.37	0.26	0.05	0.21
		N	Portugal	55.45	55.50	55.30	51.00	50.65	51.79	-4.45	-4.84	-3.51	-3.37	-0.13
		N	Slovenia	65.54	64.20	68.23	56.39	55.66	57.28	-9.15	-8.54	-10.95	-10.70	-0.25
		N	Spain	54.85	55.43	52.14	52.84	52.29	54.39	-2.02	-3.14	2.25	1.93	0.32
		N	Cyprus	43.38	46.81	38.54	49.16	50.48	46.88	5.78	3.66	8.34	8.22	0.12
		N	Croatia	56.03	55.73	57.21	58.54	58.01	59.56	2.51	2.28	2.35	1.95	0.39
		N	Malta	52.09	54.77	49.40	51.21	58.89	46.58	-0.88	4.12	-2.82	-0.44	-2.38
		N	Czech Republic	44.92	45.48	43.66	45.86	45.83	45.89	0.94	0.35	2.24	2.26	-0.02
		N	Hungary	54.83	54.32	56.06	53.62	56.21	50.57	-1.21	1.89	-5.48	-5.39	-0.09
		N	Poland	45.74	46.88	41.13	39.75	40.89	37.74	-5.99	-5.99	-3.39	-3.47	0.08
EEUR	Eastern Europe	N	Slovak Republic	44.37	46.57	40.14	38.94	38.03	40.14	-5.43	-8.54	0.01	-0.08	0.08
		N	Bulgaria	38.15	35.95	44.47	44.56	45.63	43.03	6.41	9.68	-1.44	-1.46	0.02
		N	Romania	43.11	41.00	51.89	39.24	39.41	38.80	-3.87	-1.59	-13.09	-12.90	-0.19
		S	Russian Federation	37.95	38.61	35.94	38.32	43.61	25.24	0.37	5.00	-10.70	-10.78	0.09
		S	South Africa	56.45	57.41	52.47	52.90	54.86	46.72	-3.55	-2.55	-5.76	-5.59	-0.17
		N	Israel	57.59	57.42	58.29	57.07	56.62	58.53	-0.52	-0.80	0.24	0.12	0.12
MENAT	Middle East, North Africa & Turkey	S	Turkey	28.87	29.34	26.42	34.30	34.71	32.86	5.43	5.37	6.44	6.65	-0.21
		S	Morocco	41.07	42.84	33.47	40.04	42.89	32.91	-1.03	0.04	-0.57	-0.54	-0.02
		S	Saudi Arabia	33.49	46.51	9.92	27.26	40.52	5.47	-6.23	-6.00	-4.45	-5.42	0.97
		S	Tunisia	39.61	40.42	37.68	43.41	44.56	40.74	3.80	4.14	3.06	3.18	-0.12
IND	India	S	India	31.10	31.77	25.12	34.51	36.23	25.40	3.41	4.45	0.28	0.15	0.14
CHN	China	S	China (People's Rep.)	43.56	44.92	36.42	50.97	51.75	46.31	7.41	6.83	9.90	10.20	-0.31
		S	Hong Kong, China	51.47	52.46	49.37	54.00	53.51	54.74	2.53	1.05	5.37	5.23	0.14
		S	Chinese Taipei	53.13	54.13	50.79	42.78	45.63	38.22	-10.35	-8.51	-12.56	-12.35	-0.21
DASP	Developed Asia-Pacific	N	Australia	55.33	56.40	50.04	50.50	52.67	41.57	-4.84	-3.73	-8.47	-8.89	0.42
		N	Japan	53.92	53.76	55.74	49.94	49.93	49.99	-3.97	-3.82	-5.75	-5.75	0.00
		N	Korea	51.47	52.21	48.37	47.94	49.78	43.35	-3.53	-2.43	-5.02	-4.76	-0.26
		N	New Zealand	46.82	46.75	47.02	50.01	50.30	49.07	3.19	3.54	2.05	1.75	0.30
ASEAN	Assoc. of Southeast Asian Nations	S	Brunei Darussalam	26.11	36.92	11.55	29.40	44.21	11.36	3.29	7.29	-0.19	0.48	-0.66
		S	Indonesia	32.97	34.79	26.81	33.00	34.56	26.06	0.04	-0.23	-0.75	-0.79	0.04
		S	Cambodia	39.32	40.79	34.81	39.21	42.83	34.88	-0.12	2.03	0.06	-0.46	0.53
		S	Malaysia	30.90	34.42	26.67	35.68	41.96	25.84	4.78	7.54	-0.82	-0.27	-0.56
		S	Philippines	31.32	32.61	27.24	35.64	35.90	34.83	4.33	3.29	7.59	8.17	-0.58
		S	Singapore	47.00	47.41	46.71	42.20	50.99	37.25	-4.80	3.58	-9.46	-9.64	0.18
		S	Thailand	30.25	33.14	24.17	34.82	39.11	29.39	4.57	5.97	5.22	5.26	-0.05
ROW	Rest of the World	S	Rest of the world	39.17	41.15	31.83	37.21	39.86	28.20	-1.96	-1.29	-3.64	-3.36	-0.27

Source: Own computations based on OECD-ICIO and OECD-Input-Output Databases (2021, 2018, 2015 Ed.)

To explore the multiplicity of data points in Table 2, the figures below focus on three aspects: (i) the convergence trends in the wage share, (ii) the relationship between growth and distribution and (iii) the rivalry/complementarity in the ‘within’ vs. ‘between’ components of the structural decomposition for WSF_c .

In relation to (i), Figure 6 depicts the initial level of the wage share in 1995 (x -axis) and its change between 1995 and 2018 (y -axis) for each activating source of final demand. Each data point represents a country and a linear regression model has been fitted for each global area. The negative slope of the regression line across areas and final demand sources suggests a trend towards cross-country convergence in wage shares: countries with higher initial wage share had the lowest increases or, actually, the highest decline. For the global North, the slope is always steeper than for the global South, suggesting a stronger convergence towards a lower average wage share, and reflecting a decline for most advanced industrial economies across demand sources.

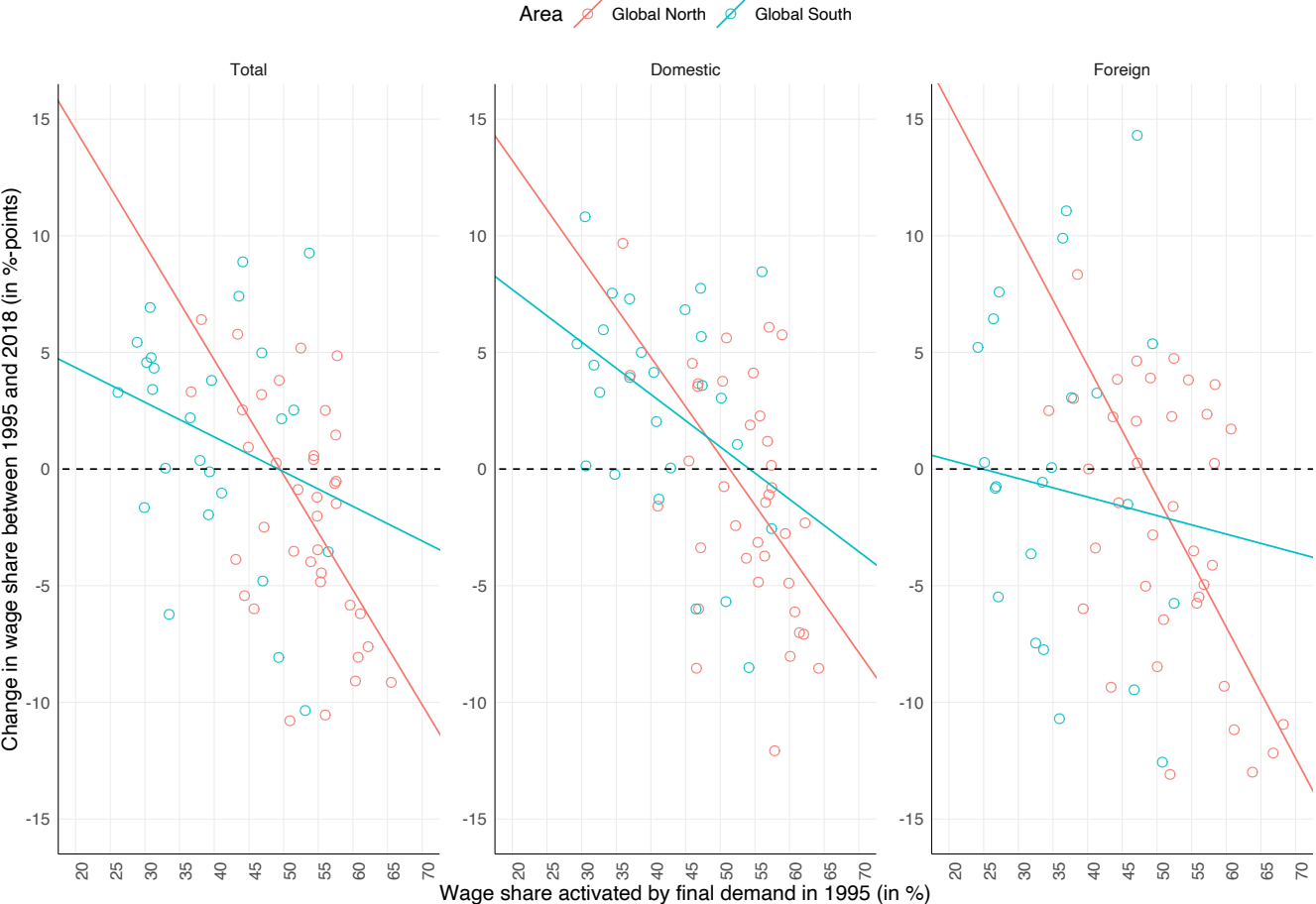


Fig. 6. Convergence trends in the wage share for each activating source of final demand within the global North and global South.

