Original Article

A Economy and Space

EPA: Economy and Space
2022, Vol. 54(7) 1323–1340

DOI: 10.1177/0308518X221107023
journals.sagepub.com/home/epn
SAGE

Global locational inequality: Assessing unequal exchange effects

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Abstract
Growth in international trade between countries at different levels of development is one of the main drivers of economic globalization. This phenomenon relates to the new international division of labour in which an Emerging Periphery, hosting the offshoring and outsourcing of world manufacturing, stands between a developed Center and a still backward, Poor Periphery. Following the analysis of the relative and absolute indices of global locational inequality, the effect of the unequal exchange on world income distribution in the last 25 years is investigated. A new methodology based on real currency misalignments and value-added trade is presented, which accounts also for international value transfers within global value chains. The counterfactual test shows that trade value transfers represent a significant source of revenue for the Center diverted from the Peripheries. Unequal exchange widens the opportunity gap between citizens of rich and poor countries through an increase in global locational inequality. Redefining post-pandemic international economic rules should therefore recognize the effect of unequal exchange on global inequality.

Keywords
Global inequality, unequal exchange, global value chains, uneven development, international trade

Introduction

As part of the theme of uneven development, the unequal exchange approach focuses on the mechanisms of value transfer implicit in trade relations between countries at different levels of development in a capitalist world economy. According to Wallerstein (2000, 56) a 'capitalist world-economy is based on a division of labour between its core, its semi periphery, and its periphery in such a way that there is unequal exchange between the sectors' through which international

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transfers of economic surplus occur. In this theoretical framework, the value drain suffered by the peripheral countries is a key mechanism for reproducing underdevelopment. In fact, it diverts economic surplus away from the capital accumulation required to boost economic modernization for the benefit of the more developed core countries. Besides dynamic effects, unequal exchange affects the distribution of world income. The distributional aspect of unequal exchange, however, does not find much attention in the literature. This article aims to investigate the effects of value transfers implied by an unequal exchange on global income inequality between countries during the age of capitalist globalization (1995–2019), characterized by a new international division of labour and the related growth in trade.

Over the past quarter century, the world economy underwent a radical restructuring process that affected both the spheres of global production and the global circulation of commodities. Major changes in the technological pattern and the economic policy regime have made the reorganization of the world economy possible. On the production side, the rapid spreading of new information and communication technologies allowed the remote and instantaneous coordination of productions at a great spatial distance. Thus, multinational firms can opt for the most cost-efficient location for each stage of production without losing control over the entire workflow. The former industrial organizational model, once vertically integrated within the internal hierarchical structure of multinational firms, has been replaced by a more flexible configuration, labelled 'the global factory' (Buckley 2009). This new industrial model increasingly uses horizontal and decentralized market relations to attain the final form of the product through an intricate network of intermediaries and subcontractors located around the globe (Heintz 2006). On the commercial side, after the Cold War, the neoliberal paradigm of the 'Washington Consensus' led to a broad liberalization of international real and financial flows. As a result, international trade, driven by intermediate and semi-finished products, grew at a faster rate than world gross domestic product.

Such structural and political transformations had a strong impact on the geography of the global economy. Intricate global value chains (GVCs) emerged in which the final value of the commodity is the outcome of working processes performed in several regions of the world (Gereffi and Korzeniewicz 1994; Bair 2005; Gereffi 2014; World Bank 2020; Bair et al. 2021). Together with vertical links inside GVCs sequential production, interconnected nodes of layered horizontal relations emerged across national borders between a multitude of competing institutional, political, social and cultural actors, structuring the transnational space through complex Global Production Networks (Hess and Yeung 2006; Coe, Dicken and Hess 2008; Yeung 2021). The effects on the global economic structure are extensive. The former dualism between industrially advanced central economies and backward peripheral economies with a predominantly agricultural and extractive vocation has been replaced by a more complex international division of labour (Taylor 2008; Charnock and Starosta 2016). Hence, a new geography of development has arisen, in which an Emerging Periphery, formed by the countries hosting the offshoring and outsourcing of world manufacturing, stands between a developed Center and a still backward, Poor Periphery. These trends support the view, originally proposed by Wallerstein (1976), that the semi-peripheral countries have an emerging competitive advantage. Similarly, Mahutga and Smith (2011), relying on the methodological approach of network analysis, show that over recent decades the intermediate countries experienced higher economic growth than countries at the extremes of the international division of labour.

In this new industrial configuration, a large part of material production, especially manufacturing, is localized in a selected group of peripheral countries. Conversely, the central countries specialize in the more profitable upstream and downstream intangible stages. With rare exceptions, peripheral industrialization was patchy, limited to few territorial areas, and dependent on the global market and the variable relocation choices of multinational firms (Arrighi and Drangel 1986; Arrighi et al., 2003; Selwyn 2015). The most notable exception is China which adopted

its peculiar model of integration into the global economy, comprising a predominant role of the State in terms of public ownership, planning of strategic industries and strict banking and financial regulation, alongside a broad openness to foreign direct investment by multinational capital (Herrera 2014; Dunford et al. 2021; Macheda and Nadalini 2022). Because of these changes in the international division of labour, in recent decades the weight of exports of goods and services on world Gross Domestic Product (GDP) has more than doubled, rising from 12.8% in 1970 to 28.3% in 2019, with a peak of 31% in 2008 (World Bank data). The fastest growing component of exports is intermediate goods and services inside the global production chains of multinational firms, which in the last decade accounted for about 50% of world trade (World Bank 2020, 19).

