EFFECTS OF US TRADE WITH LOW WAGE COUNTRIES ON US WAGES: AN ANALYSIS BASED ON THE HECKSCHER-OHLIN MODEL

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1. INTRODUCTION

The continuous and accelerated increase in income inequality is one of the most important socio-economic characteristic of contemporary US society. It considerably affects the amount of internal investments in infrastructure and productive sectors of national economy and contributes to the persistence of relatively high unemployment. As a result the growth rate of US economy is relatively low, and the difference between the US and Chinese gross domestic product is continuously shrinking. The standard of living of the US middle class is stagnant or decreasing, and the young US men and women are not more able to live as their parents were living thirty years ago.

The increase in income inequality has obviously many causes. They are of economic, social and political nature as well as historical, demographic and ethical one. Taking into consideration the basic principles of international trade theory, the trade with low wage countries might be one of these causes because it might limit the increase of real wages or even decrease them. Subsequently, I consider in this paper several data sets provided by the US Government for testing the theoretical conclusions that might be derived by using the Heckscher-Ohlin Model.

In accordance with the Factor Price Equalization Theorem, one of the four theorems that define the Heckscher-Ohlin Model, the elimination of trade barriers among countries leads to the equalization of factor prices.

The politically and socially sensitive implication of this theorem is that the free trade with low wage countries causes a decrease of wages in those with high wages. Therefore some analysts, politicians and organizations would advocate protectionist measures, while their opponents would try to argue that the theorem is nothing else than an elegant theoretical exercise invalidated by the empirical data.

The US Government data show that during the last fifty years the real wage has been virtually stagnant while the weight of the trade with low wage countries in the US trade has continuously
increased. This fact apparently suggests that the empirical data invalidate the theorem. However, it should not be considered alone, because the labor productivity has increased for more than three times during the same period of time and according to the economic theory and historical data a productivity increase should be followed by a wage increase.

This extraordinary gap has of course multiple causes. But although the political, social and historical factors specific to the United States might be very important, the impact of the trade with low wage countries cannot be discounted.

For this reason I have calculated the coefficient of correlation between the weight in the US foreign trade of the US trade with the most important low wages countries, and the difference between the indexes of labor productivity and real wage, for the 2004–2013 time interval. The resulting value was 0.9475 using the statistical data provided by the US Bureau of Labor Statistics and 0.9521 using the statistical data included in The Economic Report of the President. These values are extremely high for economic variables and therefore an explanation based on pure randomness would be inappropriate. Subsequently, the possibility of a causal relationship should be taken into consideration.

2. THE HECKSCHER OHLIN MODEL

In the international trade literature the names of the Swedish economists Eli Heckscher and Bertil Ohlin are used in reference to the theorem that bears their names and a set of four theorems that includes it.\textsuperscript{2}

The first theorem was developed by Ohlin in his influential book entitled \textit{Interregional and International Trade} published in 1933. Heckscher’s name was added at Stolper’s and Samuelson’s suggestion because he had published in 1919 an article in which had introduced some basic notions that would be later developed by Ohlin.\textsuperscript{3}

The Heckscher-Ohlin Model includes besides the theorem bearing their name:

- the Stolper-Samuelson Theorem formulated and proved by the two American economists in their article entitled “Protection and Real Wages” published in \textit{The Review of Economic Studies}, in 1941;
- the Factor-Price Equalization Theorem formulated and proved by Samuelson in his article entitled “International Trade and Equalization of Factor Prices” published in \textit{The Economic Journal} in 1948; and

Briefly expressed in non-mathematical terms, the four theorems that define the Heckscher-Ohlin Model state the following:
The Heckscher-Ohlin Theorem

A country will export those commodities which are produced with its relatively abundant factors of production, and will import those in the production of which its relatively scarce factors are important. And as a result of the shift towards increased production of those goods in which the abundant factors predominate, there will be a tendency – necessarily incomplete – towards an equalization of factor prices between the two or more trading countries. (Stolper and Samuelson, 1941)

Under the assumption that the two factors are labor and capital, the theorem states:

The country better endowed with capital will export capital-intensive goods and import labor-intensive products, and the country better endowed with labor will export labor-intensive goods and import capital-intensive products.