Instead, for the global South, the slope is relatively steeper for domestic *vis-à-vis* foreign activating final demand. Given that most points in the ‘Domestic’ panel for the global South are above zero, this suggests a catch-up process with an overall increasing wage share activated by domestic final demand (consistent with Table 1). However, the relationship is more tenuous for foreign final demand (a flatter slope in the ‘Foreign’ panel). This signals that it is less clear whether international GVC integration has accelerated wage share convergence in any specific direction (which is consistent with the almost negligible change in the overall wage share activated by foreign demand in Table 1 for the global South).

As regards aspect (ii), Figure 7 depicts the appropriated share of global income (i.e. relative growth on the *x*-axis) and wage share dynamics (i.e. functional distribution on the *y*-axis) for each activating source of final demand within the global North and global South.

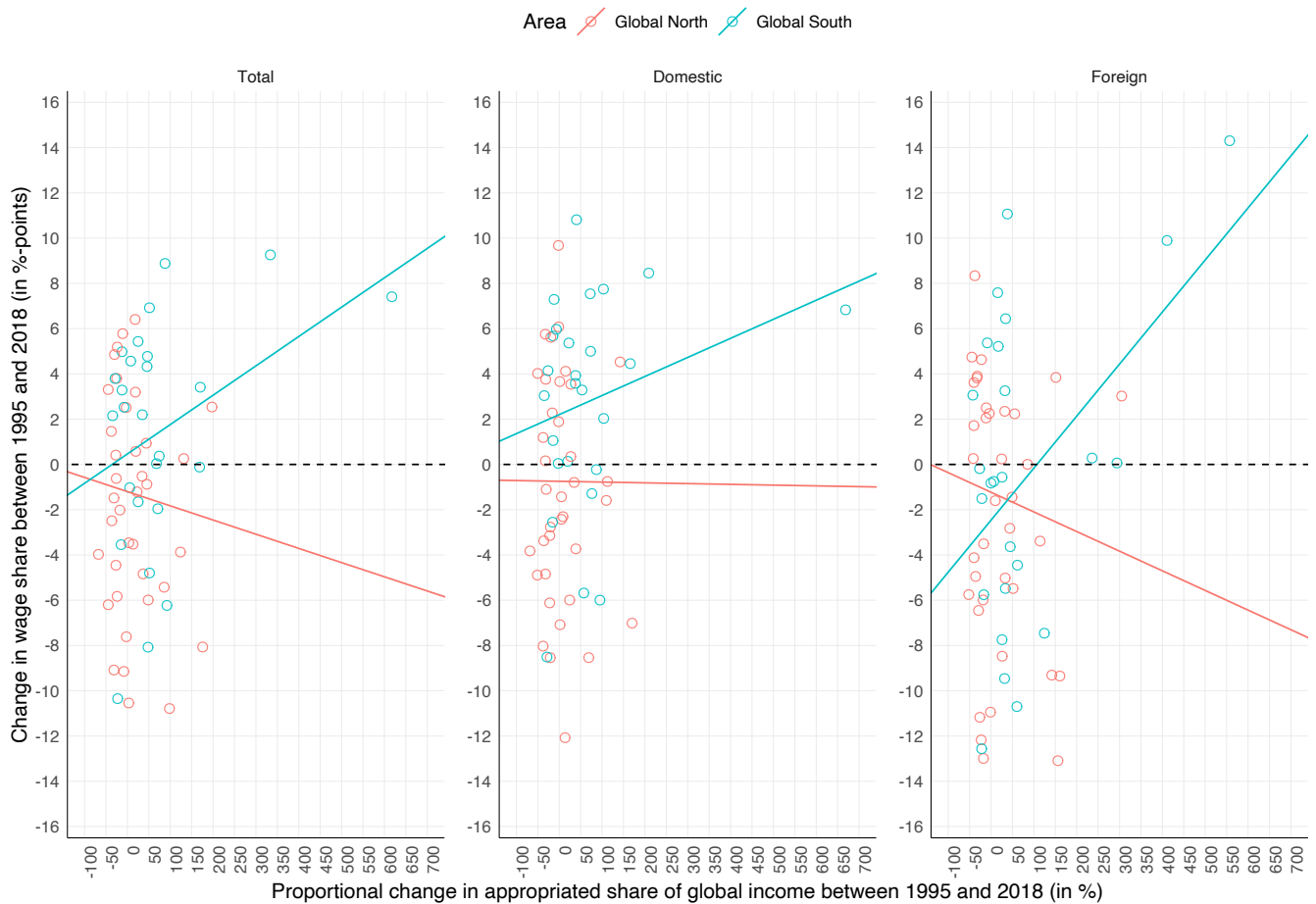


Fig. 7. Appropriated share of global income (growth) and wage share (distribution) dynamics for each activating source of final demand within the global North and global South.

At first glance, the relationship between growth and distribution within each global area seems to go in opposite directions.

Consider the global North first. There would seem to be no clear relationship between relative growth of income activated by domestic demand and wage share dynamics, pointing to the importance of institutional determinants of distribution rather than a systematic connection with the pace of growth.⁶ For the income share activated by foreign final demand, instead, there is a negative association, suggesting that higher appropriation of global income is related to a lower increase (or higher decrease) in the wage share.

Hence, the prevalent mode of international competition seems to be based on cutting labor costs: it is through wage share reductions that highest increases in income shares activated by final exports occur. This negative relationship is the one that prevails when considering total (i.e. both domestic and foreign) final demand.

The relationship for the global South apparently shows the precise opposite: higher relative growth would be positively related with wage share increases across final demand sources. The result for *domestic* final demand might be explained by a Keynesian virtuous circle of wage increases feeding into higher proportional spending per additional unit of income and a faster relative growth of aggregate output.

Instead, the result for *foreign* final demand is more puzzling: it would suggest that countries which raise their global market share (in terms of GVC income), have experienced higher wage share increases. This result would seem to contradict the idea of international competitiveness based on a ‘race to the bottom’ of labor costs in the established account of GVC participation for developing countries (UNCTAD, 2020, p. 122).

However, upon closer inspection, the results for the global South seem driven by 4 countries (China, India, Cambodia and Vietnam) with proportional growth of appropriated income higher than 200% between 1995 and 2018.

In fact, Figure 8 depicts the same variables as Figure (7), but with these 4 countries removed. The fitted models for the global South now are markedly different: the positive relationship between the increase in the share of global income activated by domestic

⁶ In fact, within part of Classical-Keynesian literature, a wage share increase is thought to positively impact the output *level*, rather than its trend growth rate (Freitas and Serrano, 2015, p. 273).

final demand and wage share dynamics becomes tenuous, whereas that for foreign final demand becomes sharply *negative*.⁷

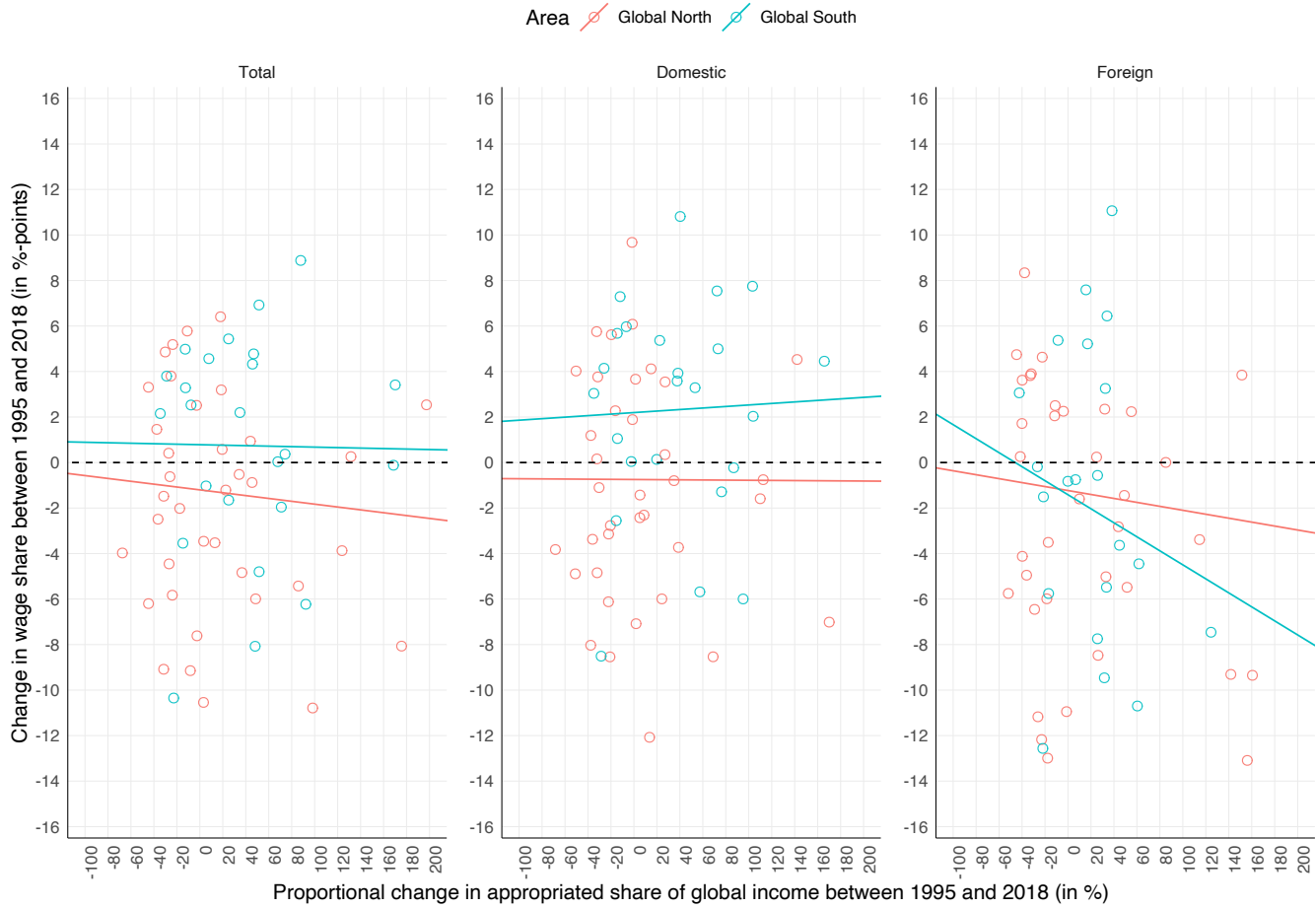


Fig. 8. Appropriated share of global income (growth) and wage share (distribution) dynamics for each activating source of final demand within the global North and global South (outliers removed).