What effects did the value transfers implicit in the new geography of world production and trade have on global income distribution? Section 2 presents an overview of global inequality during the age of globalization (1995–2019), using the decomposition originally proposed by Bourguignon and Morrisson (2002) into within-country inequality and between-country inequality. This distinction was later resumed by Milanovic (2012a) in terms of social or class inequality and locational inequality. Regarding global social inequality, statistical evidence shows a significant redistribution of income from labour to capital and from poorer to richer citizens, which increased interpersonal inequality within each country as well as globally. In contrast, the picture emerging from the geographic distribution of world income between countries is more complex. Different aspects of global locational inequality, concerning relative and absolute dimensions and demographic weighting, are analysed. The 'locational premium' (Milanović 2015) shows the impact of place of living on global inequality. It measures the inequality that would exist if domestic income distribution were perfectly egalitarian by the average per capita income gaps between different locations. Various indices of locational inequality are calculated both analytically, as the individual income variability relative to the world average, and synthetically, as the relative and absolute global Gini index. The results show a moderate reduction in relative income gaps, mainly driven by China's economic growth, faced with a persistent and increasing widening of absolute income gaps, particularly affecting the Poor Periphery.

Next, the counterfactual test will determine the impact of value transfers in trade resulting from the unequal exchange on global locational inequality. Section 3 discusses unequal exchange using a new methodology for measuring implicit value transfers in international trade based on real exchange rate misalignments. The novelty regarding previous estimates lies in sample size, including almost all countries in the world, and in using data on exports in value added, rather than in gross final value, to include value transfers within GVCs. The results discussed in section 4 suggest that unequal exchange plays a substantial role in determining per capita income, positively for the central recipient regions and negatively for the peripheral donor regions. Hence, unequal exchange widens the opportunity gap resulting from the locational premium of the place of living. Finally, section 5 contains concluding remarks.

Global inequality in the age of globalization

Global inequality is defined as the inequality in the distribution of income among the citizens of the world. It can be broken down into two components, within-country social inequality and between-countries locational inequality (Milanović 2012a). The first component results from domestic interpersonal income inequality measured through household surveys with individuals as units of observation. It is largely affected by the functional distribution of income among social classes within each country. The second component deals with per capita income inequality between countries as measured by national accounts, either unweighted or weighted by the respective demographic size.

From the point of view of the functional distribution, neoliberal globalization has been marked by a consistent increase in the share of capital income, in both forms of industrial profit and financial rent, at the expense of the wage share. This regressive redistribution occurred in all countries, regardless of their level of economic development. According to ILO (2019), in the period 2004–2017 the worldwide share of labour income fell from 53.7% to 51.4% with a homogeneous decreasing trend in all continents. Other studies confirm that since the early 1990s the world labour share declined, partly because of the increasing international openness of national economies (Guerriero 2019; Doan and Wan 2017). In addition, within the labour share, there has been a polarization towards the top level, with a reduction in the relative income of the poor and middle strata of the working population (Franzini and Pianta 2016; Piketty 2017). As a result, the concentration of income and wealth has become more pronounced. Indeed, over the period of 1980–2016, the top 1% captured 27% of global real income growth, while the bottom 50% captured only 12% (Alvaredo et al. 2018, p. 13).

While global social inequality increased during neoliberal globalization, the picture appears more complex for global locational inequality as measured by comparing average levels of GDP per capita. An issue arising, in this case, is that nations of dramatically different demographic sizes are placed on the same footing. To reduce the population standard deviation between analytical units, we group individual countries into geographical regions through a population-weighted aggregation. In this way, we measure differences in per capita income between large geographical areas of the world economy, rather than between individual countries.

Table 1 shows the ratio between regional and world average GDP per capita in current dollars over the period of 1995–2019, both in absolute terms and as a cumulative change. The first indicator reflects individual variability relative to the world average, so that the measure of inequality is independent of the unit of income denomination. It thus complies with Krtschas (1994) criterion. The second indicator shows the income redistribution from areas with a negative sign to those with a

Table 1. GDP per capita in current dollars, 1995–2019. World = 100.

		Year			Cumulative % change		
Group	Region	1995	2007	2019	95–19	95–07	08–19
Center	*North America*	511.4	545.4	546.2	***6.8***	*6.6*	*0.2*
	EMU	432.1	441.2	335.3	***−22.4***	*2.1*	*−24.0*
	West Europe	498.1	617.0	423.7	***−14.9***	*23.9*	*−31.3*
	East Asia	638.6	365.4	335.6	***−47.5***	*−42.8*	*−8.2*
	Oceania	293.2	377.2	343.8	***17.2***	*28.6*	*−8.9*
Emerging Periphery	*China*	17.2	35.5	91.4	***432.2***	*106.9*	*157.2*
	Russia	33.1	90.0	80.0	***141.3***	*171.7*	*−11.2*
	East Europe	52.7	118.3	120.3	***128.4***	*124.6*	*1.7*
	South America	81.7	74.8	70.1	***−14.1***	*−8.4*	*−6.3*
	Central America	57.5	83.8	72.3	***25.8***	*45.7*	*−13.7*
	Middle East	63.7	95.5	96.9	***52.0***	*49.8*	*1.5*
Poor Periphery	*South Asia*	7.5	11.3	17.6	***133.9***	*50.2*	*55.7*
	Southeast Asia	27.0	27.8	36.2	***34.1***	*3.1*	*30.0*
	Central Asia	31.7	54.6	42.7	***34.4***	*72.0*	*−21.8*
	North Africa	27.1	32.6	28.9	***6.6***	*20.1*	*−11.2*
	S. Sahara Africa	14.5	14.9	13.5	***−7.1***	*2.2*	*−9.1*
	World	100.0	100.0	100.0	***0.0***	*0.0*	*0.0*

Source: Own elaborations on World Bank data.

positive sign. When making international income comparisons, a choice has to be made on the set of exchange rates to convert national currencies into a common unit. There are two options: the purchasing power parity (PPP) or the market exchange rates. It is preferable to use PPP exchange rates to compare income purchasing power within the respective domestic markets, and market exchange rates to compare income purchasing power in the global economy (Wade 2004; Anand and Segal 2008). Our focus is on trade value transfers in the global economy, so we use market exchange rates. Hence, income and value transfers will always be consistently expressed in nominal dollars throughout the paper. PPP exchange rates will only be used in section 4 to calculate the real exchange rate misalignments from the equilibrium that ensures terms of trade parity.

