UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Technical and statistical report

Measuring export inclusiveness

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Table of contents

Summary

Understanding how inclusive trade is has become increasingly relevant as countries aim to promote equitable economic outcomes. This note proposes a method to evaluate how inclusive a country's exports are by considering key economic dimensions. The proposed indicators allow for comparisons across countries and overtime, providing insights into how a country's trade composition relates to broader economic outcomes, including income growth and social equity.

Building on Hausmann, Hwang, and Rodrik (2007), this technical note presents a methodology to estimate the inclusiveness of an export product across three economic dimensions: income equality, gender equality, and labour market formality. Using this product-level measure, the note constructs a country-level export inclusiveness index by calculating the export-weighted average of product inclusiveness scores. Finally, it examines the relationship between export inclusiveness and GDP per capita growth, finding that a 1 percent increase in export inclusiveness—controlling for total export value and a measure of overall national inclusiveness—is associated with a 0.21 percent increase in GDP per capita growth.

Understanding the inclusiveness of trade is increasingly important as countries implement industrial and trade policies aimed at fostering more equitable forms of production (UNCTAD 2022, 2025; United Nations 2024). As economies consider shifting toward sectors that are more inclusive, it becomes crucial to assess the associated economic trade-offs. A key question is whether reallocating resources to these sectors supports or hinders income per capita growth—an outcome that ultimately hinges on the relative productivity performance of more inclusive industries compared to less inclusive ones. WTO (2024) reviews the literature and acknowledges that trade has had a heterogeneous impact across countries in terms of inclusiveness and, in particular, income inequality.

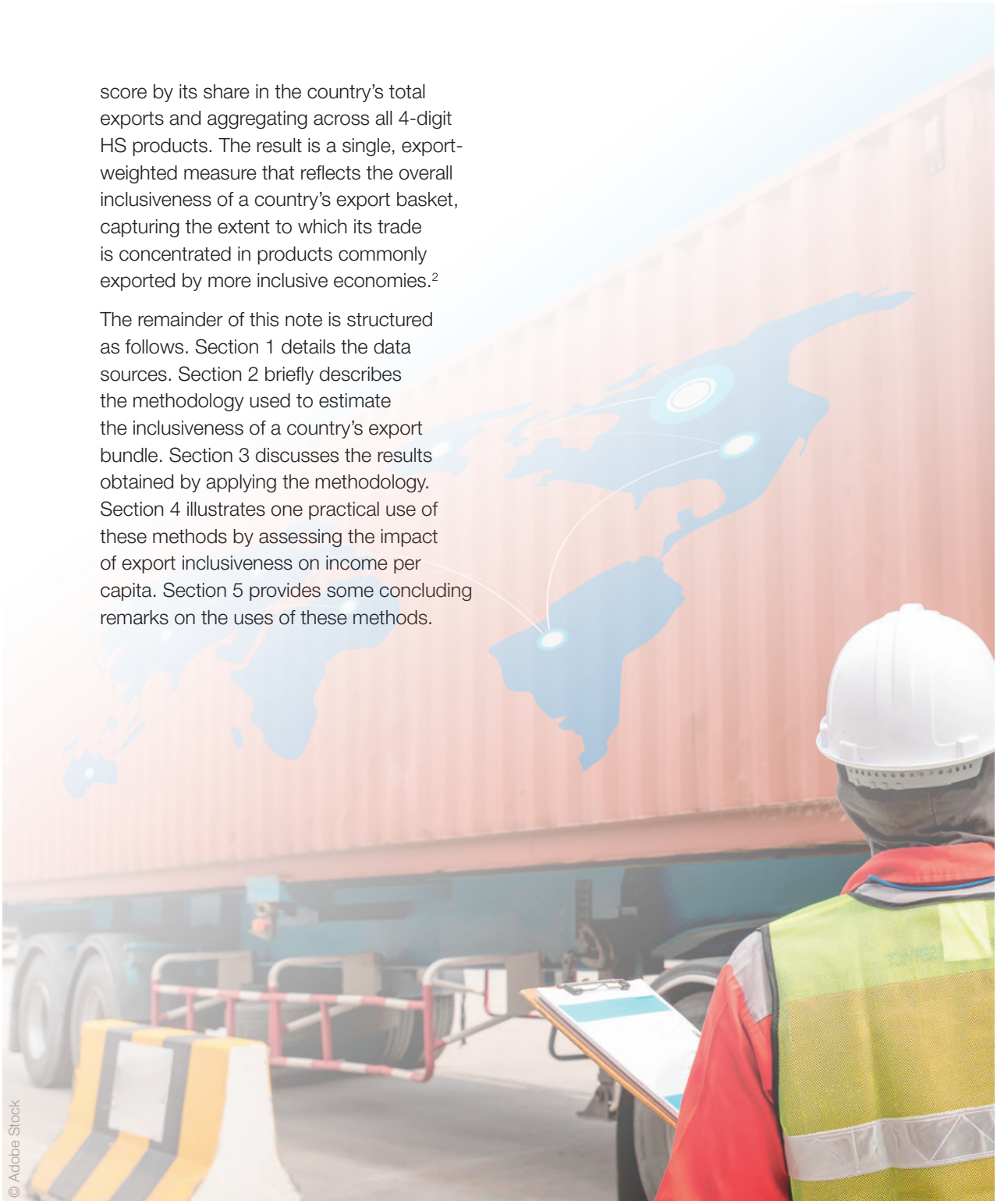
Addressing inclusiveness presents two main challenges. First, the concept itself is broad and interpreted differently across contexts. To operationalize it, this note utilizes three variables to represent economic inclusiveness: income equality, gender equality, and the share of formal employment in the labour force. While this selection does not capture the full range of inclusivity—such as the representation of minorities and indigenous populations in the labour market—it offers the advantage of consistent data availability across countries, a key requirement for the applied methodology. However, the approach is flexible and can incorporate additional dimensions of inclusiveness if relevant data becomes available. The second challenge involves quantifying the inclusiveness of a country's export bundle. This is addressed by extending the framework of Hausmann, Hwang, and Rodrik (2007), which emphasizes the importance of what a country exports. As a first step, countries are classified into "inclusive" and "less-inclusive" groups using an unsupervised clustering algorithm based on the three selected inclusiveness indicators.[1]