Note: fitted model excludes 4 countries in global South (CHN, IND, KHM and VNM) with proportional growth in appropriated income higher than 200%.

Hence, once these four *crucial* outliers are removed, the institutional determinants of the domestically activated component of the wage share and a prevalent cost-cutting mode of international competition come to the fore, across global areas.

The third aspect to consider concerns the rivalry/complementarity between components of the structural decomposition for WSF_C , reported in the last three columns of Table

⁷ It is important to distinguish between wage *rates* and the wage *share*: in many countries of the global South, real wages increased *vis-à-vis* final demand, but labor productivity increased faster, so the wage share did not follow this rising trend. See (22) above for details.

2. Figure 9 depicts the ‘within’ (x-axis) and ‘between’ (y-axis) components for each country, with a linear regression model fitted for each global area.

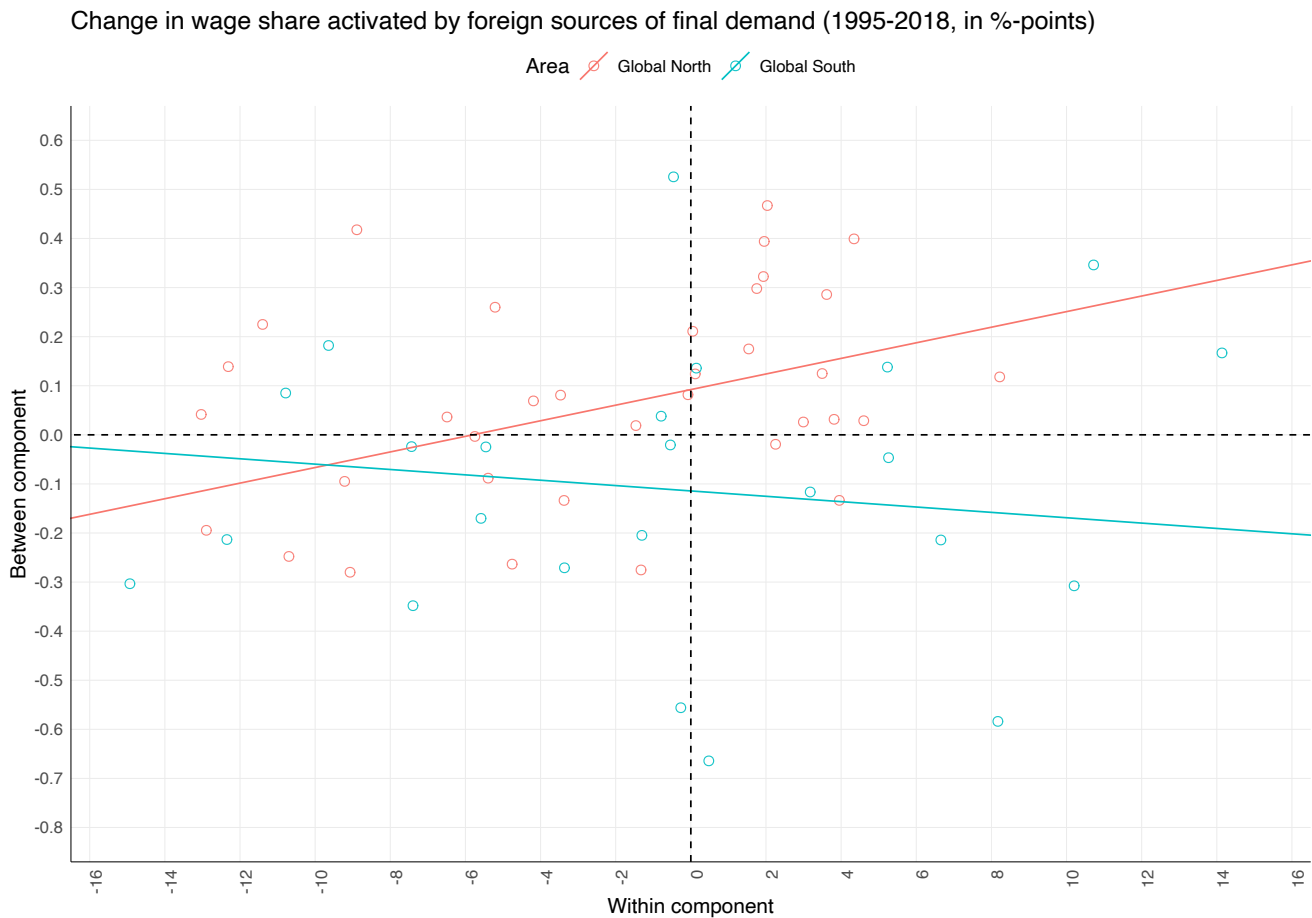


Fig. 9. Within and Between components of the change in wage share activated by foreign sources of final demand.

Interestingly, for the global North there is complementarity between components, so that wage share increases (for given final output destinations) go hand in hand with a shift towards output destinations activating a higher domestic wage share. The opposite occurs for the global South, where countries with wage share increases (for given output destinations) shift towards foreign demand sources activating a lower wage share. Hence, for this latter global area there would seem to be a trade-off between shifting trade partners and upgrading the final export basket with products activating a higher domestic wage share.

A final aspect to explore from the country-level perspective is the relationship between the technological content of a country’s final export basket and the wage share activated

by foreign final demand, i.e. the extent to which technological upgrading in GVCs is more inclusive in distributive terms.

To do so, Figure 10 depicts the share of domestic *manufacturing* value added embedded in foreign final demand (x -axis, in log scale) and the domestic wage share activated by that same source of foreign final demand (y -axis) for years 1995, 2008 and 2018. The x -axis *proxies* the technological intensity of internationalised domestic value added and the aim is to explore how higher technological intensity correlates with functional income distribution.



Fig. 10. Relationship between share of manufacturing VA in foreign final demand and wage share activated by foreign final demand.

The results suggest that the potential for technological upgrading in GVC participation to increase the activated wage share has diminished through time, especially for the global North. The fitted model for this global area in each panel of Figure 10 suggests

that the slope becomes progressively flatter, pointing to the *weakening* of a positive relationship between technological upgrading and a higher wage share. Instead, for the global South the slope was initially (in 1995) relatively lower *vis-à-vis* the global North, decreased sharply towards 2008 and slightly increased again by 2018.

Upon reflection, for China, the strategy of “raising domestic value added in manufacturing exports” (UNCTAD, 2018, p. 53) has resulted in a higher wage share activated by foreign final demand. With an ever increasing importance of South-South GVC integration, it remains an open question to what extent technological upgrading will become again a stronger vehicle conducive to higher wage shares *across* the global South.

3.3 A regional perspective

A perspective in between the ‘global area’ (North and South) view and country-level view may be obtained by computing metrics at the level of regional country groupings. These regional aggregates reflect different geographical areas and will prove useful to grasp interdependent dynamics of the constituent parts of the multilateral trading system. Table A1 of Appendix A details the allocation of countries into the regional groups considered.

Given the focus on the role of *foreign* final demand in activating *domestic* income across countries, we first ask: how important is each region in terms of the income share it activates in every country?

To this end, Figure 11 depicts the entire distribution of country income shares activated by foreign demand from each region. Each data point in Figure 11 represents the share of income activated by foreign final demand in country c that can be attributed to an activating region R :

$$\frac{\sum_{f \in R} VAF_c^{(f)}}{VAF_c}$$

While Western Europe (WEUR) and North America (NAM) remain the ‘final demand engines’ of the world economy (in *relative* terms), the figure shows a generalized decrease of regions in the global North (mainly NAM, WEUR, NEUR, SEUR and DASP) and the rise of China (CHN) in the global South.

To understand the nature of this metric, note that WEUR has a *higher* median value than NAM. This is because of the high degree of intra-European integration: a high share of