The data refer to 175 countries grouped in 16 geographic and economic homogeneous regions shown in Appendix 1. In addition, regions are assigned to macro-groups according to the classical tripartition of world system and dependency approach. For this purpose, various classification methods have been used to measure the position of countries in the world-economy hierarchy (Dezzani 2012). Since our analysis focuses on the world income distribution, here we adopt the income through methodology (Arrighi and Drangel 1986; Babones 2005). Therefore, the classification criterion relies on the GDP per capita at the end of the period, according to the following classification: Poor Periphery including regions with less than half the world average, which accounts for 52.2% of the world's population; Emerging Periphery including regions between half and twice the world average, which accounts for 34.3% of the world's population; Center including regions with more than twice the world average, which accounts for 13.5% of the world's population. The period under consideration is divided into two sub-periods of equal amplitude, with the Great Recession as a landmark.

Over the entire period, five regions worsened their relative position. Three regions belong to the Center (EMU, West Europe and East Asia) and one each to the Emerging Periphery (South America) and the Poor Periphery (Sub-Saharan Africa). Among the other improving eleven regions, the extraordinary performance of China stands out. At the end of the period, this country has almost reached the average world per capita income, starting from an initial level of less than one-fifth. Far behind the Chinese record, three regions more than doubled their relative per capita income. They are Russia and Eastern Europe, which at the beginning were still suffering from the collapse of their previous planned economy, and South Asia, which started from extremely low-income levels. Among the remaining regions, it is worth noting the strengthening of North America within the group of wealthy central regions, and of the other Asian regions within the peripheral groups. Finally, the mediocre performance of the two African regions highlights the ongoing exclusion of this continent, the poorest in the world, from the circuits of appropriation and distribution of world wealth. As for the two sub-periods, in the first expansionary phase, only two regions (East Asia and South America) lost ground, while after the outbreak of the crisis the peripheral Asian regions alone continued to improve their position in front of decline or stagnation of all the others. Therefore, the Great Recession marked a structural break in global geo-economic dynamics, particularly emphasizing the weakness of European economies and the progressive shift of the world's economic barycenter from the Atlantic to the Pacific area. In terms of global locational inequality, the immediate impression is of a reduction in the gaps in relative average per capita income over the 25 years considered. However, these gaps remain very large, as shown by the ratio between the per capita incomes of the richest and poorest regions, which, in 2019, is greater than 40. This means that a sub-Saharan African citizen, on average, earns in 1 year the same income that a North American citizen earns in 9 days.

Figure 1 shows trends in relative GDP per capita, expressed as a logarithmic scale with the world average equal to one, for the three groups of regions. In addition, the figure for the Emerging Periphery is decomposed to capture the specific contribution of China versus the rest of the group. The semi-logarithmic plot shows the Center maintains almost intact its advantage, the

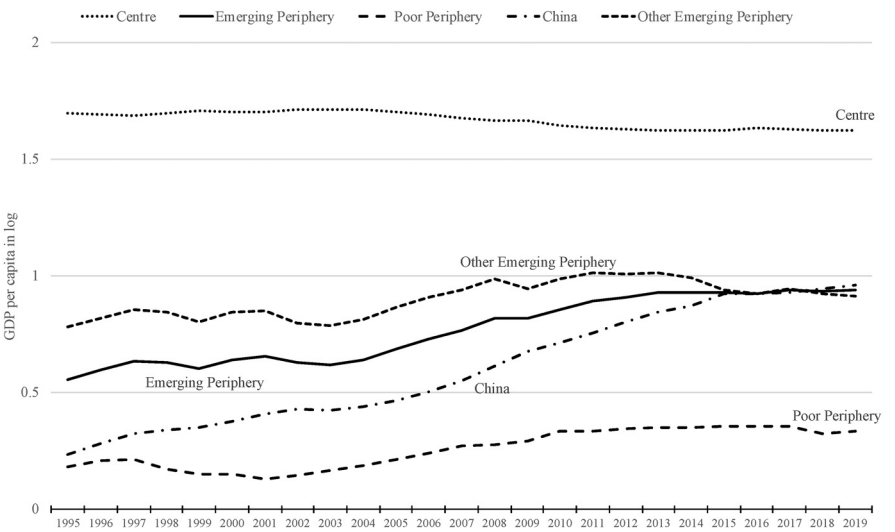

Figure 1. GDP per capita in current dollars, 1995–2019. Logarithmic scale with World = 1.
Source: Own elaborations on World Bank data.

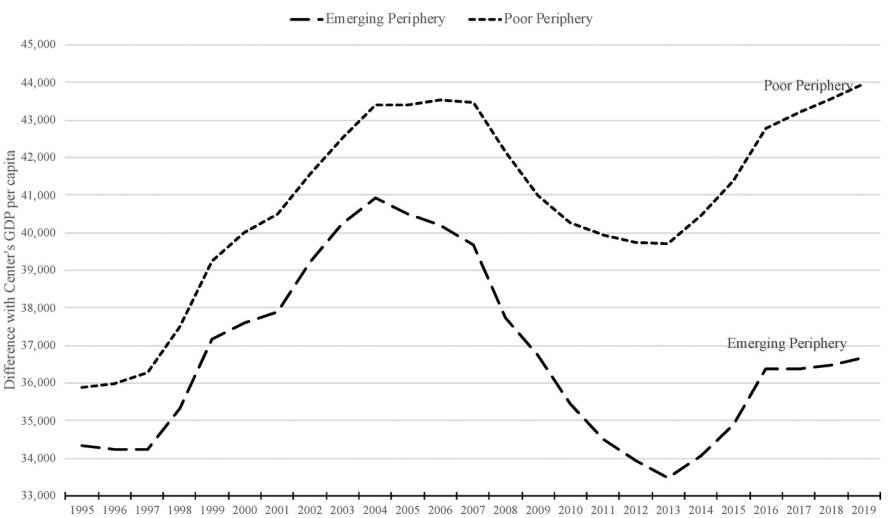

Figure 2. Difference in per capita GDP at constant 2010 dollars between Center and Peripheries, 1995–2019.
Source: Own elaborations on World Bank data.

