Vinícius de Azevedo Couto Firme

Graduate Program of Applied Economics,
Federal University of Juiz de Fora,
Brazil
✉ firmez@ig.com.br
✉ vinicius.firme@ufjf.edu.br

Joanílio Rodolpho Teixeira

Department of Economics,
University of Brasília,
Brazil
✉ joanilioteixeira@hotmail.com

Index of Macroeconomic Performance for a Subset of Countries: A Kaldorian Analysis from the Magic Square Approach Focusing on Brazilian Economy in the Period 1997-2012

Summary: This paper aims to evaluate the macroeconomic performance of some chosen countries in the period 1997-2012 using the four variables that compose the "magic square" diagram suggested by Nicholas Kaldor (1971). In order to avoid problems with the variables' scale, the standardized "Index of Economic Welfare" created by René A. Medrano-B and Joanílio R. Teixeira (2013) was utilized. The results showed a good performance of China and the Asian countries. Furthermore, in spite of the impact of the crises of 1998 and 2008 into Russia, this country presented a good recuperation and achieved a high index just after these crises. The Brazilian performance was somewhat surprising. The country showed a low growth rate and a progressive current account deficit, both typical of developed nations, along with a high inflation, typical of developing countries. A positive aspect seems to be the country's capability of avoiding external crises, like the verified in 2008-2009.

Key words: Normalized magic square, Kaldorian approach, Index of economic welfare.

JEL: E6, E01, E31, F1.

The goal of this paper is the calculation and analysis of a standardized index that allows us to compare the macroeconomic performance of countries. Therefore, four variables that, according to Kaldor (1971), would be the most relevant in describing economy were used. According to him, once the most governments had assumed the maintenance of a high and stable level of employment after the II War, they also started to take care of the other important aspects of the economy. Thus, to make viable a full-employment policy, the government should be able to ensure a sustainable balance of payments, a satisfactory growth rate and the prices and wages stability. Thereby, these four variables (economic growth rate, unemployment, inflation and trade balance) were used to compare the economic performance of developed countries (i.e.: USA and those in the Euro Area) and the main emergent economies (i.e.: Brazil, Russia, China and the recent industrialized Asian countries) in the last 15 years (1997-2012). The macroeconomic performance of these nations was calculated by the new index developed by Medrano-B and Teixeira (2013) based on Kaldor's

conception of a "magic square". The results showed a good economic performance of China and the Asian countries. Furthermore, in spite of the strong impact of the crises of 1998 and 2008 into Russian economy, this country presented a good recuperation capability and achieved an index almost as high as China and the other Asians just after these crises. Nonetheless, Brazil had the most curious results. The magic square of this country indicates that it usually has low growth and a deficit balance in current accounts, typical characteristics of developed countries, though it remains with problems common to emerging countries, such as an elevated inflation.

Beyond this introduction, this article is subdivided as follows. In Section 1 there is a discussion about the relevance of the countries analyzed in this paper. Section 2 presents the pros and cons of creating an index to evaluate the macroeconomic performance. The third section shows a review about the economic variables proposed by Kaldor (1971) and the way that such variables led to the development of what was later known as "magic squares". In Section 4 the method for the construction of Medrano-B and Teixeira's (2013) normalized economic performance index is presented. Section 5 contains the results of our research. Thereafter, we have the conclusion and references.

1. The Relevance of Selected Countries

The original selection of emerging countries was based on the importance of the BRICs (Brazil, Russia, India and China) on the international scene. According to Jim O'Neill (2001), the first one to use the term "BRIC", these countries showed characteristics that stood out from the other developing countries. One of which is that their geographical area is vast, with potential for growth, and a similar level of macroeconomic stability, trade opening and education. Holly A. Bell (2011, p. 22) stated that: "in addition to openness (...), macro stability, institutions, and education as being important factors in creating the conditions for growth in the BRIC countries". Orlando Monteiro da Silva, Rafael Rodrigues Drumond, and Fernanda Maria de Almeida (2011, p. 3) consider that there are also another common causes that could explain the verified amount of growth in these countries. According to them, all of these four countries have a large territory, a big population, large asymmetry in the distribution of income, and low *per capita* incomes. Moreover, the causes for the rapid economic growth observed recently are common to them all. They received a large inflow of foreign direct investment, mostly export oriented, because of their low labor costs. Because of these specific features, Issouf Samake and Yongzheng Yang (2011, p. 4) declare that nowadays the BRICs encompasses the most important emergent economies.

Although there is a consensus about the BRICs' relevance, there is another group, known as NIAE (Newly Industrialized Asian Economies), that have had a high level of economic growth from the 1960s, made up of Taiwan, Hong Kong, Korea, Singapore. According to Takatoshi Ito (2001), these economies are following the Japanese process of industrialization in a phenomenon known as the "flying geese".

According to Kiyoshi Kojima (2000, p. 376), this term was coined by Kaname Akamatsu in the 30's but, due to the low visibility of the Japanese language in the western countries, his work gained notoriety only in the 60's, after having been trans-

lated into English. Akamatsu suggested that the development of an economy was compound by some steps. Firstly, the economy would import products in order to supply the domestic market. Thereafter, this economy could be able to internalize this production and, later, even export these products. This process would follow a pattern similar to the geese's flight (flying geese). In other words, a new technology should first be imported from a more developed country (usually called "leader goose"), then be learned, and later, exported. This approach was very successful in Japan and accelerated the importation's substitution processes coming from the country's textile exportation. More details about this phenomenon can be found in Kojima (2000) and Ito (2001).

