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► **To cite this version:**

Rémy Herrera, Zhiming Long, Zhixuan Feng, Bangxi Li. Turning One's Loss Into a Win?. Research in Political Economy, 2023, 39, pp.31-50. hal-04367750

HAL Id: hal-04367750

<https://hal.science/hal-04367750v1>

Submitted on 30 Dec 2023

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TURNING ONE'S LOSS INTO A WIN? THE U.S. TRADE WAR WITH CHINA IN PERSPECTIVE

Rémy Herrera, Zhiming Long, Zhixuan Feng and Bangxi Li

ABSTRACT

This chapter aims to shed light on the hidden benefits and losses of U.S.-China trade within the framework of unequal exchange theory. After presenting the evolutions of the trade balance between China and the U.S., we propose two methods for measuring the unequal exchange between them: one considers the labor content directly incorporated into the exchange; the other focuses on the international values with input-output tables. This allows to present a synthesis of sectoral analyses. Our results show a significant unequal exchange in U.S.-China trade over 1995–2014, the U.S. being actually the main beneficiary of this trade. Both methods exhibit the inequality in exchange tending to decrease over time; China's disadvantage has been gradually reducing from the 2000s. We finally suggest that the relative decline in the hegemonic status of the U.S. in this bilateral unequal relationship could help explain its decision to launch its trade war with China.

Keywords: International trade, trade war, unequal exchange, Marxism, labor value, input-output table.

INTRODUCTION

After taking office in January 2017, the United States (hereafter, “U.S.”) President Donald Trump began setting trade barriers on the People’s Republic of China (hereafter, “China”), effectively starting what it is commonly called a “trade war.” Since the first half of 2018, this U.S.-China confrontation has become a spiral of reciprocal increases in customs duties targeting certain products or sectors, penalties against rival companies, tense bilateral negotiations with uncertain outcomes, then further reprisals, counter-offensives, and utterance of threats, which were not systematically followed by action. The extent of the conflict is such that hostilities have extended beyond the strict sphere of trade and into the monetary area through the devaluation of the yuan in the summer of 2019.

This dispute could affect the global system as a whole, and the reasons are multiple and complex: the supposed “unfair” competition of China due to low wages and an undervalued national currency boosting exports, on the one hand, and subsidies to domestic firms and heavy regulatory constraints hampering access to its domestic market and slowing down imports, in addition to “intellectual property theft,” in the words of the US President, on the other.

Digging (almost) continuously for several decades, the trade balance between the two countries has been largely unfavorable for the U.S. for several decades, and was the most likely pretext to start this trade war. Does the U.S. trade deficit in goods and services not provide irrefutable evidence that the U.S. President Trump was correct when he declared that China “gets away with theft” and that “hundreds of billions of dollars a year were lost dealing with China”? How could one deny the evidence that one country with a surplus induces a deficit in the other? Is it that simple? Is such logic well-founded? What is this “wealth,” exactly? We are not questioning the idea that China benefits from its trade relations with the U.S., but rather questioning how fair these exchanges are.

The issue has arisen since heterodox theoreticians, such as Singer (1950), Prebisch (1959), and Emmanuel (1972), initiated the debate on unequal exchange, and has been echoed in the fields of international trade and development economics (Bacha [1978], Evans [1989], Peet and Hartwick [2015]). Unlike mainstream analyses, this theory focuses on possible unequal relationships in trade and income distribution by considering the terms of trade that determine the value added produced in a country by its labor during the working hours over a certain period of time, which configures the distribution of benefits among protagonists in trade. The difference in the added value of one unit of labor time between countries means that they obtain different amounts of currencies and wealth with the same amount of labor. Such a difference first refers to gaps in labor productivity, meaning that countries have different abilities in commodity production, but also, more importantly, different wage levels and capital intensities among countries, so that competitive equilibrium prices create differences in the value added per unit of labor time (Emmanuel [1972]). Moreover, if some countries have monopoly power in certain markets, the deviation from the competitive equilibrium prices due to changes in the terms of trade will create this difference in value added per unit of labor time (Clelland [2014]). This latter difference is not a gap in productive capacity, but a process of product distribution. As a matter of fact, industrialized countries will gain more value-added than developing countries will because they are involved in industries that have higher capital intensity and higher average wages, and are characterized by some monopoly capabilities. In other words, the mentioned phenomena will cause prices in international trade to deviate from their value, leading to an unequal exchange.

Unequal exchange, measurable by a wide variety of methods (Gibson [1980], Webber and Foot [1984], Nakajima and Izumi [1995], Feng [2018]), reveals that, for a given traded volume, the total working time provided by the workers of an economy may be higher than that of the workers of its partner economy, thus causing a transfer of value from the one to the other, with the latter thereby appropriating the value produced by the other one. Only considering the transfer of international value—corresponding to the socially necessary working time required to produce a commodity—will reflect the effective redistribution of wealth effected between the two economies.

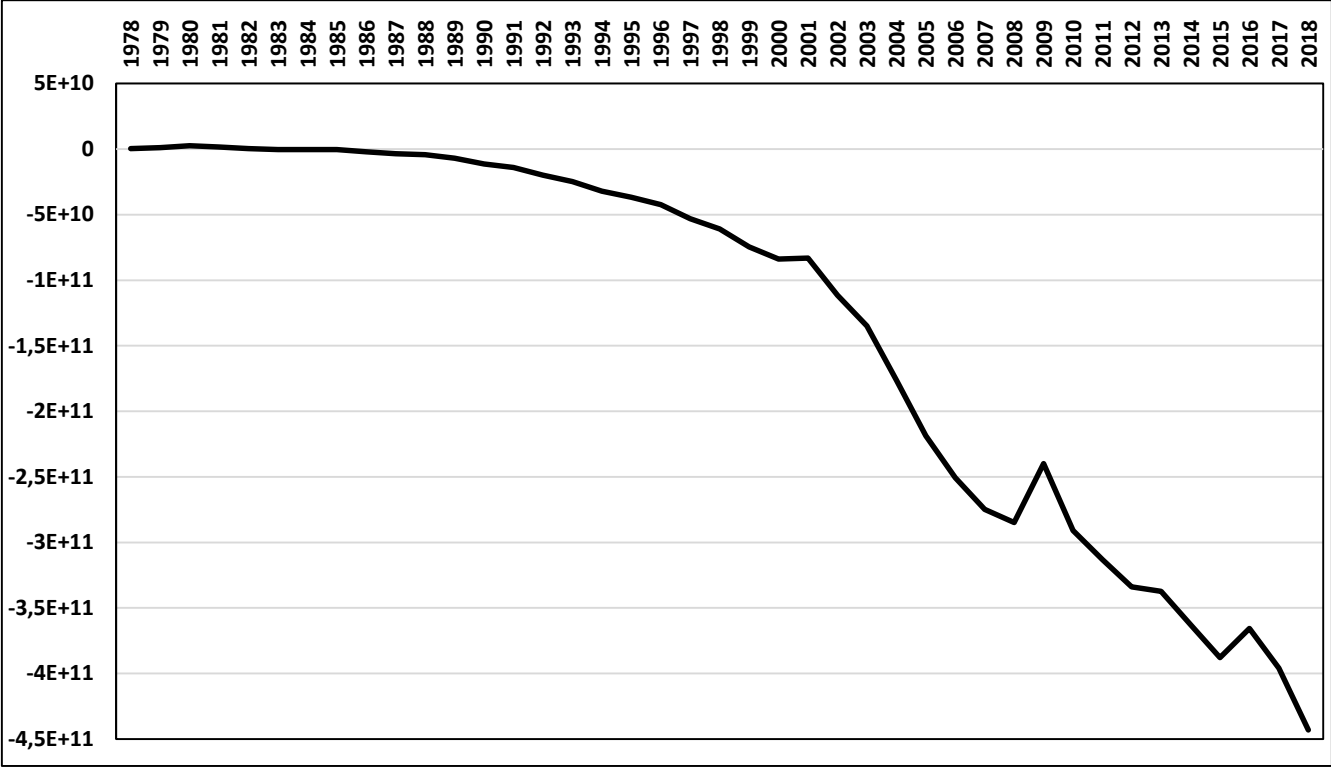
The paper is structured as follows. The evolution of the U.S.-China trade balance is presented in Part I. We propose two methods of measuring the unequal exchange between the countries. Part II considers the content in labor directly incorporated into the exchange, and, inspired by Ricci (2018), Part III centers on the international value and mobilizing input-output tables. The synthesis of the sectoral analysis is in Part IV.