Poor Periphery has a rather modest growth in relative per capita GDP, and the progress of the Emerging Periphery is largely due to the particular trajectory of China.

Hence, the initial perception of the narrowing of global locational inequality is reduced. This is confirmed by Figure 2, showing the absolute differences between per capita GDP of the Center and those of the two Peripheries measured in constant dollars at 2010 basis. Despite a fluctuating trend, the absolute income gap widened at the end of the period for both Peripheries. Thus, if on the one

hand globalization led to slow and uneven convergence of relative income levels, on the other hand, absolute income inequality between the richer and poorer regions has not stopped growing.

So far, we have analysed population unweighted world inequality, albeit by strongly mitigating its distortions through geographic and economic regional aggregation. However, to take full account of the demographic dimension, a more synthetic indicator is required, allowing for an aggregate quantification of distributional asymmetry. One of the most widely used measures of socio-economic inequality is the Gini index. It compares the cumulative proportion of the population with the cumulative proportion of income, ranging between 0 with perfect equality and 1 with maximum concentration of distribution.

Figure 3 shows the trend of the relative Gini index of the distribution of world income between regions over the period of 1995−2019, based on the regional population and GDP in current dollars. The solid line shows the Gini index for all 16 regions of the world economy, while the dotted line refers to the Gini index excluding China. It is possible to discern China's contribution to the world index of inequality from their difference. Over the whole period, the world Gini index fell from 0.69 to 0.53, showing a clear reduction in the total dispersion of average incomes among the 16 regions. Despite this progress, however, the world income distribution remains very unequal. According to the World Bank database (data extracted June 8, 2021) only eight countries, all in Sub-Saharan Africa, have a national Gini index higher than the world index. Similar results are reported in Milanović (2012b) and United Nations (2013), which have individual countries as the unit of observation and use PPP. Our estimations, on the other hand, consider regions as the base unit, and use current dollars to investigate the relative position of citizens of different regions in the world market, rather than within individual national markets. Looking at the Gini index excluding China, the reduction is more modest, stopping at 0.60 in 2019. Therefore, the exceptional performance of the Chinese economy explains almost half of the global decrease. Finally, the greatest reduction occurred in the years immediately following the 2008 crisis that most severely affected the central regions, after which global inequality increases again.

So far, we have analysed the relative Gini index, which considers inequality to be unchanged when there are equiproportional increases in income. However, while commonly used, this is an extreme definition of the concept of inequality, since it disregards changes in absolute income levels. Suppose, for

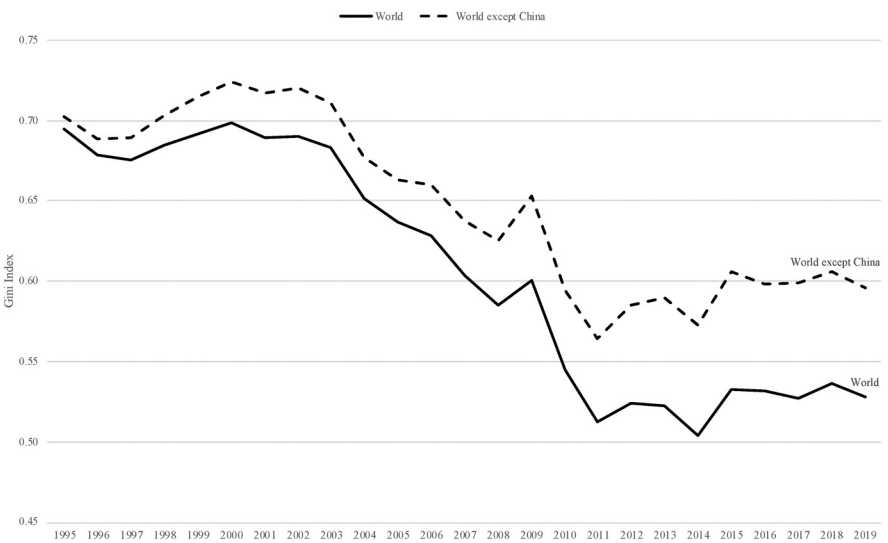

Figure 3. Gini index of world GDP distribution, current dollars 1995–2019.
Source: Own elaborations on World Bank data.

example, a population composed of two groups of the same size, the first having an income of 10 and the second an income of 100. If both income increases by 10%, the relative Gini index remains unchanged, although the absolute income gap has risen from 90 to 109. In that case, whether inequality has remained the same, as the relative Gini index suggests, or increased is a normative judgement (Atkinson and Brandolini 2004). A compromise is to consider inequality as increasing when incomes grow by the same proportion and decreasing when they grow by the same amount (Subramanian and Jayaraj 2013). An index that meets this intermediate criterion is the absolute Gini index, defined as the relative Gini index multiplied by the average world level of per capita income in current dollars (Niño-Zarazúa et al., 2017). As the trend line in Figure 4 shows, in absolute terms, the global index of locational inequality has increased. Despite a short reversal in the years immediately before and after 2008, in recent years it is significantly higher than at the outset.

To summarize, the dynamics of global locational inequality during the years of capitalist globalization is characterized by an uneven process of convergence of relative income levels. This process, driven by the spectacular growth of China, to a large extent occurs within, rather than between, the three groups (Center, Emerging Periphery and Poor Periphery) resulting from the new international division of labour. Three distinct periods can be identified. The first phase of expansive globalization up to the early 2000s is marked by a widening of relative global inequality, which in the second phase, at the turn of the 2008 financial crisis, decreases rapidly. This trend is reversed in the third and final phase from the beginning of the new decade when relative global inequality widens again following the economic stabilization after the Great Recession. In absolute terms, however, global inequality grows throughout the period.

