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The Theoretical Basis of an Integrating Currency Area. The Dilemmas of Polish Accession to the Eurozone

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Abstract

Purpose: The purpose of this paper is to present a theory that defines the creation of an area that includes many countries, in which there is one, single currency and the countries are characterized by a diversified productivity. That is why the paper shows the importance of labor productivity parity for the creation of an integrating and non-discriminatory currency area and indicates the role of this value in the theory of the exchange rate. Additionally, the paper analyzes the risks arising from joining the eurozone.

Methodology: The basic methodology is defined by a fundamental analysis of the exchange rate and its relation to labor productivity parity. The author formulates a theory of a currency area that integrates economies with different levels of labor productivity. The methodology is supplemented by calculations and a ranking of countries according to the Q-index.

Findings: Listing the member countries and candidate countries of the eurozone according to the labor productivity index has demonstrated that the founding member states are characterized by a Q-index close to 3.30. The countries that are already in the eurozone with an index of less than 2.5 belong to the group where problems are accumulating. Countries that are candidates for the eurozone with an index below 2.0, such as Poland, cannot become member of the eurozone. The principles of creating a currency area can however be modified in such a way that countries with various levels of Q can become members, by developing cooperation that is beneficial to the socio-economic development.

Originality: The labor productivity index Q is a result of elaborating an original concept of the production function that is suitable for the purposes of economic analysis. According to this function the Q-index is equivalent to the category *labor share* and the variable F corresponds to TFP. The function overcomes the disadvantageous features of econometric models of production identified by Joan Robinson and the obtained results modify the theory of the exchange rate, creating good prospects for general monetary integration.

Keywords: capital, monetary unit, exchange rate, production function, labor productivity, self-financing labor, integrating currency area

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Introduction

The aim of this paper is to elaborate a theory on the creation and functioning of a currency area, and consequently the natural question arises: what is the originality of this purpose? After all, it is a commonly known fact that the theory of currency areas has a rich bibliography, written by many prominent authors, and in particular by R. Mundell, and others. Moreover, a common currency area already exists and functions, namely the eurozone. However, the answer to the question lies in the adjective "integrating". The current common currency area with the euro as a monetary unit is not integrating, which means that becoming a member requires candidate countries to achieve an appropriate level of economic development. It requires the real economic sphere to achieve certain, determined by theory, parameters with respect to inflation, exchange rate behavior and productivity. That is why the current eurozone does not integrate European countries. It is not helpful in speeding up economic integration. On the contrary, it is clearly discriminatory and exclusionary with respect to countries with productivity levels significantly lower than in the founding member states. These latter, with a similar level of labor productivity, were already economically integrated, so creating the eurozone was a natural, formal undertaking. The difficulties started when countries with a lower rate of productivity were being included. These difficulties are enormous and insurmountable in the short term.

This paper develops a theory of an integrating currency area, that is a heterogeneous area capable of absorbing a country at its own level of development. In such an area all countries, those with higher and those with lower levels of economic development, will achieve economic benefits, added value will be created, a share of which will be received by all members of the area. As a result of the formation of an integrating currency area, its expansion could include all the countries in the world, creating a global currency area. It is therefore a theory of a global currency area and a global monetary unit. The most important factor of globalization. In this case globalization creates a magnified new quality, because at the same time the very important matter of the world's reserve currency will be solved.

What is the basis for believing that there is a possibility of creating a common currency area with economically disparate countries? It is the fact that one country often contains areas with different levels of productivity, as exemplified by the north and south of Italy, as well as Poland A and B, the grounds of the former East Germany and West Germany, etc. Despite the fact that there are significant differences within one country, there is a single currency and the country can function well, as demonstrated by Germany. This economic diversity adds dynamics to the socio-economic processes. Economic diversification within one country, or on a global scale, is natural and develops through historical processes. Creating a common currency area requires moving away from the discriminatory requirement of economic identicalness towards an approach unifying diverse economies and societies. It is natural that the theoretical basis for an integrating currency area is far different from the assumptions of the formation of and accession to the

eurozone. This theory must be characterized by absolute perfection, simplicity and efficiency, which is not an attribute of the ideas underlying the eurozone.

It is a fact that the eurozone has been formed based on a group of economically homogeneous countries, which is why it was so successful at the beginning. The problems with Greece, Portugal and other countries are caused by the much lower labor productivity in these countries. Aside from this issue, however, the question arises whether the eurozone is a scientifically defined currency area, i.e. whether this project is supported by a strong theory. Creating this type of area has already been theoretically described in many studies, and R. Mundell is considered to be the precursor in this field. However, these are not strong theories, which is demonstrated by the actual creation of the eurozone, although it is possible that in practice the theoretically established principles are not being applied. However, not only practice provides counterexamples that falsify the theory. The doubts concern the basic theories associated with the formation of a currency area, such as: the activities of central banks, the theory of the value of the monetary unit, the issue of translating this value to a single currency. This paper presents an indestructible theoretical basis for an integrating currency area.

| What Type of Area Do the Maastricht Criteria Form?

Is the eurozone a scientifically defined currency area? Let us assume, with some simplifications, that the principles for the creation of the eurozone are determined by the Maastricht criteria. These are criteria concerning inflation, exchange rate, budget deficit, quality and convergence. A thorough overview of the criteria and the associated reference values is presented, among other things, in the work of W. Małecki (2010, p. 230–254). The author gives a detailed analysis of the important criterion of exchange rate stability, especially in light of the global financial crisis. He presents the possible choice of a central exchange rate and subsequently the choice of a conversion rate. The criteria are listed below.

Inflation. The average inflation rate of a country in the year preceding accession to the Economic and Monetary Union should not exceed 1.5 percentage points above the average rate of the three EU member states with the lowest inflation over the previous year.

Interest Rates. Average long-term interest rates should be no more than 2 percentage points above the rate determined by the average level of exchange rates in the three EU countries with the lowest inflation over the previous year.

Exchange Rate. Countries that wish to adopt the European Union's single currency should during the two years prior to entry to the Economic and Monetary Union have a stable exchange rate, i.e. their national currency is required to enter the European Exchange Rate Mechanism (ERM II). These countries should maintain a normal range of variation (+/- 15%) of their currency, and

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they cannot independently resort to a devaluation of the national currency against the currency of any other EU country.