In practical terms, the approach involves calculating, for each traded product at the 4-digit level of the Harmonized System (HS), the share of global exports that originate from countries classified as inclusive. This share serves as a proxy for the degree of inclusiveness associated with each product. Using this product-level inclusiveness score, a country-level export inclusiveness index is then constructed. This is done by weighting each product's inclusiveness

[1] The parallel with Hausmann, Hwang and Rodrik (2007) would be to classify countries into rich and poor. In their case, they use one continuous measure: income per capita.

score by its share in the country's total exports and aggregating across all 4-digit HS products. The result is a single, export-weighted measure that reflects the overall inclusiveness of a country's export basket, capturing the extent to which its trade is concentrated in products commonly exported by more inclusive economies.[2]

The remainder of this note is structured as follows. Section 1 details the data sources. Section 2 briefly describes the methodology used to estimate the inclusiveness of a country's export bundle. Section 3 discusses the results obtained by applying the methodology. Section 4 illustrates one practical use of these methods by assessing the impact of export inclusiveness on income per capita. Section 5 provides some concluding remarks on the uses of these methods.



[2] Note that each dimension of inclusiveness does not directly enter the construction of the index, thereby avoiding mechanical endogeneity. However, the export inclusiveness index depends on products inclusiveness which in turns reflects the average inclusiveness of its production across all exporting countries, considering multiple dimensions of inclusiveness. This approach mirrors the methodology used in constructing PRODY (Hausmann et al., 2007), where a product's sophistication is proxied by the average income level of its exporters. However, while income can be considered a relatively stable indicator of productive capabilities, inequality is generally more context-dependent — often shaped by institutional, policy, and labour market factors that may or may not be influence the methods of production of specific products. Consequently, interpretation of the export inclusiveness index should be approached with caution, particularly in cases where a country exports only a limited range of products.

1.

Data

The analysis uses international trade and economic data to assess export inclusiveness. Inclusiveness is measured by data on by income equality, gender equality, and labor market formality across countries. The resulting dataset covers over 100 countries and supports cross-country comparisons and policy analysis on the inclusiveness of export patterns.

The data required for the methodology originates from various sources. Bilateral trade data at the HS 4-digit level are sourced from UN COMTRADE and cover the period 2012–2021. GDP per capita data (in PPP-adjusted 2021 USD) are drawn from the World Bank's WDI and are used as the measure of income per capita.

Three variables capture key economic dimensions of inclusiveness: income equality, gender equality, and the prevalence of formality in the labour market. Each variable is averaged over the period 2012–2014 to ensure consistency with the trade data. Income equality is measured using the Gini index reported in the World Bank's World Development Indicators (WDI). Gender equality is captured by the Global Gender Gap Index, as estimated by Kali Pal et al. (2024). Formality is measured using estimates from Elgin et al. (2021), who apply a Multiple Indicators Multiple Causes (MIMIC) model to estimate the size of the informal sector as a share of the economy. This results in a data sample covering 107 countries over a 10-year period.

In addition to the three core indicators, the analysis incorporates the inclusiveness index developed by Menedian et al. (2024) at the Othering & Belonging Institute at UC Berkeley. This index, available from 2016 onward, encompasses a broader conception of inclusiveness—covering group marginalization, political representation, income inequality, anti-discrimination legislation, incarceration rates, immigration and asylum policies, and climate change. As defined on their website, the index measures the "degree of institutional inclusion and protections extended to vulnerable groups across salient social cleavages, such as gender, race, ethnicity, religion, sexual orientation, and (dis)ability." Unlike the core variables used in the main methodology, this index is not limited to economic dimensions but serves as a valuable control to capture the broader societal context in which economic inclusiveness operates.

2.

Measuring export inclusiveness

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The methodology to assess the inclusiveness of each product relies on classifying products based on observed data on whether the countries exporting them are deemed inclusive or less inclusive across several dimensions. It then aggregates these product-level scores into a country-level export inclusiveness index, reflecting the extent to which a country's trade is concentrated in products linked to more inclusive economies.

The methodology for measuring the inclusiveness of a country's export basket follows two steps, based on Hausmann et al. (2007).

First, an index is constructed to capture how inclusive each product is, analogous to Hausmann et al.'s PRODY measure. While PRODY represents the income level associated with a product by calculating a weighted average of the per capita GDP of exporting countries, the proposed measure—termed PRODI—reflects the degree of inclusiveness of each product. In practice, PRODI is calculated by weighting the inclusiveness indicators of exporting countries—such as income equality, gender equality, and labour market formality—by their export shares of the product. This approach assigns a higher PRODI value to products predominantly exported by more inclusive countries, effectively capturing the inclusiveness characteristics embodied in the product's global export pattern.

The second step utilizes the product-level inclusiveness measure (PRODI) to construct an index of inclusiveness for each country's export bundle. This mirrors Hausmann et al. (2007)'s EXPY measure, which is the export-weighted average of PRODY values across a country's exports and represents the income level associated with that country's export structure. Similarly, the proposed measure —termed EXPI—is calculated as the export-weighted average of PRODI values for all products within a country's export basket. EXPI thus reflects the overall degree of inclusiveness embodied in a country's exports, capturing how much a country's trade composition aligns with products associated with more inclusive economies.

