

# **PROFIT RATE, LABOUR EXPLOITATION AND FOREIGN TRADE. A 'MARX-RICARDIAN' APPROACH**

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## **Abstract**

The present study is aimed at contributing to the literature on unequal exchange by empirically estimating the effect of the terms of trade on the main variables of Marx's economic analysis. To this purpose, a method that relies heavily on the analytical apparatus developed for Marxian analysis throughout the second half of the 20th century (*i.e.*, Morishima and Seton (1961), Morishima (1973) and Wolff (1979)) is proposed. By focusing on the analysis of variables in terms of labour value, this study may provide a more nuanced understanding of how unequal exchange manifests in international trade, which is often masked when only considering nominal prices. Data collected in the World Input-Output Database 2016 release are applied to estimate the effects of unequal labour terms of trade on the main variables of Marx's analysis, covering the assessment for 43 countries from 2000 to 2014. The study's main conclusion is that inequality in terms of trade favours a higher rate of profit in the centre and a lower rate of profit in the periphery. The main implication of all this is that if the effect of the terms of trade on growth rates were of the same order as the effect on profit rates, the unequal exchange could explain a good deal of the lack of convergence between rich and poor countries.

Keywords: Unequal exchange, surplus value, labour terms of trade, development

## Introduction

The compatibility of Ricardo's (1821) labour value theory and Marx's (1867, 1894) law of value in the context of uneven development is an ongoing debate. In their respective theories, Ricardo and Marx posited that the exchange of commodities in the capitalist mode of production implies an exchange of equivalents. Therefore, in the sphere of circulation, useful objects representing the same amount of socially necessary labour time are exchanged. However, scholars concerned with development have found it necessary to revise this assumption to comprehend the relationship between poor and rich countries.

According to development economics theorists, the stark backwardness of the Global South in comparison to developed countries might be rooted in the unequal exchange that occurs in the context of international trade, exacerbating global economic disparities. To support this statement, the literature invokes the transition from the first to the third book of Marx's *Capital*.

In the first book, Marx (1867) delved into the concept of capital in general to explain surplus production, which means that prices are proportional to values. In the third book, the focus shifted to describing how competition redistributes surplus among industries, transforming values into production prices (1894). This process is driven by the movement of capital towards sectors that offer the highest profitability while economically unattractive industries are abandoned. As a result, profit rates tend to equalise, making the production prices the gravitational centres for market prices in the long run. As noted by Marx (1894), the production price of sectors whose capital organic composition is higher than the social average will be superior to their value. The opposite occurs in industries with a low capital organic composition: the value is higher than the production price.

Therefore, when commodities are selling at a market price close to production prices, the industries that are intensive in labour power transfer value to sectors that are intensive in capital. Despite Marx placing the exploitation in the sphere of production -

*i.e.*, between capital and labour- some Marxian scholars inferred from the differences in the organic composition of capital discussed the exploitation of one nation by another.

In this vein, Bauer (1907) was likely the first author to establish the connection between the differences in the organic composition of capital and value transfers in international trade. As Bauer (1907, pp. 200–201) noted, the most developed countries or regions are characterised by a higher organic composition than less developed countries or regions, which means that surplus value is redistributed through the mechanism that equalises profit rates. In other words, the most developed countries or regions exchange less labour objectified than they receive from the backward economies. Thus, the capitalists in the most developed country or region not only exploit their workers but also appropriate a portion of the surplus value produced in the less developed region.

Like Bauer, Grossman (1929, pp. 293–295) maintains that the world equalisation of profit rates implies that value transfers from developing to developed countries. Given that advanced capitalist countries have a high organic composition of capital, their commodities will be exchanged at prices higher than their values in international trade. This means surplus value transfers from countries with a lower organic composition of capital to advanced capitalist countries that permit equalised profit rates.

On the other hand, Grossman (1929, p. 296) also infers unequal exchange within an industry from the idea of extra profit as profit upon alienation. According to Grossman, when commodities are sold at social prices, firms equipped with the best production techniques —*i.e.*, superior to the social average—make extra profits at the expense of those firms whose techniques of production are lower than the social average. Concretely, firms with the most advanced technologies produce cheaper commodities than their competitors, which are exchanged at market prices higher than their individual value. The difference between market price and individual value represents the extra profit, thus connecting with profit upon alienation *à la* James Steuart.

The mechanism is the same in the global market. When commodities are sold at world market prices, the countries with the best techniques make extra profit at the expense of countries whose technological and economic development is backward. Transfers of value are not only the result of intersectoral differences in the organic composition of capital but also arise from the uneven techniques of production within an industry. Bauer and Grossman not only set the theoretical foundations for the vast literature on unequal exchange but also disclosed the importance of the terms of trade to understand the uneven development.

On the basis of the above, the present study is aimed at contributing to the literature by empirically estimating the effect of the terms of trade on the main variables of Marx's economic analysis. To this end, the analysis takes advantage of the function of aggregation factors that Marx attributed to labour values, thus estimating the effect of labour terms of trade.

To the best of our knowledge, to date there have been no studies estimating how the terms of trade may affect the main variables of Marx's economic analysis. Indeed, most of the studies that have attempted to bring the theory of unequal exchange to empirical analysis have focused their estimation on value transfers between countries. On the contrary, in the present study the focus is on how unequal terms of trade can affect the variables that, according to Marx's analysis, impact on the accumulation of capital and, therefore, the economic growth of countries.

The study is structured as follows. In Section 1, we examine theoretically the unequal exchange hypothesis and its relationship with the term of trade. Section 2 explains mathematically labour value in an open economy. In Section 3, labour value is estimated. In Section 4, the results are critically discussed. Section 5 summarises the concluding remarks.

## 1. Unequal exchange: A brief literature review of a long discussion

Although Bauer and Grossman anticipated the theoretical foundations of unequal exchange, Emmanuel (1962, 1972) was the first author to use the term. Refusing the notion of monopolistic capital *à la* Baran-Sweezy<sup>1</sup> (1966), Emmanuel explained unequal exchange on the basis that international prices are regulated by capitalist competition and the tendency towards equalizing profit rates.

Thereby, the analysis is focused on capital movements among countries. According to Emmanuel, the rate of profit in developing countries is higher due to their extremely lower wages compared to developed countries, persisting over time as labour power immobility<sup>2</sup>. Therefore, the rate of exploitation in the Third World is greater, generating extra profits that developed countries may appropriate through the mechanism that equalizes profit rates.

Because firms from wealthier countries invest in less wealthy countries, attracted by more favourable profitability conditions, capital flows from developed to developing countries eventually equalise the global profit rate and form the production prices that

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<sup>1</sup> According to Baran and Sweezy, mature capitalism is characterised by large monopolies that determine their prices by "subjectively" setting a profit margin over unit production costs, thereby eliminating the validity of the law of value disclosed by Marx as the regulator of market prices in long run. In this way, the monopolies would obtain extra profits at the expense of the less concentrated sectors, representing a kind of unequal exchange explained by market power. However, authors such as McNulty (1968), Weeks (1981), Shaikh (2016), Semmler (1981, 1984), Tsoulfidis (2015), or Tsoulfidis and Tsaliki (2019) show that Baran and Sweezy's notion is based on the quantitative theory of competition put forth by marginalist economics, in which the number of firms measures the degree of competition. Conversely, the concentration and centralization of capital result from the dynamic competition process, which means that a greater or lesser number of firms does not indicate whether there is a more or less competitive struggle. In this vein, Emmanuel's great merit is establishing the debate on unequal exchange without abandoning Marx's law of value.