According to Ito (2001), this industrialization process verified into the NIAE economy, allowed a quick migration (after World War II) from an agricultural economy to another lighter industry (without requiring an elevated capital stock - light industry) and later, from a petrochemical heavyweight industry to an intensely electronic industry. Kojima (2000, p. 376) says that the members of NIAE are strongly guided by the Japanese industrialization. According to him: "the flying geese pattern of industrial development is transmitted from a lead goose (Japan) to follower geese (Newly Industrializing Economies - NIEs, ASEAN 4, China, etc.)". So, whenever Japan masters some new technology, these economies incorporate part of the technique by the significant amount of direct foreign investment coming from Japan. According to Ito (2001), these constant changes have allowed these countries to have high and longstanding growth.

Therefore, we intend to compare this NIAE group to that of the BRICs and other developed countries (like USA and the group of countries from Euro Area) through a composite index that measures their economic performance.

2. The Main Reasons to Create an Index of Macroeconomic Performance

The research elaborated by Romina Bandura (2008) reveals that both the composite index's importance as its elaboration has grown in the last few years. In a recent compilation, Bandura (2008) was able to collect almost 180 composite indexes that were created to analyze diverse areas such as: the environment, economy, technological evolution, education and others. Andrea Saltelli (2007) considers that, although the index simplifies the understanding of some key relationships, care must be given to the possible construction and interpretation flaws that a composite index involves. He points out that special attention must be paid to the choice of variables that will make up the index. Michaela Saisana and Stefano Tarantola (2002) describe well the pros and cons associated to the construction of these indexes. According to the Organization for Economic Co-operation and Development (OECD 2008, p. 13), the composite indexes are ideal for measuring multi-dimensional characteristics (e.g.: competitiveness, human capital, among others), which would be hard to explain using only one variable. Thus, the analysis of the economic performance with basis in only one variable, such as the GDP growth *per capita*, for example, would be as simplistic way of evaluation as the evaluating a person's knowledge by the years of his/her study. Therefore, the conception of an index, containing recognized and relevant macroeconomic variables, becomes relevant.

However, it is important to note that there is strong opposition to the creation of these indexes. Andrew Sharpe (2004, p. 5) discusses this matter. According to him, there are two main conflicting trains of thought, known as "aggregators" and "non-aggregators". The first group believes that it is possible to add variables without the loss of relevant significance. For these, the aggregation facilitates the public's, the media's and the *policymakers'* comprehension. But the second group does not believe in "easy ways" and criticizes the arbitrary way in which the variables' weights are defined. For Saisana, Tarantola, and Saltelli (2005), there's a specific aversion, coming from the statistics, to the use of these composite indexes. The reason is that a big part of the work of collecting and compiling the data is lost or "hidden" behind a single significantly dubious number. Notwithstanding, the authors discuss the temptation to resume the complex information into something more comprehensible as being almost irresistible.

An important question about these indexes is: if there are so many composite indexes, as suggested by Bandura (2008), why should we create a new one? The main reason is because the Kaldor's variables are able to better explain the economy performance and there are few works that have created an index using these variables. Actually, the GDP growth has been the most common indicator used to evaluate an economy. But, the unemployment should be considered too. As mentioned by Kaldor (1971, p. 2), the major governments accepted "as one of their primary aim and responsibilities the maintenance of a high and stable level of employment after the war". Therefore, a country that has a high GDP growth but cannot maintain the employment level should be punished in terms of economic performance. Similarly, the maintenance of a high employment level without GDP growth would not be desirable either (e.g.: countries like Cuba)[1]. However, the economic theory suggests that these situations are not common, once these variables are usually positively correlated (Okun Law). But, even a scenario with high GDP and employment level would be debatable if it were followed by inflation. Note that, if a country is using an Inflation Target model (IT), a rise in the price level could be followed by restrictive measures that could affect both the GPD growth as the employment level. Considering the Brazilian case, Nelson H. Barbosa-Filho (2008, p. 198) reveals that the "economic growth was slower under inflation targeting than under exchange-rate targeting". According to Carlos A. Carrasco and Jesús Ferreiro (2011, p. 675), these models are very common: "since its introduction in 1990 in New Zealand, Inflation Targeting (IT) has been gradually implemented worldwide, becoming the dominant monetary policy strategy". Finally, the international account, as the inflation case, could tell about the sustainability of this economic performance. In this case, a worse deficit in the current account, for example, could affect a country's solvency in the foreign market, which, in some cases, could also change the GDP and employment growth trend. According to Robert Devlin and Ricardo Ffrench-Davis (1995, p. 117), the great Latin America crisis in the 80's had the indebtedness with the international private banking system as a common link. Therefore, an index that does not consider these four variables would not be able to capture these important effects.

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[1] **Central Intelligence Agency (CIA).** 2013. The World Factbook.
https://www.cia.gov/library/publications/the-world-factbook (accessed January 15, 2013).

3. Kaldor's Magic Square

According to Kaldor (1971), since Adam Smith economic literature touches on topics such as the economic growth and income distribution, aiming to verify political effectiveness. However, only after the World War II, with the Keynesian thought diffusion (that the government should intervene in the economy in order to induce full employment), the policymakers started to adopt specific goals to determine the performance of its management. Although an official definition of its aims and goals for an optimal governmental administration did not exist, Kaldor (1971) was able to define four goals that were commonly followed, based on the declarations of the main leaders of that time. Namely: growth rate, unemployment, foreign balance and price stability.