The Stolper Samuelson Theorem:

Under the assumptions of the Heckscher-Ohlin-Samuelson Model, an increase in the relative price of a good rises the return of the factor used intensively in the production of that good relative to all other prices and lowers the return to the other factor relative to all other prices. (Navia, Nelson, Wedding, 1999)

The Factor-Price Equalization Theorem:

(1) So long as there is partial specialization, with each country producing something of both goods, factor prices will be equalized, absolutely and relatively, by free international trade.
(2) Unless initial factor endowments are too unequal, commodity mobility will always be a perfect substitute for factor mobility.
(3) Regardless of initial factor endowment even if factors were mobile they would, at worst, have to migrate only up to a certain degree, after which commodity mobility would be sufficient for full price equalization.
(4) To the extent that commodity movements are effective substitutes for factor movements, world productivity is, in a certain sense, optimal; but at the same time, the imputed real returns of labor in one country and land in the other will necessarily be lower, not only relatively but also absolutely, than under autarky.” (Samuelson, 1948)

The Rybczyinski Theorem:

An increase in a country’s endowment of a factor will cause an increase in output of the good which uses that factor intensively, and a decrease in the output of the other good.
3. THE ASSUMPTIONS OF THE FACTOR PRICE EQUALIZATION THEOREM AND
THE CHARACTERISTICS OF U.S. TRADING PARTNERS PROVIDING LOW
WAGES

In the classical two countries, two production factors, and two goods model the Factor Price
Equalization Theorem is proved under the following eight assumptions:

(1) there are not barriers to trade;
(2) there are not transportation costs;
(3) there is perfect competition in each country and full employment before and after the
elimination of trade barriers between the two countries;
(4) the production factors are mobile in each country but are immobile across national
borders;
(5) there is not complete specialization as a result of free trade, both countries continue to
produce the two goods;
(6) the production functions exhibit constant return to scale;
(7) the technologies in the two countries are identical; and
(8) there is not factor intensity reversal. (E Kwan Choi, 2010)

Subsequently, for assessing the relevance of the Factor Price Equalization Theorem for the US
trade with low wage countries, it is necessary to evaluate the extent to each these eight
conditions are practically fulfilled.

According to the data published by the US Census Bureau and the World Trade Organization
virtually all major trading partners of the United States that provide low wages are WTO
members. Therefore it is possible to affirm that – in the context of the free trade definition of
WTO – there are not commercial barriers between those countries and United States. Therefore,
accepting the WTO concept of free trade, the first necessary condition is fulfilled.

The second condition is obviously not fulfilled, but any person working in the field of the pure
teach theory of international trade – and any practitioner of course – has not expected that it would be
practically achieved. It is included for making the theorem’s proof less difficult, and because it is
implicitly assumed that the transportation costs could be regarded as negligible if the price
differentials are big, or could be included in the commodities’ prices. Therefore it is possible to
pay little attention to the fact that this condition is not fulfilled.

In the United States, the third requirement is nearly completely fulfilled with regard to
competition, but only partly achieved concerning full employment. In the case of China and the
other US commercial partners offering low wages this condition is partly or little fulfilled
according to both criteria – competition and full employment.

The fourth condition must be regarded with special attention because of the high impact of a
specific characteristic of US capitalism. It is possible to safely affirm that in this country as well
as in the other countries considered in this paper there is a reasonable internal mobility of factors
– in particular labor and capital – determined by historical, economic, political, legal and social
factors. But while our partners have the tendency to transfer and/or invest abroad relatively
moderate percentages of their free capital, we have the tendency to transfer/invest a high percentage. Therefore, only the first assumption of the fourth condition is fulfilled, while the second is not. As a result, the tendency toward factor price equalization is considerably affected - being in fact amplified.

With regard to the other four conditions it is possible to affirm that they are fulfilled in a sufficient measure by the United States and its partners. Therefore, one can conclude that the necessary conditions for proving the Factor Price Equalization Theorem are only partially fulfilled in the real world of US trade with countries with low wages. Subsequently, a brief statistical analysis of empirical data might offer some useful insights and explanations.

4. STATISTICAL OBSERVATIONS

In order to examine to what extent the process of factor price equalization is observable in the United States I use some data regarding wages/workers compensation, labor productivity and structure of international trade published by the US Census Bureau, US Bureau of Labor Statistics and US Social Security Administration.