BILATERAL TRADE BALANCE AND TRADE WAR

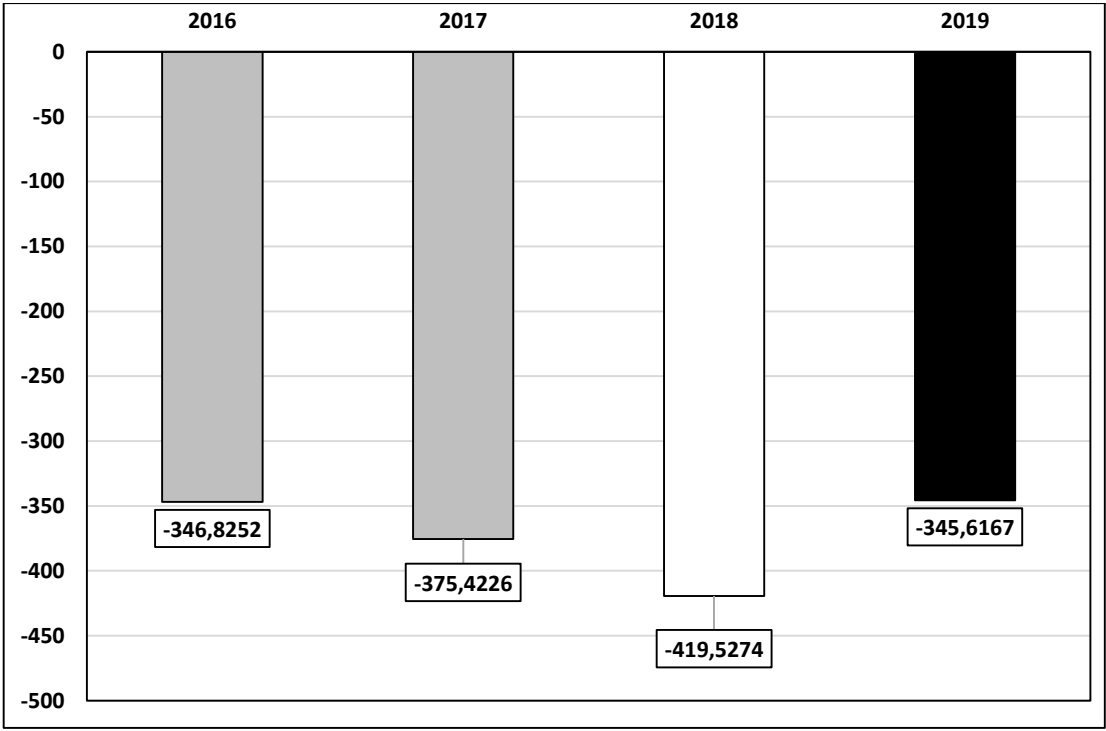
U.S.-China trade in goods and services gained initial momentum after the U.S.'s diplomatic recognition of China in January 1979, following the latter's so-called "openness reforms" adopted in late 1978 under the influence of Deng Xiaoping. Following this, China became a member of the World Trade Organization in December 2001. However, the U.S. began to show signs of a trade balance deficit with China from the very beginning of the 1970s, under the planned Maoist economy, and has continued to worsen, with rare exceptions.

Substantial accounting discrepancies are appearing over the exact amount of these trade deficits, particularly between the data disseminated by the U.S. Department of Commerce and those provided by the China Customs Administration. The differences in the assessments are due to the way in which the authorities take into account re-exports, mostly from Hong Kong, transport costs (free on board or cost, insurance and freight), and travel expenses of the respective nationals of the two countries (Xu [2018]). Nevertheless, regardless of the accounting system, an increasingly deep deficit to the detriment of the U.S. is observed.

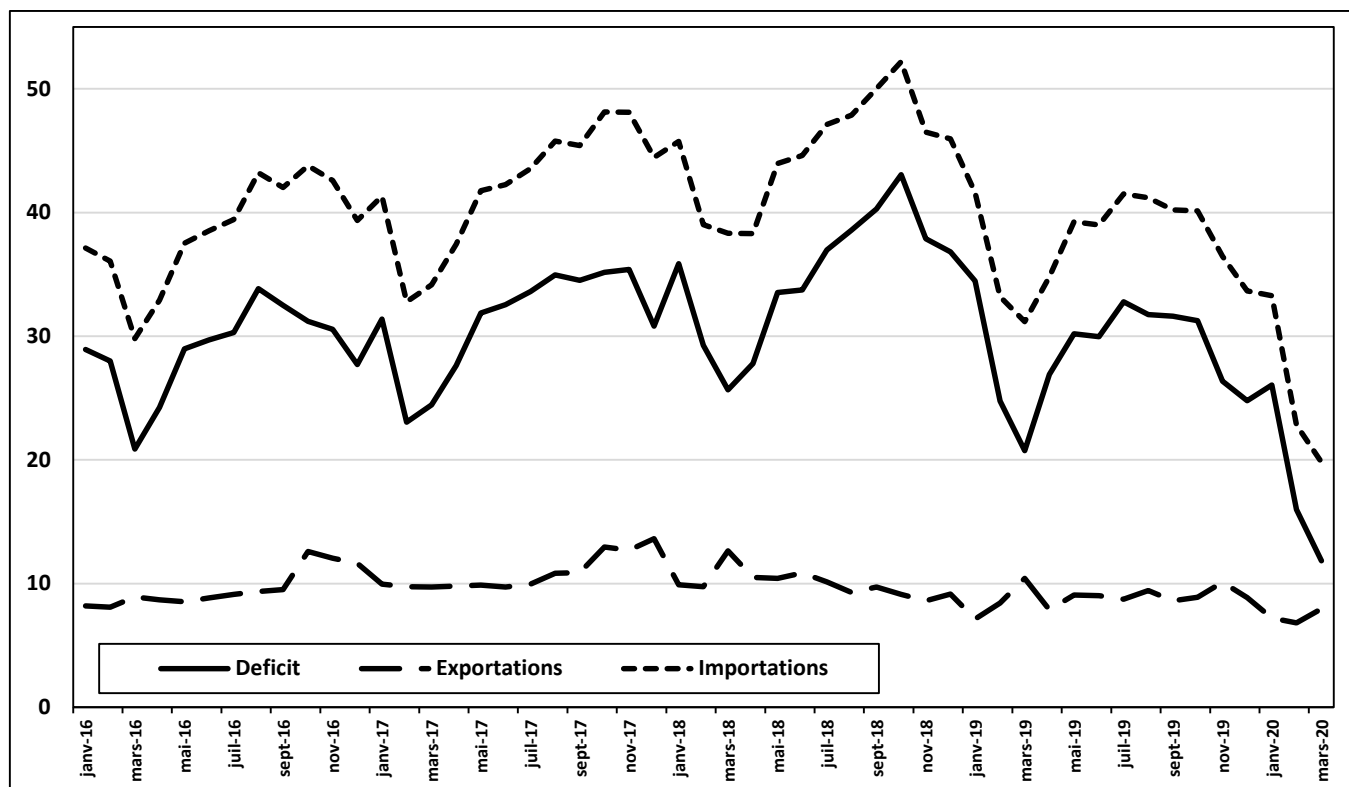
Graph 1. U.S. trade deficit in goods with China: 1978–2018
(in current billion US dollars). Source: U.S. Department of Commerce (various years).



Graph 2. U.S.-China bilateral trade (excluding services):
U.S. deficit between 2016 and 2019 (in current billion US dollars). Source: U.S. Department of Commerce (various years).



Graph 3. Bilateral monthly U.S.-China trade: exports, imports, and deficit from January 2016 to March 2020 (in current billion US dollars). Source: U.S. Department of Commerce (various years).



If we select the statistical bases of the U.S. Department of Commerce, we observe that the evolution of the trade balance between the U.S. and China has been characterized by a very marked, almost continuous, deterioration since the 1980s.