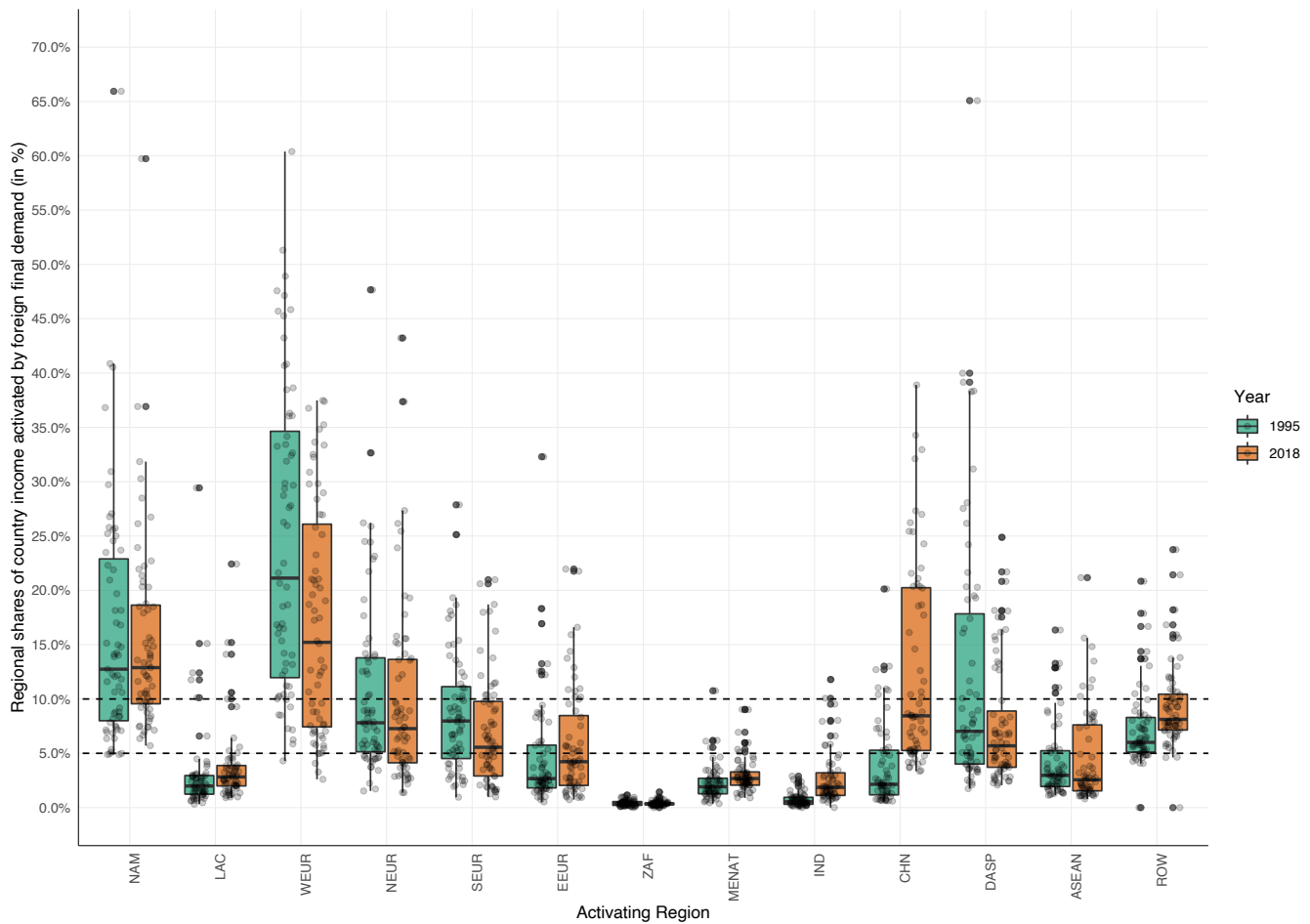


Fig. 11. Country income shares activated by foreign final demand from each region.

value added activated by foreign final demand — VAF_c in (18) — across European countries is activated by European sources, even when NAM has a higher overall share of global income (as reported in Table 3 below).

Hence, China’s final demand channeled towards other countries in the global South accounts for a crucial part of the diffused increase in South-South GVC integration documented in Figure 5. Between 1995 and 2018, China has replaced Japan, Korea, Australia and New Zealand (constituting the Developed Asia-Pacific – DASP – regional group) as the key final demand engine in the Asia-Pacific area.

Within Europe, one can see the decline of Northern and Southern Europe (NEUR and SEUR, respectively) and the relevant increase of Eastern Europe (EEUR) as an emerging activating source of final demand.

Table 3. Income and wage share activated by sources of final demand – Regional detail*(years 1995 and 2018)*

Region	Source	Income activated by final demand (in 10 ⁹ USD)			Global income share by activating final demand (in %)			Wage-share activated by final demand (in %)			
		1995	2018	95-18	1995	2018	95-18	1995	2018	95-18	
NAM	North America	Total	7,994.7	21,675.7	13,681.0	27.13	26.56	-0.57	61.75	53.89	-7.86
		Domestic	7,204.6	19,461.6	12,257.0	28.96	29.69	0.74	61.80	54.36	-7.43
		Foreign	790.2	2,214.1	1,424.0	17.20	13.77	-3.43	61.32	49.72	-11.60
LAC	Latin America & Caribbean	Total	1,502.9	4,176.8	2,673.8	5.10	5.12	0.02	42.58	43.00	0.42
		Domestic	1,325.5	3,390.5	2,065.0	5.33	5.17	-0.15	43.44	45.57	2.13
		Foreign	177.4	786.3	608.9	3.86	4.89	1.03	36.10	31.92	-4.18
WEUR	Western Europe	Total	5,164.2	8,804.9	3,640.8	17.52	10.79	-6.73	58.51	55.84	-2.68
		Domestic	4,066.9	6,103.7	2,036.8	16.35	9.31	-7.03	58.12	56.03	-2.09
		Foreign	1,097.3	2,701.3	1,603.9	23.89	16.81	-7.08	59.96	55.39	-4.57
NEUR	Northern Europe	Total	2,007.3	4,621.6	2,614.3	6.81	5.66	-1.15	54.12	55.40	1.28
		Domestic	1,510.9	3,291.0	1,780.1	6.07	5.02	-1.05	53.96	56.97	3.01
		Foreign	496.5	1,330.7	834.2	10.81	8.28	-2.53	54.61	51.52	-3.09
SEUR	Southern Europe	Total	1,969.8	3,819.2	1,849.4	6.68	4.68	-2.00	49.48	48.03	-1.44
		Domestic	1,581.6	2,829.5	1,247.9	6.36	4.32	-2.04	49.64	47.33	-2.31
		Foreign	388.2	989.7	601.5	8.45	6.16	-2.29	48.82	50.06	1.24
EEUR	Eastern Europe	Total	616.6	2,803.2	2,186.6	2.09	3.43	1.34	41.86	40.19	-1.67
		Domestic	464.9	1,883.0	1,418.2	1.87	2.87	1.00	42.31	43.30	0.99
		Foreign	151.7	920.1	768.4	3.30	5.72	2.42	40.50	33.84	-6.66
ZAF	South Africa	Total	145.5	343.5	198.0	0.49	0.42	-0.07	56.45	52.90	-3.55
		Domestic	117.1	260.9	143.8	0.47	0.40	-0.07	57.41	54.86	-2.55
		Foreign	28.4	82.5	54.1	0.62	0.51	-0.10	52.47	46.72	-5.76
MENAT	Middle East, North Africa & Turkey	Total	497.2	1,958.9	1,461.7	1.69	2.40	0.71	36.80	36.09	-0.70
		Domestic	382.8	1,396.7	1,013.9	1.54	2.13	0.59	40.23	41.39	1.16
		Foreign	114.4	562.2	447.8	2.49	3.50	1.01	25.31	22.94	-2.37
IND	India	Total	346.0	2,588.2	2,242.2	1.17	3.17	2.00	31.10	34.51	3.41
		Domestic	311.2	2,179.0	1,867.8	1.25	3.32	2.07	31.77	36.23	4.45
		Foreign	34.8	409.2	374.4	0.76	2.55	1.79	25.12	25.40	0.28
CHN	China	Total	1,075.0	14,185.7	13,110.7	3.65	17.38	13.73	46.97	50.71	3.74
		Domestic	842.6	11,908.4	11,065.8	3.39	18.17	14.78	47.82	51.60	3.78
		Foreign	232.4	2,277.3	2,044.9	5.06	14.17	9.11	43.89	46.06	2.17
DASP	Developed Asia-Pacific	Total	6,256.0	7,968.7	1,712.7	21.23	9.76	-11.46	53.72	49.63	-4.10
		Domestic	5,653.1	6,472.8	819.7	22.72	9.88	-12.85	53.72	50.37	-3.35
		Foreign	602.9	1,495.9	893.0	13.12	9.31	-3.82	53.74	46.40	-7.33
ASEAN	Assoc. of Southeast Asian Nations	Total	649.1	2,756.6	2,107.6	2.20	3.38	1.18	34.22	37.72	3.49
		Domestic	434.0	1,793.5	1,359.5	1.74	2.74	0.99	35.81	39.52	3.71
		Foreign	215.0	963.1	748.1	4.68	5.99	1.31	31.03	34.36	3.33
ROW	Rest of the World	Total	1,248.7	5,910.9	4,662.2	4.24	7.24	3.01	39.17	37.21	-1.96
		Domestic	984.0	4,569.7	3,585.7	3.96	6.97	3.02	41.15	39.86	-1.29
		Foreign	264.7	1,341.2	1,076.5	5.76	8.34	2.58	31.83	28.20	-3.64

Source: Own computations based on OECD-ICIO and OECD-Input-Output Databases (2021, 2018, 2015 Ed.)

Table 3 reports the global income and wage shares activated by alternative sources of final demand (total, domestic, foreign) in each region, analogously to Table 1 for global areas.

Let us first focus on the three quantitatively most relevant regions of the global North (in terms of the overall share of global income): North America (NAM), Western Europe (WEUR) and Developed Asia-Pacific (DASP). In these three regions, the fall in the wage share activated by foreign final demand has been (approximately) twice as much as the fall in the domestically activated wage share. This suggests a pattern of international specialization biased towards lower wage share industries with a cost-cutting mode of international competition, even for developed economies.

In terms of global income, the pattern is more heterogeneous: NAM had a sizeable decline in the share of global income activated by *foreign* final demand, DASP had a dramatic fall in the global share of income activated by *domestic* final demand, whereas WEUR had sharp but balanced declines in domestic and foreign-activated components. Hence, for NAM, *falling international competitiveness* has been the main explanation for its lower share of global income, for DASP, insufficient *domestic effective demand* has been prominent, whereas for WEUR it has been an amplified combination of both.

As regards NAM, given the relevance of the US in the global economy, note the disproportionate decrease in the wage share in relation to the contained fall in the share of global income, which suggests a possibly crucial role for institutional determinants in explaining the dramatic fall in the wage share.

Counterbalancing the decline in advanced industrial economies, we see the rise in the share of global income appropriated by China (CHN), India (IND), ASEAN, Eastern Europe (EEUR) and the rest of the world (ROW). However, while emerging regions in Asia (CHN, IND, ASEAN) also feature an increase in the wage share, EEUR and ROW experience wage share declines.

In particular, the well known increase in international competitiveness in EEUR (+2.42 %-points of global income activated by foreign final demand) has been matched by an almost threefold decrease in the corresponding wage share (-6.66 %-points), suggesting the prevalence of international competition based on cutting labor costs. But as we saw when discussing the association between growth and distribution at the country level in Figures 7 and 8, CHN, IND and some countries in ASEAN defy this inverse

relationship between growth and distribution, supporting the view that “trade acceleration was particularly strong in East and South-East Asia, based on mutually reinforcing dynamic interactions between profit, investment and exports in state-targeted industrial sectors” (UNCTAD, 2018, p. 41). These dynamic interactions rendered compatible an increasing appropriation of global income with increasing wage shares.