On the basis of these data it is possible to derive the following conclusions:

- the real wages/salaries of the private sector employees have been stagnant for nearly fifty years, although those of the top managers have increased extremely fast;
- the total compensations (including benefits) of the private sector employees have increased very slightly;
- in the same period of time, the labor productivity (output per hour x number of hours) in the nonfarm business sector has increased for more than three times;
- the percentage of US trade with the low wage countries that are the most important US trading partners has had a spectacular increase (for example: from 23.2% of US total trade in 2004 to 31.4% in 2013 – that is an increase of 35.34% in nine years!).

These remarks indicate that on long and short term, the real wages/ salaries did not decrease as a result of the huge expansion of the trade with low wage countries, and the total compensation (wages + benefits) has slightly increased. Therefore the predictions that could have been made on the basis of Factor Price Equalization Theorem might be refuted. But this does not mean that the theorem is theoretically erroneous and practically irrelevant because the data strongly suggest that the real wages/salaries have not followed the very important increase of labor productivity as would have been normal.

As most economic theories affirm and many historical cases indicate, in normal conditions the increase in productivity should be, and really is followed by an increase in real wages. The latter is usually lower than the former, and we can conceive scenarios in which the path of real wage does not shadow the path of productivity.

But an empirical case – like that of the contemporary United States – in which the real wage has been stagnant for nearly fifty years while the productivity has increased for more than three
times is abnormal. Subsequently, it should be attentively examined because its causes and effects are complex – political, social and economic. And one of these causes is the huge expansion of trade with low wage countries whose significance can be evaluated by calculating the intensity of the correlation between the expansion of this type of trade and the expansion of the gap between labor productivity and real wages.

In order to do this I consider the low wage countries included in the list of the top 15 trading partners of the United States published by the US Census Bureau. Making this choice I have to make however two observations.

The data are very limited referring to only ten years, 2004–2013, and they are not completely comparable with regard to the partners having a weight between 1% and 2% in US foreign trade. For example, in 2013, China, Mexico, Brazil and India were included in the list in this order which also was the order of their weight in the total (imports + exports) US foreign trade. But in 2005 India was not among the top 15 trading partners of the United States, and therefore was not included. But Venezuela was. According to the annual lists, the weight in the total (imports + exports) foreign US trade of the trade with the most important US partners with low wages increased from 23.2% in 2004 to 31.4% in 2013. In the same period the weight of the US imports increased from 27.1% to 35.0%. (Tables 1 and 2)

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>Mexico</th>
<th>Brazil</th>
<th>India</th>
<th>Venezuela</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>14.6%</td>
<td>13.2%</td>
<td>1.9%</td>
<td>1.7%</td>
<td>-</td>
<td>31.4%</td>
</tr>
<tr>
<td>2012</td>
<td>14.0%</td>
<td>12.9%</td>
<td>2.0%</td>
<td>1.6%</td>
<td>1.5%</td>
<td>32.0%</td>
</tr>
<tr>
<td>2011</td>
<td>13.6%</td>
<td>12.5%</td>
<td>2.0%</td>
<td>1.6%</td>
<td>1.5%</td>
<td>31.2%</td>
</tr>
<tr>
<td>2010</td>
<td>14.3%</td>
<td>12.3%</td>
<td>1.9%</td>
<td>1.5%</td>
<td>1.4%</td>
<td>31.4%</td>
</tr>
<tr>
<td>2009</td>
<td>14.0%</td>
<td>11.7%</td>
<td>1.8%</td>
<td>1.4%</td>
<td>1.4%</td>
<td>30.3%</td>
</tr>
<tr>
<td>2008</td>
<td>12.0%</td>
<td>10.8%</td>
<td>1.9%</td>
<td>-</td>
<td>1.9%</td>
<td>26.6%</td>
</tr>
<tr>
<td>2007</td>
<td>12.4%</td>
<td>11.1%</td>
<td>1.6%</td>
<td>-</td>
<td>1.6%</td>
<td>26.7%</td>
</tr>
<tr>
<td>2006</td>
<td>11.9%</td>
<td>11.5%</td>
<td>1.6%</td>
<td>-</td>
<td>1.6%</td>
<td>26.6%</td>
</tr>
<tr>
<td>2005</td>
<td>11.1%</td>
<td>11.3%</td>
<td>1.5%</td>
<td>-</td>
<td>1.6%</td>
<td>25.5%</td>
</tr>
<tr>
<td>2004</td>
<td>10.1%</td>
<td>11.6%</td>
<td>1.5%</td>
<td>-</td>
<td>-</td>
<td>23.2%</td>
</tr>
</tbody>
</table>

Source: US Census Bureau/Foreign Trade/Top Trading Partners

Table 1: Total Trade (Imports +Exports)

One immediately observes that the significance of this component of US foreign trade is extraordinary. For example in 2010 it was nearly two times (1.90) bigger than the US trade with Canada – the largest US trading partner - and nearly three times (2.85) bigger than the trade with all the European Union’s member states included in the list of 15 top US trading partners. Therefore, the influence of this component of US foreign trade cannot be discounted. It should
have, and it really has a major impact on US labor and commodities markets and finally on US social and political system.