Theoretical background and measurement methodology of unequal exchange

In principle, when the value of exported commodities corresponds to the price realized from their sale on the world market, international trade has no direct effect on the world distribution of income. In that

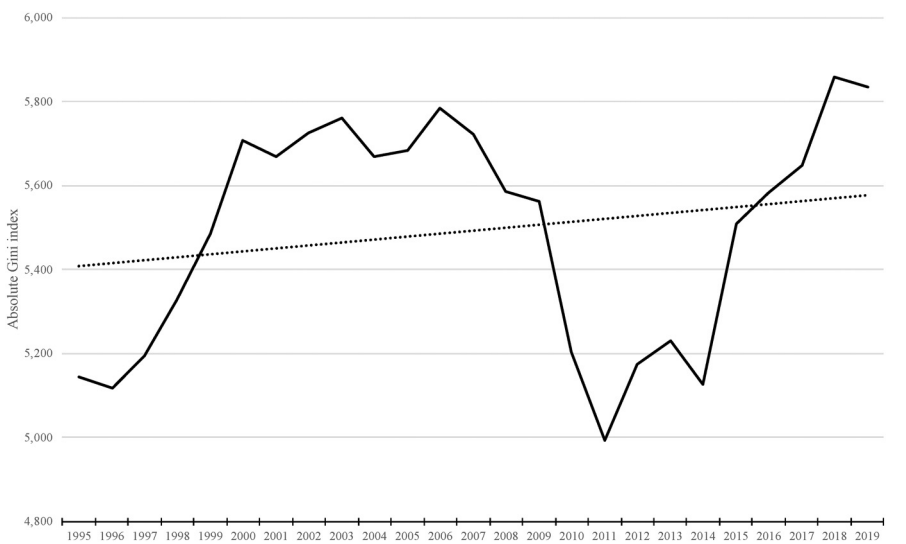

Figure 4. Absolute Gini index of world GDP distribution between regions, 1995–2019.
Source: Own elaborations on World Bank data.

case, the terms of trade, defined as the ratio between the prices of imported and exported goods of equal worth, are in equilibrium and equal to one. Neoclassical economics assumes that the adjustment mechanism leads the international economy towards an automatic equilibrium in competitive markets. In this situation, long-run nominal exchange rates should ensure the PPP of the different national currencies, such that real exchange rates, defined as the ratio of national price levels expressed in a common currency, fluctuate close to unity. Given these premises, neoclassical theory concludes that international exchanges are always equivalent, even when they occur between countries with a very different level of economic development. The neoclassical trade theory, however, is at odds with the long-established persistent higher price levels in higher-income countries than in lower-income countries. This phenomenon is known in the literature as the 'Penn effect' (Kravis and Lipsey 1983). Despite relaxing the rigid initial assumptions by introducing non-tradable goods with the so-called 'Balassa (1964)-Samuelson (1964) effect', neoclassical trade theory has not yet reconciled with the empirical evidence of the Penn effect (Engel 2000; Lothian and Taylor 2008; Zhang 2017; Eleftheriou and Müller-Plantenberg 2018; Ricci 2021b, chap.5).

The harmonious neoclassical view of international economic relations is challenged by the theory of unequal exchange, which argues on the contrary that free trade exacerbates development gaps, determining a regressive redistribution of world income through value transfers from poor to rich countries. There are two main modern theoretical approaches to unequal exchange: structuralist, associated with the leading figures of Lewis (1954), Prebisch (1959) and Singer (1950), and Marxist, with Emmanuel (1972) and Amin (1976) as important protagonists. In this theoretical framework, international exchanges are not equivalent because of a systematic divergence between the value produced and captured by different countries on the world market. This implies a persistent imbalance of the terms of trade to the exclusive benefit of rich economies at the expense of poor ones.

In the 1970s−1980s, the unequal exchange hypothesis was widely discussed at the political and academic levels, and several estimates of the value transfers implied by international trade were proposed. (Gibson 1980; Webber and Foot 1984; Marelli 1983; Williams 1985; Joseph and M. Tomlinson 1991). Their main limitation was the difficulty of determining a common numeraire for quantities of labour with different national productivity when only data on market wages and prices were available (Raffer 1987, chap. 11). These empirical difficulties, coupled with theoretical shortcomings in demonstrating unequal exchange in competitive markets, rendered the unequal exchange hypothesis unattractive.

In the following years, however, the new availability of PPP data, resulting from the launch of the International Comparison Program by the World Bank and the United Nations (Kravis 1986), allowed for more accurate international comparisons. In this light, a new methodology for measuring unequal exchange was proposed. It is based on the systematic difference between PPP and nominal exchange rates, or Exchange Rate Deviation Index (ERDI), resulting in the persistent currency overvaluation of the richer countries and, conversely, undervaluation of the poorer countries (Yotopoulos 1996; Kolher 1998; Reich 2000 and 2007). A theoretical argument for this new methodology, even in the presence of perfectly competitive markets, has recently been suggested based on a reconstruction of Marx's international theory of value (Ricci 2021b). On this basis, new estimates of trade value transfers were performed, showing the relevance of unequal exchange in the contemporary world economy (Köhler 2003; Somel 2003; Elmas 2009; Ricci 2019 and 2021a; Hickel et al., 2021).