Table 3 reports only two ‘snapshots’ — 1995 and 2018 — of the wage share activated by alternative final demand sources. To better understand the evolution of functional income distribution, Figure 12 depicts the time evolution of this metric. The upper panel displays regions in the global North, whereas the lower panel displays regions that (mostly) correspond to the global South.

The figure allows identification not only of cross-regional differences in wage share trajectories but also of within-region asymmetries in the wage share according to the source of final demand activating it (domestic *vis-à-vis* foreign).

Focusing on the upper panel, the first striking feature is the sharp decline in the wage share activated by *foreign* final demand across (almost all) regions in the global North. This decline has exceeded that for the wage share activated by *domestic* final demand. In fact, for WEUR, NEUR and DASP the latter has relatively *stabilized*, pointing to the fact that it is the foreign-activated component that is mostly responsible for the decline in the overall wage share in recent years. It also suggests that for advanced industrial economies in Europe (WEUR, NEUR) and Asia-Pacific (DASP) the high weight of selected manufacturing and non-market service industries — with higher wage shares according to Figure 3 — in *domestic* final demand plays an important role in maintaining relatively high wage shares.

Interestingly, Southern Europe (SEUR) shows the opposite pattern with respect to other regions in the global North: its foreign-activated wage share has recovered from the fall ensuing the GFC of 2008/09, whereas it is the domestically-activated wage share that has fallen the most, suggesting a negative effect of fiscal consolidation policies on functional income distribution as the Eurozone debt crisis of 2011/12 unfolded.

The picture for the global South in the lower panel of Figure 12 is markedly different. First, across most regions, the domestically-activated wage share had a declining trend which reverted (at some point between 2004 and 2010, depending on the region), to a stable or growing path since. This is particularly apparent for the cases of China (CHN) and Latin America (LAC).



Fig. 12. Time evolution of the wage share by activating source of final demand for geographical regions of the world.

But for the foreign-activated wage share, evidence is mixed. On the one hand, wage share levels for this component are always below the domestically-activated component, pointing to a general feature of international specialization in the global South: it occurs in industries with relatively lower wage shares than those composing domestic final demand. This is a key difference with respect to the global North, where such domestic *vis-à-vis* foreign asymmetry in the activated wage share is not so clear-cut. On

the other hand, the foreign-activated component shows higher volatility with respect to the domestic one. This may probably be related to the influence of the commodity price super-cycle (Reinhart et al., 2016), which alters the relative weight of industries — each with a different associated wage share — in the final export basket. This seems apparent for the case of the ROW (residual) region.

In order to delve more deeply into the volatility associated with the foreign-activated component of the wage share, Figure 13 displays its dispersion — as measured by the coefficient of variation (CV) — across foreign demand sources. Again, the upper panel depicts regions in the global North whereas the lower one those (broadly) corresponding to the global South.

If this indicator is high, it implies that the final export basket of a region varies greatly for different final output destinations. Hence, it points to a ‘destination-specific’ commodity composition of international specialization. On the contrary, lower values for the indicator suggest that a region consistently exports final products from similar industries across destinations (thus leading to similar foreign-activated wage shares).

Note, first, how dispersion levels for regions in the global North are, with few exceptions, lower than those in the global South. In particular, within the global North, wage share dispersion has been persistently rising for North America (NAM). Coupled with the sharp decrease in the foreign-activated wage share (documented in Table 3), this hints at a region shifting to products from lower wage share industries across several foreign markets, increasing volatility. That is, North America is struggling to maintain a prominent position as an exporter of final products with relatively high wage share.

Focusing on the lower panel of Figure 13 — corresponding to regions (mostly) within the global South — it is interesting to note the divide between regions in a low *vis-à-vis* high wage share dispersion regime. Especially because those regions that either maintained or decreased their wage share dispersion — mainly China (CHN), India (IND) and ASEAN (especially after the GFC of 2008/09) — have had a combination of fast appropriation of foreign-activated global income and wage share increases (as documented in Table 3). Hence, successful international specialization seems to be characterized by an homogenization of the product composition of final exports towards industries with relatively higher wage shares. Eastern Europe (EEUR) seems to be an exception to this pattern, as its wage share dispersion declined while its foreign-activated

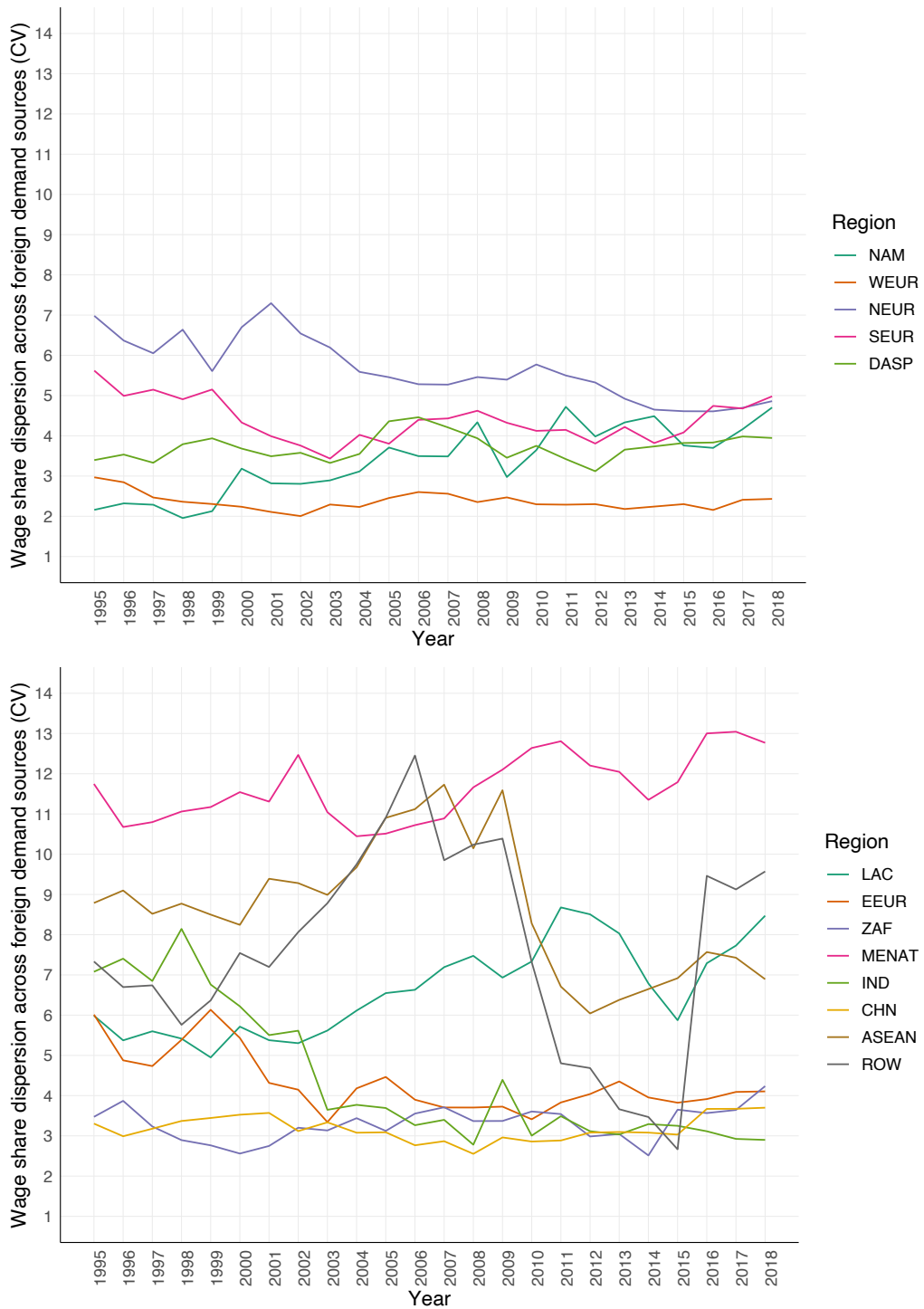


Fig. 13. Time evolution of the wage share dispersion across foreign sources of activating final demand for geographical regions of the world.

wage share also decreased sharply. Hence, EEUR has progressively homogenized the composition of final exports towards products from low wage share industries. This alerts on the possibility of potentially divergent trajectories — in terms of functional

income distribution — associated with an homogenization trend in final product export baskets.

It is apparent how an international specialization in primary products within the global South is associated with either high levels (MENAT) or considerably volatile (ROW) wage share dispersion across foreign demand sources. In this regard, it is worrying to see the increasing trend (and volatility) in the wage share dispersion for Latin America (LAC), implicitly supporting the view that its final exports are once again becoming mostly primary products.

3.4 Inter-regional interactions

We have so far considered the wage share trajectory for each region in isolation. However, the global economy is an interdependent multilateral trading system, so it is to be expected that regions demanding products from each other induce the activation of industries with relatively low or high wage shares.

A natural question, then, is: how could we map the reciprocal effects on functional income distribution of bilateral (direct *and indirect*) trade relationships between regions? In an attempt to do so, Table 4 includes — for 1995 and 2018 — a matrix summarizing bilateral foreign-activated wage shares. Essentially, across columns for a given row we see the wage share of the region in the row activated by the foreign source of final demand in the column.⁸

Such a matrix allows us to:

- (i) identify, for a given source region, the final output destinations activating the highest/lowest wage share, and
- (ii) identify those activating regions inducing relatively higher/lower wage shares on others.

⁸ For each panel, Table 4 is organized as follows:

1. Columns ‘Total’, ‘Own’, ‘Foreign’, report the wage share activated by each source of final demand for the region in a given row;
2. The following 13 columns, one for each activating region, depict the matrix of bilateral foreign-activated wage shares. The weighted average across columns for a given row equals the value of column ‘Foreign’;
3. The final column summarizes the wage share dispersion across foreign activating sources of final demand (column ‘CV’).