Frédéric Teulon (1998) points out that Kaldor's work helped consolidate the main purposes of macroeconomic management and contributed to the analysis of the economic performance based on the "magic square"; this being a graphic representation of the numerical values of the four variables proposed. We must highlight that some of these variables may be conflicting. Olfa Alouini (2012) recalls that, once accept the hypothesis of an existent trade-off between the Kaldor's variables (e.g.: the Phillips' curve - inflation *versus* unemployment), a country or region would hardly be able obtain a good performance in all of the magic's square indexes. This subject-matter had also been highlighted by Marc Pilkington (2005, p. 35). According to him: "even if most economists seem to agree in theory with the validity of the 'magic square' put forward by Kaldor (1971), it is debatable whether these fundamental objectives (full employment, price stability, balanced trade, and public budgets) can be simultaneously attained. With the existence of potentially diverging or conflicting objectives, the question of their prioritization would occur".

The analysis of the economic performance through these indicators was introduced initially by the German government. During the 1966-1969 period, the economy minister, Karl Schiller, as well as the financial minister, Franz J. Strauss, led the German economy based on the graphic analysis of Kaldor's four indicators. The combination of these variables was exposed in a square form, called "Kaldor's magic square" that simplified the comparison and display of the economy's performance (Dietmar Braun 2003). Once it developed, the technique was used by several countries. Michel Bernard et al. (1988) used it to compare France's, Japan's and England's performance during the period before and during the oil shortage (1960-1973 and 1974-1980). Ronan Porhel (2007) used it as an instrument to analyze Kenya's situation during the years of 2000-2007. Jean-Paul Fitoussi and Francesco Saraceno (2013) used this method to compare USA's economic performance and the three larger countries of the Euro Area (Germany, France and Italy) over two different time periods, 1981-1990 and 1991-2000. Alouini (2012) uses Kaldor's variables to analyze the economy of the Euro Area during the period of 1998 to 2008. Lukáš Kučera (2012) utilizes the magic squares to evaluate the Czech Republic's economy between 2006 and 2011. Furthermore, based in Ludmila Bokrošová (2005), the author uses the four variables to calculate a general performance index and concludes that 2007 was the best year for the country during the period in question. The idea of calculating an index derived from Kaldorian variables was enhanced by Medrano-B and Teixeira (2013) and is formally presented on the following section.

4. Methodology

The index proposed by Bokrošová (2005) is based on the concept of the ideal country (wonderland). So, the bigger is the area of a country's magic square, the better will be the results of Kaldor's four indicators and the closer this economy will be in relation to wonderland and, consequently, the index will be better. It is important to realize that the definition of an "ideal country" may vary. Kučera (2012), for example have used the definition proposed by the OECD where the GDP growth would be 3%, the unemployment rate 5.5%, inflation 2% and the current account deficit, in terms of GDP, equal to 0%. Meanwhile, Medrano-B and Teixeira (2013) constructed their wonderland based on the maximum and minimum values of their sample. As mentioned by Alouini (2012), it is difficult for any country to obtain a good performance in all of these four Kaldor's criteria. Therefore, the definition of an "ideal country", although good as a parameter, might be not an easy goal to achieve.

Formally the calculus of this index may be expressed in a simple manner by calculating the geometrical figures' area of the magic squares. However, in Bokrošová (2005) formalization, there was no type of standardization of the variables and the weights of each one were defined arbitrarily as being equal. Medrano-B and Teixeira's (2013) approach was a bit more sophisticated. Although it is also based on the magic's square area, the authors worked with the normalized variables. According to them the normalization is fundamental since the use of the Kaldor's magic square variables, in percentages, (as it is in the case of these articles) should be avoid because of their different scales.

In order to compute the normalized index, based on the historical rates of Kaldor's four variables, the method developed by Medrano-B and Teixeira (2013) was used. In other words, the maximum and minimum values of GDP growth (γ), trade balance (τ), inflation (φ) and unemployment (ζ), obtained by the countries included in the sample, for the period of 1997 to 2012, were used to define the possible intervals of these variables. On this issue, it is worth highlighting that these bounding values were used as parameters to assess the decision of the intervals. Since the definition of an ideal country (wonderland) involves the establishment of unattainable goals, it is advisable that the targets should be above the verified maximum and below the verified minimum. Besides this, in the case of inflation (φ), the economists usually agree that the ideal would be the maintenance of low and stable levels. Some authors have been suggested that the prices and wages increasing should not be larger than the productivity. Kaldor (1971, p. 2) mentioned that "increases in the general level of wages must be related to increased productivity". On the other hand, a lowering of prices, when $\varphi < 0$, caused by excess supply, could imply in the bankruptcy of companies and economic crisis. Since the inflation rate can assume a negative value in the real world, -2% was used as an ideal value (a little below to the minimum value of -1.4% verified in China in 1999). But since negative values are rare (3 observations in 126 alone - and all in China), this must not affect the analysis significantly. Even then, this issue must be dealt with utmost care in future articles.

Therefore, our intervals were defined as follows:

$$[-10 \leq \gamma \leq 15]; [-10 \leq \tau \leq 20]; [100 \geq \varphi \geq -2]; [15 \geq \zeta \geq 0] \qquad (1)$$

where γ represents the real growth rate of GDP *per capita*; τ is variation on the foreign trade measured by the balance in the current account; φ and ζ are the inflation and unemployment rates, respectively (more details about these variables are available in Section 4.1).