With regard to the changes in labor productivity and real wages/ salaries and the available sources of data one can observe the following.

The Bureau of Labor Statistics publishes an Employment Cost Index in constant-dollars that includes percentage changes concerning compensation, wages and salaries, and benefits. The data are first classified by sector of activity: civilian, private industry, and state and local government. They are subsequently classified by occupational group and industry. In addition the private industry data are classified by bargaining status, census region and division, and metropolitan area status.

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>Mexico</th>
<th>Brazil</th>
<th>Country</th>
<th>India</th>
<th>Venezuela</th>
<th>Nigeria</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>19.4%</td>
<td>12.4%</td>
<td>-</td>
<td>1.8%</td>
<td>1.4%</td>
<td>-</td>
<td>-</td>
<td>35.0%</td>
</tr>
<tr>
<td>2012</td>
<td>18.7%</td>
<td>12.2%</td>
<td>-</td>
<td>1.8%</td>
<td>1.7%</td>
<td>-</td>
<td>-</td>
<td>34.4%</td>
</tr>
<tr>
<td>2011</td>
<td>18.1%</td>
<td>11.9%</td>
<td>-</td>
<td>1.6%</td>
<td>2.0%</td>
<td>-</td>
<td>-</td>
<td>33.6%</td>
</tr>
<tr>
<td>2010</td>
<td>19.1%</td>
<td>12.0%</td>
<td>-</td>
<td>1.5%</td>
<td>1.7%</td>
<td>-</td>
<td>-</td>
<td>34.3%</td>
</tr>
<tr>
<td>2009</td>
<td>19.0%</td>
<td>11.3%</td>
<td>-</td>
<td>1.4%</td>
<td>1.8%</td>
<td>-</td>
<td>-</td>
<td>33.5%</td>
</tr>
<tr>
<td>2008</td>
<td>16.1%</td>
<td>10.3%</td>
<td>-</td>
<td>-</td>
<td>2.4%</td>
<td>-</td>
<td>-</td>
<td>28.8%</td>
</tr>
<tr>
<td>2007</td>
<td>16.4%</td>
<td>10.8%</td>
<td>-</td>
<td>-</td>
<td>2.0%</td>
<td>1.7%</td>
<td>-</td>
<td>30.9%</td>
</tr>
<tr>
<td>2006</td>
<td>15.5%</td>
<td>10.7%</td>
<td>-</td>
<td>-</td>
<td>2.0%</td>
<td>-</td>
<td>-</td>
<td>28.2%</td>
</tr>
<tr>
<td>2005</td>
<td>14.6%</td>
<td>10.2%</td>
<td>-</td>
<td>-</td>
<td>2.0%</td>
<td>-</td>
<td>-</td>
<td>26.8%</td>
</tr>
<tr>
<td>2004</td>
<td>13.4%</td>
<td>10.6%</td>
<td>1.4%</td>
<td>-</td>
<td>1.7%</td>
<td>-</td>
<td>-</td>
<td>27.1%</td>
</tr>
</tbody>
</table>

Source: US Census Bureau/Foreign Trade/Top Trading Partners

Table 2: Imports

The Bureau does not publish however on its web site a national wage index. The Bureau of Labor Statistics also publishes a considerable amount of data concerning labor productivity. Several tables present annual percentage changes and use a five sector classification: Business, Nonfarm Business, Manufacturing, Durable Manufacturing, and Nondurable Manufacturing. Other tables offer a very large number of historical data classified by types of industries. Two synthetic bar graphs present productivity changes in the nonfarm business and manufacturing sectors from 1947 to 2013.

The net compensation includes only wages, while the compensation includes benefits besides wages. The compensation is – of course – always higher than the wage and it has the tendency to
grow faster than the wage. But this does not mean that implicitly the standard of living of wage earners increases when the amount of benefits increases because of benefit structure.