Deficit. The budget deficit criterion assumes that the budget deficit of a candidate country should not exceed 3% of gross domestic product (GDP) and public debt should be less than 60% of GDP, according to the measurement in the year preceding entry to the eurozone. The country cannot be subjected to the excessive deficit procedure.

Quality and Convergence Criteria. A condition for the participation in the eurozone is the independence of the central bank (fiscal, financial, personal). Another condition that must be met is legal compliance, i.e. harmonization of national legislation with the EU legislation.

There are quite a few conditions for currency integration in the eurozone, but in the specified criteria there is no mention of the condition imposed on productivity. It is a well-known fact that since 1964, thanks to the works of B. Balassa and P. Samuelson, the productivity parity in the field of goods exchanged in markets determines the trend of the exchange rate. The currency of the country with a higher productivity strengthens. It can be assumed that in the criteria this issue is covered by the condition imposed on exchange rate and inflation. Indeed, a stable exchange rate may indicate productivity parity, but this conclusion only applies to a natural, stable economy, and not in a situation where central banks issue billions of monetary units *to rescue* economies in crisis, whose previous actions have caused this crisis. This creates disturbances of the natural trends in exchange rates. Independent central banks issuing monetary units, for whatever reasons, is a fact, and therefore a candidate country maintaining a stable exchange rate for two years could be the result of the activities of central banks rather than the achieved labor productivity. If the U.S. central bank issuance increases considerably and the Polish central bank issuance decreases, then the Polish zloty strengthens against the dollar until the impulse disappears. Subsequently, with time, due to the lack of labor productivity parity, the Polish zloty will weaken.

One can imagine the economy of a poor country, which is technologically backward, is mainly agricultural, but with a good administration and wages well-adjusted to the value of the performed labor. Such an economy will have a low productivity and at the same time a low inflation. Countries with a low productivity should not enter a currency area established in countries with a higher productivity. This is the main dilemma of expanding the eurozone, which was initially established in countries with a similar level of productivity.

The weakness of the theory of creating a common currency area is also affected by the lack of a strong theory of the exchange rate, as demonstrated in many studies, and in particular (Dobija, 2001; Jędrzejczyk, 2012). Neither the law of one price nor the PPP hypothesis have become strong theories, because they have not passed empirical tests (Madura, 1995, p. 212 and Jędrzejczyk, 2013, p. 32–39). A sufficient counterexample is exchange rates determined based on McDonald's hamburgers. More plausible theories of exchange rates and their impact on the economy are

developed taking into account measures of productivity (Beachill and Pugh, 1998), and in particular the labor productivity measure (Grabowski, 2001; Dobija, 2001; 2003; 2008; Jędrzejczyk, 2012). In recent years, studies have been elaborated demonstrating that the productivity measure for the theory of the exchange rate should be more specific. In the papers of M. Dobija (2001; 2008) and M. Jędrzejczyk (2012) it is pointed out that the correct measure for the theory of the exchange rate and economy rankings is the labor productivity measure Q. It is the unitless ratio Q representing the quotient of real GDP and wages W.

The cited studies are characterized by the fact that the determination of the exchange rate is more specific, compared to texts that do not explain the essence of the monetary unit. In articles pointing to the role of labor productivity, the authors define the exchange rate as the price of a monetary unit of one country relative to another, but also indicate that this monetary unit is a labor unit. Therefore, the exchange rate specifies the relationship between labor productivity in the countries it concerns. On the other hand, labor is a transfer of human capital to work facilities and this process generates money (Dobija, 2011a; 2013). It is the essence of *laborism*, i.e. the economic theory, in which the creation of cash by the central bank is ruled out.

It should be noted here that the Maastricht criteria do not specifically point to labor productivity parity. Perhaps it was expected that this issue would be covered by the restriction imposed on the exchange rate. This could be the case if not for the cash issued by central banks with no relation to labor. These kind of activities cause the exchange rate trend not to be dominated (during certain periods) by productivity parity. In times of crisis there are many factors strongly influencing the exchange rate, which significantly interfere with the impact of labor productivity parity. Moreover, as stated by (Tomkiewicz, 2010, p. 266), the financial crisis delays achieving the results specified by the Maastricht criteria, especially when it comes to the criteria concerning inflation and budget deficit.

Concerns regarding the criteria are also stimulated by the general state of economic knowledge, which does not give much confidence to undertake big projects. N. Roubini and S. Mihm (2011, p. 59) describe the dominant differences among economists in almost every important issue. They write the following: "…Such divergence of views can seem to be astonishing for the economic layman. After all, the economics tries to be the science full of equations, laws, mathematical models and other objective parameters. However, behind the façade of the only 'scientific' truth a large number of the opposite opinions are hidden, especially when we consider the timeless question of reasons for the financial crisis. This was so in the 19th and 20th centuries and it is so also today…".

J. Żyżyński (2010, p. 7) has some interesting remarks about the weakness of theoretical explanations: "So far, there is no intellectual, much less a political consensus on the nature of the crisis. … Disputes about the economic and social consequences are still present. And, which is more understandable, there is still no consensus regarding the economic theory on which the economic policy should be based, in order to not only cope with the manifestations and consequences of the crisis, but also to effectively prevent similar perturbations in the future. …".

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However, these remarks refer to the crisis of the years 1929–1930, suggesting the helplessness of the economy in explaining even powerful economic phenomena. But, let us add our own opinion, this is not the result of the intellectual weakness of scholars, but the overall entanglement of historical and political factors maintaining a faulty theory of money, both Keynesianism and monetarism. The sources and political causes of the failure of economic thought in terms of the functioning of the monetary system is clearly elucidated by S. Hongbing (2010). The impact of political factors on the activities of banks in the sphere of regulation is revealed in a recent book by K. Jackowicz (2013, pp. 291–329). Scientific criticism points to the reasons inherent in the lack of respect for the fundamental laws governing reality (Dobija, 2011a; 2013; Dobija and Kurek, 2013).