This deterioration temporarily slowed down as a result of the crises that shook the US economy (from the bursting of the “new economy” or Dot-com bubble in 2001 to the 2008 Financial Crisis or Subprimes Crisis, which was systemic in reality and had effects on China in 2009 and even more so in 2012), the appreciations of the yuan in 2005 and 2011, and the 2015–2016 Chinese stock market turbulence (*Graph 1*). The trade balance slowly degraded in the 1990s, then more bluntly in the years 2000–2010; it crossed the 100 billion USD mark in 2002, 200 billion USD in 2005, then 300 billion USD in 2011, before reaching the record deficit of 420 billion USD in 2018 for goods only (excluding services) (*Graph 2*). China then officially became the U.S.’s largest trading partner for goods, with a total of 660 billion USD exchanged: 120 billion USD in exports, and 540 billion USD in imports. Meanwhile, the trade in services exhibited a surplus in favor of the U.S. at 41 billion USD.

It was in this same year, 2018, when the U.S. launched the trade war against China. The initial measures, which consisted of abruptly increasing the customs tariffs borne from specific products imported from China (such as household equipment and photovoltaic solar panels), were enacted in January. From March, there were increases in the barriers to imports from China, affecting sectors such as metallurgy, the automobile industry, aeronautics, robotics, new information and communication technologies, and medical equipment. Then, in April, sanctions were imposed on Chinese firms, banning them from using inputs made in the U.S. A year later, in June 2019, after tariff increases were extended to new sectors, China was no longer the U.S.’s largest trading partner (its NAFTA associates, Mexico and Canada, succeeded

it). However, at the end of 2019, the significantly reduced trade deficit returned to -346 billion USD, which is below that observed in the last year of President Barack Obama's second term as President of the U.S. in 2016. This inflection is clearly visible in monthly data in the first months of 2019 (*Graph 3*). Could it be then that D. Trump has won and, thus, was correct? The answer to this question requires knowing whether, as mainstream economists have claimed for a long time, the trade between the U.S. and China is now "equal." We examine this further.

FIRST METHOD OF MEASURING UNEQUAL EXCHANGE: LABOR CONTENT OF EXPORTED GOODS

We first calculate the respective values in labor employed in the goods and services traded in the bilateral trade between the U.S. and China. To do this, consider that, for the given year t , China exports XL_{CHt} hours of work performed by Chinese workers and, in return, obtains $XL_{US t}$ working hours of U.S. workers, to which are added $SL_{US t}$ working hours of these same U.S. workers corresponding to the trade balance (seen from the point of view of China), that is, S_t dollars in monetary terms. The unequal exchange between the two countries can therefore be written as the ratio between the values in labor integrated in the respective exports of the two countries:

$$\rho_t = \frac{X L_{CH t}}{X L_{US t} + S L_{US t}} \quad (1)$$

where X represents the total exports of each country that we measure in hours of their domestic workers; the trade balance SL is measured in working hours of U.S. workers. SL has a positive sign if it is a surplus registered by China, and negative if it is not.

Under these conditions, we must also estimate how many hours of work is equivalent to a U.S. dollar alternatively in the U.S. and in China:

$$XL = \frac{L}{Y} \cdot X \quad (2)$$

where, for each of these two countries, L corresponds to the sum of the hours of work over the year, Y is its total product, X is the exports expressed in dollars, and XL represents these same exports measured in hours of work.

Similarly:

$$SL = \frac{L}{Y} \cdot S \quad (3)$$

where SL is the trade balance, considered from the point of view of China, but also measured in hours of work.

Thus:

$$\rho_t = \frac{\frac{L_{CH t}}{Y_{CH t}} \cdot X_{CH t}}{\frac{L_{US t}}{Y_{US t}} \cdot X_{US t} + \frac{L_{US t}}{Y_{US t}} \cdot S_t} \quad (4)$$

Firstly, for the U.S., L_{US} is obtained by multiplying the average number of hours worked per year and per worker, sourced from the OECD (various years), by that of the number of employed persons, whose data are sourced from the International Labor Organization (various years). In the case of China, the labor input L_c is the product of the number of workers employed, the database sourced from the National Bureau of Statistics (various years), by that of the weekly hours of work of urban employees on average, sourced from the databases of the *China Labor Statistics Yearbooks* and the *China Population and Employment Statistics*

Yearbooks between 1998 and 2018 (a variable which is stable enough to allow recourse, retroactively from 1978 to 1997, to calculate the average for this period). The data are spread over the 52 weeks of the year.

Secondly, the product Y_{US} is obtained from the U.S. Bureau of Economic Analysis. We use the total product instead of Gross Domestic Product (GDP) because we need to keep the production data consistent with those of exports and imports. As a matter of fact, the data of exports and imports are measured in total output; intermediate input and net value added are not differentiated. Just like for the U.S., to estimate Y_C for China, we use the total product, not GDP. However, data are available only for the years for which the input-output tables of the Chinese economy have published (NBS, various years), though the data are irregular. Among the possible different methods to complete this series, we use the value-added rate of the year with an input-output table in order to estimate the value-added rate of the year for which the data are missing, and then use the product of the value-added rate and GDP to find China's total output. The missing points are replaced by those of the nearest year or by the average of two equidistant points, if available. In order to homogenize the procedures for calculating unequal exchange ratios, we use the following two approaches: the first one, as described above, was built by ourselves; and the second one was derived from Ricci (2018) and verified by ours (*cf. Part III*). Thirdly, the labor contents directly included in the traded goods (XL_{CH} and XL_{US}) are estimated by using the data of the respective exports of the countries. The X_{US} and X_{CH} series are sourced from the database on trade provided by the United Nations (various years), with the same statistical scope. Under these circumstances, our series could be built from 1978 to 2018. The calculations were all carried out at current prices, and the conversion of the currencies between them was conducted using the official annual average exchange rate, given by the World Bank (various years).

Our results illustrate the existence of an unequal exchange between the U.S. and China over the past four decades, operating in favor of the former and at the expense of the latter. The changes in the contents of labor integrated in the goods and services traded (*Graph 4*) were different in both countries: in China, they increased rapidly until the mid-2000s, then fell sharply before stabilizing at the start of the decade 2010; in the U.S., they increased much more moderately and continuously. The two curves converged at the end of the period. The extent of the unequal exchange is revealed when the ratio of the contents in labor of exports is calculated. Thus, we find that, between 1978 and 2018, one hour of work in the U.S. was exchanged for nearly 40 hours of work in China, on average.

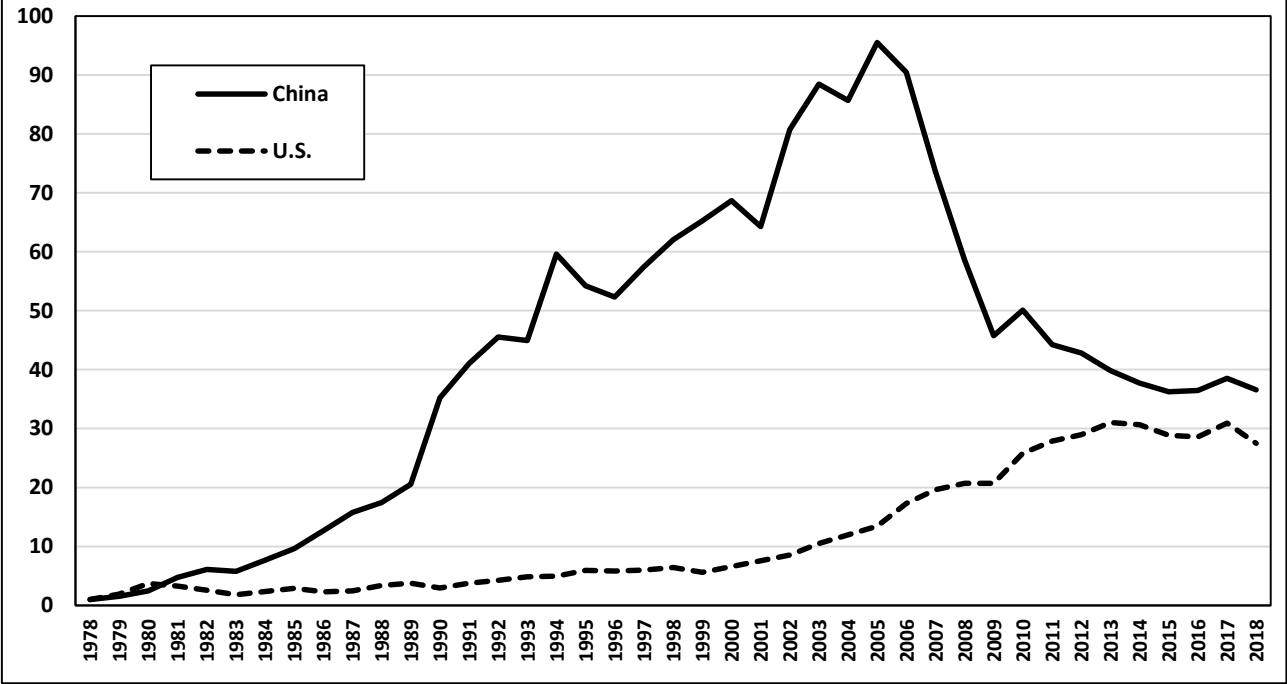
However, from the middle of the 1990s, that is, the years of deep reforms in China driven mainly by fiscal and budgetary matters, we observe a very marked decrease in unequal exchange (*Graph 5*). As a matter of fact, in 2018, 6.4 hours of Chinese work were being exchanged for one hour of work from the U.S. If we do not take into account the trade balance (trade surplus for China) over the 40 years examined, the Chinese worker had to work more than 121 hours to obtain one hour of U.S. work, on average (*Graph 6*). Would the erosion of this advantage in the exchange of the U.S. explain the trigger of its trade war?