Table 4. Wage share activated by sources of final demand – Regional breakdown of foreign activating sources

(years 1995 and 2018)

Region	Year 1995											Dispersion CV					
	Activating source of demand		Foreign activating source of demand														
	Total	Own	Foreign	NAM	LAC	WEUR	NEUR	SEUR	EEUR	ZAF	MENAT		IND	CHN	DASP	ASEAN	ROW
NAM	61.7	61.8	61.3	56.2	63.1	62.9	63.4	61.9	63.0	62.3	63.0	62.9	62.9	62.5	63.3	62.2	2.16
LAC	42.6	43.4	36.1	32.0	41.2	38.1	39.0	38.8	41.3	41.5	39.5	41.3	39.6	39.2	39.1	38.9	5.99
WEUR	58.5	58.1	60.0	61.0	58.6	60.6	59.8	61.4	63.5	61.1	63.1	62.9	62.9	59.8	62.0	60.1	2.97
NEUR	54.1	54.0	54.6	52.5	56.3	54.1	54.1	55.8	58.8	54.9	57.5	57.7	57.7	56.0	57.2	55.0	6.98
SEUR	49.5	49.6	48.8	47.5	51.3	48.6	48.7	50.2	48.9	51.9	48.8	48.6	50.3	48.1	49.2	49.2	5.62
EEUR	41.9	42.3	40.5	40.2	41.6	41.8	39.7	40.5	40.8	43.6	40.7	41.4	38.7	39.2	41.2	38.5	6.01
ZAF	56.4	57.4	52.5	53.4	53.9	51.5	51.5	52.9	53.4	0.0	51.2	52.1	51.4	51.7	54.1	54.3	3.47
MENAT	36.8	40.2	25.3	24.2	23.9	30.1	34.0	26.8	33.6	32.1	21.8	21.3	19.5	14.6	21.8	30.5	11.75
IND	31.1	31.8	25.1	23.5	26.2	24.8	25.3	24.5	24.7	24.8	0.0	27.1	26.1	26.1	26.2	26.6	7.08
CHN	47.0	47.8	43.9	43.9	44.1	42.8	43.3	41.7	43.0	45.0	43.0	44.1	0.0	43.0	45.8	44.7	3.30
DASP	53.7	53.7	53.7	53.5	54.3	54.3	54.8	54.8	54.3	53.8	54.1	52.8	54.5	51.0	55.1	54.3	3.40
ASEAN	34.2	35.8	31.0	30.8	32.1	31.5	32.4	30.7	30.6	31.5	31.0	34.3	32.6	28.8	34.5	31.8	8.79
ROW	39.2	41.1	31.8	32.0	33.2	31.8	35.3	30.7	35.0	30.4	32.5	30.0	31.4	29.5	32.6	0.0	7.33

Region	Year 2018											Dispersion CV					
	Activating source of demand		Foreign activating source of demand														
	Total	Own	Foreign	NAM	LAC	WEUR	NEUR	SEUR	EEUR	ZAF	MENAT		IND	CHN	DASP	ASEAN	ROW
NAM	53.9	54.4	49.7	47.2	47.3	51.5	52.5	49.6	51.6	50.8	51.1	50.5	50.7	49.9	51.1	50.2	4.70
LAC	43.0	45.6	31.9	27.1	40.7	37.8	38.4	34.3	38.7	40.1	34.1	33.8	32.1	29.3	36.0	37.4	8.47
WEUR	55.8	56.0	55.4	54.7	55.6	55.0	56.0	55.8	55.2	55.2	56.1	56.1	55.5	55.6	55.7	55.6	2.43
NEUR	55.4	57.0	51.5	50.6	53.0	50.5	49.1	52.0	52.3	56.1	54.0	55.3	53.0	53.8	55.6	53.3	4.86
SEUR	48.0	47.3	50.1	49.4	51.1	50.1	50.0	51.1	49.7	51.1	50.6	50.3	49.7	49.5	49.3	49.8	4.98
EEUR	40.2	43.3	33.8	33.7	34.3	36.6	34.7	34.8	36.1	35.7	29.9	32.2	28.2	28.8	31.0	33.8	4.11
ZAF	52.9	54.9	46.7	47.2	48.0	48.1	48.8	48.5	47.8	0.0	46.3	43.8	43.4	43.5	46.4	50.3	4.24
MENAT	36.1	41.4	22.9	23.7	26.2	31.9	32.9	26.6	32.4	12.9	25.1	13.3	12.8	17.6	14.7	25.4	12.77
IND	34.5	36.2	25.4	25.4	26.3	25.4	25.4	25.0	27.4	25.5	0.0	25.3	25.2	25.2	25.7	25.2	2.90
CHN	50.7	51.6	46.1	46.5	45.8	46.6	47.3	46.6	46.5	45.7	45.6	44.9	0.0	46.2	45.3	45.9	3.70
DASP	49.6	50.4	46.4	47.8	46.3	47.7	48.7	47.4	47.4	47.9	47.9	44.3	45.1	44.5	47.1	47.7	3.95
ASEAN	37.7	39.5	34.4	36.3	33.9	36.1	37.7	36.2	36.0	31.8	33.8	31.1	33.3	35.2	32.3	33.7	6.89
ROW	37.2	39.9	28.2	29.8	29.4	29.8	31.7	27.9	32.2	26.9	29.5	26.1	25.8	26.6	26.2	0.0	9.57

Source: Own computations based on OECD-ICIO and OECD-Input-Output Databases (2021, 2018, 2015 Ed.)

Both (i) and (ii) are particularly relevant in the design of a multilateral trading system, as (i) indirectly hints at the distributive consequences of deepening GVC integration between certain regions (assuming a *given* product composition of trade), whereas (ii) provides an idea of the distributive consequences at home of a domestic final demand expansion abroad.

However, while Table 4 is useful for inspecting specific regional interactions, a visualization device highlighting crucial bilateral relationships is helpful in portraying a general picture of this network structure. To select which cells of the bilateral matrix in Table 4 to highlight, we proceeded as follows:

1. The inter-regional section of Table 4 can be codified as a matrix $\mathbf{W} = [WSF_r^{(f)}]$, whose element $WSF_r^{(f)}$ represents the wage share in region r activated by final demand from region f ;
2. For each source region r (i.e. row of matrix \mathbf{W}) we compute the following z -score:

$$z_r^{(f)} = \frac{WSF_r^{(f)} - \overline{WSF}_r}{sd(WSF_r)}, \text{ where:}$$

$$\overline{WSF}_r = \frac{\sum_{f \neq r} WSF_r^{(f)}}{\sum_{f \neq r} 1} \text{ and}$$

$$sd(WSF_r) = \sqrt{\frac{\sum_{f \neq r} (WSF_r^{(f)} - \overline{WSF}_r)^2}{\sum_{f \neq r} 1}}$$

to capture by how many standard deviations the wage share in region r activated by region f deviates from the average for region r ;

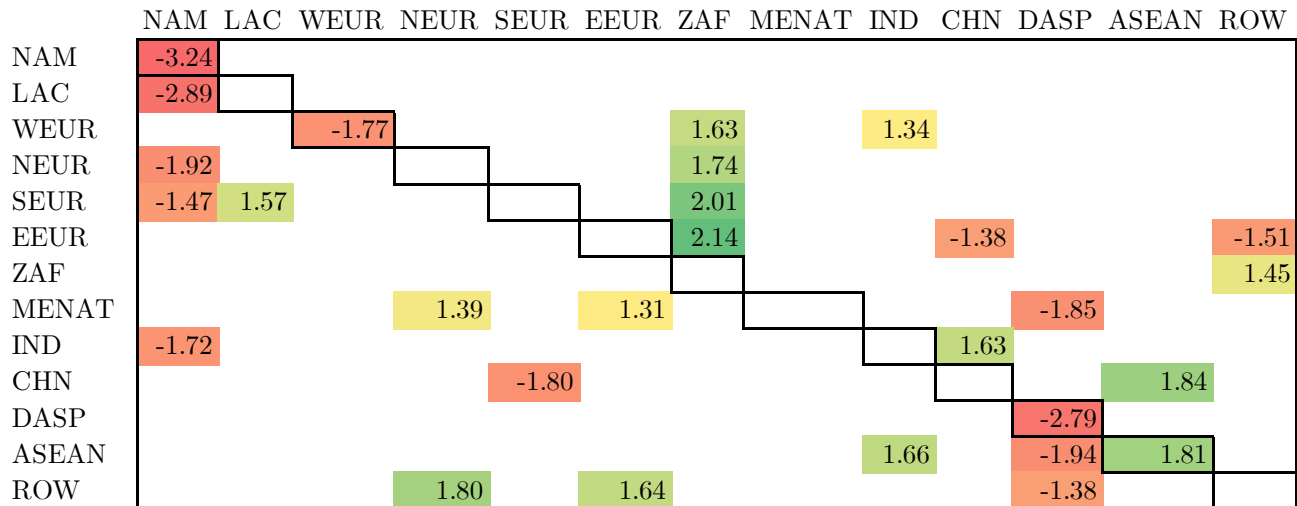
3. If $\text{abs}(z_r^{(f)}) > \alpha$, i.e. if the absolute value of the z -score is higher than a threshold, filter value α , then activating region f induces a sufficiently large deviation from average on source region r , so as to highlight the link between regions r and f in matrix \mathbf{W} .

In this way, the matrix of filtered z -scores provides us with an adjacency matrix of a network of *quantitatively relevant* inter-regional links. Such matrices for 1995 and 2018 are reported in Table 5. Each cell in these matrices reports a z -score, hence, a positive (negative) value indicates that the region in the column is inducing a higher-than-average (lower-than-average) wage share on a source region in the row. Therefore, if we look at this table across a row (column), we can find an answer to point (i) (and point (ii)) above.