The medical benefits have the largest weight in the benefit package, and the cost of medical services has nearly exponentially increased. This means that the increase in benefits really means a redistribution of income in favor of those who provide medical services without any real gains for the employees. In most cases even if the medical benefits expressed in dollars increase, they decrease as services provided to the wage earners.

The historical comparisons of wages (net compensations), compensations and levels of productivity require of course taking inflation into consideration, and with regard to this there are two opposite positions. Martin Feldstein, for example, considers that the use of the consumer price index is inappropriate because both productivity and compensation refer to production and not to consumption. Therefore, he argues in favor of using as a deflator the ratio between the increase in nominal compensation and the increase in nominal productivity. A point of view leading to comparable conclusions is also expressed by those who argue in favor of using as deflator the production cost index.

In both cases the gap between the increase in productivity and in compensation is smaller than when the method based on the consumer price index is used. Nevertheless, many other people – including myself – believe that the correct method to use is the one based on the consumer price index.

The argument is simple and clear. Only by using the consumer price index is possible to determine the physical amount of goods and services that the wage earners could buy with their wages. Using a production cost index does not allow this. It conceals the fact that an increasing part from the new wealth created by the employees from one sector is transferred to another sector, and/or contributes to the increase of the top managers’ incomes and/or corporate profits.

With regard to wages, and wage changes it is also useful to examine the data published by the Social Security Administration that calculates a national average wage index on the basis of the annual wage data tabulated by the Administration itself, and estimates the average and median amount of net compensation.

The differences between the median and average amounts indicate the net compensation inequality and they are significant. For example the ratio of median to average net compensation went from 71.875% in 1990 to 67.242% in 2009, which means an increase in an inequality which had been considerably high even in 1990.

According to the 2010 Economic Report of the President, from 1964 to 2010 the average weekly earnings in the private nonagricultural industries were virtually stagnant going from $312.21 (in constant 1982–1984 US dollars) in 1964, to $341.83 in 1972, and $266.46 in 1992. In July 2010 they were $298.18, and in December, 2010 $298.19. In accordance to the last Economic Report of the President published in April 2014 the revised figure for 2010 is $297.36 (in constant 1982–1984 US dollars) and the one estimated for 2013 is $295.51 in constant 1982-1984 US dollars or $677.67 in current US dollars.
In parallel, the data included in the 2010 Economic Report of the President show that the index of the output (output per hour x number of hours) of all persons employed in the nonfarm business sector has increased from 19.7 in 1960 to 104.3 in the third trimester of 2010, 2005 representing 100. Therefore the labor productivity increased 5.29 times from 1960, and 3.44 times from 1964. In accordance to the 2014 Report the output increased from 25.0 in 1965 to 112.1 in 2013, 2009 being the reference year. This means that for a period of nearly fifty years, the increase in productivity was not shadowed by an increase in real earnings as is theoretically assumed, and was previously observed in the United States and other developed industrial countries.

Summarizing these remarks, one observes that the statistics published by the US government that are relevant for this paper are the following:

- the percentages describing the weights in the US trade of the trade with the low wage countries included in the list of 15 Top Trading Partners of the United States for the 2004-2013 period;
- the National Average Wage Index, the National Average Net Compensation, and the National Median Net Compensation published by the Social Security Administration;
- the Employment Cost Index for Total Compensation for Civilian Workers, the Productivity Change in the Manufacturing Sector (average annual percent changes for six periods from 1987 to 2013) published by the Bureau of Labor Statistics;
- the Productivity and Related Data, Business and Nonfarm Business Sector, 1960–2013 including the Real Compensation per Hour Index for the Non-farm Business Sector and the Output per Hour of All Persons for the Nonfarm Business Sector, attached to the President’s Economic Report.

One observes that there are some differences among the indexes included in the tables presented by the web-site of the US Bureau of Labor Statistics and those included in the tables attached to the President’s Report. Subsequently, I calculated the coefficient of correlation between the weight of the foreign trade with low wage countries in total US foreign trade and the gap between US labor productivity and US wage for two times, using both sets of data.

First, I correlated the weights with the compensation and productivity data provided by the US Bureau of Labor Statistics and US Social Security Administration. And, second, I correlated the same weights with the data regarding the output per hour and the real compensation per hour attached to the President’s Economic Report.