The normalization demanded some type of transformation on the expressed original rates in (1), thus:

$$[0 \le \gamma' \le \alpha]; \ [0 \le \tau' \le \alpha]; \ [0 \le \varphi' \le \alpha]; \ [0 \le \zeta' \le \alpha]. \tag{2}$$

So, based on a linear transformation, proposed by Medrano-B and Teixeira's (2013), as shown in Figure 1, it was possible to describe the performance of each variable through a linear function. Therefore, for the case of foreign trade, if $\tau = -10 \Rightarrow \tau' = 0$ and $\tau = 20 \Rightarrow \tau' = \alpha$.
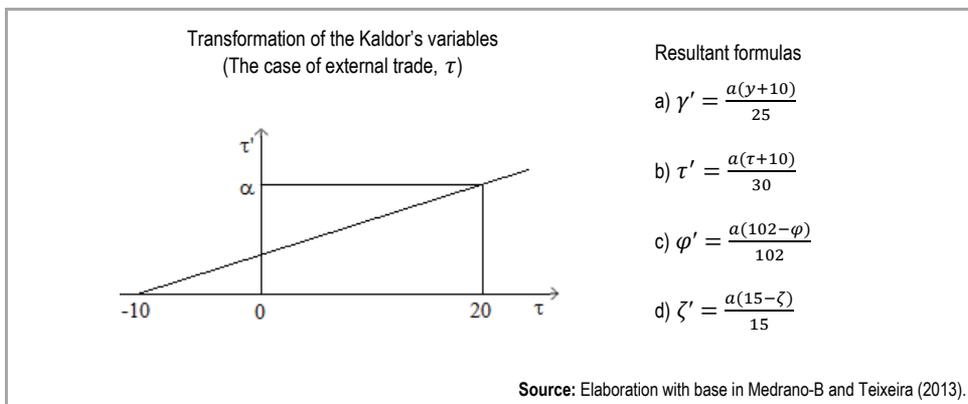

Transformation of the Kaldor's variables (The case of external trade, τ)

Resultant formulas

a) $\gamma' = \dfrac{a(y+10)}{25}$

b) $\tau' = \dfrac{a(\tau+10)}{30}$

c) $\varphi' = \dfrac{a(102-\varphi)}{102}$

d) $\zeta' = \dfrac{a(15-\zeta)}{15}$

Source: Elaboration with base in Medrano-B and Teixeira (2013).

Figure 1 Transformation of the Kaldor's Variables and the Resultant Formulas

This procedure helped us to elaborate a "Modified Magical Square", where all the axes are expressed in the same scale (Figure 2):
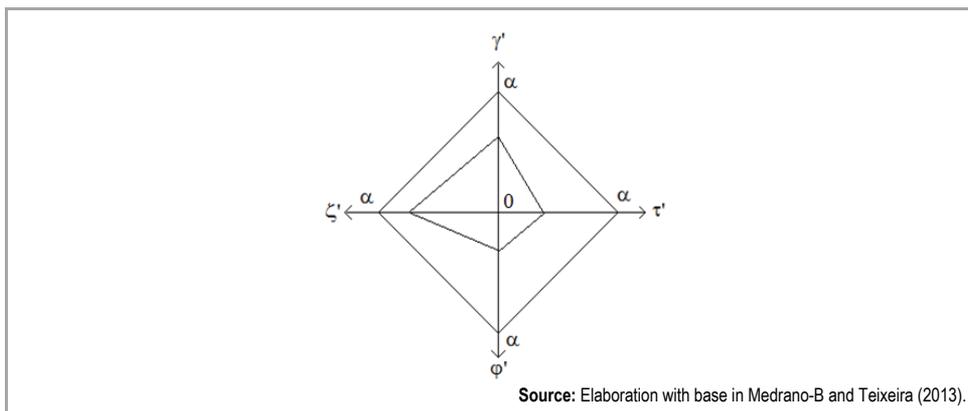

Source: Elaboration with base in Medrano-B and Teixeira (2013).

Figure 2 The Modified Magical Square

where the area of the larger diamond (A'_w), in the Figure 2, represents the index obtained by an ideal country (wonderland) and may be calculated as follows: $A'_w = 4(a^2/2)$. Making the $A'_w = 1$, we can find that $a^2 = 1/2$. Moreover, the polygon's internal area reveals the performance of a hypothetical country and can be calculated by the following formula proposed by Medrano-B and Teixeira (2013):

$$A' = \frac{1}{2}(\gamma'\tau' + \tau'\varphi' + \varphi'\zeta' + \zeta'\gamma'), \text{ where } 0 \leq A' \leq 1. \tag{3}$$

Substituting the normalized variables of the Equation 3, by its respective formulas (Figure 1), it is possible to obtain A'. Which is, actually, a normalized economic performance index (NEPI) for each country. Therefore, A' may be considered an index of "economic well-being", where the zero value would be a catastrophic result (with zero growth, worsening of 2% in the foreign balance, 10 % in inflation and 12% in unemployment). Alternately, a unitary index would indicate an ideal case (wonderland). It is worth to mentioning that, once each variable has the same weight in our index (1/4), two economies can get the same coefficient even facing distinct economic problems. Therefore, a country with high inflation and unemployment could achieve the same index of another one with low GDP growth and problems in the foreign balance. Thus, in spite of being two different economies, both of them will be considered similar, because we are considering only the index magnitude (i.e.: the bigger the index the better will be the economic well-being).