We make use of the ERDI methodology to calculate value transfers in international trade. Defining ERDI as the ratio of PPP exchange rate to the nominal exchange rate, the value transfers (T) implied by international trade for each country are calculated according to the following expression, where X^{VA} denotes exports in value added:

$$T = (1 - ERDI)(X^{VA})$$

When ERDI is below one, the current exchange rate is overvalued relative to PPP and, conversely, when ERDI is above one, it is undervalued. The country with an overvalued currency has favourable terms of trade and benefits from value inflows in international trade. Vice versa, the country with an undervalued currency has unfavourable terms of trade and suffers value outflows. This methodology measures only one of the two components of unequal exchange, as it does not include the differential rent component of inter-industry unequal exchange developed by Ricci (2019) and also applied by Baiman (2020). However, this second component, which would increase the size of unequal exchange, is not measurable in our case, because of the lack of a world input–output matrix that includes all 175 countries considered here.

In sum, two points distinguish this research from previous estimates. First, the use of trade data expressed in value added, rather than in gross final value, allows the evaluation of the country's particular contribution in each intermediate stage of production, so that international transfers occurring within GVCs are captured. Second, the size of the sample, the same as in the previous section, includes almost all countries in the world with a temporal continuity of data from 1995 to 2019.

Results: Unequal exchange and global inequality over the period of 1995–2019

For each country, ERDI is derived from International Monetary Fund data as the ratio of GDP in PPP to current GDP. Demographic data are derived from the World Bank database. International trade data are taken from the UNCTAD-EORA GVCs database referring to the country-by-country breakdown matrix (see Casella et al. 2019 for methodological background). The steps to determine from the UNCTAD-EORA raw data the total value added achieved by a country are as follows. First, the domestic value added in national exports is calculated by subtracting the foreign value added from the total value added in national exports. Then the result is added to the domestic value added in other countries' exports to get the total domestic value added of the country's exports. This procedure is reiterated for each of the 175 countries in the sample. In all years, value transfers flow from low-income peripheral regions to high-income central regions. Their growth in nominal terms is substantial, rising from $1334 billion in 1995 to $3924 billion in 2019. In relative terms, their global amount fluctuates around 5% of global GDP. But more significant is to consider the relative share of value transfers on the GDP of the three groups of regions, as shown in Figure 5.

For the central regions, value inflows to GDP increased significantly, rising from an initial 5.4% to 7.8% in the last year, showing the growing importance of unequal exchange for the more developed economies. The two peripheral groups, starting from a similar situation with considerable outflows of value around 20% of GDP in 1995, subsequently exhibit a divergent trend. Since the early 2000s, the Emerging Periphery shows a rapid reduction in value outflows up to 6.3% of GDP in 2019. By contrast, the Poor Periphery suffered a drastic deterioration in the 1990s, followed by a period of partial reduction of value outflows which, however, in 2019 were still higher at 22.8% of GDP than at the outset. This evolution results from the new international division of labour marked by the rapid economic growth of some emerging countries, China in particular, and the economic marginalization and decline of large areas of the poorer periphery, such as Africa. The economies of the Center, on the other hand, partially offset the negative macroeconomic impact of the financial crisis by relying more on their 'currency rent' in the world market.

Since unequal exchange can be considered as a tribute paid by citizens of poorer countries to those of richer countries hidden in international trade, Table 2 shows the annual per capita value transfers at the beginning, middle and end of the period, and their average weight on the per

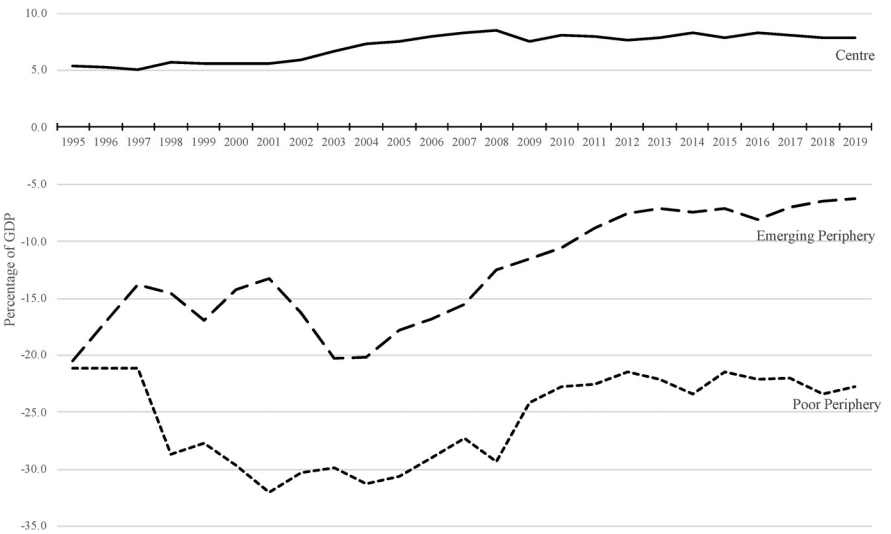

Figure 5. Value transfers in percentage of GDP, 1995–2019.
Source: Own elaborations on Unctad-Eora, IMF and World Bank data.

capita income of the 16 regions of the world economy. In the Centre, the absolute and relative figures for the two European regions are impressive, as value transfers account on average for over 10% of their per capita income, growing further since the 2008 financial crisis. North America and East Asia maintained stable value inflows of around 4% and 6%, respectively, of their per capita income throughout the period, while Oceania experienced a sharp increase in the second phase following the financial crisis. Turning to the peripheral regions, Southeast Asia stands out, with an average outflow of value approximating half of the per capita income over the entire period, although the temporal dynamics show a progressive improvement. Then comes North Africa with a constant outflow of value equal to almost a third of per capita income. The overall average figures for Russia and Eastern Europe are strongly affected by the collapse of the Soviet Bloc in the early 1990s. For all other peripheral regions, the outflow of value is between 10% and 20% of per capita income, except for South America, where the weight of unequal exchange appears substantially lower. Finally, it should be noted the positive performance of China, which in the last decade reduced the outflow of value up to only 4% of per capita income in 2019.