The data regarding the compensation changes published by the US Bureau of Labor Statistics and Social Security Administration are presented in Table 3. The corresponding productivity indexes for the nonfarm business sector and manufacturing sector provided by the US Bureau of Labor Statistics are shown in Table 4.

On the basis of these four tables one can calculate the three data trends for the 2004–2013 time interval that are shown in Table 5. The third and fourth columns (Total compensation index and Labor productivity index) are calculated by changing the reference year from 2009 to 2004, and the last column is the difference of the fourth and the third.
<table>
<thead>
<tr>
<th>Year</th>
<th>Employment cost index for total compensation for all civilian workers/December December 2005 = 100</th>
<th>Median net compensation (not adjusted for inflation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Source: Bureau of Labor Statistics/ Employment Cost Index</td>
<td>Source: Social Security Administration</td>
</tr>
<tr>
<td>2001</td>
<td>97.0</td>
<td>$21767.29</td>
</tr>
<tr>
<td>2002</td>
<td>97.9</td>
<td>22152.84 1.771%</td>
</tr>
<tr>
<td>2003</td>
<td>99.8</td>
<td>22576.71 1.913%</td>
</tr>
<tr>
<td>2004</td>
<td>100.3</td>
<td>23355.83 3.451%</td>
</tr>
<tr>
<td>2005</td>
<td>100.8</td>
<td>23962.20 2.596%</td>
</tr>
<tr>
<td>2006</td>
<td>100.8</td>
<td>24891.59 3.879%</td>
</tr>
<tr>
<td>2007</td>
<td>100.0</td>
<td>25737.20 3.397%</td>
</tr>
<tr>
<td>2008</td>
<td>102.5</td>
<td>26514.38 3.020%</td>
</tr>
<tr>
<td>2009</td>
<td>101.2</td>
<td>26261.29 -0.955%</td>
</tr>
<tr>
<td>2010</td>
<td>101.7</td>
<td>26363.55 0.389%</td>
</tr>
<tr>
<td>2011</td>
<td>100.7</td>
<td>26965.43 2.283%</td>
</tr>
<tr>
<td>2012</td>
<td>100.9</td>
<td>27519.10 2.053%</td>
</tr>
<tr>
<td>2013</td>
<td>101.3</td>
<td>Not available</td>
</tr>
</tbody>
</table>

Table 3: Employment Cost Index and Median Net Compensation (2001-2013)

<table>
<thead>
<tr>
<th>Years</th>
<th>Nonfarm business sector</th>
<th>Manufacturing sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990 – 2000</td>
<td>2.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>2000 – 2007</td>
<td>2.6%</td>
<td>3.9%</td>
</tr>
<tr>
<td>2007 – 2013</td>
<td>1.6%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics/ Office of Productivity and Technology

Table 4: Productivity Indexes
### Table 5 Differences between labor productivity and total compensation indexes

Using the data included in Table 5 (the second and fifth column) I found that the coefficient of correlation between the weight of the trade with low wage countries in the US foreign trade, and the difference between the labor productivity and total compensation indexes is 0.9475.

In order to calculate the same coefficient by using the data included in the President’s Economic Report I considered the data presented in Table 6, and – as in the preceding case – I changed the reference year and I calculated the differences. The calculation results are presented in Table 7, and the corresponding correlation coefficient is 0.9521. The difference between the values of the correlation coefficient calculated using the two sets of data is 0.0046.

#### 5. CONCLUSIONS

When I started this research, and I selected the first set of data I had the intuition that the correlation coefficient might be significant, but I did not expect to be so high. The fact that it was so close to 1 made me to some extent skeptical about my method of reasoning and the data. Subsequently I calculated it using the second set of data. And when I saw the result I was astonished. It was not only equally high, but the difference between the two values was 0.0046. These kinds of results are usually unexpected in social sciences, and they indicate that this problem should be studied with attention.