By capturing the inclusiveness characteristics of the products that a country exports, EXPI provides an indicator of how inclusive a country's export structure is. This allows for comparisons across countries and over time, revealing whether a country's exports are concentrated in products linked to more inclusive economies. In empirical analysis, EXPI can be used to investigate the relationship between export inclusiveness and broader economic outcomes, such as income per capita growth or poverty reduction. By controlling for other factors, researchers can assess whether countries with more inclusive export baskets experience different growth trajectories or social outcomes compared to those specializing in less inclusive products.

To measure product inclusiveness, the process begins with two steps. First, a clustering algorithm is applied to classify countries into "inclusive" and "less-inclusive" groups based on three core measures of inclusiveness: (i) income equality, (ii) gender equality, and (iii) the size of the formal sector in the labour market. The three variables are first standardized by subtracting their mean and dividing by their standard deviation. The clustering algorithm is then instructed to form two groups. Each country is assigned to the cluster whose median is closest, based on the Canberra distance, to the median of the three standardized variables.[3]

[3] More formally, if the vector of medians of the three standardised variables in one of the groups is noted m_i where subscript i refers to each of the three variables, and the vector for country c is given by c_i, the Canberra distance between m and c is given by $d(m;c) = \sum_{i=1}^{3} |c_{i-m_i}|/(|c_i| + |m_i|)$.
The Canberra distance has the advantage over the Euclidean distance of giving adequate weight to elements with small absolute values. It has the additional advantage that it can handle cases where elements in both vectors take the value 0.

After this initial assignment, new cluster medians are calculated, and the process iterates—reassigning countries and updating medians—until no countries change clusters between iterations, indicating convergence.[4]

After classifying countries into the two groups, the next step is to calculate, for each HS 4-digit product, the share of global exports accounted for by countries identified as inclusive. This share serves as an indicator of the product's overall inclusiveness in international trade:

$$PRODIp = \frac{\sum_{c \in I} x_{cp}}{x_p} \quad (1)$$

where $PRODIp$ is the share of world exports of product p (HS 4-digit products) of inclusive countries, I is the set of countries c that are classified as being inclusive in the first step, xc,p are exports of product p by country c, and xp are world exports of product p. $PRODIp$ as defined in equation (1) varies between 0 and 1.

Using the values of PRODI for each product ppp, the inclusiveness of each country's export bundle is calculated as an export-weighted average of these product-level inclusiveness scores, following the methodology outlined by Hausmann et al. (2007):

$$EXPI_c = \sum_p \frac{x_{pc}}{x_c} PRODI_p \quad (2)$$

where $EXPIc$ is the inclusiveness of the export bundle of country c, xp,c are exports of product p by country c, and xc are total exports by country c. $EXPIc$ also varies between 0 and 1 as it is a weighted measure of $PRODIp$ which varies between 0 and 1.

While the approach described above divides countries into two clusters—deemed optimal for the current set of variables—this may not remain optimal if additional indicators of inclusiveness are introduced. The methodology is designed to be flexible and can accommodate a greater number of clusters if warranted by the data. For instance, to test the robustness of the results, it is possible to perform a check by allowing for three or more clusters, rather than two, when classifying countries along the three economic dimensions of inclusiveness. Moreover, this allows for assessing the stability of the $PRODIp$ and $EXPIc$ measures under alternative classification schemes.

[4] Because clustering may be sensitive to how data is sorted, the procedure sorts data according to each variable separately, and performs the clustering algorithm three times.

3.

Inclusiveness of exports and countries

Analysis of export patterns suggests that some sectors tend to be more inclusive than others, with less-inclusive products appearing more often in labor-intensive industries and more inclusive products concentrated in high-value or technologically advanced sectors. However, there is substantial variation in inclusiveness across both product types and countries' export baskets.

This section illustrates the results obtained by the methodology described above. It begins by presenting the results of classifying countries into inclusive and less-inclusive groups using a clustering algorithm applied to the three economic dimensions of inclusiveness. It then reports the estimation results of $PRODIp$, along with a discussion of its robustness to alternative specifications. Finally, the results for $EXPIc$ are presented, including an assessment of their sensitivity to the two alternative methods used to construct $PRODIp$.

Classification of countries

Table 1 presents the results of the clustering algorithm using both two and three clusters to identify inclusive countries based on the three economic dimensions: income equality, gender equality, and the share of the formal labour market. When using three clusters, countries in the top group are retained as inclusive, while those in the middle and bottom groups are grouped together as less inclusive. As shown in Table 1, the number of countries classified as inclusive decreases when moving from two to three clusters, as expected. Notably, all countries identified as inclusive under the three-cluster approach were also classified as inclusive under the two-cluster approach. Moreover, no country reclassified as inclusive under the three-cluster method had previously been considered less inclusive under the two-cluster method, reinforcing the consistency of the classification.

Table 1

List of countries based on inclusiveness

#Clusters	Category	Country list
2	More inclusive countries	Algeria, Argentina, Australia, Austria, Bahamas, Belarus, Belgium, Bulgaria, Canada, Costa Rica, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Iran (Islamic Republic of), Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Lebanon, Lithuania, Luxembourg, Malta, Mongolia, Netherlands, New Zealand, Norway, Poland, Portugal, Qatar, Republic of Korea, Republic of Moldova, Russian Federation, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Ukraine, United Kingdom, United States of America, Venezuela (Bolivarian Republic of), Viet Nam, Yemen.
2	Less inclusive countries	Armenia, Albania, Bolivia (Plurinational State of), Brazil, Bhutan, Burundi, Burkina Faso, Cambodia, Cameroon, Chile, China, Colombia, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Georgia, Ghana, Greece, Guatemala, Guinea, Honduras, India, Indonesia, Jamaica, Liberia, Madagascar, Malaysia, Mali, Mauritania, Mauritius, Mexico, North Macedonia, Nicaragua, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Rwanda, Saudi Arabia, Senegal, Sri Lanka, Thailand, Turkey, United Republic of Tanzania, Uganda, Uruguay
3	More inclusive countries	Argentina, Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Costa Rica, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Kazakhstan, Lao People's Democratic Republic, Latvia, Lithuania, Luxembourg, Malta, Mongolia, Netherlands, New Zealand, Norway, Poland, Portugal, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, United Kingdom, Viet Nam.
3	Less inclusive countries	Albania, Armenia, Bahamas, Bolivia (Plurinational State of), Brazil, Bhutan, Burundi, Burkina Faso, Cambodia, Cameroon, Chile, China, Colombia, Cyprus, Czechia, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Georgia, Ghana, Greece, Guinea, Guatemala, Honduras, India, Indonesia, Iran (Islamic Republic of), Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Lebanon, Liberia, Madagascar, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Morocco, North Macedonia, Nicaragua, Pakistan, Panama, Paraguay, Peru, Philippines, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Slovakia, Sri Lanka, Thailand, Turkey, United Republic of Tanzania, Uganda, Ukraine, Uruguay, United States of America, Venezuela (Bolivarian Republic of), Yemen

Note: The two top panels provide the results of the clustering algorithm with two clusters and the bottom two panels the results of the clustering algorithm when using three clusters.

Table 2 presents summary statistics for the two groups of countries identified using the two-cluster classification approach, based on the three economic variables used to define inclusiveness: income equality, gender equality, and the formality of the labour market. On average, countries in the more inclusive group score higher across all three dimensions. Specifically, the average income equality among the 57 more inclusive countries is 65.54, compared to 52.80 among the 51 less inclusive countries. The average gender equality score is 0.71 for the more inclusive group and 0.67 for the less inclusive group. Similarly, the average rate of labour market formality is 76.75 in the more inclusive countries, versus 62.40 in the less inclusive group. Importantly, the differences in means across the two groups are statistically significant, supporting the validity of the clustering approach.

Table 2

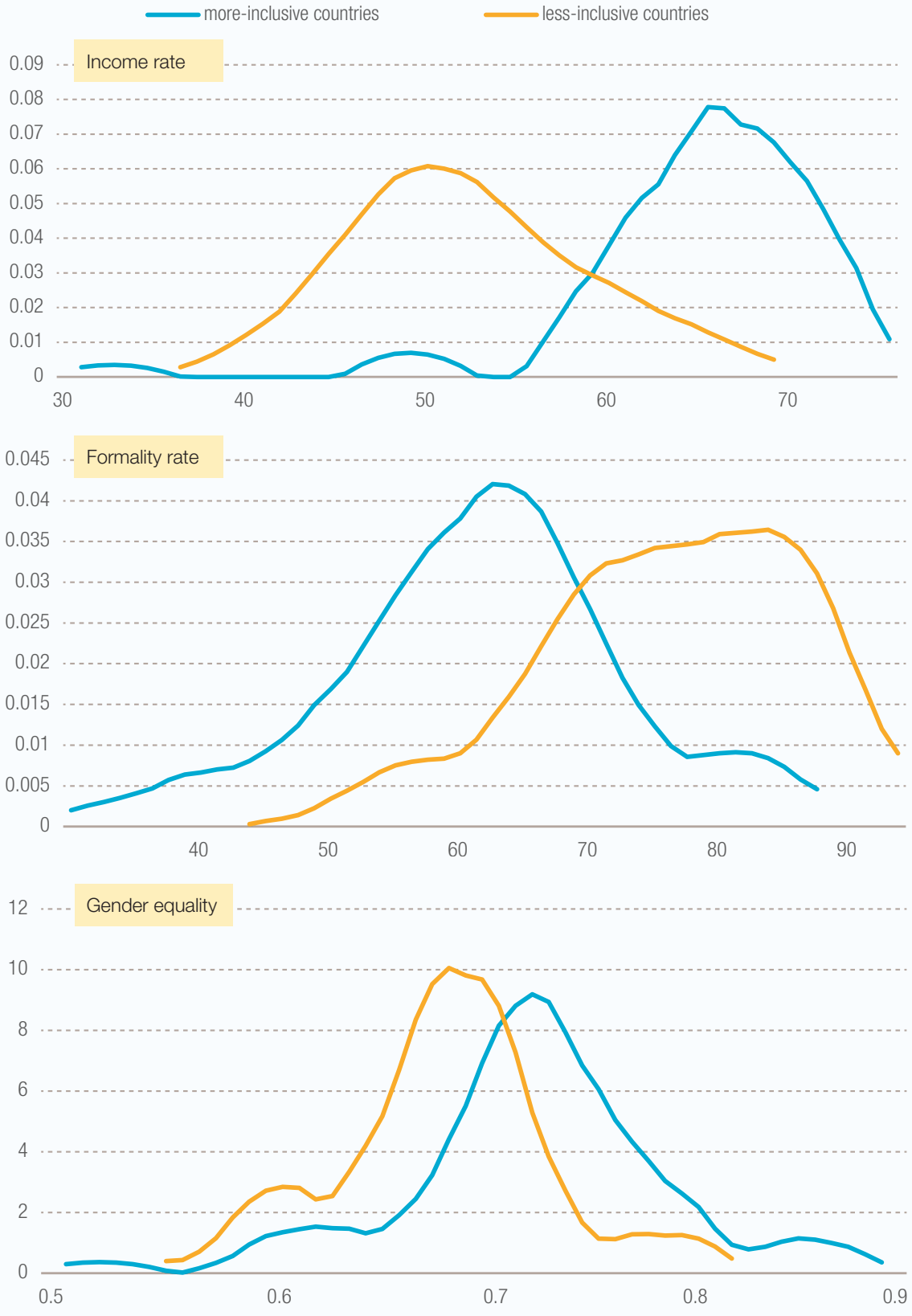
Summary statistics

Variable	#Obs	Mean	Std. Dev	Min	Max
	More inclusive countries				
Income equality	57	65.538	6.765	33.340	74.160
Gender equality	57	0.714	0.063	0.510	0.863
Formality rate	57	76.750	9.528	52.414	91.538
	Less inclusive countries				
Income equality	51	52.795	6.447	40.290	68.080
Gender equality	51	0.672	0.049	0.550	0.790
Formality rate	51	62.402	10.974	35.028	87.690

The average of each variable is statistically greater in the group of more inclusive countries. Income equality measures the degree of equality in income distribution in each country (it is measured as 100 minus the GINI, data come from the WDI). Gender equality is an index taken from WEF (2014) that measures gender equality among various dimensions (education, health, economic participation, and political empowerment). Formality rate measures to the level of formalisation of the economy, i.e. 1 minus the informality rate (data come from Elgin et al. (2021)).

Figure 1

Distribution of inclusiveness variables for more and less inclusive countries



The yellow lines plot the kernel density distribution of each inclusiveness variable for the group of less inclusive countries. And the blue lines plot the distribution for the group of more inclusive countries.

Source: UNCTAD.

To move beyond mean differences, Figure 1 presents the full distribution of the three inclusiveness variables—income equality, gender equality, and labour market formality—for both groups of countries (more inclusive and less inclusive), based on the two-cluster classification.

The distributional plots clearly indicate that the group of more inclusive countries stochastically dominates the less inclusive group across all three dimensions[5].

Computing Product Inclusiveness (PRODI)

After confirming that the classification of countries into more and less inclusive groups along the three economic dimensions produces consistent and reasonable results, the analysis proceeds to calculate the product inclusiveness index (PRODI) for each HS 4-digit product using equation (1). Table 3 displays the distribution of PRODI scores within each HS 2-digit product category, based on the two-cluster classification.[6]

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[5] Stochastic dominance implies that for any threshold value, the cumulative distribution of the more inclusive group lies to the right (or above) that of the less inclusive group, indicating that the former consistently scores higher across the full range of the variable.

[6] The correlation in PRODI values when using two and three digit clusters is 0.8.

Table 3

Distribution of PRODI across HS 2-digit products

HS Code	Short Description	Average	Median	St. Dev
01	Live animals	0.86	0.89	0.09
02	Meat and edible offal	0.83	0.88	0.15
03	Fish and seafood	0.63	0.61	0.16
04	Dairy, eggs, honey	0.83	0.91	0.20
05	Animal products n.e.s.	0.57	0.60	0.28
06	Live plants and cut flowers	0.86	0.90	0.13
07	Vegetables and roots	0.61	0.67	0.20
08	Fruit and nuts	0.57	0.56	0.15
09	Coffee, tea, spices	0.38	0.38	0.13
10	Cereals	0.82	0.96	0.25
11	Milling products, starches	0.74	0.81	0.18
12	Oil seeds, medicinal plants	0.69	0.84	0.29
13	Gums, resins, plant extracts	0.46	0.46	0.14
14	Vegetable products n.e.s.	0.41	0.41	0.02
15	Fats, oils, and waxes	0.68	0.73	0.29
16	Meat and fish preparations	0.58	0.62	0.22
17	Sugars and confectionery	0.56	0.58	0.24
18	Cocoa and cocoa products	0.63	0.68	0.24
19	Cereal preparations	0.70	0.80	0.25
20	Preserved fruits and vegetables	0.59	0.62	0.18
21	Misc. food preparations	0.77	0.81	0.13
22	Beverages and vinegar	0.85	0.89	0.11
23	Food industry waste, animal feed	0.72	0.73	0.18
24	Tobacco products	0.66	0.81	0.26
25	Salt, stone, plaster, cement	0.59	0.60	0.20
26	Ores and ash	0.65	0.67	0.21
27	Mineral fuels and oils	0.73	0.75	0.19
28	Inorganic chemicals	0.70	0.70	0.16
29	Organic chemicals	0.69	0.71	0.14
30	Pharmaceuticals	0.87	0.89	0.10
31	Fertilizers	0.71	0.69	0.23
32	Dyes, paints, inks	0.78	0.84	0.13

HS Code	Short Description	Average	Median	St. Dev
33	Perfumes and cosmetics	0.79	0.78	0.13
34	Soaps, waxes, cleaning agents	0.81	0.82	0.10
35	Proteins, enzymes, glues	0.82	0.78	0.11
36	Explosives and matches	0.70	0.79	0.24
37	Photographic goods	0.87	0.89	0.13
38	Misc. chemical products	0.81	0.84	0.15
39	Plastics	0.77	0.78	0.11
40	Rubber	0.59	0.65	0.27
41	Raw hides and leather	0.72	0.64	0.18
42	Leather goods	0.49	0.46	0.10
43	Furs and artificial fur	0.55	0.51	0.32
44	Wood and wood products	0.68	0.74	0.23
45	Cork and articles of cork	0.97	0.97	0.03
46	Straw and basketware	0.18	0.18	0.05
47	Pulp of wood or paper	0.88	0.91	0.14
48	Paper and paperboard	0.80	0.82	0.12
49	Printed materials	0.76	0.86	0.20
50	Silk	0.40	0.39	0.28
51	Wool and animal hair	0.66	0.67	0.21
52	Cotton	0.36	0.33	0.14
53	Other vegetable fibers	0.36	0.25	0.30
54	Man-made filaments	0.56	0.54	0.17
55	Man-made staple fibers	0.46	0.43	0.23
56	Wadding, felt, yarns	0.60	0.58	0.13
57	Carpets and floor coverings	0.51	0.35	0.26
58	Special fabrics, lace, embroidery	0.45	0.42	0.15
59	Coated and laminated fabrics	0.69	0.69	0.17
60	Knitted or crocheted fabrics	0.53	0.58	0.20
61	Knitted apparel	0.36	0.35	0.13
62	Woven apparel	0.40	0.40	0.13
63	Home textiles, worn clothing	0.39	0.33	0.24
64	Footwear	0.41	0.42	0.14
65	Headgear	0.37	0.31	0.16
66	Umbrellas, canes	0.27	0.29	0.13

HS Code	Short Description	Average	Median	St. Dev
67	Feathers, artificial flowers	0.18	0.15	0.12
68	Stone, plaster, cement products	0.69	0.69	0.17
69	Ceramic products	0.55	0.55	0.20
70	Glass and glassware	0.66	0.71	0.17
71	Precious stones, metals, jewelry	0.68	0.67	0.22
72	Iron and steel	0.77	0.80	0.15
73	Articles of iron or steel	0.65	0.68	0.15
74	Copper and articles	0.70	0.75	0.17
75	Nickel and articles	0.89	0.93	0.11
76	Aluminum and articles	0.72	0.73	0.16
78	Lead and articles	0.82	0.82	0.07
79	Zinc and articles	0.82	0.82	0.06
80	Tin and articles	0.63	0.67	0.27
81	Other base metals	0.67	0.75	0.25
82	Tools and cutlery	0.55	0.54	0.20
83	Misc. base metal goods	0.59	0.63	0.18
84	Machinery and mechanical appliances	0.78	0.82	0.14
85	Electrical equipment	0.63	0.65	0.17
86	Railway equipment	0.71	0.73	0.23
87	Vehicles and parts	0.71	0.76	0.18
88	Aircraft and spacecraft	0.90	0.91	0.04
89	Ships and boats	0.67	0.69	0.22
90	Instruments (medical, optical, etc.)	0.78	0.79	0.12
91	Clocks and watches	0.65	0.65	0.18
92	Musical instruments	0.57	0.54	0.13
93	Arms and ammunition	0.86	0.91	0.10
94	Furniture and lighting	0.55	0.53	0.16
95	Toys and sports goods	0.49	0.45	0.22
96	Misc. manufactured articles	0.46	0.49	0.21
97	Art, antiques, collectibles	0.96	0.97	0.04

According to the methodology discussed above, the HS chapters that rank as less inclusive based on their PRODI index include many categories within the textile and apparel sectors. In contrast, the most inclusive products are found in sectors such as pharmaceuticals, aerospace, certain agricultural goods (e.g., cereals and dairy products), and selected metal products like nickel and zinc. This pattern largely reflects the index's construction: countries that score higher on the three inclusiveness dimensions tend to be relatively larger exporters of these products, thereby determining the ranking. Nonetheless, considerable variation exists within most HS 2-digit categories, indicating notable heterogeneity in export inclusiveness even among products classified under the same HS chapter.

Computing Export Inclusiveness (EXPI)

With the product inclusiveness index (PRODI) in hand, the analysis computes each country's export bundle inclusiveness (EXPI) using equation (2). Table 4 illustrates EXPI values for all countries in 2021, based on the two-cluster classification.[7] The countries with the highest EXPI scores include Ireland (84%), Switzerland (83%), New Zealand (82%), Belgium (81%), and Mali (80%). In contrast, countries with the lowest EXPI values in 2021 include Cambodia (40%), Pakistan (41%), Panama (41%), Sri Lanka (43%), and Mauritius (50%). It is important to note that this ranking captures the inclusiveness of countries' export compositions based solely on the three dimensions defined above, and does not necessarily reflect the broader structural inclusiveness of their economies or societies.

[7] The correlation between the EXPI measures when using two and three clusters is 0.77.

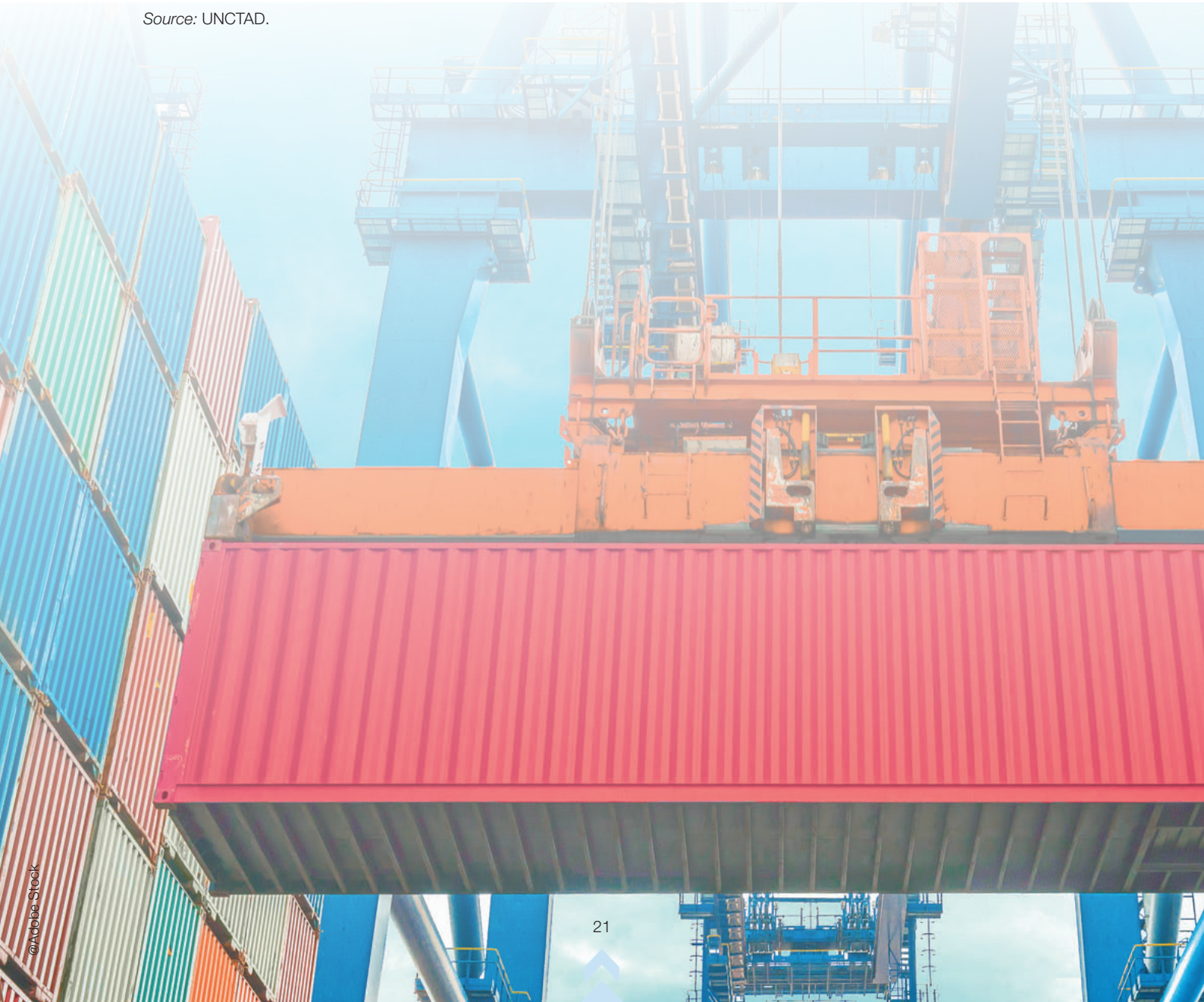
Table 4

Distribution of EXPI in 2021

Country	EXPI	Country	EXPI
Cambodia	0.40	Czechia	0.70
Panama	0.40	Costa Rica	0.70
Pakistan	0.41	Lebanon	0.70
Sri Lanka	0.43	Republic of Moldova	0.70
Mauritius	0.50	Uganda	0.70
Guatemala	0.52	Estonia	0.71
Albania	0.53	Argentina	0.71
Ecuador	0.53	Singapore	0.71
Chile	0.53	Republic of Korea	0.72
Viet Nam	0.54	Belarus	0.72
Indonesia	0.54	Iran (Islamic Republic of)	0.72
El Salvador	0.55	Israel	0.72
Honduras	0.55	Hungary	0.72
Peru	0.56	Italy	0.73
China	0.57	Romania	0.73
Burundi	0.57	North Macedonia	0.73
Nicaragua	0.58	Greece	0.73
Madagascar	0.58	Croatia	0.73
Guinea	0.58	Denmark	0.73
Philippines	0.59	Netherlands	0.73
Mongolia	0.61	Slovakia	0.73
Armenia	0.61	Algeria	0.73
Malaysia	0.62	Australia	0.73
Morocco	0.62	Russian Federation	0.74
Thailand	0.64	Malta	0.74
Rwanda	0.64	Bahamas	0.74
Liberia	0.64	Spain	0.74
Cameroon	0.64	Iceland	0.74
Mauritania	0.65	Lithuania	0.74
Ghana	0.65	Saudi Arabia	0.75
Brazil	0.65	Norway	0.75
Türkiye	0.65	Venezuela (Bolivarian Republic of)	0.75
Colombia	0.66	Latvia	0.75
Paraguay	0.66	United States of America	0.75
India	0.66	Austria	0.75
Senegal	0.66	Burkina Faso	0.76
Jordan	0.66	Canada	0.76
Mexico	0.66	Luxembourg	0.76
Yemen	0.67	Sweden	0.76
Bhutan	0.67	Japan	0.77

Country	EXPI	Country	EXPI
Fiji	0.67	Finland	0.77
Egypt	0.67	Ukraine	0.77
Kazakhstan	0.68	Germany	0.77
Georgia	0.68	Qatar	0.78
Dominican Republic	0.68	Slovenia	0.78
Bolivia (Plurinational State of)	0.68	France	0.78
United Republic of Tanzania	0.68	South Africa	0.78
Lao People's Democratic Republic	0.68	Cyprus	0.79
Jamaica	0.69	United Kingdom	0.80
Poland	0.69	Belgium	0.81
Uruguay	0.69	Mali	0.81
Bulgaria	0.69	New Zealand	0.82
Portugal	0.69	Switzerland	0.84
Kyrgyzstan	0.70	Ireland	0.86

Source: UNCTAD.



4.

Impact of export inclusiveness on GDP per capita

Taking export inclusiveness into account is important, as countries whose exports are concentrated in more inclusive sectors generally see higher income growth, regardless of overall export size or wider social policies. This evidence highlights the role of trade policies that foster inclusive production to promote economic growth, with robustness checks supporting the consistency of these findings.

This section uses the EXPI results to examine whether countries with higher levels of export inclusiveness have experienced faster growth in GDP per capita.

To estimate the relationship between export inclusiveness and income growth, the analysis relies on the following equation:

$$y_{c,t} = \gamma EXPI_{c,t} + \beta X_{c,t} + \alpha_c + \alpha_t + \epsilon_{c,t} \quad (3)$$

where $y_{c,t}$ is the GDP per capita in country c at time t, $EXPIc,t$ is the measure of the inclusive intensity of the exports of country c explained in the previous section, and Xc,t is a set of country specific controls that include total exports and the Inclusiveness Index by the Othering & Belonging Institute at Berkeley. Controlling for total exports ensures that the coefficient γ isolates the effect of reallocating production toward more inclusive sectors, rather than capturing the broader impact of export volume on income. Similarly, including the Berkeley index helps disentangle the effect of export inclusiveness from the influence of a country's overall institutional and social inclusiveness. The model also includes country fixed effects to control for unobserved, time-invariant characteristics (αc)—such as geography, historical institutions, or long-term development trajectories—and time fixed effects (αt) to capture global shocks or trends that affect all countries in a given year. This specification assumes that, conditional on these controls, the variation in export inclusiveness across time and countries helps identify its impact on income growth.