The data discussed above show that at the level of individual regions, value transfers resulting from unequal exchange substantially affect the level of average per capita income, positively for the central regions and negatively for the peripheral regions. To measure the impact of unequal exchange on overall global inequality, a counterfactual Gini index is computed assuming a scenario of the world economy in the absence of value transfers, leaving all other things unchanged. Comparing the two Gini indices, actual and counterfactual, allows us to examine how value transfers affect the locational premium, which indicates the opportunity gaps resulting from the place of living between citizens in different areas of the world economy. To calculate the counterfactual Gini index, we remove unequal exchange from actual GDP by subtracting inward transfers from the income of recipient countries and adding outward transfers to the income of donor countries. In this way, we can compare the actual locational inequality expressed by the effective Gini index discussed in section 2, with the counterfactual one that would exist if the terms of trade between countries were in equilibrium, all other things being equal.

Table 2. Per capita unequal exchange, 1995–2019.

	In current dollars			In % of per capita GDP		
Annual per capita transfers	1995	2007	2019	*95–19*	*95–07*	*07–19*
North America	761	1965	2680	***3.9***	*3.7*	*4.1*
EMU	1720	4939	4836	***10.3***	*8.5*	*12.2*
West Europe	2429	7531	6921	***12.7***	*10.6*	*14.8*
East Asia	1984	1766	2540	***5.8***	*5.9*	*5.7*
Oceania	526	2626	3638	***7.1***	*4.5*	*9.8*
China	−196	−810	−426	***−14.1***	*−19.0*	*−10.0*
Russia	−767	−1108	−1850	***−29.7***	*−40.9*	*−17.2*
East Europe	−901	−615	−1309	***−14.7***	*−18.9*	*−9.9*
South America	−269	−472	−490	***−6.1***	*−8.4*	*−3.9*
Central America	−471	−379	−454	***−11.9***	*−13.6*	*−9.8*
Middle East	−1443	−1502	−950	***−18.9***	*−24.8*	*−12.8*
South Asia	−77	−220	−351	***−21.5***	*−20.2*	*−23.0*
Southeast Asia	−463	−1350	−1631	***−46.8***	*−53.9*	*−40.3*
Central Asia	−272	−380	−924	***−11.9***	*−13.6*	*−9.8*
North Africa	−426	−1099	−1034	***−30.7***	*−31.6*	*−30.4*
S. Sahara Africa	−65	−120	−132	***−10.0***	*−11.6*	*−8.3*

Source: Own elaborations on Unctad-Eora, IMF and World Bank data.

Figure 6 shows the difference in percentage terms of the actual and counterfactual Gini indices. As can be seen, the unequal exchange is a non-negligible factor in making the world income distribution more unequal. In the age of globalization, its contribution to the global Gini index increased overall from 4.8% in 1995 to 7% in 2019. The peak close to 9% was reached in 2008 with the outbreak of the financial crisis when there was a rapid fall followed by a stabilization in the last decade.

One of the main reasons that make the relative Gini index so popular as an indicator of inequality concerns the possibility of deriving the Lorenz curve. The Lorenz curve coincides with the bisector of the quadrant with perfect equality, in which every individual receives the same income. Conversely, it coincides with the broken line formed by the horizontal axis and the right vertical axis with perfect inequality, in which a single individual receives the whole income. So the farther Lorenz curve lies from the bisector of the quadrant, the more unequal the distribution of income. The Lorenz curve is a widely used tool in the theory of social welfare because it allows the evaluation of the redistributive effects of policy measures in terms of total social utility (Kakwani 1980). Assuming identical social utility functions for all individuals, and provided the Lorenz curves of two alternative distributions do not intersect, the more egalitarian distribution is always welfare-superior. In that case, progressive measures of redistribution from the richest to the poorest improve total social welfare, while regressive measures from the poorest to the richest worsen it.

Figure 7 shows exactly the case for the actual world income distribution in the year 2019 compared with the counterfactual one without unequal exchange. Thus, we can conclude that unequal exchange substantially increases global inequality and worsens global social welfare.

Conclusions

The present study contributes to establishing a link between two strands of literature that have so far been quite separate, global inequality on the one hand, and unequal exchange on the other. These

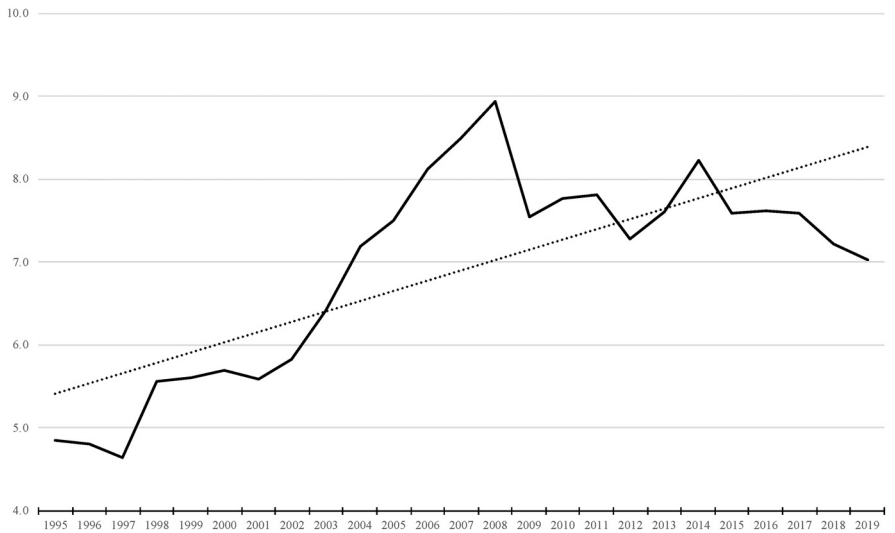

Figure 6. Percentage contribution of unequal exchange to world Gini index, 1995–2019.
Source: Own elaborations on Unctad-Eora, IMF and World Bank data.