4.1 Database

The data used in this paper was obtained from the International Monetary Fund (IMF 2013)[2] on the World Economic Outlook Database. The GDP's percentage change was used at constant prices to determine the economy's growth rate (γ). For φ, the inflation, we use the average price level for the consumer. The unemployment rate (ζ) was expressed in terms of the full work force. Finally, the balance of the current account was considered, as GDP percentage, to evaluate the external situation (τ).

As we have mentioned before, our data includes fifteen years (from 1997 to 2012). This period was selected due to the availability data. Actually, the information on the current account balance, mentioned in the IMF (2013), for the countries of the Euro Area were only disclosed in 1997. Therefore, there were only two options left: first, it would be possible to include some of the developed countries of Europe instead of the Euro Area. However, since Russia only began to release data in 1992, this strategy would increase the period being analyzed by only 5 years (from 1997 to 1992). Besides, the inclusion of other countries with similar characteristics (such as the European case) would only complicate the analysis without much to show for it. The second option, put forth in this article, was to begin analysis in 1997 using the Euro Area group of countries.

It is worth to mention here that, initially, the India's inclusion was considered. So it would be possible to compare all of the emergent countries' members, nomi-

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[2] **International Monetary Fund (IMF).** 2013. World Economic Outlook Database.
http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/index.aspx (accessed January 15, 2013).

nated "BRICs". However, there was not an unemployment series available to India, during the analyzed period.
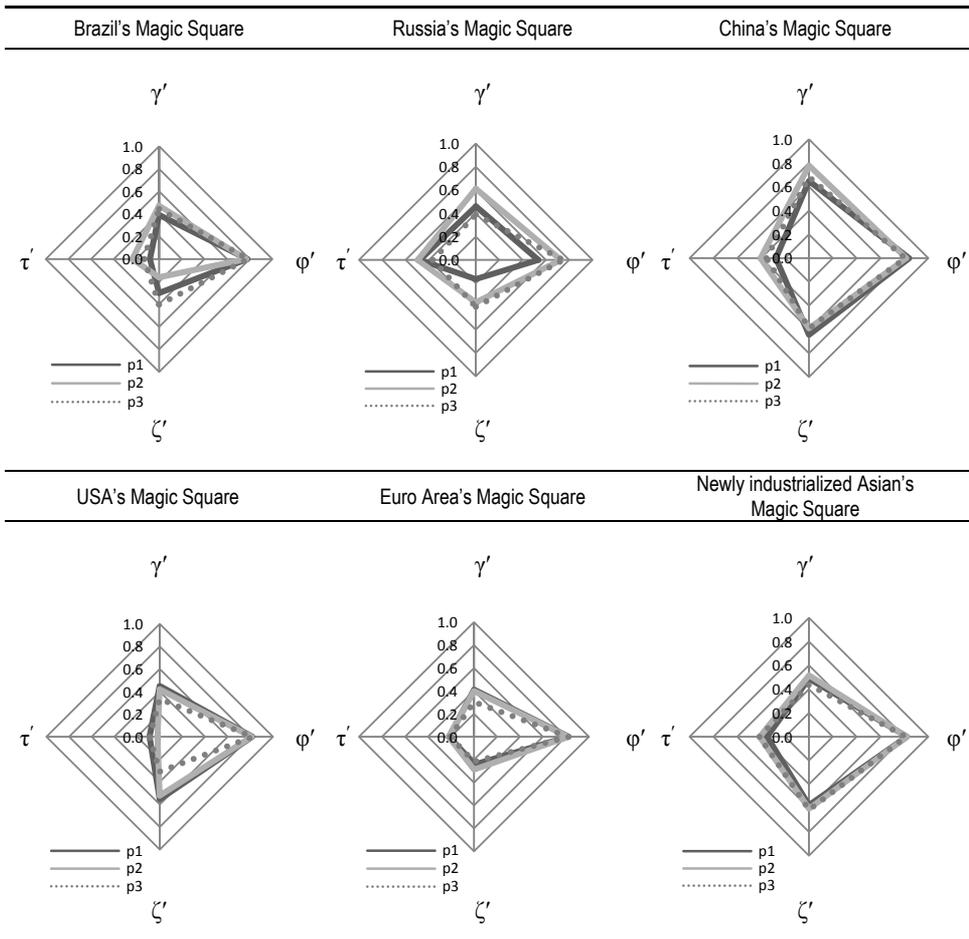
5. Results

Once there were some important crises between 1997 and 2012, the database was initially divided in 3 distinct periods (each one with five years): 1997-2002, 2003-2007 and 2008-2012. The first period was marked by the Asian (1997) and Russian (1998) crises and their effects on the following years. According to Morris Goldstein (1998, p. 1): "the turmoil that has rocked Asian foreign-exchange and equity markets since June 1997 and that has spread far afield is the third major currency crisis of the 1990s". Regarding the impact of 1998's crisis into Russia, Brian Pinto, Evsey Gurvich, and Sergei Ulatov (2005, p. 406) stated that it caused a "comprehensive macroeconomic collapse, involving its exchange rate, the banking system, and public debt". Abbigail J. Chiodo and Michael T. Owyang (2002, p. 16) also explain that the Asian's crisis was one of the main reasons to explain the expectations of Russia's devaluation and default that triggered the Russian crisis. According to them: "the Asian crisis made investors more conscious of the possibility of a Russian default". In 2007 another important crisis started in the USA, but its effects on the world economy have only spread after the Lehman Brothers bankruptcy in September 2008. Therefore, 2003-2007 can be considered a lull economic period, while 2008-2012 was marked by economic recession, in 2008-2009, and recuperation, in the last years.

Based on the normalized magical squares, calculated in Table 1, we note that, during the period of 1997-2002 (named P1), China obtained the best performance in three out of the four described variables. This country earned the best growth rate together with the least inflation and unemployment among those being analyzed. Regarding the normalized index, the following results were obtained ($\gamma' = 0.65$; $\varphi' = 0.84$; $\zeta' = 0.64$). Besides this, China's current account balance ($\tau' = 0.28$) only did not surpass Russia's ($\tau' = 0.48$) and that of the Newly Industrialized Asian Economies, Asian-NI ($\tau' = 0.35$).

In relation to Russia, the significant result in the current account could be explained by the crisis that befell the country in 1998. In this year, the Russian government had a high external debt and was forced to have strong currency devaluation. Such a policy fed the inflation and its average index reached the value of $\varphi' = 0.54$ during 1997 and 2002. Configuring the worst Russian's performance when comparing with the periods of 2003-2007 ($\varphi' = 0.73$) and 2008-2012 ($\varphi' = 0.75$). During 1997-2002 the country's average inflation exceeded 31% p.a., however, it seemed to have helped the beginning of the GDP's growth, seen in the period after the crisis. This fact permitted recuperation for Russia in the γ' index, during the period of 1997-2002. On the opposite side of China is Brazil, where both growth and current account balance had the worst rates of the sample ($\gamma' = 0.39$ and $\tau' = 0.08$, respectively). Not only that, but its inflation only was not worse than Russia's and its unemployment was larger than the USA's, China's and the Asians'-NI.

Table 1   Results Obtained through Kaldor's Magical Squares - Period: 1997-2012

Brazil's Magic Square	Russia's Magic Square	China's Magic Square

USA's Magic Square	Euro Area's Magic Square	Newly industrialized Asian's Magic Square

Normalized Economic Performance Index (NEPI)												
Period (average):	Brazil		Russia		China		USA		Euro Area		Asian-NI	
	NEPI	Δ (%)	NEPI	Δ (%)	NEPI	Δ (%)	NEPI	Δ (%)	NEPI	Δ (%)	NEPI	Δ (%)
P1: 1997-2002	0.23	-	0.34	-	0.69	-	0.41	-	0.28	-	0.60	-
P2: 2003-2007	0.25	8.7	0.58	70.6	0.80	15.9	0.33	-19.5	0.31	10.7	0.68	13.33
P3: 2008-2012	0.33	32.0	0.45	-22.41	0.70	-12.5	0.23	-30.3	0.24	-22.6	0.64	-5.88
Total: 1997-2012	**0.27**		**0.45**		**0.73**		**0.33**		**0.28**		**0.64**	

Source: Developed by authors on data provided by the IMF (2013).

During the period of 2003-2007, Brazil reaches the worst comparative index on unemployment (ζ'). The average rate verified in 1997-2002, 2003-2007 and 2008-2012 was, respectively: $\zeta'_{p1} = 0.30$, $\zeta'_{p2} = 0.16$ and $\zeta'_{p3} = 0.40$. It is worth highlighting that a significant part of this weak performance on unemployment is associated to the year 2003 and might be explained by the electricity and thus power supply crisis verified into the country in 2001-2002. Vinícius de A. C. Firme and Fernando S. Perobelli (2012, p. 140), using the Input-Output approach, revealed that this was

one of main reasons for the lowered employment multiplier verified in the country in 2002. Therefore, it became less capable to create jobs on the following years. Our data show that the unemployment index would only reach the same level of 2000 (before the crisis) in 2010. Looking at Figure 3 we may see that the Brazilian overall performance was weak in the following years after this crisis, especially from 2001 to 2003.
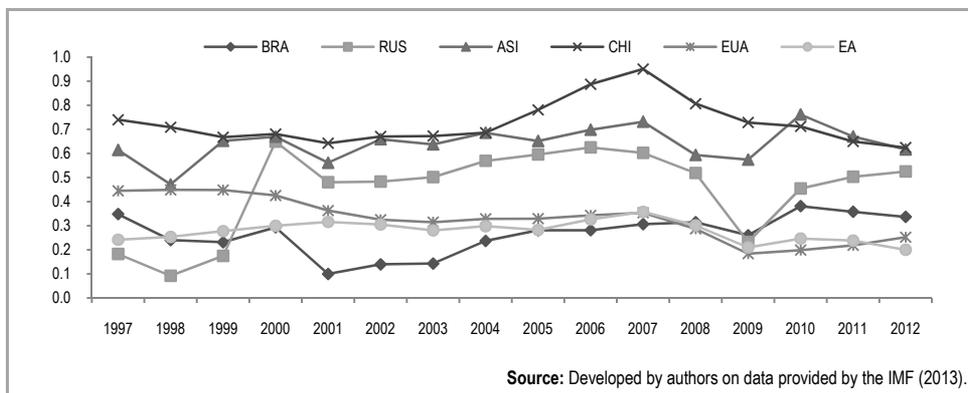

Source: Developed by authors on data provided by the IMF (2013).

Figure 3 Normalized Economic Performance Index (NEPI) between 1997-2012

By contrast, the rise in international commodity prices (see Figure 4) improved the current account balance in several countries, including Brazil, China, the Asian-NI and Russia (Table 1). Looking at the NEPI, we can see that, except for the USA, the countries were able to reach higher levels than those obtained in 1997-2002 (it is worth to mentioning that, during 1997-2002's period, the world faced two strong crises, which were: the Asian financial crisis, in 1997, and the Russian financial crisis, in 1998). In terms of progress in relation to the later period, no country was better than Russia. We need only to observe the magical square of this country to notice that the polygon that refers to the first period (1997-2002) is completely contained in the polygon of 2003-2007. In other words, this country improved its performance in the four spheres (growth, unemployment, inflation and current balance). This result can be explained by Pinto, Gurvich, and Ulatov (2005, p. 407). According to them: "the crisis became a positive turning point in Russia's transition to a market economy. Macroeconomic policy and government behavior changed radically. Budget constraints started hardening for all levels of the government and for enterprises". Besides that, China did not only maintain the largest NEPI of the second period analysis (P2), as was able to raise it significantly in relation to the first period (P1), going from 0.69 to 0.80. As can be seen in the magical square, this index rise is primarily due to the elevated growth verified during the period ($\gamma' = 0.78$) which, in turn, was driven by the raise in current account balance ($\tau' = 0.41$), (Table 1).

During the period of 2007-2008, the crisis generated by real-estate speculation in the USA impacted strongly and negatively on international economy, affecting the performance of most of the analyzed countries. Figure 3 reveals that the effects of this crisis were more intense in 2009. Highlighting Russia, which seems to have been

the one mostly affected by this crisis; the Russian NEPI was maintaining itself close to the Asian economies since the year 2000 (varying between 0.5 and 0.6). However, in 2009, we can see a sharp down change, falling Russia's performance to a similar level than Brazil's, USA's and the Euro Area's (NEPI close to 0.2). It's worth mentioning that, after the crisis' peak in 2009, Russia restarted a journey to progress its NEPI, and in 2012 showed a high index once again (0.53), close to China's (0.62) and the Asian's (0.62). On the other hand, Brazil, that seemed to be showing progress in its performance in 2010, again decreased during the following years, and in 2012 obtained 0.34 NEPI (a value close to the USA and the Euro Area group).

According to André Moreira Cunha, Daniela Magalhães Prates, and Fernando Ferrari-Filho (2011, p. 711), Brazil has adopted some Keynesian policies in order to face this international financial crises started in September 2008 (after the Lehman Brothers bankruptcy): "early in 2009, after the initial impact of the nternational financial crisis had been absorbed, the economic authorities decided to implement countercyclical economic measures to reverse the recessive economic trends (...) the measures produced the impact expected, and, as a result of, the Brazilian economy increased 7.5% in 2010". They also pointed out some policies that could help us to understand the Brazilian performance after 2010. According to them, the Brazilian Central Bank began to increase interest rate (Selic) in 2010 in order to keep inflation under control. Furthermore, the government decided to increase primary surplus target and the Brazilian currency has continued its appreciation process.

Clearly the Euro Area has been having major problems since the crisis has started in 2007 (Figure 3). Casimir Dadak (2011, p. 600) explained the reasons behind the crisis into the Euro Area as follows: "(...) the monetary union in Europe is a political rather than an economic enterprise, because the region does not meet an optimal currency area requirement, has low labor mobility and lacks a central fiscal authority. For these reasons, the Euro Area is prone to asymmetric demand-side shocks and lacks effective defenses against such adverse developments". According to him: "the current crisis in several member-states, especially in Greece, Ireland, and Portugal supports these views and casts a shadow over the future of the euro". In spite of having had a better recovery than Euro Area, the USA has been facing problems too. The country, which had gotten the third best overall index in 1997, is fighting with the Euro Area for avoiding the worst performance. This result matches the research made by Phillip A. O'Hara (2012, p. 2). He declared that "the most badly affected areas were the relatively high income regions of especially Western Europe, North America and Eastern Europe. These areas were intimately connected with the major financial innovations of the 1990s and 2000s, especially the growth of investment banks, collateralised debt obligations (CDOs) and subprime mortgage market bonds (SMMBs). The regions that were both rapidly opening themselves up to international capital and also those regions already heavily penetrated by investment banking institutions were the hardest hit in terms of rate of growth of GDP *per capita* over the 2008-2010 period".

Although the results, presented in Figure 3, for Brazil during the period of 2008 to 2012 may be frustrating, the Table 1 reveals that this was the only country that made progress in the index's average during this period in relation to 2003-2007.

One explanation is that the government proposed the use of incentives on Keynesian lines to strengthen its internal market, since the country is less dependent on the international market than the others. Another relevant issue, which may have contributed to the progress of Brazil's index, has to do with its profile of exporting. As was mentioned above, a significant part of Brazil's exportation is primarily composed of commodities from the agricultural and mineral sectors. Therefore, the virtuous elevation of the prices of these products internationally, verified soon after 2009, may have influenced Brazil's performance positively (Figure 4).
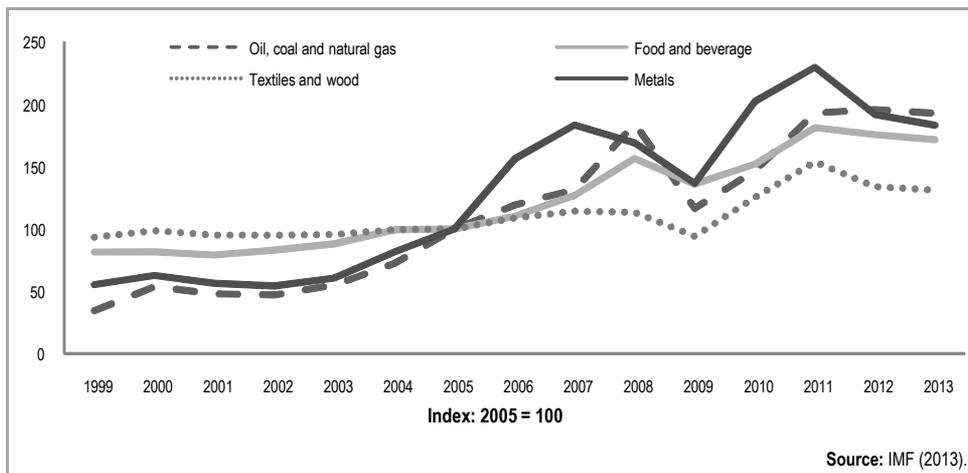

Figure 4 Evolution of Specific Commodities' Price during the Period of 1999 to 2012

Attentively analyzing Brazil's magical square (Table 1) we notice that the formed polygon is closer to the USA and Euro Area than to China, Russia and the Asian-NI. In other words, Brazil resembles low growth regions that are not able to keep surplus in its current accounts. These characteristics (low growth and current account deficits) are usually associated to low inflation. In fact, although inflation has not been an important problem in the USA and Euro Area, this is not the case in Brazil. During the period of 2008 to 2012, the average inflation in the USA and Euro Area was 2%. In Brazil, it was 5.5%, above the rate of inflation verified in countries with high growth, like China (3.4%) and the Asian-NI (2.9%). Regarding unemployment, Brazil and Russia fit into an intermediate group (on average, unemployment was 6.9% of the workforce during the period of 2008-2012), worse than China and the Asian (4.2% and 3.8% respectively) and better than the USA and Euro Area (8.4% and 9.7% respectively). In summary, Brazil holds the status of an emergent power (together with Russia, India and China) and presents the inherent problems to this group (as is the case of inflation that goes above the pattern of developed countries) but maintains a low growth rate and a deficit commercial balance typical of developed countries.

6. Conclusion

This article's aim was to analyze the macroeconomic performance of economies such as Brazil, Russia, China, USA, Euro Area and the recent industrialized Asian economies (Hong Kong, Korea, Singapore and Taiwan) in the period of 1997 to 2012 using the four variables that compose the "magic square" diagram suggested by Kaldor (1971). In order to avoid problems with the variables' scale, the standardized "Index of Economic Welfare" created by Medrano-B and Teixeira (2013) was utilized.

The results showed a good economic performance of China and the Asian countries of the recent industrialization. Furthermore, it was noticed that, in spite of the strong impact of the 1998 and 2008 crises, Russia presented a high index, close to economies like China and the other Asians. Nonetheless, Brazil had the most curious results. The magic square of this country indicates that it usually has low growth and a deficit balance in current accounts, typical characteristics of developed countries, though it remains with problems common to emerging countries, such as an elevated inflation. In spite of this, Brazil was the only country that was able to improve its economic performance index during the period of 2008-2012.

The Brazilian capability of avoiding the 2008 crisis could be explained by the government's procedures, with Keynesian characteristics, and the small participation of the current account into GDP, suggesting that Brazilian economy is tighter than the ones of the other emerging countries (Russia, China and the other Asian ones). Furthermore, the rise of international prices of the most important commodities exported by Brazil seems to have contributed to its index growth. Nevertheless, it is worth mentioning that during the period of analysis, Brazilian economic performance was similar to the USA and Euro Area (ranging from 0.15 to 0.35), well below the average index obtained by the other emerging countries (Russia, 0.45; Asian economies of recent industrialization, 0.64; China, 0.73).

Thus, the analysis of the magic squares and of the normalized economic performance index (NEPI) indicated that Brazil, although included in the main group of emerging countries (named BRIC), portrays some duality. In other words, it is not able to export like China, Russia and other Asian economies, nor can grow at the same rate as them. Therefore, it would be plausible to suppose that Brazil could be included (based on its economic performance alone) in the group of developed countries. Nevertheless, such countries are known for a low and controlled inflation rate (varying at about 2%) which is not the Brazilian case. Considering only the period of 2008-2012, when Brazil's inflation was the lowest among the selected periods of this research, the average inflation exceeded 5.5%.

In spite of these disturbing results, we notice that there was an aura of well-being in the country, partly due to low unemployment levels, rising real wages and various governmental transfers. The recent unemployment rate has been half of its registered rate at the beginning of 2005. This fact has been celebrated but still requires an in-depth analysis of its causes. The main question: is it possible to have an economy growing at mediocre rates and still maintain a workforce employed in the vicinity of full employment? Is this a sustainable situation? We must also highlight the peculiarities and paradoxes of the Brazilian economy. Altogether, the growth of GDP rates *per capita*, along with the international accounts and inflation rates may merit increasing concerns. The sensation of well-being can be deceiving and unsustainable. But these issues remain for further research.

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