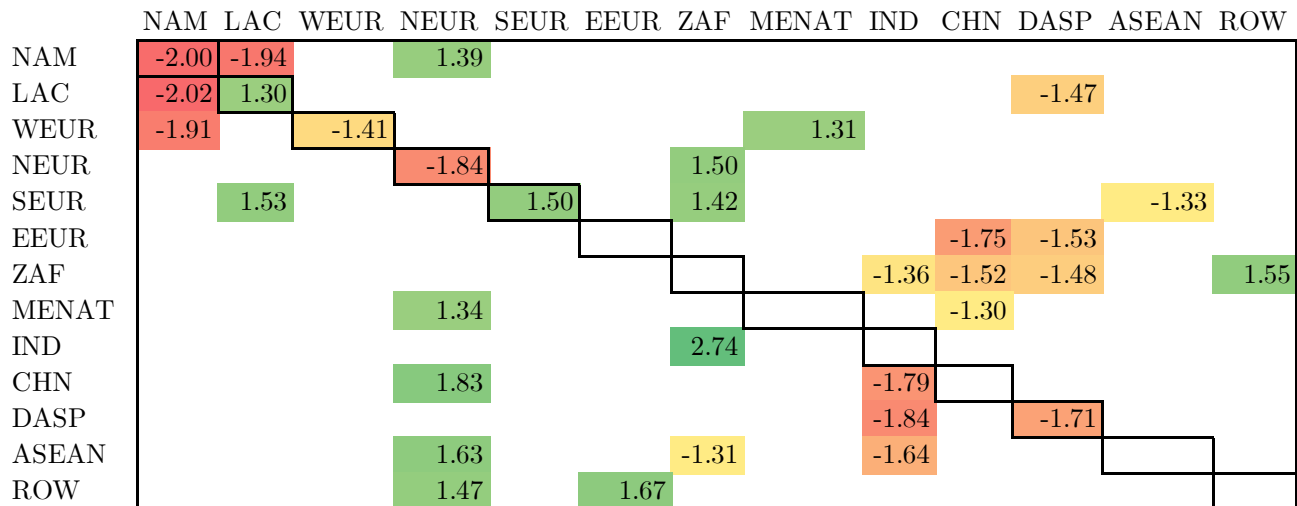
Table 5. Regional interaction network increasing or diminishing the wage share activated by foreign final demand

(values indicate z -scores across columns for each row which are higher than an absolute threshold of $\alpha = 1.3$)

Adjacency matrix for 1995



Adjacency matrix for 2018



Source: Own computations based on OECD-ICIO and OECD-Input-Output Databases (2021, 2018, 2015 Ed.)

Direct inspection of Table 5 already suggests some insights into the effects of inter-regional interactions on functional income distribution.

To begin with, figures across the main diagonal display the potential distributive effects of further *intra*-regional trade integration.⁹ Consider key regions in the global North.

⁹ Note that these are *intra*-regional but still *inter*-country effects, i.e., they exclude wage share changes induced by own, domestic final demand.

It is noticeable how — both for 1995 and 2018 — three final demand engines of the world economy (NAM, WEUR and DASP) had considerably negative z -scores along the main diagonal, pointing to a relatively lower wage share activated by *intra*-regional trade. Hence, while intra-regional integration may have boosted income, its distribution seemed to be biased towards profits.

However, this does not seem to be the case for Latin America (LAC) and Southern Europe (SEUR) in 2018, where intra-regional integration exerts a positive effect on foreign-activated wage shares. This is particularly relevant for regions like Latin America, frequently re-thinking its regional integration strategy. This positive effect would suggest that “intraregional trade was more in line with technological upgrading, with slightly larger shares of technology-intensive manufactures” (UNCTAD, 2018, p. 48), which show higher wage shares than primary commodities.

Looking now across rows for a given column of the matrix, note how two key regions in the global North (NAM and DASP) exert a downward pressure on wage shares of other source regions. This may be reflecting power asymmetries along a GVC: lead firms usually located in NAM and DASP induce GVC trade relations at a lower wage share with input providers from other regions. For the case of North America (NAM), the persistent negative effect exerted on the activated wage share in Latin America (LAC) hints at the primary-commodity nature of such trade relationship. For the case of the developed Asia-Pacific region, it is interesting to note the transition between 1995 and 2018: while in 1995 DASP was exerting a negative effect on the activated wage share of regions geographically close by (such as ASEAN), in 2018 it is mostly exerting a negative effect on regions which are geographically distant (such as EEUR and LAC), suggesting a progressive upgrading of close-by regions in Asia.

When considering the global South, it is noticeable how regions that have increasingly appropriated shares of foreign-activated global income (see Table 3) — such as China (CHN) and India (IND) — by 2018 were exerting a downward effect on wage shares of some of their trade partners. Hence, it would seem as if moving up the ladder of technological upgrading would be associated with exerting a negative effect on the wage share of other regions. This might not be necessarily true for all technologically advanced regions, as suggested by the case of Northern Europe. In fact, a final demand expansion from this region would contribute to (proportionally) increasing wage income across several regions of the world economy.

The adjacency matrices reported in Table 5 are visually represented as networks in Figure 14, with regions as *nodes* and cell intersections (i.e. *z*-scores) as *links*. Positive effects (i.e. *z*-scores greater than zero) are represented as links in light blue, whereas negative effects (i.e. *z*-scores lower than zero) as links in dark red. The source of the link is given by the row and the destination by the column of the adjacency matrix. Hence, for instance, in 1995, the light blue arrow from SEUR to LAC indicates that final demand from LAC exerts a positive effect on the wage-share activated in SEUR. Therefore, when SEUR (directly or indirectly) exports final products to LAC, the commodity composition of those exports is biased towards industries with relatively higher wage share.

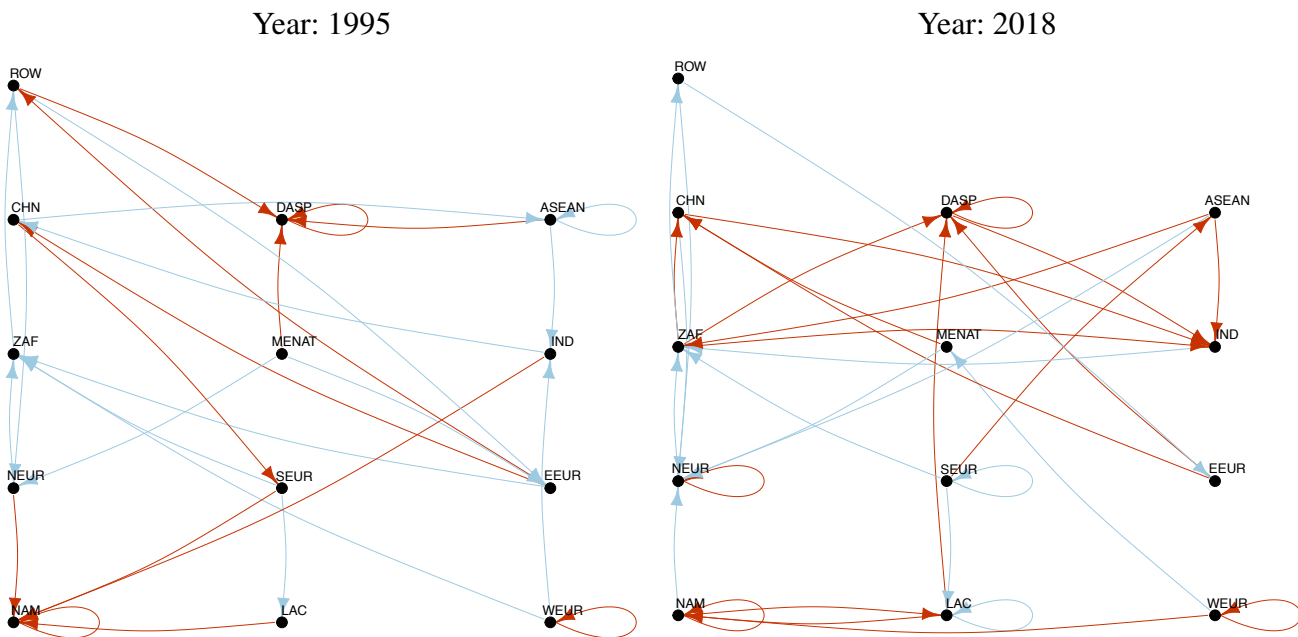


Fig. 14. Regional interaction network increasing or diminishing the wage share activated by foreign final demand sources (Years 1995 and 2018).

According to this representation, incoming (outgoing) links correspond to columns (rows) in the adjacency matrices of Table 5. Hence, a node with a high number of red-coloured (blue-coloured) incoming links points to a region that exerts a negative (positive) effect on the wage-share of others.

Given that both networks in Figure 14 have the same node layout, it is straightforward to visually identify changes in inter-regional interactions. Note that there is an overall increase in the number of significant links between 1995 and 2018, indicating the rise in trade-induced differences in functional income distribution.

In particular, the well known increase in the number of red links for nodes in the Asia-Pacific area (CHN, DASP, ASEAN, IND) indicates that the shift in economic activity towards ‘Factory Asia’ (documented in Table 3) has been accompanied by a decreasing foreign-activated wage share in provider regions. This supports the view that “rapid development of China (and more generally East and South-East Asia) has not triggered significant positive structural changes in the export structures of other developing regions; rather, it has intensified their role as providers of commodities” (UNCTAD, 2018, p. 50).

4 Summary of findings and concluding remarks

The aim of this paper was to connect country-level functional income distribution with its originating sources of final demand by means of Global Value Chain (GVC) participation. The key analytical tool was the distinction between country-level income, wages and wage share activated by domestic *vis-à-vis* foreign final demand. The empirical results which emerged point to relevant trends helping to rethink alternative regional integration projects, in view of a more inclusive multilateral trade system.

To begin with, we now live in a world of declining global wage share with faltering globalization. The wage share distribution across countries for each industry has become *more equally unequal*, suggesting that the prevalent mode of international competition has become one based on labor cost reductions, with a disconnect between real wage and productivity increases.

In terms of shares of global income, the world economy has seen a decline of the global North and a rise of the global South. In particular, the novel importance of South-South interactions in global trade is not something quantitatively explained due to only a few key players in the South — such as BRICS — but rather a generalized phenomenon: countries in the global South are now almost equally reliant on foreign final demand from both global areas of the world economy.

Within the global North, we can see a clear process of cross-country convergence in wage shares activated by both domestic and foreign final demand: countries with higher initial wage share had the lowest increases or, actually, the highest decline. Within the global South, while a catch-up process with an increasing wage share activated by *domestic* final demand is observed, it is less clear whether GVC integration has accelerated wage share convergence in any specific direction.