<sup>2</sup> Following Marx, Emmanuel (1962, 1972) conceived wages as an exogenous variable determined by a historical and moral element. In this way, Emmanuel may explain why wages in developed countries are between twenty and fifty times higher than in developing countries. While in developed countries, the development of the productive forces modifies and creates new needs by increasing the consumer basket with more and better products, in developing countries, the needs of workers remain at a lower stage so that the value of their labour power is almost at the level of physiological subsistence. Thus, Emmanuel (1962, p. 59) concludes that the extra profit of unequal exchange stems from the difference between the capability of the "underdeveloped" man to use modern tools and his primitive necessities. On the other hand, Emmanuel made an interesting critique of the widely held idea that wages are determined by direct labour productivity. Since the value of labour-power is subject to the value of the commodities that enable the social reproduction of the workers and their families, the productivity of the sectors providing the means of subsistence matters in determining wages, not the productivity of the sector in which the labour-power is employed as suggested by Emmanuel's opponents.

regulate international market prices. Hence, when commodities are traded at prices close to production prices, a portion of the extra surplus value produced by developing countries is transferred to developed countries.

However, Emmanuel received strong criticism from his contemporaries for assuming that value transfers solely stem from wage differences between countries and that unequal exchange<sup>3</sup> would thwart the international socialist program as it turned the workers of developed countries into a sort of *labour aristocracy* or *white-collar workers* living off the exploitation of developing countries. Despite facing strong criticism from both his contemporaries and later authors, Emmanuel should be credited for inspiring literature that explains unequal exchange based on Marx's law of value.

In that regard, the works of Carchedi (1991) and Shaikh (2016) are notable as they take up Grossman's perspective by examining the mechanism of intra-sectoral value transfers. Given that each commodity represents the social labour time determined by the best reproducible technical conditions of production -i.e., modal or regulating conditions- the individual value of firms with the best techniques will be lower than social value, whereas the opposite occurs with technologically lagging firms.

Therefore, Carchedi and Shaikh point out that if commodities are exchanged at market prices proportional to social value, high technologically firms would appropriate an extra profit at the expense of low technologically firms<sup>4</sup>. It is important to remark that

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<sup>3</sup>It should be noted that Emmanuel (1972) that value transfers that occur when wages are equal, and the organic composition of capital differs among nations are not a real unequal exchange. According to Emmanuel, that scenario is equivalent to the national relationships between industries based on the redistribution of general surplus value to equalise the profit rate and form production prices inherent in capitalist competition. In this sense, Bettelheim (1962), Amin (1970, 1981) or Marini (1979) critic Emmanuel's standpoint because the sectoral differences in the organic composition of capital imply, in turn, sectoral differences in labour productivity. For these authors, those industries that are intensive in capital may appropriate extra surplus value at the expense of industries that are intensive in labour power as they are more productive. Nevertheless, Astarita (2010) discloses that assuming that one sector is more productive than another is unreasonable since they produce qualitatively distinct commodities representing incomparable use values. In other words, it makes no sense to state that the industry that produces 1,000 units of *i* per hour is more productive than those that produce 500 units of *j* per hour because the commodities *i* and *j* are different useful things. Consequently, Emmanuel emerges victorious in this debate.

<sup>4</sup>As noted by Shaikh, value transfer from the lowest to the best technologically firms is closely related to James Steuart's profit upon alienation, disclosing that the second source of profit is an unequal exchange in circulation.

this intra-industry unequal exchange holds even when value is transformed into production prices through the tendency toward equalisation of profit rate.

While real competition within an industry involves the rate of profits tends to differ among firms, inflows and outflows of capital will tend to level profitability among industries, as discussed previously. Shaikh states that these apparently contradictory tendencies coexist insofar as those equalised profit rates correspond to modal firms or regulating capitals. That is, production prices that regulate market prices in each industry are the sum of regulating capitals` unit costs and the average profit rate.

Because real competition within an industry compels firms to sell their commodities at the same price -the so-called Law of Correlated Prices *à la* Shaikh- firms with the best techniques will realise an extra profit as their individual value is lower than the production price. These value transfers will be greater if sector in which these firms compete has an organic composition of capital superior to social average (see Table 1). In the context of a national economy, unequal exchange stems, then, from the differences in productivity among firms as wages tend to be equal within an industry.

**Table 1. Value transfers**

	High C/V	Low C/V
High efficiency	+	-
Low efficiency	-	-

Source: Based on Shaikh (1980, p. 49)

Shaikh extends this approach by including the international trade. In contrast to Ricardo`s theory based on comparative costs<sup>5</sup>, Shaikh contends that the absolute cost

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<sup>5</sup> Shaikh (1979, 1980, 2016) criticizes Ricardo's foreign trade theory on its main points: 1) the idea that Hume's (1752) specie flow mechanism regulates international prices and 2) the assumption of capital immobility across borders. On the first point, Shaikh refers to the monetary theories of Steuart (1767) and Marx (Marx, 1859, 1867, 1894), who argued that the total prices in an economy determine the amount of money in circulation, not vice versa, as Hume and Ricardo suggested. This means that an excess of money in circulation can be hoarded, affecting bank reserves and interest rates. Specifically, when money is taken out of circulation and hoarded, it increases bank reserves and reduces interest rates. Since the most competitive country has a trade surplus, money inflows will reduce its interest rates. Conversely, money outflows will increase interest rates in countries

advantage regulates the real terms of trade. That is to say, the real exchange rates are regulated by the relative vertically integrated unit labour costs of modal firms or regulating capitals from each industry internationally<sup>6</sup>.

Therefore, unequal exchange depends not only on different levels of productivity but also on different levels of wages among countries. If productivity differentials exceed wage differentials, firms in less developed countries will transfer value to firms in more developed countries. In other words, when a country has an absolute cost advantage in a given sector, it will appropriate extra profits at the expense of the country with an absolute cost disadvantage in the same sector. Unequal exchange among nations emerges from intra-industry technological and wages differences, as well as inter-industry differences in organic composition of capital, revealing the importance of measuring the effects of the terms of trade on uneven development.

It is worth mentioning that when analysing the effect of terms of trade and changes in relative prices, it is essential to resort to the labour theory of value. As noted by Morishima (1973), Marx's theory not only explains equilibrium prices but also facilitates the aggregation of factors.

Connecting this to the hypothesis of unequal exchange as explored by Bauer, Grossman, Emmanuel, and Shaikh, the reliance on the labour theory of value becomes particularly significant. Emmanuel's framework emphasizes the disparities in the exchange value of labour between different countries, highlighting the structural inequalities in global trade. Similarly, Bauer and Grossman analysed how capitalist dynamics and imperialist practices lead to unequal exchange, focusing on the distribution of surplus value. Shaikh's contributions further examine the competitive mechanisms and

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with a trade deficit. In this sense, Shaikh takes up Harrod's (1957) insight by disclosing the importance of international capital mobility insofar as it will permit adjusting the balance of payment even with the trade deficit. Concretely, capital will flow from competitive countries to lesser competitive countries attracted by their higher interest rates. Like Emmanuel, Shaikh highlights that the fundamental flaw in Ricardo's theory is his supposition of capital immobility.

<sup>6</sup> Several studies have obtained robust empirical evidence that may support Shaikh's theory (Antonopoulos, 1999; Antonopoulos & Shaikh, 2012; Boundi-Chraki & Perrotini-Hernández, 2021; Boundi Chraki, 2021; Martínez-Hernández, 2010, 2017; Poulakis & Tsaliki, 2022, 2023; Seretis & Tsaliki, 2016; Tsaliki et al., 2018; Tsoulfidis & Tsaliki, 2019).



value transfers inherent in international trade, reinforcing the analysis of unequal exchange.

The present study proposes a method that relies heavily on the analytical apparatus developed for Marxian analysis throughout the second half of the 20th century (*i.e.*, Morishima and Seton (1961), Morishima (1973) and Wolff (1979)). This method, to a certain extent, can be considered a continuation of Wolff's (1979) work. Unlike other methods proposed in the literature, the present study focuses on the analysis of variables in terms of labour value<sup>7</sup>. By analysing variables in terms of labour value, this study may provide a more nuanced understanding of how unequal exchange manifests in international trade.

This method allows for a deeper examination of the intrinsic value disparities and the exploitation embedded in global economic structures, which are often masked when only considering nominal prices. Thus, the study contributes to the ongoing discourse on unequal exchange by integrating and extending the theoretical foundations laid by Bauer, Grossman, Emmanuel, and Shaikh.

## **2. Labour Value in an Open Economy**

In Marx's economic thought, the labour theory of value plays at least two functions (Morishima, 1973): i) explain equilibrium prices (or exchange values), around which real prices fluctuate over time; ii) facilitate aggregators or aggregation factors.

Virtually, it is possible to quantitatively determine the basic ingredients of Marx's economic analysis from Leontief's input-output framework. However, to this end, it is necessary to make a series of hypotheses. Some particularly important assumptions are:

1. For each industry, there is only one production method available.
2. There are no primary factors of production other than labour; this is measured in terms of abstract, homogeneous, or unskilled labour.

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<sup>7</sup> As pointed out by Duménil (1980), calculating in terms of values and prices often yields similar figures.

3. All production processes have the same production period and are of the 'point-input-point-output' type.

Now, consider an economy with  $n$  productive sectors and define:

- $\mathbf{A}$  = an  $n \times n$  matrix of input-output coefficients;
- $\mathbf{K}$  = an  $n \times n$  matrix of capital-output coefficients;
- $\mathbf{b}$  = an  $n \times 1$  vector of good shares in wage consumption;
- $\mathbf{x}$  = an  $n \times 1$  vector of gross production;
- $\mathbf{l}$  = an  $n \times 1$  vector of labour-output coefficients
- $\boldsymbol{\lambda}$  = an  $n \times 1$  vector of labour values;
- $\omega$  = the hourly wage rate.

From these definitions, it is immediate to set up the main variables of Marx's economic analysis using labour-values as aggregators (Morishima, 1973). Thus, the total amount of variable capital is equal to:

$$V = \omega \boldsymbol{\lambda}^T \mathbf{b} \mathbf{l}^T \mathbf{x} \quad (1),$$

and the total amount of constant capital:

$$C = \boldsymbol{\lambda}^T (\mathbf{A} + \mathbf{K}) \mathbf{x} \quad (2),$$

so that the organic composition of capital  $\sigma$  is equal to:

$$\sigma = \frac{c}{v} = \frac{\boldsymbol{\lambda}^T (\mathbf{A} + \mathbf{K}) \mathbf{x}}{\omega \boldsymbol{\lambda}^T \mathbf{b} \mathbf{l}^T \mathbf{x}} \quad (3).$$

Total surplus value is equal to:

$$S = \mathbf{l}^T \mathbf{x} - \omega \boldsymbol{\lambda}^T \mathbf{b} \mathbf{l}^T \mathbf{x} \quad (4),$$

so that the exploitation rate is defined as:

$$\epsilon = \frac{s}{v} = \frac{1 - \omega \boldsymbol{\lambda}^T \mathbf{b}}{\omega \boldsymbol{\lambda}^T \mathbf{b}} \quad (5).$$

Finally, the profit rate is obtained as:

$$\pi = \frac{e}{1 + \sigma} \quad (6).$$

The problem arises when trying to empirically measure variables (1) to (6) from data typical of the input-output framework.

The first problem that arises has to do with assumption 2. Indeed, in national accounting, labour is not measured in terms of homogeneous labour, so to obtain the vector  $\mathbf{l}$  from the labour-output coefficients that can be found in input-output tables  $\mathbf{h}$ , it is necessary to apply some conversion ratios of actual labour into homogeneous labour  $\mathbf{\theta}$ , so that:

$$\mathbf{l} = \mathbf{\theta h} \quad (7).$$

Virtually, several criteria could be applied here to set up conversion ratios. However, it can be shown (Morishima, 1973) that only in the case that the conversion ratios are proportional to the wage rates corresponding to the different types of labour is the exploitation rate the same in all sectors and the equality (5) holds. Therefore, it is convenient to apply this criterion empirically even though Marx (1867, Chapter I) himself pointed out some limitations in this regard.

Once the labour-output coefficients have been found in terms of homogeneous labour, it is possible to define the labour value of a commodity as the sum of the direct labour and the labour materialized in the other factors of production that are embodied in the production of such good. Then, the vector  $\boldsymbol{\lambda}$  is obtained by solving the following system of equations:

$$\boldsymbol{\lambda} = (\mathbf{A} + \mathbf{DK})^T \boldsymbol{\lambda} + \mathbf{l} \quad (8).$$

where  $\mathbf{D}$  is a diagonal matrix of depreciation coefficients. Nevertheless, a new problem arises here since, in an open economy, the production of goods often requires imports. The presence of imports creates a special problem in the calculation of  $\boldsymbol{\lambda}$ . Since some inputs are not produced domestically, they cannot be valued according to the amount of domestic labour embodied in them. This problem can be handled in two ways.

On the one hand, imports can be valued based on the domestic labour involved in obtaining them – namely, the labour embodied in exports. Thus, it can be considered that there is a  $n$ -th sector whose output is imports and whose inputs are exports. In this case, the input-output coefficient matrix must be increased as follows:

$$\mathbf{A} = \begin{pmatrix} \mathbf{A}_d & \mathbf{a}_e \\ \mathbf{a}_m^T & 0 \end{pmatrix}$$

where  $\mathbf{A}_d$  is an  $n \times n$  matrix of domestic-input-output coefficients,  $\mathbf{a}_m$  is an  $n \times 1$  vector of foreign-input-output coefficients and  $\mathbf{a}_e$  is an  $n \times 1$  vector of commodity shares in exports. The importing sector does not use neither labour nor fixed capital since it is only devoted to using output from other industries (exports) to get foreign goods. Then, the system of equations that must be solved to obtain  $\boldsymbol{\lambda}$  is:

$$\boldsymbol{\lambda} = \left[ \begin{pmatrix} \mathbf{A}_d & \mathbf{a}_e \\ \mathbf{a}_m^T & 0 \end{pmatrix} + \mathbf{D} \begin{pmatrix} \mathbf{K}_d & \mathbf{0} \\ \mathbf{k}_m^T & 0 \end{pmatrix} \right]^T \boldsymbol{\lambda} + \begin{pmatrix} \mathbf{1} \\ 0 \end{pmatrix} \quad (9).$$

where  $\mathbf{K}_d$  is an  $n \times n$  matrix of domestic-capital-output coefficients while  $\mathbf{k}_m$  is an  $n \times 1$  vector of foreign-capital-output matrix. The vector  $\boldsymbol{\lambda}$  has now  $n + 1$  elements. The  $n + 1$ -th element represents the amount of labour embodied in exports needed to import one unit of foreign product.

On the other hand, when global input-output tables are available, imports can also be evaluated based on the labour embodied in them worldwide. Indeed, if there are  $m$  countries in the world economy, the matrix of inter-industry coefficients can be augmented in the following way:

$$\mathbf{A} = \begin{pmatrix} \mathbf{A}_{dd} & \mathbf{A}_{dm} \\ \mathbf{A}_{md} & \mathbf{A}_{mm} \end{pmatrix}$$

where  $\mathbf{A}_{dd}$  is an  $n \times n$  matrix of domestic-input-domestic-output coefficients,  $\mathbf{A}_{dm}$  is an  $n \times n(m - 1)$  matrix of domestic-input-foreign-output coefficients,  $\mathbf{A}_{md}$  is an  $n(m - 1) \times n$  matrix of foreign-input-domestic-output coefficients and  $\mathbf{A}_{mm}$  is an  $n(m - 1) \times n(m - 1)$  matrix of foreign-input-foreign-output coefficients. In this case, also the vector of labour-output coefficients must be augmented:

$$\mathbf{l} = \begin{pmatrix} \mathbf{l}_d \\ \mathbf{l}_m \end{pmatrix},$$

where  $\mathbf{l}_d$  is the  $n \times 1$  vector of domestic-labour-domestic-output coefficients, while  $\mathbf{l}_m$  is an  $n(m - 1) \times 1$  vector of foreign-labour-foreign-output coefficients. To obtain this vector from the labour-output coefficients  $\mathbf{h}$  found in world input-output tables:

$$\mathbf{h} = \begin{pmatrix} \mathbf{h}_d \\ \mathbf{h}_m \end{pmatrix},$$

it is also necessary to apply conversion ratios of actual into homogeneous labour  $\Theta$ , so that (7) is fulfilled. To do this, it is possible to follow the same criteria as before and assume that the conversion ratios are proportional to the wage rates corresponding to the different types of labour. Here, in order to avoid the possible influence of exchange rates on international wage differences, it is appropriate to consider wages adjusted for purchasing power parity. Then, the system of equations that must be solved to obtain the vector of labour values is:

$$\lambda = \left[ \begin{pmatrix} \mathbf{A}_{dd} & \mathbf{A}_{dm} \\ \mathbf{A}_{md} & \mathbf{A}_{mm} \end{pmatrix} + \mathbf{D} \begin{pmatrix} \mathbf{K}_{dd} & \mathbf{K}_{dm} \\ \mathbf{K}_{md} & \mathbf{K}_{mm} \end{pmatrix} \right]^T \lambda + \begin{pmatrix} \mathbf{l}_d \\ \mathbf{l}_m \end{pmatrix} \quad (10).$$

where  $\mathbf{K}_{dd}$  is an  $n \times n$  matrix of domestic-capital-domestic-output coefficients,  $\mathbf{K}_{dm}$  is an  $n \times n(m - 1)$  matrix of domestic-capital-foreign-output coefficients,  $\mathbf{K}_{md}$  is an  $n(m - 1) \times n$  matrix of foreign-capital-domestic-output coefficients and  $\mathbf{K}_{mm}$  is an  $n(m - 1) \times n(m - 1)$  matrix of foreign-capital-foreign-output coefficients. The vector  $\lambda$  has now  $nm$  elements. Elements 1 to  $n$  represent the labour value of domestic production while elements  $n + 1$  to  $nm$  represent the labour value of foreign production.

A problem arises at this point: Which of the two methods of measuring labour-values is preferable, (9) or (10)? A first thought could make us conclude that (10) is preferable to (9), since it measures the labour actually embodied worldwide in the production of goods. However, it is possible to show that method (9) is accounting-consistent, so that calculations in terms of values of, for instance, the rate of profit (6) by means of (9) are similar to calculations in current prices (Wolff, 1979). This does not have to be the case regarding (10).

Actually – and this is the key point of the present study – the possible discrepancy between both methods is due to the existence of unequal labour terms of trade in line with Bauer, Grossman, and Shaikh explanation of unequal exchange.

Indeed, the reason why the calculation of variables (1) to (6) with one or another method may differ is due to the fact that the labour embodied in imports worldwide is not always equal to the domestic labour embodied in exports. Thus, when for a country the labour value calculated by (10) is greater (less) than the labour value calculated by (9) we say that the labour terms of trade are favourable (unfavourable). This reflects that labour embodied in imports and exports is not always balanced, which directly ties into the unequal exchange hypothesis by highlighting the potential for persistent trade imbalances based on labour values.

These imbalances can lead to a situation where developing countries experience unfavourable labour terms of trade, supporting the unequal exchange hypothesis *à la* Bauer-Grossman-Emmanuel. Likewise, countries with an absolute cost advantage (lower vertically integrated unit labour costs) will likely have favourable labour terms of trade, aligning with the observation that the labour embodied in their exports is greater than that in their imports. This reinforces the unequal exchange as developed countries dominate trade due to their competitive advantages, leading to unequal labour exchanges with developing countries. Computing differences in labour terms of trade may reflect the broader dynamics of unequal exchange and absolute cost advantage, explaining how these trade imbalances persist and manifest in international trade.

In this way, it is possible to empirically investigate the effect of the labour terms of trade on the main variables of Marx's economic analysis, taking advantage of these two possible ways of calculating labour value in an open economy.

### 3. Estimating Labour Value from WIOD

In order to estimate the effects of unequal labour terms of trade on the main variables of Marx's analysis, the method set out in **section 2** is applied to data collected in the World Input-Output Database (Timmer et al., 2015, 2016). The 2016 release of this database collects information for the period 2000-2014 for  $n = 56$  sectors and  $m = 43$  countries plus a composite country that represents the rest of the world.

WIOD collects data regarding sectoral hours worked by employees, sectoral number of employees, sectoral persons engaged (employed plus self-employed and proprietors) and sectoral wage bill. Labour compensation, which also appears in WIOD, results from imputing to self-employees and proprietors the same wage as employees. Following this same logic, the number of hours worked by persons engaged in each sector can be estimated. Then,  $\omega$  is calculated as the ratio between total labour compensation and total hours worked in the home country, thus obtaining an average hourly wage rate. Then, when labour value is calculated from (9), the conversion ratios of actual labour into homogeneous labour are simply:

$$\theta_i = \frac{w_i}{\omega}, i = 1, \dots, 56.$$

To calculate the conversion ratios of actual into homogeneous labour needed to get (10), it is necessary to make further adjustments to the WIOD data. Indeed, the data appear either in local currency or in dollars, so it is not possible to avoid the influence of the real exchange rate simply by taking these data into account. Therefore, the IMF's implicit PPP conversion rates were used to find:

$$\theta_{i+n(j-1)} = \frac{e_j w_{i+n(j-1)}}{\omega}, i = 1, \dots, 56, j = 1, \dots, 43,$$

where  $w_{i+n(j-1)}$  is the money wage rate of sector  $i$  in country  $j$  and  $e_j$  is the real exchange rate as derived from the IMF's implicit PPP conversion rates.

Another problem that appears when trying to apply the method set out in **section 2** to WIOD data is that they do not contain capital matrices. It is only possible to construct vectors of capital-output coefficients. There are two options here. The analysis can be

restricted to the case in which the sectors do not use fixed capital, in the manner of Morishima (1973). An approximate capital-output matrix can also be constructed from:

$$\mathbf{K} = \mathbf{a}_k \mathbf{a}_i^T,$$

where  $\mathbf{a}_k$  is a vector of capital-output coefficients and  $\mathbf{a}_i$  is a vector of good shares in fixed investment. This, of course, is equivalent to assuming that the ingredients of fixed capital are the same in all sectors of each country. In the present study, for theoretical consistency, this second option was chosen.

Finally, given that for the rest of the world there is not enough data available regarding sectoral employees, sectoral wages, etc., the world input-output coefficient matrix must be augmented as follows:

$$\mathbf{A} = \begin{pmatrix} \mathbf{A}_{dd} & \mathbf{A}_{dm} & \mathbf{a}_{de} \\ \mathbf{A}_{md} & \mathbf{A}_{mm} & \mathbf{a}_{me} \\ \mathbf{a}_{rd}^T & \mathbf{a}_{rm}^T & \mathbf{0} \end{pmatrix},$$

where  $\mathbf{a}_{rd}$  is an  $n \times 1$  vector of rest-of-the-world-input-domestic-output coefficients,  $\mathbf{a}_{rm}$  is an  $n(m - 1) \times 1$  vector of rest-of-the-world-input-foreign-output coefficients,  $\mathbf{a}_{de}$  is an  $n \times 1$  vector of domestic-good shares in exports to the rest of the world and  $\mathbf{a}_{me}$  is an  $n(m - 1) \times 1$  vector of foreign-good shares in exports to the rest of the world.

#### 4. Numerical Results

The method presented in **section 2** was applied to the data available in the WIOD database as indicated in **section 3** for each of the 43 countries in the sample. In this sample 22 are Western developed countries (Australia, Austria, Belgium, Canada, Switzerland, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Sweden, United States United States), 3 are non-Western developed countries (Japan, Korea, Taiwan), 11 are emerging Central or Eastern European countries (Bulgaria, Czechia, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Romania, Slovakia, Slovenia) and 7



are non-European emerging countries (Brazil, China, Indonesia, India, Mexico, Russia, Turkey).

Figures 1 to 6 and Table 1 show the main results of the estimation. To see how the terms of trade affect each country according to its level of development, the results of the estimates are frequently presented in relation to GDP per capita. To this purpose, data on GDP per capita were taken from the Maddison Project Database 2023 (Bolt & Van Zanden, 2024) for the period 2000-2014. Figures and Tables often present average values for the sample countries in the period 2000-14 and, when this is not the case, it is indicated. With this in mind, some comments follow.

Figure 1 shows the two ways of measuring the value rate of profit in an open economy in relation to the general rate of profit as measured at current prices. As seen in the figure, the general rate of profit is closely correlated to the value rate of profit estimated by method (9), in which the labour value of imports is calculated from the domestic labour embodied in exports. On the contrary, when the value rate of profit is estimated by method (10) in which the labour value of imports is calculated from labour embodied worldwide, the correlation is weaker. This is an expected result, given that only actual costs enter the profit rate and –under balanced trade- actual labour costs of imports are equal to the labour cost of exports. These costs will only be equal to the foreign labour cost of imports if the labour terms of trade were unitary (one unit of domestic labour in exchange for one unit of foreign labour). This allows us to assume that the value rate of profit calculated from labour embodied domestically (9) is the actual value rate of profit. The value rate of profit calculated from labour embodied worldwide (10) is the value rate of profit that would exist if there were no inequality in the labour terms of trade.

Thus, it is possible to conceive of the difference between the two estimates as the effect of unequal exchange on the rate of profit. This is what Figure 2 shows, in which a clear correlation is observed between this assumed effect and GDP per capita. Indeed, for developed countries the terms of trade are favourable, meaning that the domestic labour actually used in the reproduction of capital is less than the worldwide labour embodied in the goods that make up capital. For emerging countries, the opposite occurs:

the terms of trade are unfavourable, and they use more labour in the reproduction of capital than capital goods embody. These effects are particularly notable in the small and very open economies of Europe, both in a positive sense in the case of advanced Western European countries (Norway, Switzerland, Denmark), and in a negative sense in the case of emerging Central and Eastern European countries (Croatia, Hungary, Romania). In large, less open countries, the effects are smaller although they have the same pattern: they are positive in the case of advanced countries (United States, Germany) and negative for emerging countries (Russia, India, China).

According to equation (6), the fact that the labour terms of trade affect the value rate of profit is due to the fact that they affect the exploitation rate (5) or the organic composition of capital (3). This is precisely what Figures 3 and 4 show.

Thus, in Figure 3, it can be seen that in developed countries the favourable terms of trade allow the exploitation rate to increase - *i.e.*, to increase the surplus value per worker for a given real wage. For emerging countries, the opposite occurs: unfavourable terms of trade cause the surplus value per worker to be lower given the wage rate. The reason for this is because, when the terms of trade are favourable, it is possible to devote less labour to the reproduction of variable capital - *i.e.*, to the production of wage goods. Therefore, the fraction of the working day that workers devote to producing their means of subsistence is smaller. The opposite occurs when the terms of trade are unfavourable. It can be seen from Figure 3 that these effects can be very large, especially for the small and very open economies of Europe.

Figure 4 shows the effects of the terms of trade on the organic composition of capital. In developed countries, favourable terms of trade make it possible to reduce the organic composition of capital - *i.e.*, reduce the labour devoted to reproducing constant capital in relation to the labour devoted to reproducing variable capital. In emerging countries, the opposite occurs: unfavourable terms of trade increase the amount of labour devoted to reproducing constant capital.

In this case, those countries most negatively affected by this unequal exchange are the emerging countries of Asia and Eastern Europe with high investment rates and, therefore, great dependence on imported capital goods.

Naturally, behind the effects shown in Figures 3 and 4 is the different impact of the terms of trade on the value of variable capital (wage goods) or on the value of constant capital (intermediate and fixed-capital goods). In this sense, Table 1 presents an estimate of the impact of labour terms of trade on the value of variable capital and constant capital and their effects on the profit rate. Thus, it is observed that, in general, both effects have the same order of magnitude. In the case of some countries the effect of exchange on the value of constant capital is more important (China, India, Indonesia, Turkey), while for other countries the most important effect is the effect of the terms of trade on variable capital (United Kingdom, Japan, Korea).

If inequality in the terms of trade means that, for a given real wage, the rate of profit is higher in developed countries and lower in emerging countries, this may imply a certain tendency towards equalization of the rate of profit. This is precisely what Figure 5 shows, which shows that the hypothetical rate of profit (in which the terms of trade are unitary) is more correlated with the GDP per capita of the countries than the effective rate of profit (in which the terms of trade are unequal). This result is the assumption made by the theorists of unequal exchange (Bauer, 1907; Carchedi, 1991; Emmanuel, 1972; Grossman, 1929; Shaikh, 1980, 2016) and reflects the greater international mobility of capital (through outsourcing, foreign direct investment, etc.) compared to the limited international mobility of labour.

This equalisation effect on profit rates can have effects on the GDP growth rate. Indeed, according to the Marxist theory of growth (Shaikh, 2016), the growth rate is proportional to the profit rate:

$$g_Y = f_K(\pi - i).$$

So, assuming that the population growth rate and real wages remain the same, we would expect that:

*Effect on  $g_y \sim$  Effect on  $\pi$ .*

Thus, the terms of trade, insofar as they have an effect on the rate of profit, also have an effect on the growth rate. In this sense, Figure 6 shows the actual growth rate in the period 2000-2014 and a hypothetical growth rate if there were no unequal exchange in the same period, both as a function of GDP per capita in the year 2000. Thus, it is shown that, if it were not for inequality in the terms of trade, the convergence in growth in that same period would have been 50% higher. This result implies that a significant part of the lack of convergence in global economic growth may be due to unequal exchange, as assumed by unequal development theorists.

*Figure 1. The General Rate of Profit and the Value Rate of Profit, as Measured in Two Possible Ways. Average for the Period 2000-14.*

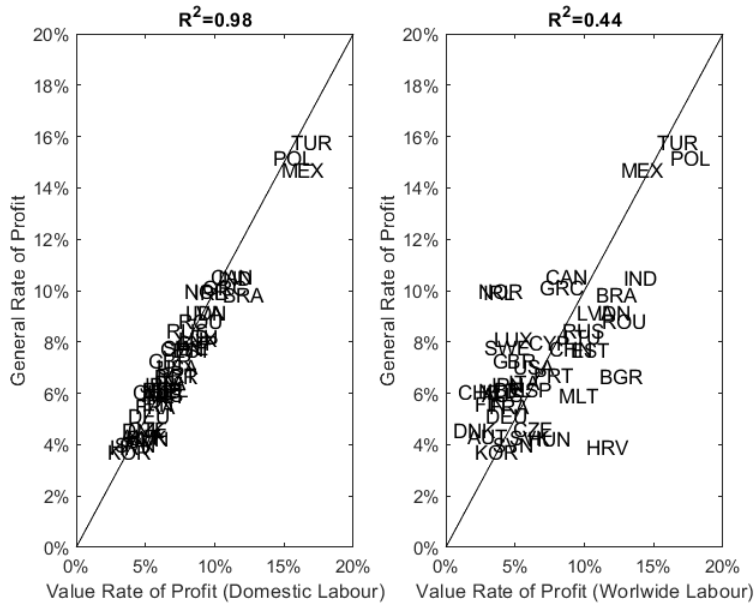


Figure 2. Effects of the Terms of Trade on the Value Rate of Profit for a Given Wage Rate, in relation to GDP per Capita. Average for the Period 2000-14.

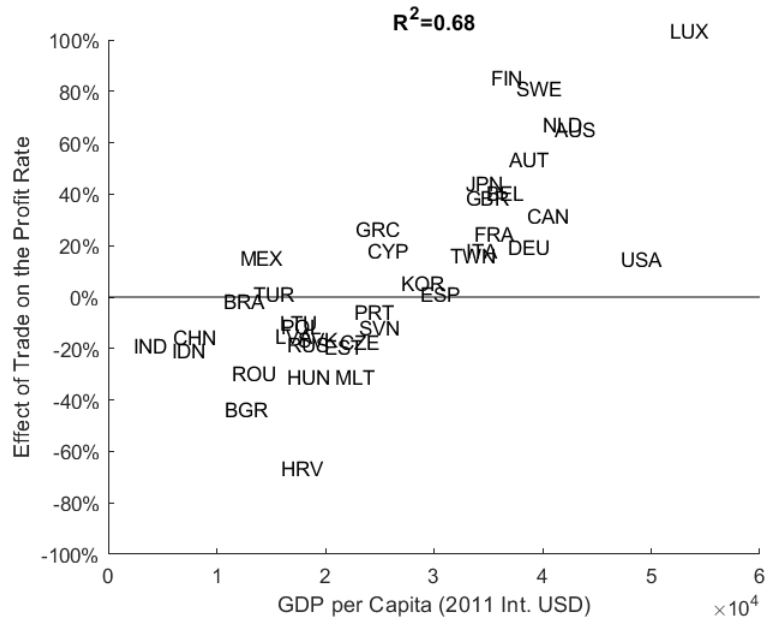


Figure 3. Effects of the Terms of Trade on the Rate of Exploitation for a Given Wage Rate, in relation to GDP per Capita. Average for the Period 2000-14.

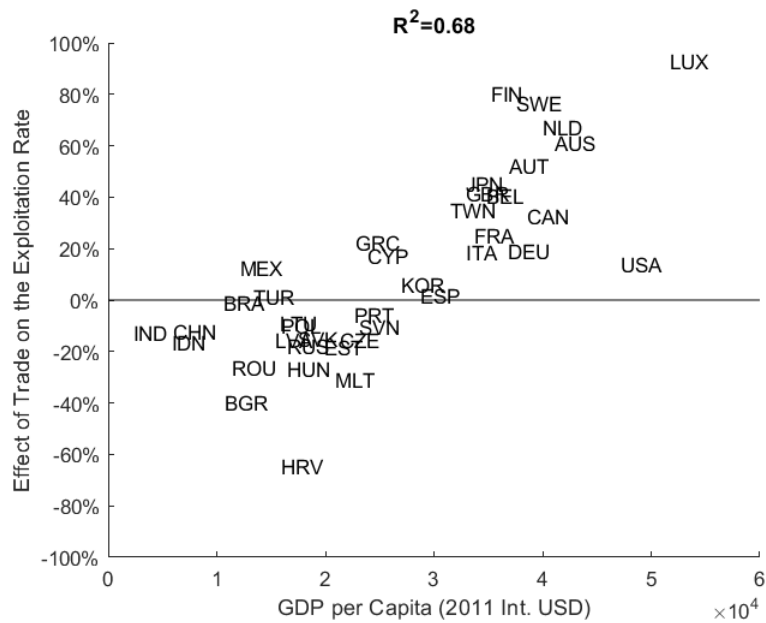


Figure 4. Effects of the Terms of Trade on the Organic Composition of Capital for a Given Real Wage, in relation to GDP per Capita. Average for the Period 2000-14.

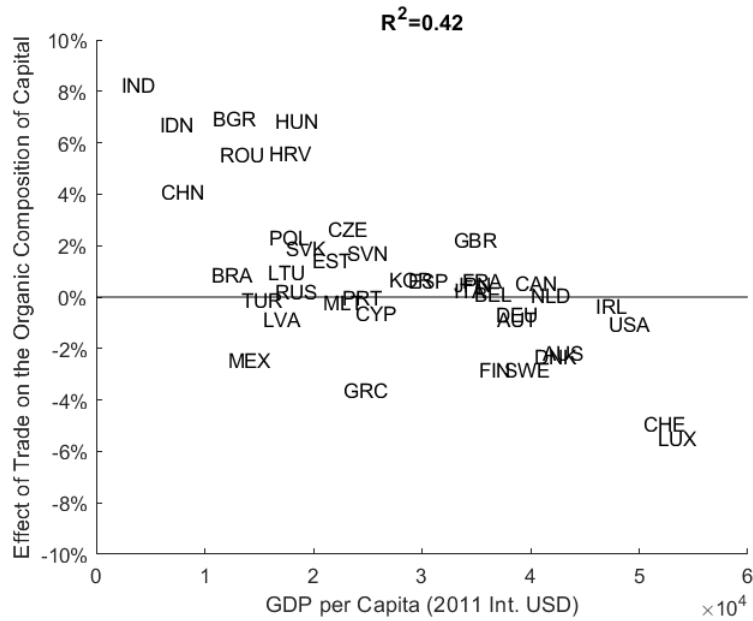


Figure 5. The Value Rate of Profit, as Measured in Two Possible Ways, in relation to GDP per Capita. Average for the Period 2000-14.

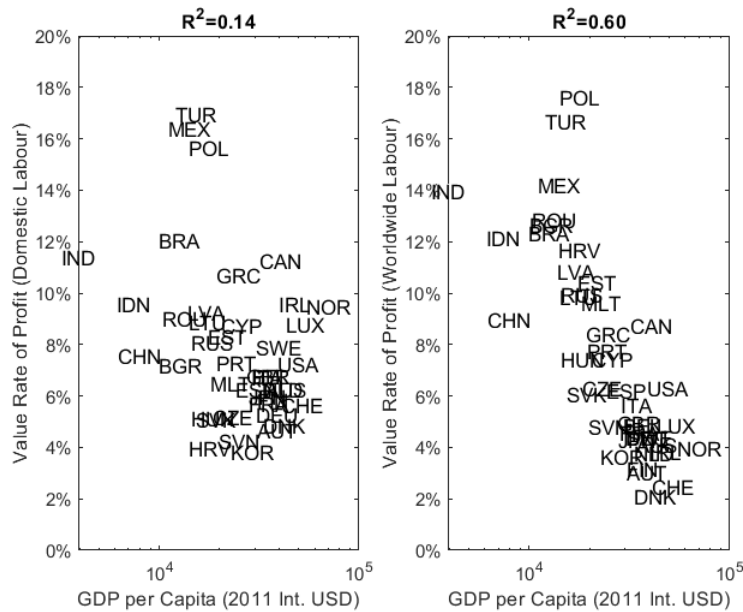
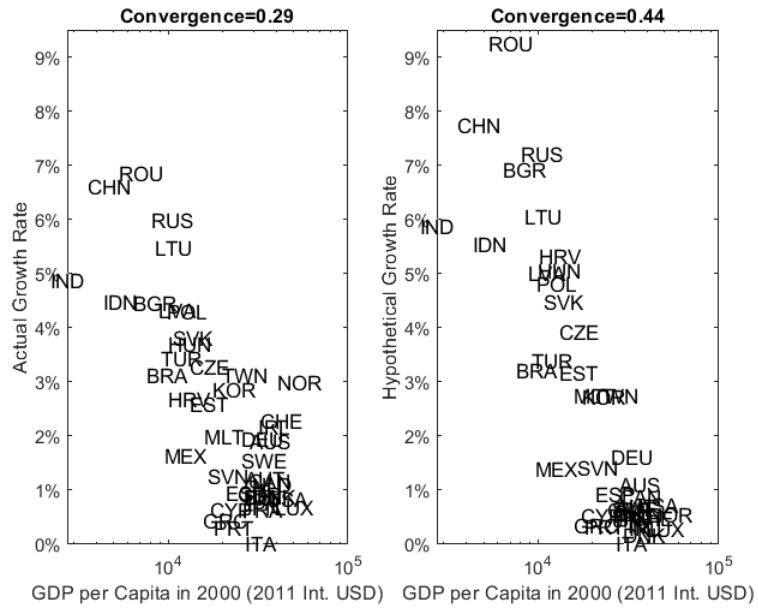


Figure 6. Potential Effect of Unequal Terms of Trade on Convergence in Growth in the Period 2000-14.



*Table 1. Effects of the Terms of Trade on the Value Rate of Profit. Percentage Change with respect to the Base Year. Average for the Period 2000-14.*

	Due to the effect on variable capital	Due to the effect on constant capital	Total
	(1)	(2)	(1)+(2)
Australia	32.2	14.4	46.6
Austria	31.4	10.9	42.3
Belgium	24.0	9.5	33.5
Bulgaria	-27.7	-28.6	-56.3
Brazil	-0.3	-1.1	-1.4
Canada	18.3	8.9	27.2
Switzerland	66.4	18.8	85.2
China	-8.0	-8.6	-16.6
Cyprus	10.3	6.1	16.4
Czechia	-9.9	-9.5	-19.4
Deutschland	12.7	5.2	17.9
Denmark	64.2	18.1	82.3
Spain	1.4	0.1	1.5
Estonia	-11.9	-9.9	-21.8
Finland	43.3	16.7	60.0
France	16.4	5.3	21.7
United Kingdom	24.2	6.0	30.2
Greece	12.5	11.0	23.5
Croatia	-68.0	-30.2	-98.2
Hungary	-19.6	-17.9	-37.5
Indonesia	-10.5	-12.4	-22.9
India	-7.4	-13.1	-20.5
Ireland	62.3	29.4	91.7
Italy	11.4	5.3	16.7
Japan	23.8	9.1	32.9
Korea	3.3	0.0	3.3
Lithuania	-5.7	-5.0	-10.7
Luxembourg	40.7	25.9	66.6
Latvia	-9.4	-6.4	-15.8
Mexico	4.7	9.6	14.3
Malta	-23.7	-14.0	-37.7
Netherlands	37.0	13.0	50.0
Norway	61.4	27.3	88.7
Poland	-5.5	-6.5	-12.0
Portugal	-4.0	-1.9	-5.9
Romania	-15.9	-20.1	-36.0
Russia	-12.9	-8.3	-21.2
Slovakia	-9.3	-9.5	-18.8
Slovenia	-8.3	-4.2	-12.5
Sweden	38.3	20.1	58.4
Turkey	0.5	0.8	1.3
Taiwan	34.5	-23.6	10.9
United States	9.0	4.9	13.9



## **Concluding remarks**

The main conclusion of the study is that inequality in the terms of trade favours a higher rate of profit in the centre and a lower rate of profit in the periphery. This is because, through trade, central countries can use less labour to reproduce their variable capital - thus increasing the rate of exploitation for a given real wage. Furthermore, through trade, the central countries save more labour in the reproduction of constant capital than in the reproduction of variable capital - thereby decreasing the organic composition of capital. In the peripheral countries, exactly the opposite occurs. The main implication of all this is that, if the effect of the terms of trade on growth rates were of the same order as the effect on profit rates, unequal exchange could explain a good deal of the lack of convergence between rich and poor countries.

In central countries, the favourable terms of trade result in higher profits in line with the unequal exchange hypothesis. This is achieved because central countries need to use less labour to produce the goods and services that are exchanged for imports. Consequently, the central countries can appropriate surplus value as they exchange less value from their exports compared to the value of their imports. In peripheral countries, the situation is reversed. Unfavourable terms of trade mean that peripheral countries must use more labour to produce goods for export, compared to the labour embodied in the imports they receive.

The unequal terms of trade thus contribute to economic divergence between rich and poor countries. The central countries, benefiting from favourable terms of trade, can reinvest higher profits into further productivity improvements, technological advancements, and capital accumulation. This virtuous cycle leads to sustained economic growth and higher living standards. Conversely, peripheral countries, suffering from unfavourable terms of trade, face constraints on growth. Lower profit rates limit their ability to invest in productivity improvements and capital accumulation. This creates a vicious cycle of underdevelopment and economic stagnation.

The lack of convergence between rich and poor countries can be attributed to these dynamics. The central countries' ability to consistently achieve higher profit rates and lower organic compositions of capital through favourable terms of trade exacerbates the economic disparity. As a result, the peripheral countries struggle to catch up, perpetuating global inequality.