SECOND METHOD OF MEASURING UNEQUAL EXCHANGE: VALUE TRANSFER AND INPUT-OUTPUT TABLES

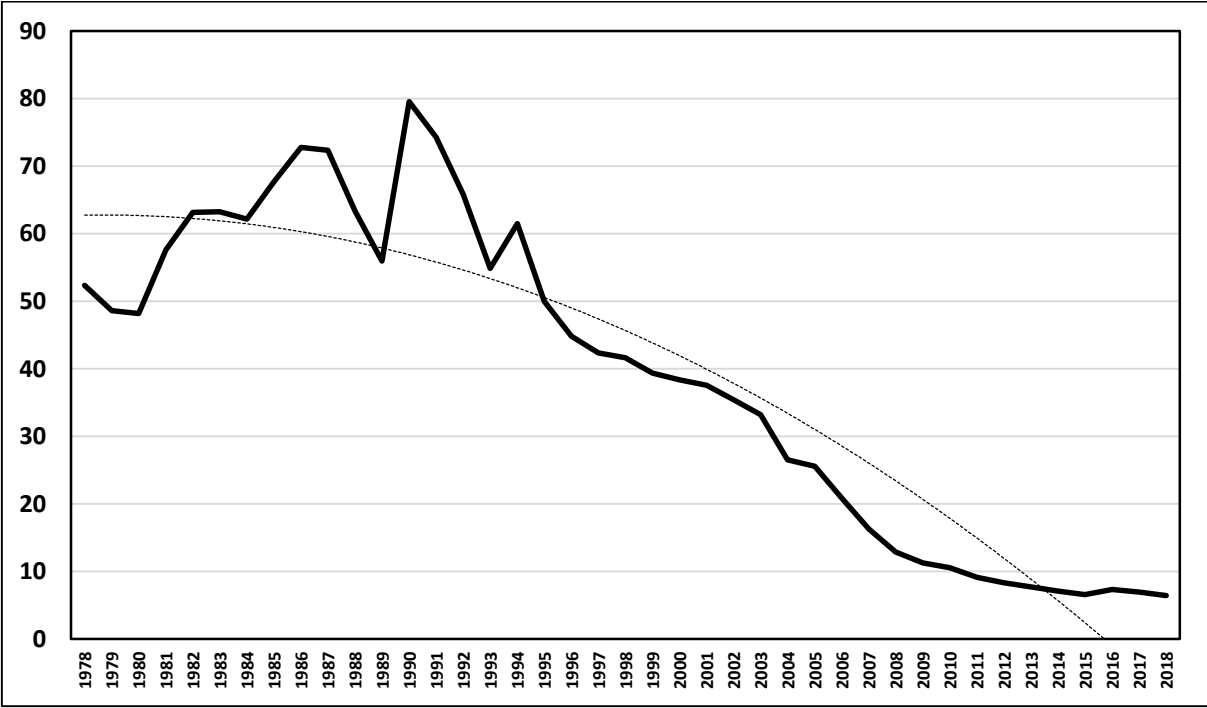
In the above, it was the comparison of the working hours required on average to manufacture the goods and services traded that allowed us to assess the unequal trade between the U.S. and China markets. Nevertheless, the measurement of the appropriation of the produced wealth between the countries is only truly taken through the bilateral transfer of the necessary social work time, that is, the international value, which is empirically estimated here. Given the

macroeconomic data available, it was only possible for us to calculate the living labor directly incorporated into exports with our first method, given gross product also includes materialized labor, crystallized in the various production methods.

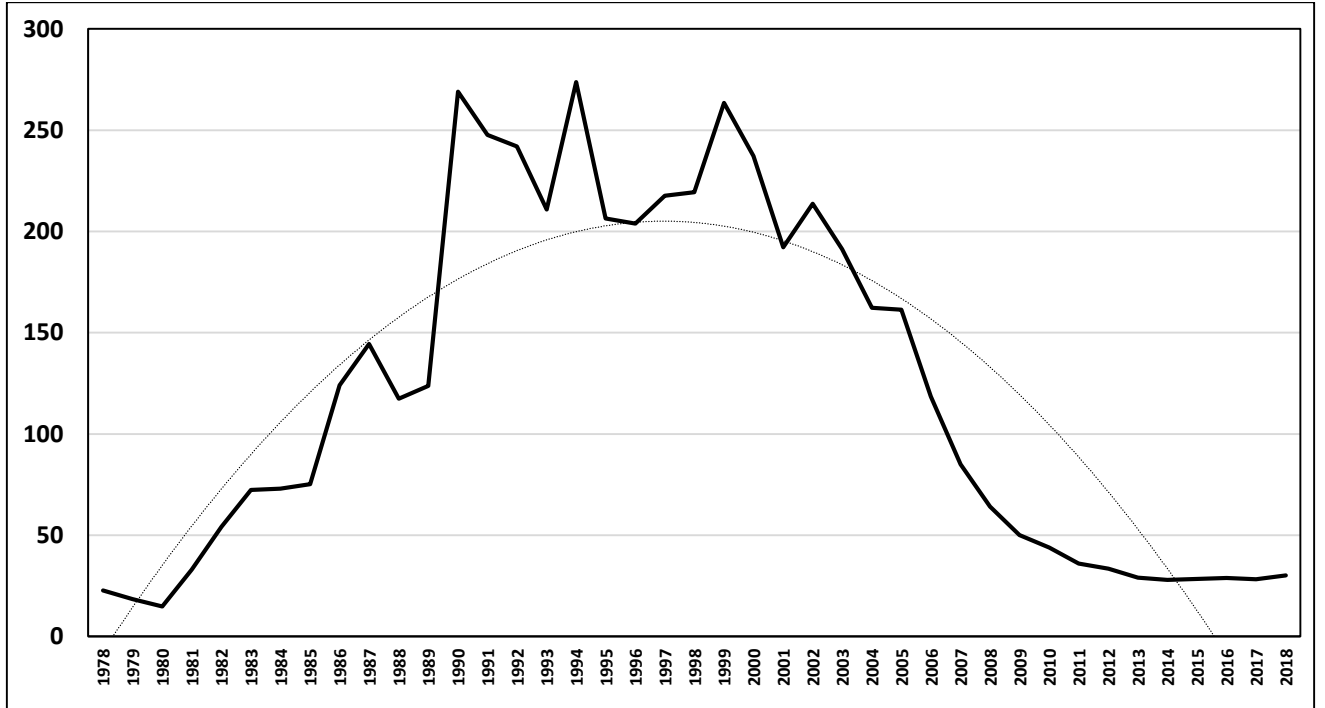
Graph 4. Indices of labor contents included in bilateral exports: China and the U.S., 1978–2018 (index 1 in 1978). *Source:* Authors’ calculations.



Graph 5. Ratio of the labor exchange included in U.S.-China trade, bilateral balance included: 1978–2018. *Source:* Authors’ calculations.



Graph 6. Ratio of labor exchange in U.S.-China trade, excluding bilateral balance: 1978–2018. Source: Authors' calculations.