Economics and economists are trapped in the overwhelming discrepancies due to the lack of a precise definition of key concepts, especially the concept of capital and related categories, of which there are many (Dobija and Kurek, 2013). Here it should be mentioned that capital, which is an abstract category and means the **ability to perform work**, rather than capital goods or cash, i.e. assets, is also associated with theories of interest rate, discount rate and growth rate, which must be flawed if they do not take into account the existence of an economic constant of potential growth. Capital is also associated with the labor category, which is a dynamic version of capital and its full understanding and ability to measure are essential for a good economic theory. Measuring the value of labor is necessary to determine its equivalent, i.e. remuneration. The remuneration is the equivalent of the performed labor and in the practice of the commodity-monetary economy it is a record of payment (receivables) for the carried out work. The lack of a consistent understanding of the above categories and their associations leads to permanent divergences that prevent progress in economics.

The Link Between Exchange Rate and Labor Productivity

The link between exchange rate and labor productivity is demonstrated in the following dependencies, where RGDP is the real GDP, i.e. according to the prices from the preceding year, and W means the labor costs incurred in the production of GDP. Quotient Q = RGDP/W and means real labor productivity. However, there is an important stipulation. The labor costs must be determined in accordance with a correct understanding of labor and remuneration, taking into account self-financing of labor. This means that the value of W needs to be adjusted by the part of the remuneration that is deducted as tax for the financing of salaries in the budget sector (Dobija, 2008, p. 8–18).

By introducing index P, which is Poland, and index A, which is the country that we are comparing Poland to, we obtain the following natural dependencies:

$$RGDP_P = W_P \cdot Q_P \qquad (1a)$$

$$RGDP_A = W_A \cdot Q_A \qquad (1b)$$

Then we divide these equations as follows:

$$\frac{RGDP_p}{RGDP_A} = \frac{W_P}{W_A} \cdot \frac{Q_P}{Q_A} \qquad (2)$$

Then we obtain the following equation (assuming that index A is USA)

$$RGDP_P[zł] = \frac{W_P}{W_A} \cdot \frac{Q_P}{Q_A} \cdot RGDP_A[\$] \qquad (3)$$

Whereas if we divide the labor costs (W) by the number of employees (L), we obtain a formula with the average labor cost per employee (S).

$$RGDP_P[zł] = \frac{S_P}{S_A} \cdot \frac{L_P}{L_A} \cdot \frac{Q_P}{Q_A} \cdot RGDP_A[\$] \qquad (4)$$

And if we divide the RGDP by the appropriate number of employees, we obtain the following equation:

$$RGDPE_P[zł] = \frac{S_P}{S_A} \cdot \frac{Q_P}{Q_A} \cdot RGDPE_A[\$] \qquad (5)$$

where RGDPE means real GDP per employee.

In formula (5) we enter cipher one:

$$RGDPE_P[zł] = \frac{S_P}{S_A} \cdot \{\frac{Q_A}{Q_P} \cdot \frac{Q_P}{Q_A}\} \cdot \frac{Q_P}{Q_A} \cdot RGDPE_A[\$] \qquad (6)$$

On the other hand, knowing that the parity of average remuneration multiplied by the inverse labor productivity parity determines the average exchange rate (Dobija, 2001), we obtain an important formula:

$$RGDPE_P[zł] = ER\frac{zł}{\$} \cdot \frac{Q^2{}_P}{Q^2{}_A} \cdot RGDPE_A[\$] \qquad (7)$$

This formula gives us the desired link between exchange rate and labor productivity:

$$ER\frac{zł}{\$} = \frac{Q^2{}_A}{Q^2{}_A} \cdot \frac{RGDPE_p[zł]}{RGDPE_A[\$]} \qquad (8)$$

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As indicated by the formula (8), the average exchange rate is very strongly linked to labor productivity. This formula can be directly used to determine the Polish RGDPE based on, for example, the American equivalent. Primarily, the formula (8) is used to calculate Q, having a direct calculation of the U.S. labor productivity. Other values are calculated in a similar manner, which is discussed in more detail by M. Jędrzejczyk (2013, p. 71–124) in his recent book.

The economic significance of labor productivity Q follows from the fact that this indicator was discovered as a result of introducing a new format of the production function. This is a production function that takes into account the criticism of the econometric modeling of production expressed by J. Robinson (1954, p. 81)[2]. The starting point is to present production at the sale price as a function of the production costs: **P = C (1 + r) (1 + I),** where P – annual production at the sale price, C – the production costs, r – rate of cost profitability; r = Z/C = P/C – 1, where Z = P - C – surplus of sales over the value of production. The variable I is the above-average rate of profitability. When we get rate I, then the company has a value called intellectual capital. Then the rate of return exceeds the average value in the given industry and the intellectual capital of the company (X) can be calculated based on the following equality: Z/(A + X) = 0.08, so X = Z/0.08 – A = 12.5Z – A, where A – the value of assets of the company (equity and foreign capital).

The value of Z/C is the profitability of costs and is the function of two variables: return on assets (ROA) = Z/A and the number expressing total asset turnover compared to costs C. Assuming that the total asset turnover is value w = C/A, we get that C = w×A. Therefore, r = Z/(w×A), i.e. r = ROA/w.

While the costs of the factors of production include: W – labor costs and B – the remaining costs determined by technology and the management process, thus C = W + B. The costs of raw materials, depreciation and the costs of services, making up value B, are applied to assets, giving a total asset turnover compared to costs reduced by wages. Therefore, B/A = z, so B = A×z, where z – total asset turnover.

Thus, we can write the following formula:

$$\mathbf{P = (W + z \times A) (1 + r) (1 + I),}$$

[2] Joan Robinson, the author of *The Production Function and the Theory of Capital* (1953–1954, p. 81) wrote the following critical opinion: "... the production function has been a powerful instrument of miseducation. The student of economic theory is taught to write Q = f (L, K) where L is a quantity of labor, K a quantity of capital and Q a rate of output of commodities. He is instructed to assume all workers alike, and to measure L in man-hours of labor; he is told something about the index-number problem in choosing a unit of output; and then he is hurried on to the next question, in the hope that he will forget to ask in what units K is measured. Before he ever does ask, he has become a professor, and so sloppy habits of thought are handed on from one generation to the next".

where: **A** – assets at historical, balance sheet prices. After converting, the production market value is as follows:

$$\mathbf{P = W\,[1 + A/W \times z\,]\,(1 + r)\,(1 + I)}$$

Since labor costs **W** are a derivative of human capital, then **W = u × H,** where: **u** is the rate of payment of human capital, and **H** is the total value of the human capital employed. After substitution the following formula is obtained:

$$\mathbf{P = W\,[1 + A/H \times z/u\,]\,(1 + r)\,(1 + I)}$$

The values r, s, I are small, close to zero, thus using the approximate equality: $1 + x \approx e^x$, we can express the production function with the following formulas:

$\mathbf{P = W\,e^{r+I}\,[1 + A/H \times z/u\,] = W \times Q,}$ where Q – unitless value determining labor productivity. This function generates a production model (A) and derivatives.