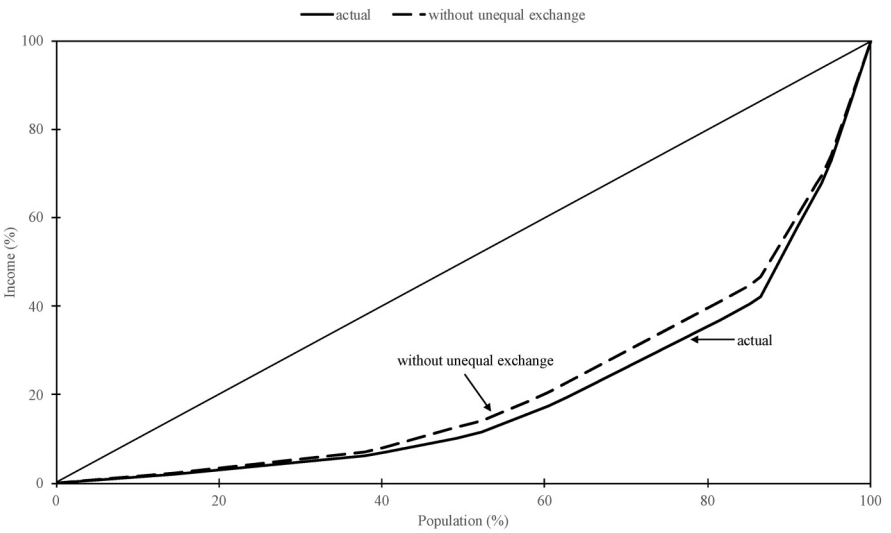

Figure 7. Actual and counterfactual Lorenz curve with and without unequal exchange, year 2019.
Source: Own elaborations on Unctad-Eora, IMF and World Bank data.

two themes are in fact connected since value transfers arising from uneven trade affect the actual distribution of global income by increasing global locational inequality resulting from the place of living. Furthermore, unequal exchange has been calculated through a new methodology, based on real exchange rate misalignments, using value-added trade data, unlike previous studies based on gross exports. In doing so, international transfers of value within the GVCs of multinational firms are assessed.

Over the past quarter century, capitalist globalization produced radical transformations in the international division of labour, the organization of production, and the world circulation of commodities. All this altered the previous framework of global inequality. At the social level, in both the more developed and less developed countries, there has been a significant redistribution of income from labour to capital and from the poorest to the richest citizens, supported by the dominant neoliberal policies, which aggravated the already wide global interpersonal inequalities in social and economic conditions. Besides, at the geographical level, global absolute inequality increased despite a moderate reduction in relative inequality, mainly driven by the exceptional performance of China. As a result, the per capita income gap between the rich regions of the Center and the regions of the Poor Periphery, where the absolute majority of the world's population lives, widens.

In this new scenario, the unequal exchange implicit in international trade played an important and increasing role in determining global inequality. Transfers of value, resulting from the difference between the value produced and captured on the world market by different countries, constitute a structural feature of the global capitalist economy. They benefit rich countries with higher labour productivity to the detriment of poor countries with lower labour productivity. This mechanism reflects in the constitution of a global monetary pyramid with the currencies of the more developed countries at the top and the currencies of the less developed countries at the bottom, which gives rise to a systematic and permanent alteration of the terms of trade to the advantage of the former and to the disadvantage of the latter. Although with different degrees of intensity, our analysis showed that unequal exchange is a heavy burden for the peripheral economies and, on the contrary, a substantial premium for the central economies. Hence, it widens the opportunity gap between citizens of rich and poor countries through an increase in global locational inequality.

Two complementary conclusions can be drawn. Since it involves transfers of value from the poorest to the richest, unequal exchange worsens global social welfare, not just for individual countries or regions. Trade or fiscal policy measures aimed at correcting the regressive effects of unequal exchange on the world income distribution improve social welfare globally, not just for individual countries that experience value drainage. There is, therefore, a full rationale for interventionist national and regional economic policies in the Periphery, aimed at rebalancing the unfavourable terms of trade generated by the free and spontaneous functioning of the global market. However, even more effective and efficient would be a global redistributive intervention aimed at reducing the regressive consequences of unbalanced trade on the world distribution of income. Then, it would be desirable that the issue of unequal exchange, and the distortions in allocative efficiency and distributive equity that it entails, should find a place on the international agenda of post-pandemic reconstruction of the global economy.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Appendix

Appendix 1: Country's classification in geographical regions

North Africa: Algeria, Egypt, Libya, Morocco, Tunisia.

Sub-Saharan Africa: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African, Chad, Congo Dem., Congo Republic of, Côte d'Ivoire, Djibouti, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe

Oceania: Australia, Fiji, New Zealand, Papua New Guinea, Samoa, Vanuatu.

China: China, Hong Kong SAR, Macao SAR, Taiwan (data source IMF).

East Asia: Japan, South Korea, Singapore.

South Asia: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.

Southeast Asia: Brunei Darussalam, Cambodia, Indonesia, Lao People's, Malaysia, Myanmar, Philippines, Thailand, Vietnam.

Central Asia and the Caucasus: Afghanistan, Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Turkey, Uzbekistan, Mongolia.

Western Europe: Denmark, Iceland, Norway, San Marino, Sweden, Switzerland, United Kingdom.

Eastern Europe: Albania, Bosnia, Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Montenegro, Poland, Romania, Serbia.

Russia and CSI: Moldova, Russia, Ukraine, Belarus.

EMU: Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Latvia, Lithuania, Estonia, Slovak Republic, Slovenia.

Middle East: Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab, United Arab, Yemen.

Central America and Caribbean: Bahamas, Antigua, Aruba, Barbados, Belize, Costa Rica, Dominican Rep., El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama,Trinidad and Tobago.

North America: Canada, United States.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela.