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STOCK MARKETS IN BRIC: DEVELOPMENT LEVELS AND MACROECONOMIC IMPLICATIONS

Summary: The main purpose of the article is the presentation of changes in the stock market development level and their implications for the real economy in BRIC, i.e. Brazil, Russia, India and China. Research method was case studies based on qualitative and quantitative data. First part of the text is devoted to presenting main concepts regarding theoretical linkages between the stock market and real economy. Empirical part begins with the analysis of the changes in the level of stock market development linked with assessment of main functions fulfillment level between 2002 and 2012. Results indicate that the differences between BRIC countries are significant, with Brazil and India having most advanced stock markets and Russia most underdeveloped. Second empirical part focuses on the economic growth effects linked with the stock market development. According to the results, stock markets in BRIC countries influence the real economy mostly through changes in the stock of the economy's fixed capital. However, this impact is strongest in Brazil and India, while in Russia stock market is of minimal significance (results for China are not fully comparable).

Keywords: BRIC, emerging markets, stock market, stock offerings.

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1. Introduction

Countries included in the BRIC group, i.e. Brazil, Russia, India and China [O'Neill 2001], were in the first decade of the 21st century among the fastest developing in the world (despite notable differences in the achieved growth rates). Significant changes were also observed in their financial systems, including stock markets. The main aim of this article is to present the most important changes that occurred on the stock markets in the BRIC countries at the beginning of the 21st century and present main macroeconomic implications of these processes with focus on differences between four selected economies.

First section of the article is introduction. Second section of the text will be devoted to main theoretical concepts concerning functions of the stock market in the economy. First part of the third, empirical section will focus on presenting the results

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of the analysis of development levels of the stock markets in BRIC countries and linked fulfillment of the main macroeconomic functions. Second empirical part will include assessment of the role played by this part of the financial sector in shaping the stock and productivity of the fixed capital.

2. Main theoretical links between stock markets and economy

Global financial and economic crisis since 2008 showed clearly some weaknesses of the financial markets and mistakes made by their participants. However, due to its tasks, financial system is a necessary part of a properly operating economy. Roles played by the stock market, part of the financial system, in the real economy (i.e. sectors other than financial) can be divided into a few main categories: mobilization of savings, allocation of funds and facilitating valuation of assets [Kulpaka 2007]. Three main tasks of the stock markets will be presented in the following paragraphs. Additionally, secondary functions of the stock market can be listed, such as enabling more effective control over listed companies, using the stock market to achieve the goals of the state's policy (e.g. gathering funds from privatization) or increasing the level of society's economic knowledge [Rousseau, Wachtel 2000].

Increasing mobilization of savings is one of the crucial roles of the stock markets. Mobilization occurs both on the primary and secondary market but only in the first case funds are transferred (more precisely: usually with stock brokers as direct intermediaries or other entities, e.g. mutual or pension funds, as indirect) from households to the companies seeking financial resources, e.g. to finance investment projects. Highly developed stock market offers investors access to shares of variety of companies thus enabling construction of portfolios meeting their risk/return profile requirements. Investing in stocks may be regarded as an alternative to deposits or bonds. On a macro scale this feature should increase propensity to save, and thus the stock of capital available for companies, which in the long term should boost the economic growth – differences in access to capital are perceived in growth models as a key explanation of varying economic development levels and paces of growth [Acemoglu 2008].

Second key task of the stock market is allocation of funds flowing through the stock markets to the projects in which the capital will be used most effectively from the point of view of the whole economy [Sławiński 2006]. Such transfers are possible due to rivalry between various companies trying to finance their undertakings. Investors, either individual or institutional, disposing of funds, use their knowledge concerning the listed companies (or companies entering the market in the initial public offering) to make decisions how to direct their capital. Companies assessed by investors as having better future prospects and able to use the funds more effectively should have easier access to financing. Due to the large number of market participants and equal access to information about the listed stocks (conditions

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resembling perfect competition) prices should reflect the real situation of the companies [Kulpaka 2007]. However, failures of the financial supervision system and speculative bubbles (caused by e.g. psychological factors [Akerloff, Shiller 2009]) may disrupt the fulfillment of this function. Allocation function requires not only adequately operating primary but also secondary market. Withdrawing from the investment assessed negatively without incurring losses is difficult in illiquid stock markets due to high transaction or market impact costs [Matysek-Jędrych 2010]. Liquidity of the markets enables investors to promptly adapt their portfolios and ensures that allocation function is fulfilled during both the issuance of stocks and further trading.

Third primary function of the stock market, i.e. valuation of assets, is fulfilled mostly in course of the transactions conducted on the secondary market. These transactions lead to continuously updated price balancing market demand and supply that can be used to establish the cost of capital, one of the key data in the functioning of the economy. Current stock prices have double meaning – for managers they imply the financing cost (through stock issuance), for investors potential rate of return. Valuation function is interrelated to the two main stock market's tasks described in the preceding paragraphs as, on the one hand, effective allocation of capital (including transactions occurring on the primary market) requires up-to-date and reliable information, and, on the other hand, obtaining such information is impossible on illiquid markets.

The links between development of the financial sector (development of the stock market) and economic growth have been the topic of much research in the recent decades. However, the strength of the impact or its direction (direction of the causality) remains still unclear – there are many groups of theories as well as empirical research with mixed results. Five main groups are the following:

1) supply-leading: financial development leads to economic growth [King, Levine 1993],

2) demand-leading: financial development is caused by economic growth [Robinson 1952],

3) bidirectional causality: both processes occur simultaneously and reinforce each other [Greenwood, Smith 1997],

4) no impact: there are no significant links between the two processes [Lucas 1988],

5) negative-impact: financial development influences negatively economic growth [Keynes 1936].

Extensive review of the literature on the mentioned subject lies outside the scope of this article. Nevertheless, as far as emerging economies are concerned (all BRIC countries are usually included in various lists of this group), results of most empirical studies show positive correlation between financial development and economic growth. In most countries advancements in the financial sector were one of the

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economic growth sources but the strength of this relation depended, among others, on the economic development level and other factors such as institutions. Examples of studies devoted to BRIC countries include: [Chakraborty 2008; Wang, Wang, Zhang 2012] (for single countries), [Pradhan, Dasgupta, Bele 2013] (for the whole group). However, none of the authors conducted a comparative analysis of the stock market development levels in the BRIC economies and the role played by the stock markets in the economic growth processes based not only on the main indicators but also on qualitative aspects. Moreover, the preceding researches focused on the relations between stock markets and changes in GDP (gross domestic product) and omitted the complex transmission channels. This is also one of the first articles in which data on value of stock offerings is used.

3. Stock markets in BRIC

3.1. Research methods

Multi-step research approach was applied. In the first part of the research the development level of stock markets in BRIC was analyzed using main indicators such as capitalization or turnover in addition with information about selected qualitative aspects. One of the key elements of the first part was assessment of the level of fulfillment of the stock markets' functions – higher level was regarded as proof for higher stock market development level. Secondly, using the results of the first stage of the analysis, the impact of the stock market on the two main transmission channels outlined in the literature was assessed. Due to problems with data availability (only short time series can be used) no econometric models were constructed (more extensive discussion on problems related to using such methods in research on emerging countries can be found e.g. in: [Balcerowicz, Rzońca (eds.) 2010]). Moreover, research focused on the most direct and observable macroeconomic impact of stock markets – on transmission channels. Robust quantitative analysis of very complex relation between financial development and changes in GDP can be performed with reference to the banking sectors or stock markets in Brazil or India but not for China or Russia for which there are no enough data. Time period covered was 2002–2012, i.e. after the dot-com bubble burst and during the fast growth of the BRIC countries but also in the global financial crisis – choice of such period enabled examining the impact of stock markets on the economy during the expansion s well as slowdown phase. Due to data availability problems, only public stock markets were subject of the research.

3.2. Stock markets development in BRIC

Stock markets in BRIC countries in their current form have very different histories. In Brazil, despite its beginnings at the end of the 21st century, there was almost no

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activity on the local stock market before the 1990s, when extensive plan of economic reforms was conducted. Next changes, focused on the capital market, were introduced in the first decade of the 21st century; one of their effects was merger of all smaller stock exchanges into one, currently operating under the name "BM&F BOVESPA" [Dos Santos 2011]. In Russia, stock market development in the 20th century was halted by the communist regime. It was reactivated in the mid 1990s after the fall of the Soviet Union, however, it still remains relatively underdeveloped. An important event was (similarly to Brazil) merger of two leading stock exchanges in 2011 and establishment of the Moscow Exchange MICEX-RTS in 2011 [MICEX-RTS 2012]. Indian stock market has been functioning with no significant breaks since the 19th century but its development was spurred by the liberalization of the financial sector in the early 1990s and further reforms in the 21st century [Dasani 2011]; currently, stock market in this country consists mostly of two exchanges, both of them situated in Bombay. After the establishment of the People's Republic of China (PRC) in 1949, stock exchanges in mainland China were closed, while the other exchange, in Hong Kong, developed quickly and after several years became one of the most advanced in the world. Stock market in PRC was reestablished after the Deng Xiaoping's reforms – in 1990 stock exchanges in Shanghai and Shenzhen were opened, yet their expansions was initially limited by the authorities regarding them as too "capitalistic" and a threat to the hybrid Chinese economic system [Wong 2006]. However, over the next years they were supported and used to conduct partial privatization. In this text the stock exchange in Hong Kong will be omitted because it still cannot be perceived as an integral part of the PRC's economy and stock market (due to various limitations, e.g. on issuance of stocks by mainland companies).