(A) $P = We^{\frac{AF}{H}}$, **(B)** $\mathbf{P = W \times Q}$, **(C)** $\mathbf{W = u \times H}$, **(D)** $\mathbf{W = L(1 + g)}$, **(E)** $\mathbf{L = p \times H}$,

(F) $Q = e^{\frac{AFp}{L}}$, **(G)** $\mathbf{Q = e^{TF}}$.

In these formulas F means the general variable of management and is an equivalent of the value TFP, L – fixed basic salary, g – percentage bonus in relation to L, T = A/H technical work equipment, p – economic constant of potential growth (0.08).

The Q-Index and the "Labor Share" Category

The Q-index is defined as the quotient of real GDP to the total wages including all contributions, i.e. labor costs. However, this constitutes a serious problem. Employees receive remuneration, which is part of the added value that is generated in production processes, but the employees of the budgetary sphere are financed from funds that are created based on imposed taxes. That is the current state of affairs sanctioned by the existing economic theory. This is a wrong situation, which is characterized by a lack of understanding of the triad of key concepts: capital-labor-money. The result of this situation is the lack of understanding of the fact of self-financing of labor as well as the fact that labor creates money (Dobija, 2013, p. 157–187). Therefore, it is considered that a chimney sweeper that works to ensure that chimneys work properly creates added value, while a teacher that develops the human capital of a student does not, even though the teacher, similarly to the chimney sweeper, transfers his/her human capital to work facilities. The chimney sweeper and others like him should "make money for" the teacher. An integral part of the theory of production, which is reflected in the presented production function and manifests

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itself with the Q-index, is the theory of human capital measurement and the derivative of the fair wage theory, which explains these issues properly. That is why, when calculating the Q-index, the labor costs are adjusted based on self-financing. This means that wages are reduced by the amount of the tax that funds salaries in the budget.

The category of labor share in GDP (*labor share* S_L or *wage share*) is one of the most important issues of economics. Defined as the quotient of labor costs to the nominal GDP, it is like a simple inverse Q-index = GDP/W. This fraction (S_L) also constitutes the real labor cost per unit. However, the point is that when calculating this quotient, the labor costs only concern the employees of the production sphere and do not, like in the case of Q, include the labor costs of all employees in the economy. Both $Q_L = 1/Q$ and Q are key indicators of the distribution of the value generated in the economy. They indicate what the part of Q_L is and what the part of Q_A is, i.e. how much is attributable to assets (in economics rather than assets we say capital), and $Q_L + Q_A = 1$. The Q_A part besides depreciation and rents also includes interest income and company profits to the extent not paid in the form of bonuses.

Table 1 contains the numerical measures of labor productivity calculated annually since 2006 for a group of selected countries using the formula (8) and the previous direct calculation of Q for the United States. You can see how this measure is stable and varies little despite the crises. This is natural, since Q is similar to S_L, which is known for its stability (McConnell and Brue, 1986, p. 463). We can write identity equations including Q, which shed new light on the issue of the share of wages in GDP.

$$GDP = GDP\frac{1}{Q} + GDP\frac{Q-1}{Q} = W + GDP_A \qquad (9)$$

$$1 = \frac{1}{Q} + \frac{Q-1}{Q} = \frac{W}{GDP} + \frac{GDP_A}{GDP} = Q_L + Q_A \qquad (10)$$

where W determines the remunerations and GDP_A is the remaining part that is attributable to assets. This is a disjoint and complete division. Assets always have an owner, either a private person or a municipality. As you can see, the higher the share of wages in GDP, the poorer the country, because the funding attributable to existing assets is too small. In the U.S. the share of disposable wages in GDP (after deduction of the tax that finances budgetary salaries) is at the level of 0.29 and thus the share of GDP attributable to assets is 0.71. Given that wages in the U.S. are of a decent size (Dobija, 2011b), i.e. the human capital of workers is properly compensated, the part attributable to assets can be considered substantial. Table 1 contains calculations of the Q-index for a group of selected countries.

The stability of Q illustrates the value sequence of this index for Poland well. In 2007 Poland achieved good economic results. As a result a growth of Q was noted up to 1.992. However, this

Table 1 | List of values of the Q-index for a group of countries (2006–2012)^

Country/Year	2006	2007	2008	2009	2010	2011	2012
USA	3.458	3.470	3.560	3.500	3.452	3.648	3.620
Japan	3.069	3.093	3.186	3.433	3.279	3.448	3.329
UK	3.204	3.517	3.444	3.082	3.095	3.216	3.279
Switzerland	3.534	3.645	3.748	3.650	3.509	3.498	3.850
Germany	3.305	3.380	3.389	3.276	3.169	3.158	3.350
Czech Republic	2.055	2.204	2.355	2.210	2.134	2.356	2.252
Poland	1.881	1.992	1.854	1.869	1.903	1.935	1.958
China	1.415	1.512	1.685	1762	1,768	1,777	1,886

Source: Own calculations based on information from the databases: TEDB, OANDA, BLS. TEDB (Groningen Total Economy Database), OANDA – Exchange rate convertor, BLS – Bureau of Labor Statistics.

^The indicators for the year 2012 are calculated on the basis of expected GDP values.was a time of large wage increases (at the same time people were protesting that these were too small). That is why in the following year a decrease of Q was noted to 1.854, and the level of the year 2007 was more or less reached only in 2012. This example shows that the prospect of "catching up" with the western economies is not optimistic and that in fact the crux of the matter lies not in the industry itself, where productivity is growing, but more so in the public sector, its size and efficiency.