To take these arguments into account, let us now adopt an alternative method, inspired by that of Ricci (2018), to examine more precisely the importance of this unequal exchange. Based on the New Interpretation of Labor Value Theory (hereafter, "New Interpretation") (Foley [2000], Meng [2015]), we assume that, whatever the sector, the newly-created international value on the world market is equal to the total quantity of labor directly allocated as an input to this sector by the various countries of the world; that is, in each sector, assuming that its goods are homogeneous, the quantity of direct labor input allocated by each country is equivalent to the international value, which is obtained by multiplying the share of the country's production in that sector at the world scale by the total amount of international value created in that sector. If the prices of these homogeneous goods are similar, then the quantity of direct labor input corresponding to the international value in each country is itself equal to the product of the country's proportion in the total value added of the sector at the world level and the total amount of international value created in this sector.

In this framework, we derive the expression of the newly-created quantity of international value in country i and sector j , as follows:

$$l_{ij} = \left(\frac{e_{ij}^p Y_{ij}}{Y_{Wj}} \right) l_{Wj} \quad (5)$$

where l_{ij} is the quantity of direct labor input considered as international value in country i and sector j ; l_{Wj} , the total direct labor input into the global market for this sector j , in other words, the total international value newly created in the same sector j ; Y_{ij} , the added value of sector j of country i , denominated in local currency; Y_{Wj} , the total added value of sector j on the world market, denominated in US dollars; and e_{ij}^p the exchange rate stated in purchasing power parity (PPP).

The reason why the expression of the exchange rate is essentially needed in PPP is because its use makes it possible to reflect the proportion of the product of a country in total production on the world market, and to reduce the eventual impact of fluctuations of the real exchange rate. The formula for calculating e_{ij}^p in PPP is as follows:

$$e_{ij}^p = e_i^p \frac{\sum_i e_i^m Y_{ij}}{\sum_i e_i^p Y_{ij}} \quad (6)$$

where e_i^p is the exchange rate in PPP of the currency of a country i compared to the US dollar, and e_i^m the nominal exchange rate of this same national currency of country i against the dollar. Equation (6) guarantees a normalization of the exchange rate in PPP of a country to ensure that the total added value at the world level calculated at the nominal exchange rates and in PPP are indeed equal. By applying such a process of monetary normalization, it is understood that the exchange rate in PPP will be different according to the sector in each country.

To calculate the difference existing between the world market price and the newly-created international value by each sector of the different countries, it is necessary to resolve two particularly important difficulties mentioned at the beginning of this current part: one is linked to the monetary translation of value; and the other is linked to the integration of materialized work in the means of production.

The first problem is that the unit of international value calculated by Equation (5) is working time, while that of the world market price appears in monetary terms. Therefore, we need to convert the calculated international values into monetary units. This is in fact relatively easy to perform in the context of the New Interpretation of labor value because we can achieve this through the methods of Monetary Expression of Value or the Monetary Expression per Labor Time. Since, at the global level, the direct labor that is allocated in all sectors is equivalent to the quantity of the new added value created, the value of all sectors represented globally by value added in money can be expressed as the ratio of total value added to total direct labor, that is:

$$\mu = \frac{\sum_j Y_{Wj}}{\sum_j l_{Wj}} \quad (7)$$

μ being the monetary expression by working time or the unit of value.

A second problem to be solved is related to the fact that, in the previous calculation, we essentially consider the newly created part of the value of the merchandises, that is, living labor alone. However, in calculating the difference between the market price and the real value, we must take into consideration not only this living labor, but also the part that is associated with labor materialized in the means of production. In Ricci's method (2018), the total value of goods in country i and sector j is written:

$$V_{ij} = \mu l_{ij} + e_i^m C_{ij} \quad (8)$$

with C_{ij} the capital of sector j of country i corresponding to the purchase of the means of production in local currency; and $e_i^m C_{ij}$ is the total constant capital denominated this time in US dollars.

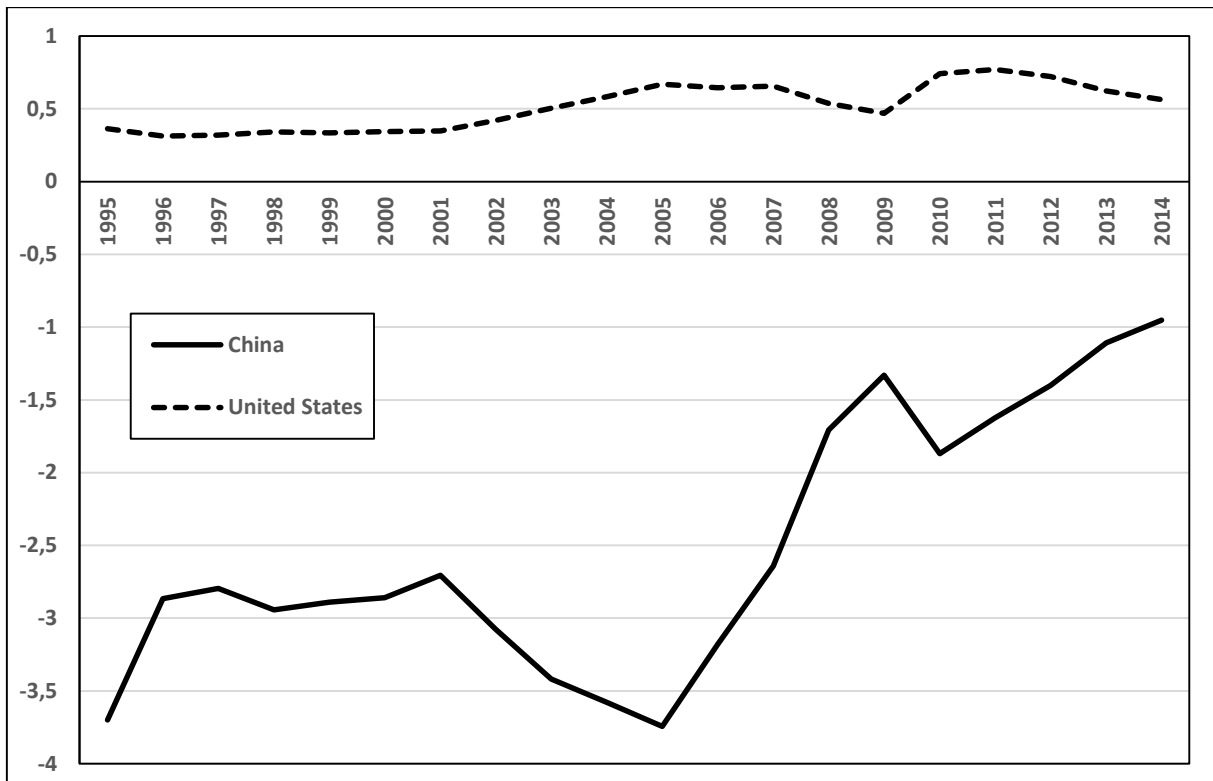
At the same time, the complete form of the market price for sector j in country i will be:

$$M_{ij} = e_i^m Y_{ij} + e_i^m C_{ij} \quad (9)$$

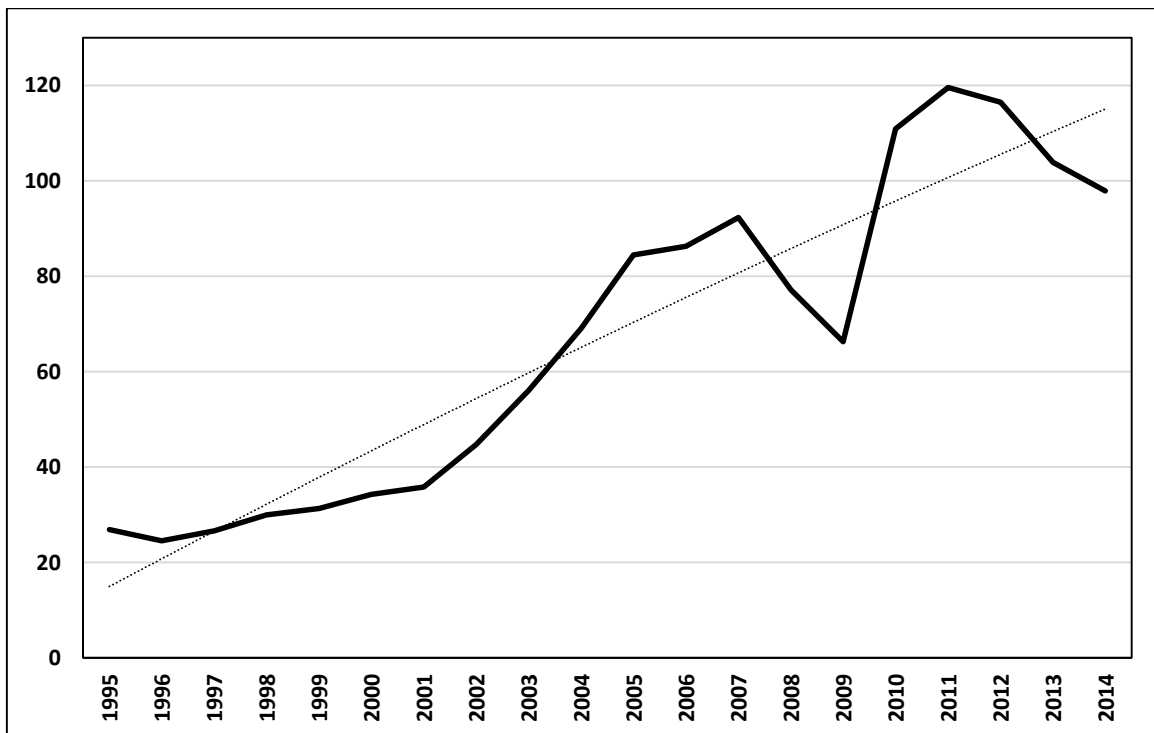
Using Equations (8) and (9), we can now obtain the difference between the world market price and the international value, according to the formula:

$$d_{ij} = M_{ij} - V_{ij} = e_i^m Y_{ij} - \mu l_{ij} = \left(\frac{e_i^m Y_{ij}}{l_{ij}} - \mu \right) l_{ij} \quad (10)$$

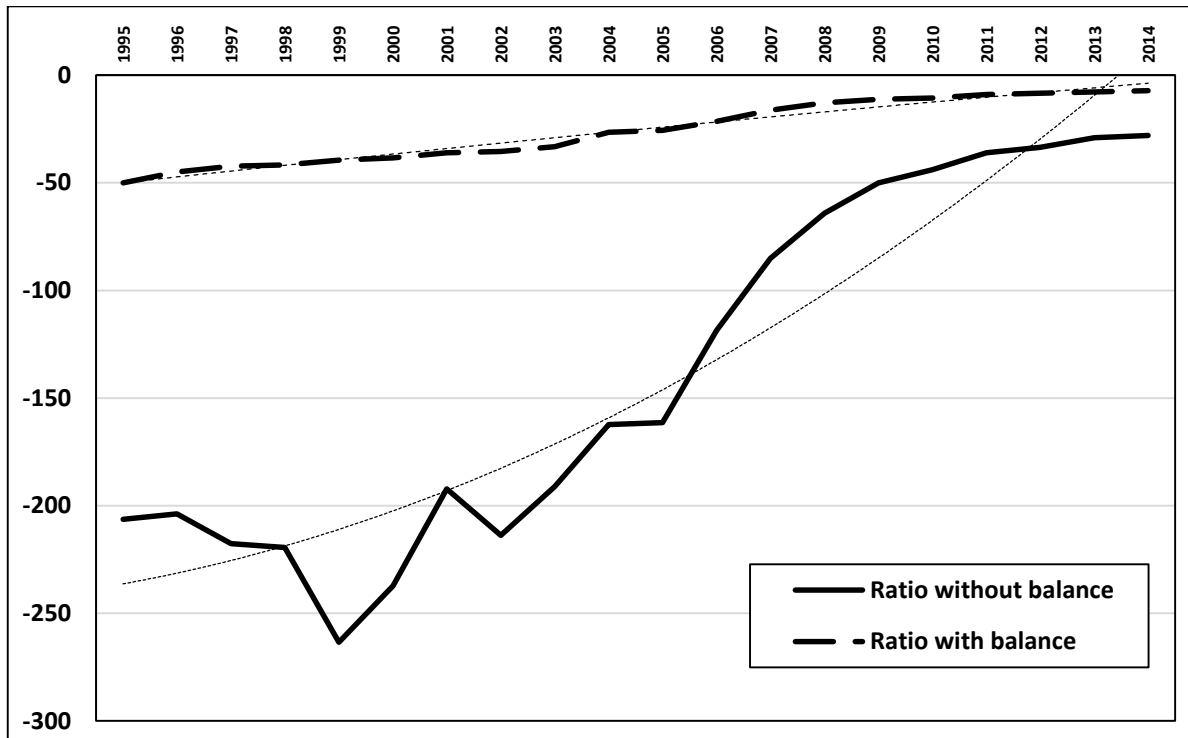
Graph 7. U.S.-China unequal exchange in proportion of the respective added values of the countries: 1995–2014 (in percentages). Source: Authors' calculations.



Graph 8. Amount of unequal trade between the U.S. and China: 1995–2014 (in billions of dollars). Source: Authors' calculations.



Graph 9. Ratio of the labor exchange in U.S.-China trade, balance included or not (according to the first calculation method): 1995–2014. Source: Authors' calculations.



This difference is then multiplied by the proportion of exports from each sector and country in total production to calculate the estimated amount of value transferred through exports, as inputs, or as outputs. By considering both the gaps in other sectors and the quantities of products imported by them, we thus obtain the value transferred from or to other economic activities that is recorded by this sector. We can then arrive at an estimate of the net value transferred relating to this sector; that is, at the level of unequal exchange that corresponds to this sector.

In practice, when the world trade matrix constructed from the table of international inputs and outputs is calculated, the process that we have just analyzed can be carried out by the sequence of the following three stages: (1) once the amount of international value newly created in each sector and each country l_{ij} is obtained by Equation (5), we use the total production of each sector M_{ij} in order to estimate the ratio between the value newly created and the total production $\phi_{ij} = l_{ij}/M_{ij}$ (step 1); (2) we multiply this ratio by the world trade matrix given in monetary terms to find the one in values, that is, in hours of work; and (3) the term $\frac{e_i^m y_{ij}}{l_{ij}} - \mu$ in Equation (10) is, at the very end, multiplied by this matrix of world trade in values so as to finally obtain that of transfers of international values.

Compared to other methods available in the literature, the one we use in this third part has serious advantages (Ricci [2018]). First, it provides a rigorous theoretical framework, based on a strict and logical interpretation of labor value, and is capable of being integrated into a unified model, the possible distinct forms taken by the unequal exchange between countries. Second, its empirical application does not require much data. Only the series concerning working time and value added are needed here to measure the difference between world market prices and international values since the axiomatic associated with the New Interpretation of the theory of labor value does not require additional assumptions on technology. Third, due to the very simplicity of measuring international values, the impact of missing data on the expected results

is quite minor (more so for those of small Southern countries, whose weight in total value added is low), and does not significantly affect the accuracy of the calculations.

This procedure is carried out over the period 1995–2014 for 43 countries, representing more than 85 percent of world added value, and obviously including both the U.S. and China. As our aim was to discuss the U.S.-China trade war, we will thus focus on their bilateral relations. Our data on value added and inputs of direct working hours in the different sectors of each country are taken from the World Input-Output Database (WIOD) (Timmer *et al* [2015]). Its two versions, dating from 2013 to 2016, present different sectoral classifications for multi-country input-output tables: the first has 35 sectors and 40 countries and regions, and covers the period 1995–2009; and the second has 68 sectors and 43 economies, and covers the period 2000–2014. Thus, we use the first version between 1995 and 2009, and the second version from 2010 to 2014. For this last period, the input in working time by the hired employees is not provided. The missing points are estimated using International Labor Organization data (various years) and the same method as that used in the WIOD database. For those concerning the business sectors, we retain the data of higher levels in the sectoral classification. For those of temporal dimension, we replace the observations of the nearest year or use linear interpolation, if they are located between two equidistant years. PPP exchange rates are sourced from the World Bank (various years).