## References

- Amin, S. (1970). El comercio internacional y los flujos internacionales de capitales. In *Imperialismo y comercio internacional: el intercambio desigual* (pp. 105–143). Siglo XXI.
- Amin, S. (1981). *L'échange inégal et la loi de la valeur. La fin d'un débat*. Anthropos.
- Antonopoulos, R. (1999). A classical approach to real exchange rate determination with an application for the case of Greece. *Review of Radical Political Economics*, 31(3), 53–65. [https://doi.org/10.1016/s0486-6134\(99\)80132-6](https://doi.org/10.1016/s0486-6134(99)80132-6)
- Antonopoulos, R., & Shaikh, A. (2012). Explaining Long Term Exchange Rate Behavior in the United States and Japan. In J. K. Moudud, C. Bina, & P. L. Mason (Eds.), *Alternative Theories of Competition* (pp. 223–250). Routledge. <https://doi.org/10.4324/9780203102671-19>
- Astarita, R. (2010). *Economía política de la dependencia y el subdesarrollo. Tipo de cambio y renta agraria en la Argentina*. Bernal.
- Baran, P., & Sweezy, P. (1966). *Monopoly Capital: An Essay on the American Economic and Social Order*. Modern Reader.
- Bauer, O. (1907). *The Question of Nationalities and Social Democracy*. University of Minnesota Press.
- Bettelheim, C. (1962). Intercambio internacional y desarrollo regional. In *Imperialismo y comercio internacional: el intercambio desigual* (pp. 69–104). Siglo XXI.
- Boundi-Chraki, F., & Perrotini-Hernández, I. (2021). Absolute cost advantage and sectoral competitiveness: Empirical evidence from NAFTA and the European Union. *Structural Change and Economic Dynamics*, 59, 162–173. <https://doi.org/10.1016/j.strueco.2021.08.020>
- Boundi Chraki, F. (2021). Testing the relationship between real effective exchange rate and absolute cost advantage. A dynamic panel GMM analysis from NAFTA. *Applied Economics Letters*, 28(15), 1332–1335. <https://doi.org/10.1080/13504851.2020.1814941>

- Carchedi, G. (1991). *Frontiers of Political Economy*. Verso.
- Duménil, G. (1980). *De la valeur aux prix de production: une réinterprétation de la transformation*. Economica.
- Emmanuel, A. (1962). El intercambio desigual. In *Imperialismo y comercio internacional: el intercambio desigual* (pp. 29–68). Siglo XXI.
- Emmanuel, A. (1972). *Unequal exchange: A study of the imperialism of trade*. Monthly Review Press.
- Grossman, H. (1929). *The Law of Accumulation and Breakdown of the Capitalist System, Being also a Theory of Crises*. Pluto Press.
- Harrod, R. (1957). *International economics*. University of Chicago Press.
- Hume, D. (1752). *Of Money, and Other Economic Essays*. Independent Publishing Platform.
- Marini, R. M. (1979). Plusvalía extraordinaria y acumulación. *Cuadernos Políticos*, 20, 18–39.
- Martínez-Hernández, F. A. (2010). An alternative theory of real exchange rate determination: Theory and empirical evidence for the Mexican economy, 1970–2004. *Investigacion Economica*, 69(273), 55–84. <https://doi.org/10.22201/fe.01851667p.2010.273.24249>
- Martínez-Hernández, F. A. (2017). The Political Economy of Real Exchange Rate Behavior: Theory and Empirical Evidence for Developed and Developing Countries, 1960–2010. *Review of Political Economy*, 29(4), 566–596. <https://doi.org/10.1080/09538259.2017.1382060>
- Marx, K. (1859). *A Contribution to the Critique of Political Economy*. Progress.
- Marx, K. (1867). *Capital. A critique of political economy, Vol I*. Penguin.
- Marx, K. (1894). *Capital. A Critique of Political Economy, Vol. III*. Penguin.
- McNulty, P. J. (1968). Economic theory and the meaning of competition. *Quarterly Journal of Economics*, 82(4), 639–656. <https://doi.org/10.2307/1879604>

- Morishima, M., & Seton, F. (1961). Aggregation in Leontief Matrices and the Labour Theory of Value. *Econometrica*, 29(2), 203. <https://doi.org/10.2307/1909289>
- Morishima, Michio. (1973). *Marx's economics. A dual theory of value and growth*. Cambridge University Press.
- Poulakis, T., & Tsaliki, P. (2022). Exchange Rate Determinants of the US Dollar and Chinese RMB: a Classical Political Economics Approach. *Investigación Económica*, 82(323), 3–26. <https://doi.org/10.22201/fe.01851667p.2023.323.83171>
- Poulakis, T., & Tsaliki, P. (2023). Dynamic linkages between real exchange rates and real unit labour costs: evidence from 18 economies. *International Review of Applied Economics*, 37(5), 607–620. <https://doi.org/10.1080/02692171.2023.2240257>
- Ricardo, D. (1821). *On the Principles of Political Economy and Taxation*. Liberty Fund.
- Semmler, W. (1981). Competition, Monopoly, and Differentials of Profit Rates: Theoretical Considerations and Empirical Evidence. *Review of Radical Political Economics*, 13(4), 39–52. <https://doi.org/10.1177/04866134820130040>
- Semmler, W. (1984). On the classical theory of competition, value and prices of production. *Australian Economic Papers*, 23(42), 130–150. <https://doi.org/10.1111/j.1467-8454.1984.tb00081.x>
- Seretis, S. A., & Tsaliki, P. V. (2016). Absolute Advantage and International Trade: Evidence from Four Euro-zone Economies. *Review of Radical Political Economics*, 48(3), 438–451. <https://doi.org/10.1177/0486613415603160>
- Shaikh, A. (1979). Foreign Trade and the Law of Value: Part I. *Science & Society*, 43(3), 281–302.
- Shaikh, A. (1980). Foreign Trade and the Law of Value: Part II. *Science & Society*, 44(1), 27–57.
- Shaikh, A. (2016). *Capitalism. Competition, Conflict, Crises*. Oxford University Press (OUP).
- Steuart, J. (1767). *An Inquiry into the Principles of Political Economy: Being an Essay on the Science*

*of Domestic Policy in Free Nations, in which are particularly considered Population, Agriculture, Trade, Industry, Money, Coin, Interest, Circulation, Banks, Exchange, Publ. Hansebook.*

Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R., & de Vries, G. J. (2015). An Illustrated User Guide to the World Input-Output Database: The Case of Global Automotive Production. *Review of International Economics*, 23(3), 575–605. <https://doi.org/10.1111/roie.12178>

Timmer, M. P., Los, B., Stehrer, R., & Vries, G. J. de. (2016). based on the WIOD 2016 Release groningen growth and. *GGDC Research Memoranda*, 162.

Tsaliki, P., Paraskevopoulou, C., & Tsoulfidis, L. (2018). Unequal exchange and absolute cost advantage: Evidence from the trade between Greece and Germany. *Cambridge Journal of Economics*, 42(4), 1043–1085. <https://doi.org/10.1093/cje/bex060>

Tsoulfidis, L. (2015). Contending conceptions of competition and the role of regulating capital. *Panoeconomicus*, 62(1), 15–31. <https://doi.org/10.2298/PAN1501015T>

Tsoulfidis, L., & Tsaliki, P. (2019). *Classical Political Economics and Modern Capitalism: Theories of Value, Competition, Trade and Long Cycles*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-17967-0>

Weeks, J. (1981). *Capital and Exploitation*. Princeton University Press.

Wolff, E. N. (1979). The Rate of Surplus Value, the Organic Composition, and the General Rate of Profit in the U.S. Economy, 1947-67. *American Economic Review*, 69(3), 329–341.