To address endogeneity concerns, countries are classified and PRODI is estimated using data from 2012–2014, while the impact of EXPI on income per capita is assessed over the subsequent period, 2015–2021. To further mitigate potential endogeneity arising from the construction of the EXPI index, four robustness tests will be conducted. First, a version of $PRODIp$ will be constructed that excludes country c own trade flows when calculating $EXPIc$ for that country. Then, three placebo tests will be performed: (1) randomly assigning countries to inclusive and less-inclusive groups, (2) randomly allocating export shares between inclusive and less-inclusive countries to compute $PRODIp$, and (3) randomly redistributing export shares within each country to construct $EXPIc$.

Impact of export inclusiveness on GDP per capita

Using the export bundle inclusiveness measure (EXPI) over time for each country, the analysis estimates how increases in export inclusiveness affect income per capita. Table 5 shows the results from estimating equation (3). Columns (1) and (2) report baseline results using two- and three-cluster classifications, respectively. Both models find positive and statistically significant coefficients on export inclusiveness and total exports. Specifically, a 1 percent increase in export bundle inclusiveness leads to a 0.22 percent increase in income per capita under the two-cluster classification and a 0.26 percent increase under the three-cluster classification. The broader Inclusiveness Index from the Othering & Belonging Institute at Berkeley does not show a statistically significant effect. This suggests that more inclusive policies alone do not directly raise income per capita, while a more inclusive export bundle—measured across the

three economic dimensions here—strongly associates with higher income levels. One reason the Berkeley Inclusiveness Index lacks significance is its limited variation within countries over time, and country fixed effects capture most of the variance.

Columns (3) and (4) add controls for the rule of law and human capital. The results remain qualitatively similar to those in columns (1) and (2), although the coefficients for the rule of law and human capital are positive but not statistically significant. This does not imply that rule of law or human capital have no effect on income per capita; rather, the short time span of the panel limits within-country variation, making it difficult to estimate their precise impact.

Finally, columns (5) and (6) address potential endogeneity in constructing the export inclusiveness measure. To do this, exports from each country ccc are excluded when calculating the product inclusiveness measure, which then feeds into that country's export inclusiveness. Table 3 shows that the estimates in columns (5) and (6) closely match those in columns (3) and (4), indicating that the EXPI measure does not suffer from endogeneity by construction.

Table 5

Impact of EXPI on income per capita

	(1)	(2)	(3)	(4)	(5)	(6)
Ln EXPI (2-cluster)	0.222[a]		0.212[a]		0.213[a]	
	(0.069)		(0.071)		(0.071)	
Ln EXPI (3-cluster)		0.255[a]		0.245[a]		0.245[a]
		(0.074)		(0.075)		(0.075)
Ln Total Exports	0.057[a]	0.065[a]	0.055[a]	0.062[a]	0.055[a]	0.062[a]
	(0.016)	(0.016)	(0.017)	(0.018)	(0.017)	(0.018)
Berkeley Index	0.017	0.018	0.016	0.018	0.016	0.018
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Rule of Law			0.042	0.041	0.042	0.041
			(0.050)	(0.050)	(0.050)	(0.050)
Ln Human Capital			0.118	0.095	0.118	0.095
			(0.143)	(0.140)	(0.143)	(0.140)
Country FE	✔	✔	✔	✔	✔	✔
Year FE	✔	✔	✔	✔	✔	✔
Observations	519	519	519	519	519	519

The table reports the results of the estimation of equation (3). Odd columns report results using a two-cluster algorithm to classify countries into more or less inclusive, and even columns report results using a three-cluster algorithm. Columns (5) and (6) report results excluding exports from country c when computing the PRODI that will be used to calculate EXPI for country *c*. Standard errors are clustered at the country level. Significance levels: [c] p<0.1, [b] p<0.05, [a] p<0.01

Source: UNCTAD.

5.

Concluding remarks

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The methodology presented in this note offers a tool for designing trade and industrial policies that foster inclusive growth. It can assist governments in monitoring progress and aligning trade strategies with broader social and sustainable development goals. While data limitations and correlation-based results warrant cautious interpretation, the framework provides flexibility and actionable insights for incorporating social outcomes into trade policy decisions.

This note introduces a novel methodology to assess the inclusiveness of countries' export bundles across three core economic dimensions: income equality, gender equality, and labour market formality. By using clustering techniques to classify countries into more and less inclusive groups, the approach produces product- and country-level inclusiveness indices that offer a new lens through which to examine the structure of international trade.

The insights derived from this methodology can inform trade and industrial policies aimed at fostering exports sectors that are generally associated with inclusiveness as defined by the three dimensions used in this study (income equality, gender equality, and labour market formality. This enables a shift in trade policy—beyond a narrow focus on volumes or value-added—toward one that explicitly considers social outcomes within global production systems. On the other hand, countries that find themselves historically specialized in less inclusive sectors may consider pro-active social policies to address the social impact of these sectors.

The export inclusiveness index can also function as a practical tool for monitoring and evaluating the inclusiveness of trade over time. It allows for evidence-based adjustments to policy in response to changing patterns in trade and inclusivity, including improvements in labour conditions, gender representation, and income distribution.

Moreover, the framework's adaptability to incorporate additional dimensions—such as minority representation or environmental standards—makes it a forward-looking tool that can evolve with data availability and policy priorities. This makes it especially relevant for countries seeking to align their trade strategies with broader sustainable development objectives and inclusive growth agendas.

Finally, while the methodology offers a simple framework for assessing export inclusiveness, it is important to outline some of the main limitations. First, its feasibility depends on the availability and quality of national-level data, which may be limited in low-income or informal economies. This calls for better and more comprehensive data if economic inclusiveness has to be properly measured and monitored. Second, the approach assumes that products exported by more inclusive countries are themselves inclusive—an assumption that may broadly hold but overlooks product varieties and differing production methods, which can introduce substantial sectoral heterogeneity. Third, the framework captures correlations rather than causal relationships. The presence of certain products in inclusive economies' export baskets does not imply that these products drive inclusiveness. As such, findings should be interpreted with caution and ideally complemented by micro-level empirical evidence.

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