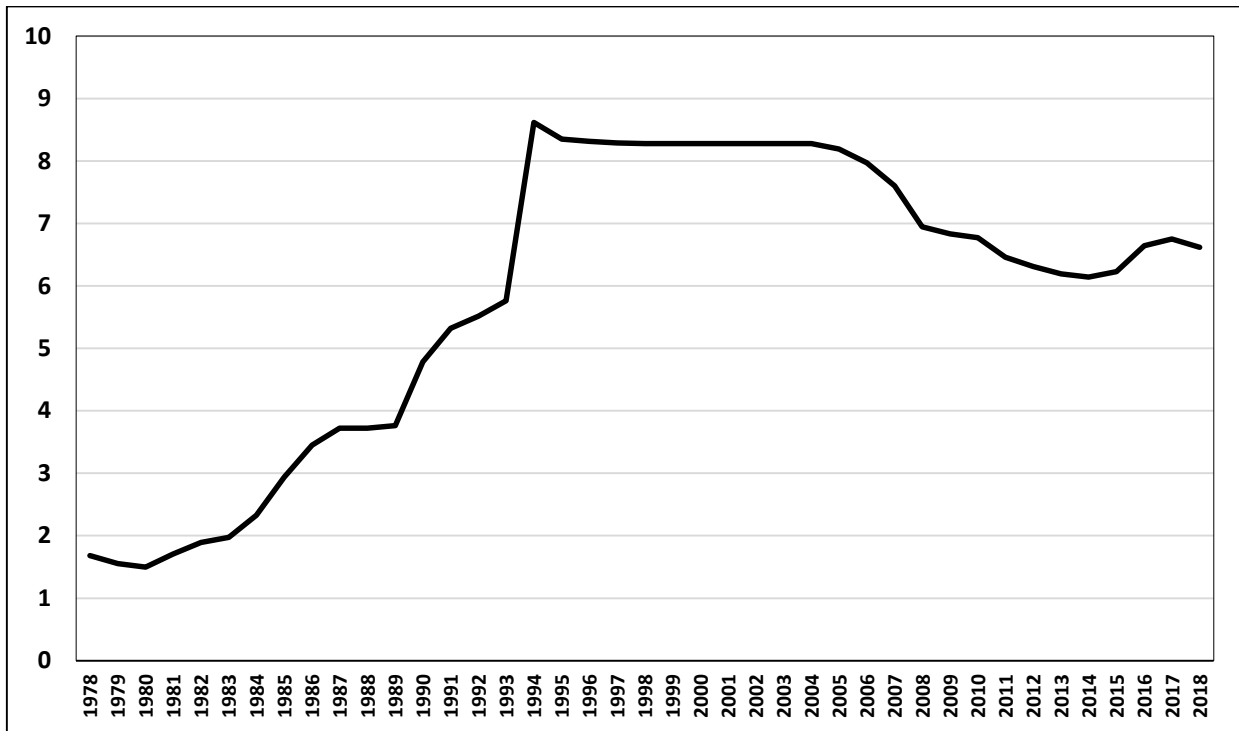
In the following, we only present the results for U.S.-China bilateral trade. They confirm those already collected using the first method (in *Part II*), and highlight the existence of inequality in trade between the two countries between 1995 and 2014. The recorded signs, positive for the U.S. and negative for China, corroborate the idea that the transfer of international value occurs from the former country to the latter. This redistribution that operates for the benefit of the current world hegemony is particularly visible when this unequal exchange is expressed in proportion to the respective added values of the two countries (*Graph 7*). The amount of this unequal exchange, indicated in monetary terms in current dollars, even tends to increase from 1995 to 2014, reaching 100 billion USD at the end of the period (*Graph 8*), or just under 0.5 percent of total U.S. value added.

What we do observe, however, is that the U.S. is finding it increasingly difficult to maintain its advantage and come out on top in this trade competition, and by extension bear all the implications of free trade, even when it once defined the rules as the hegemony of the capitalist world system, largely for their own benefit. As a matter of fact, China has managed to reduce the importance of this unequal exchange very significantly; the transfer of wealth to its disadvantage (and the U.S.'s advantage) gradually dissipated, from -3.7 percent to -0.9 percent of its total added value, between 1995 and 2014 (*Graph 7*). This result clearly supports the downward trends in the ratio of labor exchanges included in the bilateral trade previously observed (*Part II*). As can be seen in *Graph 9*, China needed to trade 50 hours of Chinese labor for one hour of U.S. labor in 1995, but just over seven in 2014, if the bilateral trade balance is considered. Multiple overlapping factors explain these developments, some of the most influential of which are exchange rate fluctuations (marked by a yuan that is not systematically undervalued [*Graph 10*]) and productivity dynamics (reflecting technological catch-up [*Graph 11*]), but we reserve their study for future research.

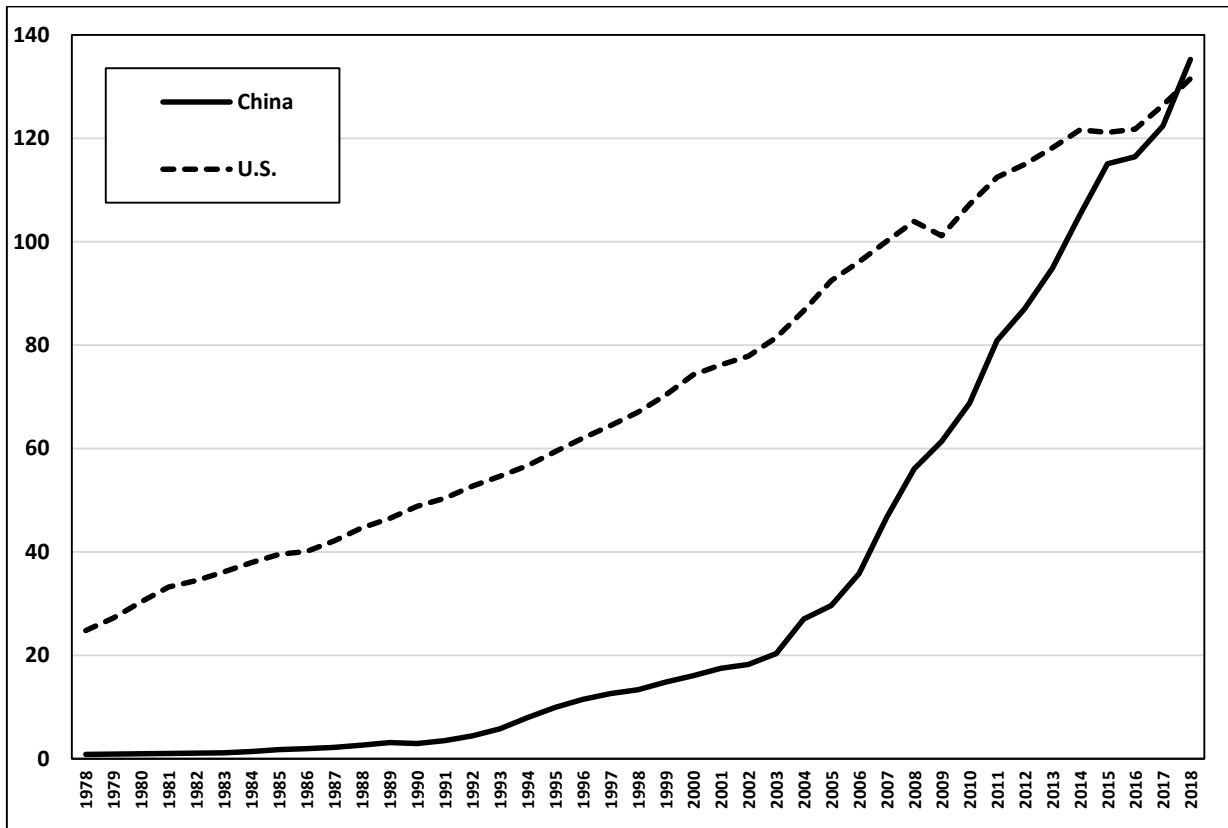
ELEMENTS OF SECTORAL ANALYSIS

It is nevertheless fundamental to note that these general results, jointly highlighted by our two separate methods of calculating the unequal exchange between the U.S. and China (*Parts II and III*) cover very pronounced disparities, depending on the sectors of activity that one chooses to examine.

Graph 10. Exchange rate dollar – yuan: 1978–2018. Source: World Bank (various years).



Graph 11. Gross product / labor ratio: China and the U.S., 1978–2018. Source: Authors' calculations (according to the first method, presented in Part II).