Across global areas, the relationship between growth (in terms of shares of appropriated global income) and distribution (in terms of the wage share) does not seem to go in any definite direction for domestically activated income — pointing to the importance of institutional determinants — and is *negative* for foreign-activated income, confirming the view of a prevalent cost-cutting mode of international competition.

However, there are important exceptions. In particular, China (CHN), India (IND) and some countries in ASEAN seem to defy the inverse relationship between growth and distribution: dynamic interactions rendered compatible an increasing appropriation of global income with increasing wage shares. These results, though, lend support to the view that “the positive contribution of GVCs to structural change in Asia does not necessarily apply to other regions” (UNCTAD, 2016, p. 119).

With the weakening of the positive statistical relationship between domestic manufacturing value added content in foreign final demand and activated wage share at home, it remains an open question to what extent technological upgrading will again become a stronger vehicle conducive to higher wage shares across the global South. This is particularly important in the current context of higher South-South GVC integration, in which — for countries in the global South — there seems to be a trade-off between shifting trade partners and upgrading the final export basket with products activating a higher domestic wage share.

As regards changes in the final demand engines of the world economy, it is noticeable how China’s final demand channeled towards other countries in the global South accounts for a crucial part of the diffused increase in South-South GVC integration. Hence, the country-specific commodity composition of Chinese demand abroad may bear important consequences for income distribution in countries of the global South.

Results also suggest that successful — in terms of increasing GVC income shares — international specialization seems to be characterized by an homogenization of the product composition of final exports towards industries with relatively higher wage shares.

Hence, technological upgrading in itself may not be enough for securing inclusive growth, but may need to be combined with efforts towards homogenising the commodity composition of destination-specific final export baskets. In sum, leveraging on scale

economies applied to technology-intensive products. Countries should deepen productive integration with trade partners allowing for such a virtuous process.

Aggregating countries into regional groups provided us with further insights into how inter-regional trade *interactions* may impact functional income distribution. By building a bilateral matrix of wage shares activated by each foreign source of final demand, it was possible — for a given source region — to identify which are the final output destinations activating the highest/lowest wage share and, at the same time, identify those activating regions inducing relatively higher/lower wage shares on others.

Results indicate that key regions in the global North (North-America and Developed Asia-Pacific) exert a downward pressure on wage shares of other source regions. This may be reflecting power asymmetries between lead firms and input providers along a GVC. At any rate, it is noticeable how regions in the global South that have increasingly appropriated shares of foreign-activated global income — such as China (CHN) and India (IND) — were also exerting a downward effect on wage shares of some of their trade partners. Hence, it would seem as if moving up the ladder of technological upgrading would be associated with exerting a negative effect on the wage share of other regions. Such a hypothesis deserves further research.

Finally, it emerged how, for some regions of the world economy, *intra*-regional integration exerts a positive effect on foreign-activated wage shares. This was the case for Latin America and Southern Europe, leading us to reconsider the potential of such integration strategies in the pursuit of inclusive growth.

Appendix: Dataset and additional tables

This appendix details the methodology used to estimate the dataset and includes country/region and industry classification tables used in the main text of the paper.

1 Dataset Sources and Methodology

The data needed to carry out the analysis are a set of inter-country Input-Output (ICIO) tables, together with a disaggregation of gross value added (at basic prices) into two of its constituents: (i) compensation of employees and (ii) gross operating surplus and net taxes on production.

All data comes from the Organisation for Economic Co-operation and Development (OECD). In particular, for the ICIO tables, we used the latest OECD Inter-Country Input-Output (ICIO) Tables 2021 Edition.¹ These cover the entire 1995-2018 period, disaggregate transactions into 45 ISIC Rev. 4 industries and provide data for 67 country aggregates.

When it comes to the separation of gross value added (GVA) into components (i) and (ii) in order to divide (i) by GVA and obtain the wage share for each country \times industry combination, at the time of performing the analysis, there was no comprehensive OECD dataset matching the latest OECD-ICIO tables. Hence, an exercise of articulation with previous OECD datasets, imputation and estimation had to be pursued.

There are two alternative OECD data sources reporting gross value added components by country \times industry combination: OECD Input-Output Tables (IOTs)² and the Trade

¹ <https://www.oecd.org/sti/ind/inter-country-input-output-tables.htm>

² <https://www.oecd.org/sti/ind/input-outputtables.htm>

in Employment (TiM) database.³ In particular, for the former, the following are available:

1. Input-Output Tables (IOTs) 2018 ed. (2005-2015, ISIC Rev. 4 industries)
https://stats.oecd.org/Index.aspx?DataSetCode=IOTSi4_2018
2. Input-Output Tables (IOTs) 2015 ed. (1995-2011, ISIC Rev. 3 industries)
<https://stats.oecd.org/Index.aspx?DataSetCode=IOTS>

whereas for the latter, the following are available:

1. Trade in employment (TiM) 2019 ed. (2005-2015, 36 ISIC Rev. 4 industries)
https://stats.oecd.org/Index.aspx?DataSetCode=TIM_2019_MAIN
2. Trade in employment (TiM) 2015 ed. (1995-2011, 34 ISIC Rev. 3 industries)
https://stats.oecd.org/Index.aspx?DataSetCode=TIM2015_C1

Given that these datasets differ in the number of industries and countries with respect to the OECD-ICIO 2021Ed., a consolidation of industries (and industry classifications) and countries had to be performed. In order to match the multiple industry disaggregations available, a minimum common denominator of 31 industries was used, whereas in order to match the countries available across datasets, a subset of 64 country aggregates was used.⁴

We first considered the 1995-2011 period, using the OECD-IOTs 2015 Ed. The database contains the following variables: VALU (gross value added), LABR (labor compensation), GOPS (gross operating surplus) and OTXS (net taxes on production). In theory, $VALU - (LABR + GOPS + OTXS) = 0$, however, in 9 countries this is not the case, and this is because most of them do not explicitly report gross operating surplus (GOPS).⁵ At any rate, the discrepancy is always positive, so the proportion LABR/VALU represents — for these countries — a *lower limit* to the estimation of employee compensation per unit of income.

A second validation concerns the fact that if $GOPS + OTXS < 0$, then $LABR/VALU > 1$, i.e. negative operating surplus (and/or net taxes) leads to a wage share higher than 1.

³ <https://www.oecd.org/sti/ind/trade-in-employment.htm>

⁴ The three countries present in the OECD-ICIO 2021Ed. database which were absent in the other OECD datasets were: KAZ (Kazakhstan), LAO (Lao People's Democratic Republic) and MMR (Myanmar). The inter-industry transactions of these countries were added to the Rest of the World (ROW) residual region.

⁵ The countries are: CHE (Switzerland), HUN (Hungary), IND (India), ISL (Iceland), JPN (Japan), KHM (Cambodia), MYS (Malaysia), RUS (Russian Federation) and ROW (Rest of the World).

This occurs in 248 country \times industry \times year combinations. In these cases, the wage share was corrected and set equal to 1.

We then moved on to the 2005-2015 period, using first the OECD-IOTs 2018 Ed. In this case, two validations were needed. First, for 12 observations belonging to either the ‘Coke and refined petroleum products’ (D19) or ‘Basic metals’ (D24) industries, $VALU < 0$. This was mainly due to the fact that $GOPS$ was sharply negative, probably indicating very high consumption of fixed capital (i.e. very high depreciation costs). In this case, the wage share was set to 0. Also in this dataset there were 165 observations with $GOPS + OTXS < 0$ (but $VALU > 0$) leading to $LABR/VALU > 1$, for which the wage share was set equal to 1. For the same subperiod (2005-2015), data from the OECD-TiM 2019 Ed. was used to check the consistency of the OECD-IOTs 2018 Ed. dataset. For each country \times industry \times year combination, the IOT data point was adopted, but when the wage share was either 0 or 1, the value from the TiM dataset was used.

To merge both sub-periods (1995-2011 and 2005-2015), we used 2005-2015 data and link-chained it to the absolute year-on-year (retrospective) variation of the wage share using the 1995-2011 dataset between 2005 and 1995.⁶

Finally, to extend the wage share dataset from 2015 until 2018, we computed a country \times industry-specific linear trend between 1995 and 2015, and used the estimated regression coefficients to obtain point estimates for the three remaining years (2016-2018).

With all these data points we obtained a dataset of wage shares for each country \times industry \times year combination for the entire 1995-2018 period.

⁶ The only exception for this procedure was the estimate for the Rest of the World (ROW) region. This is because while the 1995-2011 dataset provides an estimate for the wage share of the residual ROW, such an estimate is absent for the 2005-2015 dataset. Hence, in this latter case, we estimated the wage share of the ROW as the aggregate wage share of non-OECD countries.

Table A2. Industry classification

#	Industry	OECD Code	Short descriptor
1	01T03AGR	D01T03	Agriculture
2	05T09MIN	D05T09	Mining
3	10T12FOD	D10T12	Food products
4	13T15TEX	D13T15	Textiles and Apparel
5	16WOD	D16	Wood products
6	17T18PAP	D17T18	Paper products
7	19PET	D19	Refined Petroleum
8	20T21CHM	D20T21	Chemicals and Pharma
9	22RBP	D22	Rubber and plastics
10	23NMM	D23	Non-metallic mineral products
11	24MET	D24	Basic metals
12	25FBM	D25	Fabricated metals
13	26CEQ	D26	ICT Equipment
14	27ELQ	D27	Electrical Equipment
15	28MEQ	D28	Machinery Equipment
16	29MTR	D29	Motor vehicles
17	30TRQ	D30	Transport Equipment
18	31T33OTM	D31T33	Other Manufacturing
19	35T39EGW	D35T39	Energy services
20	41T43CON	D41T43	Construction
21	45T47WRT	D45T47	Trade
22	49T53TRN	D49T53	Transport and Logistics
23	55T56HTR	D55T56	Accomodation and Food
24	58T63ITS	D58T63	ITS and Telecomm.
25	64T66FIN	D64T66	Finance
26	68REA	D68	Real Estate
27	69T82OBZ	D69T82	Business Services
28	84GOV	D84	Public Admin.
29	85EDU	D85	Education
30	86T88HTH	D86T88	Health
31	90T98OTS	D90T98	Other services

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