Obviously, as any introductory course in statistics emphasizes, correlation does not necessarily implies causality, but it is also necessary to investigate if causality exists when the correlation is extremely high, as it is in this case. For this reason, it seems to me that this empirical result should be examined from two points of view – econometric and political-economic.
<table>
<thead>
<tr>
<th>Year</th>
<th>Low wage countries’ weight in US foreign trade (total trade = imports + exports)</th>
<th>Real compensation per hour index 2009 = 100</th>
<th>Labor productivity (output per hour) index 2009 = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Business sector</td>
<td>Nonfarm business sector</td>
<td>Business sector</td>
</tr>
<tr>
<td>2013</td>
<td>31.40</td>
<td>100.4</td>
<td>106.2</td>
</tr>
<tr>
<td>2012</td>
<td>32.00</td>
<td>100.1</td>
<td>105.1</td>
</tr>
<tr>
<td>2011</td>
<td>31.20</td>
<td>99.6</td>
<td>103.6</td>
</tr>
<tr>
<td>2010</td>
<td>31.40</td>
<td>100.3</td>
<td>103.3</td>
</tr>
<tr>
<td>2009</td>
<td>30.30</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>2008</td>
<td>26.60</td>
<td>98.6</td>
<td>96.8</td>
</tr>
<tr>
<td>2007</td>
<td>26.70</td>
<td>99.7</td>
<td>96.0</td>
</tr>
<tr>
<td>2006</td>
<td>26.60</td>
<td>98.2</td>
<td>94.6</td>
</tr>
<tr>
<td>2005</td>
<td>25.50</td>
<td>97.6</td>
<td>93.7</td>
</tr>
<tr>
<td>2004</td>
<td>23.20</td>
<td>97.3</td>
<td>91.8</td>
</tr>
</tbody>
</table>

Source: The Economic Report of the President, 2014/Table B-16

Table 6: The Indexes of Real Compensation per Hour and Labor Productivity

<table>
<thead>
<tr>
<th>Year</th>
<th>Low wage countries’ weight in US foreign trade (total trade = imports + exports)</th>
<th>Real compensation per hour index 2004 = 100</th>
<th>Labor productivity (output per hour) index 2004 = 100</th>
<th>LPI - RCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>31.40</td>
<td>103.29</td>
<td>115.23</td>
<td>11.94</td>
</tr>
<tr>
<td>2012</td>
<td>32.00</td>
<td>103.08</td>
<td>114.58</td>
<td>11.50</td>
</tr>
<tr>
<td>2011</td>
<td>31.20</td>
<td>102.47</td>
<td>112.95</td>
<td>10.48</td>
</tr>
<tr>
<td>2010</td>
<td>31.40</td>
<td>103.19</td>
<td>112.40</td>
<td>9.21</td>
</tr>
<tr>
<td>2009</td>
<td>30.30</td>
<td>102.77</td>
<td>108.81</td>
<td>6.04</td>
</tr>
<tr>
<td>2008</td>
<td>26.60</td>
<td>101.23</td>
<td>105.44</td>
<td>4.21</td>
</tr>
<tr>
<td>2007</td>
<td>26.70</td>
<td>102.36</td>
<td>104.68</td>
<td>2.32</td>
</tr>
<tr>
<td>2006</td>
<td>26.60</td>
<td>100.92</td>
<td>102.94</td>
<td>2.02</td>
</tr>
<tr>
<td>2005</td>
<td>25.50</td>
<td>100.31</td>
<td>102.07</td>
<td>1.76</td>
</tr>
<tr>
<td>2004</td>
<td>23.20</td>
<td>100.00</td>
<td>100.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table 7. Differences between labor productivity and real compensation per hour indexes
From an econometric perspective we should study under what set of circumstances the liberalization of international trade prevents the normal increase of wage caused by productivity increase and prevent the normal decrease of interest caused by capital increase. From a political-economic perspective we should analyze how the liberalization of trade could allow to very small groups of people to accumulate very large amounts of wealth when the national wealth of their country is stagnant or decreasing. At the same time, we should assess the utility of trade liberalization by using medium and long term criteria, and not only the short term ones.

6. BIBLIOGRAPHY


The White House, (2014), The Economic Report of the President


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**7. NOTES**

1. An early version of this paper was published in my book *Nonpolarity and International Tension*.
2. I wrote this essay having in mind those political scientists who are interested in domestic socio-economic problems, but are not familiar with the theory of international trade. For this reason I did not include the mathematical formulations and the proofs of the theorems, and I gave only some basic information regarding the Heckscher-Ohlin Model.
3. Heckscher was Ohlin’s professor and Ph.D. advisor, and it was assumed that his student was influenced by his ideas. His 1919 article was written in Swedish and was unknown abroad, but it was quoted in Ohlin’s *Interregional and International Trade*.
4. The weight of each low wage country which is not included in the list of the 15 top US trading partners is less, or significantly less than one percent. Therefore the use of this list – the only weight list of which I am aware – does not considerably affect the results.