Tables 1 and 2 thus present, for the last year of our second sample (2014), the amounts of cross sectoral transfers linked to unequal trade occurring in both directions during U.S.-China trade. Of the 55 sectors listed in the WIOD database, and whose input-output movements were not zero in 2014, more than three-quarters activities (78.2%, or 43 activities) recorded a transfer of value from China to the U.S. The 20 largest transfers, measured in millions of USD, are listed in Table 1. The textile, clothing, and leather goods sectors largely lead with an amount of 71.2 billion USD transferred, followed by that of furniture and other supplies at 21.0 billion USD. These two activities account for almost 95 percent of total net transfers from unequal trade. The other sectors are far behind, but seven of them still reveal a transfer of an amount greater than a billion USD: electrical equipment (3.3 billion USD), air transport (2.8 billion USD), wood and wooden articles, cork, straw or spart excluding furniture (1.6 billion USD), rubber and/or plastic articles (1.4 billion USD), chemicals and their derivatives (1.3 billion USD), legal, accounting and management consultancy activities (1.3 billion USD), as well as miscellaneous general-purpose machinery and equipment not elsewhere classified (1.1 billion USD).

Conversely, 12 business sectors are at the origin of a value transfer that operated at the expense of the U.S. in 2014 (Table 2), but only four are of an amount exceeding 400 million dollars: manufacturing of computer, electronic and optical products (6.9 billion USD), agriculture and livestock (3.1 billion USD), motor vehicles, trailers and semi-trailers (1.1 billion USD), and basic pharmaceuticals and pharmaceutical preparations (422 million USD).

Table 1. Amounts of bilateral unequal exchange transfers from China to the U.S. by economic sector in 2014 (in million dollars). Source: Authors' calculations.

Rank	Title of the economic sector	Amount of the transfer
1	Textile, clothing and leather goods manufacturing	71,165.3378
2	Manufacture of furniture and other supplies	20,977.5645
3	Manufacture of electrical equipment	3,256.4309
4	Air transport	2,838.4923
5	Manufacture of wood and wooden articles, cork, straw or spart (excluding furniture)	1,574.1495
6	Manufacturing of rubber and plastic articles	1,366.7739
7	Manufacturing of chemicals and derivatives	1,307.0527
8	Legal and accounting activities, head offices, and management consulting	1,295.6958
9	Manufacturing of general-purpose machinery and equipment (not elsewhere classified)	1,121.7315
10	Manufacturing of other non-metallic mineral products	996.4750
11	Manufacturing of Food, Beverage and Tobacco Products	732.9350
12	Manufacturing of fabricated metal products (except machinery and equipment)	695.6651
13	Other service activities	486.7961
14	Mines and quarries	456.9488
15	Land transportation and pipeline transportation	440.0414
16	Fishing and aquaculture	404.7337
17	Manufacturing of paper and paper products	315.2882
18	Wholesale trade (except motor vehicles and motorcycles)	159.5265
19	Telecommunications	147.8567
20	Public administration and social security	122.1474

Table 2. Amounts of bilateral unequal exchange transfers from the U.S. to China by economic sector in 2014 (in million dollars). Source: Authors' calculations.

Rank	Title of the economic sector	Amount of the transfer
1	Manufacturing of computer, electronic and optical products	6,907.3447
2	Agriculture and farming, hunting and related services	3,127.2840
3	Manufacturing of motor vehicle, trailer and semi-trailer	1,056.8188
4	Manufacturing of basic pharmaceutical products and pharmaceutical preparations	422.3682
5	Manufacturing of other transport equipment	383.7530
6	Forestry and logging	329.1851
7	Manufacturing of base metal	256.6966
8	Supply of electricity, gas, steam and air conditioning	69.8080
9	Manufacturing of coke (coal) and refined petroleum products	19.1010
10	Water collection, treatment and distribution	8.1942

Table 3. Proportion of Chinese sectoral value added transferred in bilateral trade from China to the U.S. by sector in 2014 (in percentages of Chinese sectoral value added). Source: Authors' calculations.

Rank	Title of the economic sector	Share of added value
1	Manufacture of furniture and other supplies	29.6716
2	Textile, clothing and leather goods manufacturing	28.0065
3	Air transport	12.0741
4	Manufacture of electrical equipment	1.9620
5	Manufacture of wood and wooden articles, cork, straw or spart (excluding furniture)	1.7162
6	Manufacturing of rubber and plastic articles	1.3709
7	Manufacturing of paper and paper products	0.6719
8	Legal and accounting activities, head offices, and management consulting	0.6278
9	Manufacturing of chemicals and derivatives	0.5943
10	Manufacturing of fabricated metal products (except machinery and equipment)	0.5658
11	Sanitation; collection, treatment and disposal of waste; materials recovery; other waste management services	0.4561
12	Manufacturing of other non-metallic mineral products	0.4429
13	Manufacturing of general-purpose machinery and equipment (not elsewhere classified)	0.4290
14	Fishing and aquaculture	0.4197
15	Other service activities	0.2034
16	Manufacturing of Food, Beverage and Tobacco Products	0.1780
17	Postal and courier activities	0.1529
18	Land transportation and pipeline transportation	0.1434
19	Printing and reproduction of recorded media	0.1324
20	Scientific research and development	0.1323

Table 4: Proportion of U.S. sectoral value added transferred in bilateral trade from the U.S. to China by sector in 2014 (in percentages of US sectoral value added). Source: Authors' calculations.

Rank	Title of the economic sector	Share of added value
1	Manufacturing of computer, electronic and optical products	2.5777
2	Agriculture and farming, hunting and related services	1.7649
3	Forestry and logging	1.3871
4	Manufacturing of motor vehicle, trailer and semi-trailer	0.7536
5	Manufacturing of basic pharmaceutical products and pharmaceutical preparations	0.4452
6	Manufacturing of base metal	0.4300
7	Manufacturing of other transport equipment	0.3052
8	Water collection, treatment and distribution	0.0883
9	Supply of electricity, gas, steam and air conditioning	0.0257
10	Manufacturing of coke (coal) and refined petroleum products	0.0112

As illustrated in *Table 3*, when compared as a share of the respective sectoral value added of the U.S. or China, transfers reflecting these unequal exchanges appear to be the most costly for the Chinese economy in the manufacturing of furniture and other supplies (29.7 percent), and the manufacturing of textiles, clothing and leather goods (28.0 percent) sectors. Accompanying the industries already listed in *Table 1*, and added to that of air transport (12.1 percent), quite a number of services, ranging from the sector of legal, accounting and management activities (0.6%) to sanitation (0, 5 percent), via those of post and courier (0.2 percent) or printing and reproduction of recorded media (0.1 percent), are also characterized by such value transfers profiting in the U.S. Those sectors that on the contrary, benefited China (*Table 4*) concern a much narrower range of business activities and reach smaller proportions in U.S. value added. Although, it should be observed that there are significant transfers for the manufacturing of computer, electronic and optical products (2.6 percent), agriculture and livestock (1.8 percent) and forestry (1.4 percent).

CONCLUSION

By successively using two alternative methods of calculation, we have shown that the working hours integrated into the trade between the U.S. and China were, by reference to the same volume traded, greater in the case of the latter than for that of the former. This reveals an unequal exchange in value. Such a phenomenon is highlighted over the last four decades with the first method (1978–2018) and over 20 years with the second method (1995–2014). To put it another way, the unmistakable finding that China has reaped monetary receipts from growing bilateral trade surpluses since the 1970s is nuanced by the fact that, in terms of working time incorporated into exports, it is mainly the U.S. who benefited from these exchanges, as suggested by our calculations on sectors.

In such a paradoxical context, the outbreak of the trade war against China in 2018 could be interpreted as an attempt by the U.S. President Trump to curb the continuous deterioration in the trade advantages the U.S. has seen for decades with China, its emerging rival. However, is the remedy likely to be worse than the disease?

A complexification arises in the analysis of the question that occupies us when we take into account recent changes in the configuration of value chains that have seen China play an integral

and decisive part in the globalized supply networks of many economic sectors. Indeed, a substantial part of Chinese exports are made up of components that have been previously manufactured abroad before being delivered to China as inputs to assemble on its territory. However, as soon as these various imported components are subtracted from Chinese exports, the deficit in the U.S. trade balance with China is halved.

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PUBLISHED IN 2023 IN RESEARCH IN POLITICAL ECONOMY, VOL. 39, P. 31-52.