The correspondence between the indicators Q and *labor share* S_L is very limited for two reasons. Q is derived from a natural functional description of the production process, while S_L is a derivative of the econometric production model. A recent study of D. Schneider (2011) contains a thorough review of the theory and question marks in the field of the category of *labor share*. As is demonstrated by this paper, the fundamental difference between Q and S_L consists in the fact that the labor costs that are taken into account when determining S_L do not include wages of those employed in the budgetary sphere and agriculture. This limits the economic significance of S_L, while Q is part of the theory of the exchange rate and the wage equation of exchange and has many macro- and micro-economic uses, which is discussed more in detail in (Dobija, 2012, p. 41–63).

D. Schneider (2011, p. 3–4) demonstrates using graphs how S_L is formed numerically in economically developed countries; he shows that it ranges between 60% and 70% with a tendency to decrease. He also gives a bibliographic review in the field of *labor share*, which indicates that scholars consider an increase of this share to be positive. The interpretation of the Q-index is the opposite; if the inverse of Q is high, the country is poor. In the extreme case of an economy of natural resources their product is equal to wages, so Q = 1, just like the share of wages in GDP. According to studies of economists, S_L in the U.S. is currently about 65%, and 1/Q does not exceed 0.30 (in Poland 0.5), which is a feature of rich countries. Whether a country

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is economically well-developed is determined by assets and their productive use. While the validity of wages is determined by the theory of human capital, which is not yet functioning in mainstream economics.

| Why Do Some Countries Not Become Member of the Eurozone?

The data in Table 2 provide information about how productivity developed in the selected year 2006 in countries belonging and aspiring to belong to the eurozone. This table confirms what we already know from media reports. For example, on 3 March 2013 in the Portuguese capital a demonstration took place with 1.5 million people protesting against the government and poverty, which affects people to an increasing extent. Spain, which has a slightly higher labor productivity than Portugal, is, according to the opinions expressed in the media, threatened by the financial crisis and so is Italy, though to a lesser degree.

Table 2 | A selection of countries divided according to labor productivity (2006)

1 < Q < 2		2 < Q < 3		3 < Q < 4	
Poland	1.881	Greece	2.081	Germany	3.325
Estonia	1.678	Slovenia	2.266	Switzerland	3.534
Portugal	1.845	Spain	2.165	UK	3.204
Slovakia	1.758	Italy	2.493	France	3.201
Hungary	1.946	Czech Republic	2.055	Belgium	3.345
				The Netherlands	3.437
				Denmark	3.433

Source: own elaboration based on Dobija (2008b).

The euro, as we know, was introduced at the beginning of 1999, fully since 2002, when there was a delegation of competence in the field of the single monetary policy to the European Central Bank. The 11 member states were joined in 2001 by Greece and in 2007 by Slovenia. On 1 January 2008 the following countries joined the eurozone: Malta and Cyprus. While creating a eurozone in countries where Q > 3.0 was justified by a high labor productivity (assessment based on the situation in 2006), joining the eurozone with a productivity of approximately 2.5 is questionable, and with Q less than 2.0 – inappropriate.

Obviously, Europe has several "speeds". Polish politicians do not want to belong to the Europe of the second speed, but their words are really just a form of putting a spin on reality. If a country is to considerably increase labor productivity, politicians need to be aware of their goal. In the denominator of the Q-index are the labor costs. These are the costs of labor in the business sphere and the budgetary sphere. Privatization and globalization have caused labor productivity in the

industrial sector to grow, but the labor costs in the budgetary sphere (public sector) increased as a result of the administrative reform and the establishment of *powiats* (counties) and many other institutions justified politically rather than economically. And above all, labor costs are not rationalized due to the lack of a reasonable law on wages, a law ensuring compliance of wages with the value of human capital and job performance, as presented in the theory of human capital (Dobija, 2011).

Currency areas can be created based on the current economic theory, as described by various prominent authors, adopting an independent central bank and its functions as the canon of economics. The most renowned author is R. Mundell (1968, p. 177–186), whose examples of creating a currency area (division of the North American continent into East and West), illustrating the theory of optimum currency areas, have long been capturing the imagination of many scholars. This scholar has been credited with the title of "the intellectual father of the euro", which is discussed in an interesting and rather critical way by R. McKinnon (2000). One can also express doubts about the views of this author with regard to the opinion on the role of the exchange rate.

As we know, the possibilities of an empirical verification of the market valuation of a given monetary unit relative to another monetary unit actually only appeared since the 1970s, after the fall of the Bretton Woods agreement. This is a very important moment in economic history, because this is when market forces proved to be stronger than political forces and they tore the chains resulting from the misconceptions of politicians and leaders about money, that the free market should be tamed and controlled with money in every possible way. It should be noted here that the politicians and economists preaching a free market excelled at this. One of the epigones of such views is undoubtedly R. Mundell[3]. This scholar is the author of statements contained in articles (Mundell, 2000a; 2000b), in which free-market fluctuations of exchange rates he considers to be pointless and has visions of control over exchange rates by central banks. R. Mundell ignores national efforts leading to increased productivity and does not see the impact of labor productivity on exchange rate. If this is not the case, then why and in the name of what does he ignore market forces?

In 2001 Greece joined the eurozone, which was created not fully in accordance with the theory of optimum currency area, and is still part of it. According to a source, i.e. the Polish Ministry of Economy, the situation of Greece at the time of entry was at least good. The information presented on the websites of Polish exporters proclaimed a stable and optimistic situation in Greece.

"… The Greek economy is developing rapidly, showing a continued and strong GDP and income per capita growth since many years. The year 2001 has brought – for the sixth consecutive time - growth of the Greek economy that is higher than the average of EU countries (4.1%). The policy

[3] "... Because the dollar and euro areas have each achieved monetary stability, large changes in the exchange rates are real changes, both unnecessary and damaging. The same could be said of the dollar-yen rate, whose fluctuations over the past 15 years have caused a lot of havoc, particularly in the Japanese economy ...".

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of the Greek government in the field of public finance has also brought great results over the past years. The government deficit in 2000 amounted to only 1.1% of GDP and in 2001 it achieved a budget surplus of 0.1% of GDP. In the year 2002 the Greek expect to maintain the economic growth at a higher level than the average of EU countries, despite the downturn in the international economy" (http://www.exporter.pl/kraje/k_europa/grecja_2002_sektory.html, 21.03.2013).

Greece is a country with a specific culture and historical continuity since at least the Mycenaean times. For our European Hellenic culture it is also a spiritual homeland. The development and course of the crisis in Greece can be described using numbers and comments, however, in order to express the tragedy of this country it is sufficient to mention the unemployment data "… The unemployment rate in Greece is also increasing dramatically. According to the Greek Statistical Authority the unemployment rate in July increased, for the first time since the start of the crisis, to over 25 percent. A year ago it was still 17.8 percent. Among the group of young people aged 15–24 as many as 54 percent are registered as unemployed. …"(reuters, dpa, AFP / Iwona D. Metzner, ed. answer: Małgorzata Matzke, 11.10.2012).

Greeks are, to some extent, regarded by many Europeans through the prism of the movie "Zorba the Greek". Presumably the movie does show some truths about the attitude of the Greek man, his greater carelessness than that of the European man from the north, his aversion to detailed planning and consistent execution, and his tendency to live based on rather unrealistic ideas. The point is that in a "Europe of Homelands" such an attitude should also be respected, especially since it did not bother anyone. All these characteristics as well as the transmitted by the media carelessness and generosity of wages in relation to productivity of activities caused a weak drachma compared to the mark, the pound or the franc. Due to the weak, inflationary currency part of the value disappeared because of inflation, the cheapness of the drachma attracted tourists, while taxes rose along with income and the budget could be successfully constructed from year to year. The country did not lack the tools to maintain an economic and financial balance. This state, which is fitting and adequate to the "Greek spirit" was interrupted by a little thought through entry to the eurozone, the effects of which are widely known.

Is Japan a good candidate for the eurozone? This tricky question indicates a problem, because Japan with its debt of 240% of GDP would be disqualified as a candidate for the eurozone. On the other hand, it is a powerful economy, which does not suffer from inflation, but deflation. Media reports (Ireneusz Sudak, 23.01.2013) show titles like "Japan prints money without limit. Is that how the currency war begins?", referring to the strange to the Europeans monetary policy. According to the cited report: "Starting with the year 2014 the Bank of Japan will print money in unlimited quantities. This way it wants to shake up the sluggish economy of the country, but maybe also start a currency war…". With this decision, the bank started a new era – was the comment of the CNBC. "... Starting next year, every month the Bank of Japan will buy up treasury bills and bonds in the market worth 13 trillion yen, or 145 billion dollars. And it will do so indefinitely until the long awaited inflation appears in the Land of the Rising Sun. For the last

20 years prices in Japan have been falling – in recent months by 0.2 percent. This week the bank raised the inflation target from 1 percent to 2 percent. …". The question why Japan and Switzerland have to fight deflation will be answered later in the text.

However, what works most in favor of the Japanese economy is the fact that the cost of debt is one of the lowest in the world. The yield on the 10-year bonds is 0.73 percent, while the yield on similar Polish bond amounts to approximately 4 percent. Additionally, in Poland there is a constant risk that agencies will lower the assessment of the Polish economy and the costs of servicing will increase. This risk does not concern Japan, because the bondholders are Japanese citizens. Labor productivity in Japan far exceeds 3.0, so this country is one of the world's leaders, and that position the country gained by its own labor and management, rather than by having huge natural resources. This country would be one of the leaders in the eurozone. Another country that finances its public debt as cheaply as Japan is Switzerland. It seems that the difficult for the economy consequences of debt financing are skillfully eliminated by Japan and Switzerland. This is possible mainly on account of the fact that these countries maintain considerable political independence and autonomy. Currency management is a valuable political capital of these countries, and the large savings, i.e. the wealth of citizens, enables them to finance the public debt on their own, which is safe for the economy.

Poor countries, like Poland, finance their debt to a large extent through foreign loans, which determines their economic position. J. Osiatyński (2010, p. 217–219) presents the process of funding the needs of the public finance sector based on the example of the year 2009. " ... The structure of domestic and foreign debt financing amounted to a net of PLN 30.2 billion domestic and PLN 18.5 billion foreign. However, as far as domestic financing was concerned, in the hands of the domestic holders of Treasury securities only PLN 10.1 billion was left (of which PLN 3.9 billion served to finance the debt still from 2008), while PLN 23.9 billion went into the hands of foreign investors buying Treasury securities in the domestic market. … This shows that domestic financing only covered about 20% of the net borrowing needs …". By 2013 not much has changed, so the cost of debt servicing to a large extent depends on foreign decision-makers, which is a huge threat. Even domestic debt financing in Poland is much more expensive than in Japan.

In this situation only one unambiguous conclusion is justified. Poor countries, with a much lower productivity than the average value characterizing the founding member states, and which finance their budget deficit by selling bonds in international markets, do no enter the eurozone. There are good reasons to believe that the decision to join the eurozone will lead to an economic disaster in Poland.

| Doubts of a General Nature Concerning the Decision to Introduce the Euro in Poland

On 27.03.2013 on the Internet (source: onet.waluty) a statement appeared regarding the Polish accession to the eurozone: *Poland is not yet lost. But its leaders remain determined to give disaster*

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a chance. – is what American economist and Nobel Prize laureate Paul Krugman wrote on his blog "The New York Times". He emphasizes that Poland is one of Europe's relative success stories in the times of crisis. And a lot of that relative success clearly had to do with the fact that Poland not only kept its own currency, but allowed the zloty to float, thanks to which Poland managed to avoid sheer economic horror.

At this point of this paper it is worth recalling what other researchers think of the case at hand, as well as the Polish experiences in terms of important national decisions. Even though experiences are somewhat background matters, their significance becomes paramount when in the decision-making process party and political benefits prevail, and scientific analyses are of no importance to the decision-makers. As far as making crucial national decisions is concerned, a good example is the reform of counties and provinces. The decision on this reform has had a negative impact on the level of labor productivity in Poland, and thus has indirectly lead to the decision to withdraw from accession to the eurozone. The process of reaching this decision is described in detail by W. Kieżun (2012, p. 297–320). Practice shows that scientific knowledge, common sense, economic calculations must yield if "partiocracy" sees something to its own interest. Then also scientists will be found that will serve the government, ready to use arguments *ad personam* rather than *ad rem* in order to brutally combat manifestations of common sense. While politicians will demonstrate disregard, if not contempt towards scientific results. This tandem of power and compliant science will push through each desired option.

The question arises whether the theory, which is supposed to be the basis for creating a common currency area, is strong enough to manage this process effectively. There can be no positive answer to this question, as since their entry to the eurozone economic disasters have struck Greece, Spain, Ireland, Cyprus, countries belonging to the Western capitalist economy. The fact that there is no clear postulate on the most important economic indicator in this issue, which is labor productivity, does not raise confidence in the theory, even though productivity has always been the basis for creating a common area. The thing is, the entire science of economics is at a crossroads. This is well put by G. Kołodko (2010, p. 11), who writes the following: "… It is difficult to resist the impression that in the heat of the constant ideological, political and economic disputes actually a great world war of ideas, opinions, and most of all interests is being fought. … What this ongoing conflict will really bring, depends at least in part on how the economy deals with the contemporary crisis and with itself. With itself, because there is reason to believe that this discipline of knowledge is also collapsing, just like the economy, which it attempts to explain and to change…". It should be added that there never was a strong, scientific economic theory, and the reasons for this are explained in the paper (Dobija and Kurek, 2013).

Scientific analyses conducted by Polish scientists objectively present the pros and cons of Poland's accession to the eurozone, but it is not easy to give the respective benefits and risks the appropriate significance in order to obtain a quantitative evaluation. K. Łaski and L. Podkaminer (2010, p. 268–281) discuss the matter of accession in a broader context of the challenges for the

economic policy of the European Union. Already at the beginning of their paper the authors point to the need to change the paradigms underlying the policy of the EU. Without this, according to the authors, the EU can be subject to the centrifugal forces that have emerged in recent years. Since the majority of intellectuals believes that the existence of the EU and Polish membership lie in the interest of Poland, efforts should be made to implement the necessary reforms. The fundamental reform associated with the eurozone will be discussed in the conclusion. As regards the most important issue the authors K. Łaski and L. Podkaminer (2010, p. 275) write the following: "…A significant loss of competitiveness – which most likely cannot be made up in a system of a single currency – is never final in a system of an autonomous floating exchange rate...".

W. Małecki (2010, p. 230–254) also highlights the risk of losing competitiveness. In his fourth conclusion (p. 252) he writes he following: "…The crisis in the eurozone has demonstrated that the greatest danger for new member states may turn out to be the gradual loss of competitiveness of their economies after accession…". The conclusions of the author, who seems to be rather in favor of accession, are thought through and reasonable, although it is difficult to deduce from them what the final stance is. However, it can be assumed that the author would change his favorable opinion on accession if he would know for a fact that the Polish economy will prove to be uncompetitive, mainly because it already is. The belief that an increasingly efficient industry will compensate the excessive burden of the public sphere cannot be justified. The low value of Q clearly indicates that. A low productivity will be followed by a low credibility and the benefits of cheaper funding will prove to be illusory. The ideas discussed in this paper and the experience of countries with a lower labor productivity than the founding member states justify a conservative attitude and a rejection of Poland's accession to the eurozone, given the knowledge of the insufficient intellectual grounds. Accession to the eurozone should be postponed in time, not only because of the fact that Poland is not ready, but also because of the inadequate conditions to expand the zone.

A Currency Area that Guarantees Integration of Countries with Different Levels of Development

Poland could join the eurozone, but its structure needs to be different, i.e. not subject to destructive monetarism but people-friendly laborism. Understanding that it is productive labor that generates money with stable purchasing power is the basis for creating currency areas by countries that know that the whole is more than the sum of its parts and that want to stimulate economic development, but most of all a common development in the humanistic dimension. Countries that want to increase human freedom, the free exchange between people, including products and services. A well-created currency area can integrate societies, leading towards the elimination of armed conflict and ensuring sustainable and peaceful cooperation. Currency areas are a laudable idea towards unifying humanity for a better and more secure future. However, currency areas

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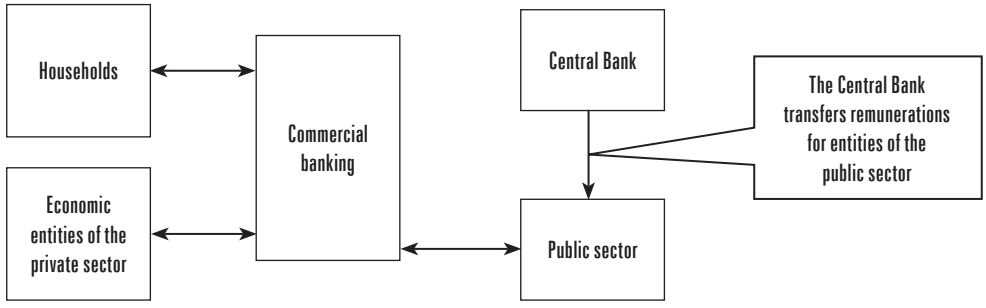
are a crowning achievement of positive economic knowledge, while monetarism is just the opposite. It is only a transitional phase that humanity must experience in order to get away from it.

The benefits that authors point to associated with the accession of a country to a common currency area are considerable. These benefits are presented in detail by W. Małecki (2010, p. 236–237), who categorizes them as follows: immediate, medium-term, long-term. A total of 15 items. These benefits and many additional ones, such as a decrease in the Gini Index, countries can achieve a lot easier by implementing reforms of the principles for creating a common area. The reform of the eurozone, leading to creating a potential for positive changes, which is mentioned above, requires four steps.

A. Removal of the European Central Bank and a prohibition of borrowing from the World Bank and the International Monetary Fund, while maintaining the name of the monetary unit: euro.
B. Transforming the national central bank into an institution distributing wages in the budgetary sphere (public sector).
C. Giving the transformed central bank the authority to control labor productivity in order to prevent a decline of this indicator.
D. A preliminary calculation of wages according to algorithms that take labor productivity into account.

The first step consists in adapting activities to the fundamental principles of reality; to respect the principle that the ability to perform work, i.e. capital and energy, do not arise out of nothing. This is also the criterion determining if the economic theory and practice are committed to the path of development defined by *science*. More on this subject can be found in the works of (Dobija and Górowski, 2012; Dobija and Kurek, 2013). In accordance with the nature of capital and labor (Dobija, 2011a; 2013), labor does finance itself, thus the central bank becomes an institution with the authority to pay wages in the budgetary sphere (step 2). These remunerations are no longer financed with taxes and therefore budgets should not generate deficits. In the Polish economy labor costs in the budgetary sphere (public sector) amount to PLN 130 billion, so they exceed the budget deficit at least three times. Figure 1 presents the transformation of the functions of the central bank.

Figure 1 | Transformation of the financial system and reform of the central bank



Source: Dobija (2009; 2011a).

In the third step, the central bank is granted the authority to control and its mission is to prevent labor productivity from declining and to promote its growth, as is formally explained in previous studies. This way inflation does not increase and the currency does not depreciate, as long as productivity growth is at the same level in other countries. The size of the budget sector is also controlled by the labor productivity index.

The last step, which is also the beginning of the accession to the currency area, consists in a conversion of the wages, prices and deposits, receivables and liabilities to a common currency, i.e. the euro. This matter concerns accession to an existing currency area as well as a planned one based on the presented principles. Deposits, receivables and liabilities are subject to law and the state cannot regulate anything, but only indicate a conversion rate that should maintain the original value of the holder as much as possible. However, the state can combine the act of accession to the eurozone with the necessary regulation of the minimum wage and a possible adjustment of remunerations in the budget.

This issue is important yet made difficult by the confusion as to the comparability of wages. Even just a look at the list of minimum wages in selected European countries could lead to confusion. For example, by the end of 2011 these wages, at the normal conversion rate, were as follows: Netherlands 1424€, Belgium 1415€, France 1365€, UK 1139€, Slovenia 748€, Portugal 566€, Poland 369€, Czech Republic 319€, Slovakia 317€, Hungary 281€, Estonia 278€, Romania 157€, Bulgaria 123€. This does not mean that the standard of living of an employee with minimum wage in the Netherlands was 1424:369 = 3.86 times higher than that of a Polish employee with minimum wage. It also isn't scientifically justified to claim that in order to keep up with the Netherlands the minimum wage in Poland should be: 1424€ times the euro exchange rate (4.186) = 5961PLN. Wages can be converted properly using the exchange rate only in countries with equal labor productivity. Otherwise, the real parity needs to be taken into account. According to the formula of the average exchange rate (Dobija, 2002, p. 83), there is an equality that can be used to determine a comparable wage. We assume that the indexes P and A represent Poland and the USA respectively.

$$ER = \frac{S_P}{S_A} \cdot \frac{Q_A}{Q_P} \qquad \text{therefore} \qquad S_P = S_A \times Q_P/Q_A \times ER[PLN/\$]$$

For example, if we set the minimum wage corresponding to the level of the American dollar, then the estimate calculation using the exchange rate and labor productivity parity leads to the following hourly labor cost: 7.25USD×1.064×1.958/3.620×3.236 = 13.50PLN (1.064 brings the rate to the labor cost, because it includes payments to the pension fund). On a monthly basis this comes down to 2008PLN, including social security contributions paid by the employer. The actual minimum wage is currently 1600PLN × 1.18 = 1888PLN, or 10,73PLN/ hour, which corresponds with the known fact that it is about 20% lower than the living wage level (Dobija, 2011b). Furthermore, the percentage of pension fund contributions paid by the employer in the U.S. is

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6.4% and in Poland about 18%. Not taking into account the real parity, the hourly rate multiplied only by the exchange rate would be absurd, namely (7.25 × 3.236) = 25.46PLN. Similarly, all wage comparisons that are conducted using only the exchange rate are worthless when labor productivity parity is not close to one.

In terms of minimum wages, state authorities should create clear initial conditions for the day of entry to the eurozone. Knowing that the highest minimum wages in Europe amount to more than 9.0€ per hour and assuming, for example, that the Polish minimum wage should be (with some exceptions) equal to 4.0€ per hour, then the conversion is as follows (1600PLN : 176 hours) : X = 4.00€, therefore X = 2.27PLN/€. Conversion using only the euro exchange rate will give an hourly rate equal to just 2.17€. The suggested approach will stabilize the lowest wages, which will also have a positive impact on the formation of commodity prices. The conversion of low wages in the range from, for example, 1600PLN to 4000PLN would have to be done using proportional conversion rates from the interval (2.27PLN/€ to the chosen exchange rate). This way of calculation does not only protect people with the lowest incomes, but is also a step towards respecting the knowledge derived from the theory of human capital (Dobija, 2011), which is necessary for the organization of the socio-economic life.

Conclusions

The deliberations and analyses indicate that the Maastricht criteria are not intellectually refined; they do not contain the condition of labor productivity conformity and are therefore insufficient to qualify candidate countries for accession to the currency area, which the eurozone was intended to be. The eurozone was by definition not designed to integrate. Poland, due to its low labor productivity and financing of a major part of the deficit through selling debt securities in foreign markets, should not aspire to join the current eurozone if it wants to remain independent in its economic decisions and maintain its autonomy.

It is also a fact that the eurozone in its intended form discriminates countries (dividing them into groups) rather than integrating them. An adequate candidate for the eurozone is a country with a labor productivity index of higher than 3.0, and the Q-index for Poland does not even reach 2.0. If, however, the founders of the European Union really want to develop integration for the benefit of the nations, then the necessary reforms need to be implemented in the organization of the eurozone. These are organizationally and technically easy, but very difficult in terms of politics. However, the creation of a currency area according to the described principles will create a positive and lasting development stimulus, so efforts should be undertaken. Another road to integration could involve Poland initiating a smaller currency area (for example in the Visegrad Group and neighboring countries), which, after achieving a higher labor productivity, would integrate with the eurozone on its own terms. However, these are long-term processes the aim of which must be to increase the Q-index, which is what the countries could not achieve.

An integrating currency area is an idea based on the economic theory respecting the fundamental laws of Nature (Dobija and Kurek, 2013), and in particular the fact that capital does not arise out of nothing. This implies that the activities of the current central banks are inconsistent with scientific knowledge of reality. What is worse, the existence of the central bank in its current form forces an increase in debt, not allowing for the natural state of the economy, in which it is productive labor that generates money, as labor transfers human capital to work facilities. In this situation self-financing of labor is not being used, which frees the economy from a large part of taxes and in normal conditions does not allow for the creation of a budget deficit and a debt loop throttling the economy. In a proper theory an independent central bank is the controller of labor productivity and the distributor of wages for the public sector. A currency area that integrates economies is a natural consequence of a correct and fair economic theory.

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