At the beginning of the analyzed period relative sizes of stock markets in all four economies were similar (Figure 1). Changes aimed at strengthening of this part of the financial sector were introduced but their results are mixed. In Brazil they included introduction of market segmentation (market divided into segments with different corporate governance requirements) and incentives for institutional investors [Dos Santos 2011]. These reforms led to gradual increase in capitalization up to 2007. In Russia capitalization was relatively high until 2007. However, it should be taken into account that only a relatively small percentage of listed stock was available for investors [Abdullaev, Organisyan, Weafer 2012]. Such situation was caused to a large extent by very low limited activity of Russian companies on domestic capital market and raising capital on more advanced, foreign markets [Marszk 2012]. Average relative capitalization of the Indian market was the highest which should be linked to changes such as reform of the supervision authorities and improvements in the trading and settlement infrastructure. In China, observed variations in capitalization were much higher than in other BRIC economies. However, in the analyzed period as a whole, secondary stock market in China in relation to GDP was on average second largest. Some of the key reasons for the growth of Chinese stock

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market were partial reduction of the barriers between various market segments and, above all, listing large state-owned companies e.g. banks.

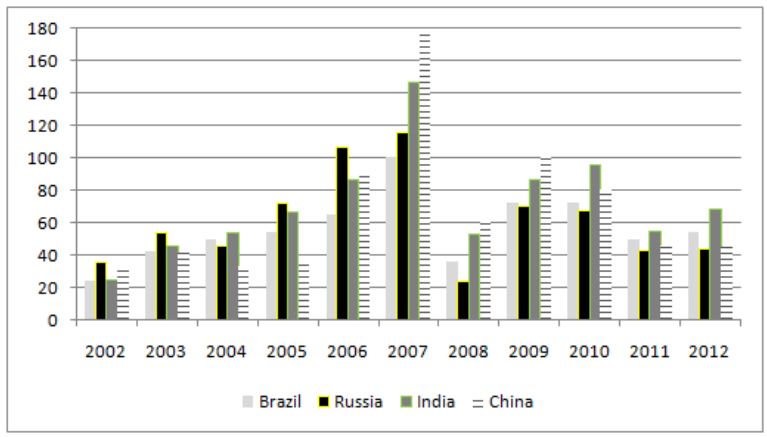

Figure 1. Stock market capitalization in BRIC in 2002–2012 (%GDP)

Source: own elaboration based on [The World Bank 2013].

Stock market liquidity, measured by relative market turnover, increased between 2002 and 2012 in three BRIC economies (all apart from India), thus stock markets in these countries fulfilled their capital allocation functions potentially to a higher extent. Changes in turnover were caused by similar factors to the ones mentioned in context of the capitalization. Notable increase in the liquidity of the Chinese market since 2007 was caused mostly by large initial public offerings and growing interest of individual investors. Despite the decline in relative turnover in India at the end of the time period considered, its average level was, together with China, the highest among selected countries. During and shortly after the global financial crisis liquidity in Brazil and Russia remained at a relatively high level. These differences may be attributed to the structure of stock investors in the four countries – in India and China the share of retail investors, more sensitive to large changes in stock prices, was higher than in Brazil and Russia [SEBI 2011; KPMG 2011].

Evaluating the level of valuation function fulfillment is difficult due to lack of broadly accepted indicators. However, there are some indicators that can be used to gain insight into this aspect of the stock market. One of them is turnover ratio, i.e. value of stocks traded in a given year divided by average annual capitalization [The World Bank 2013] which can be interpreted as an intensity of trading on a selected exchange (how many times a year one hypothetical unit of capitalization is bought/sold). Higher value of the indicator means that market is more active and should be able to provide participants with more comprehensive and timely information.

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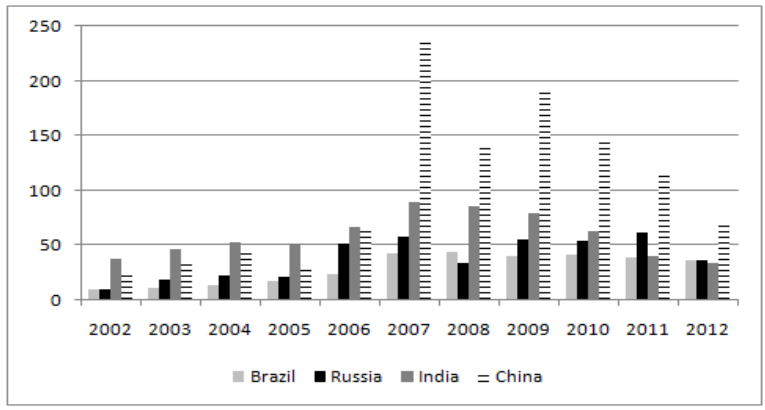

Figure 2. Stock market turnover in BRIC in 2002–2012 (% GDP)

Source: own elaboration based on [The World Bank 2013].

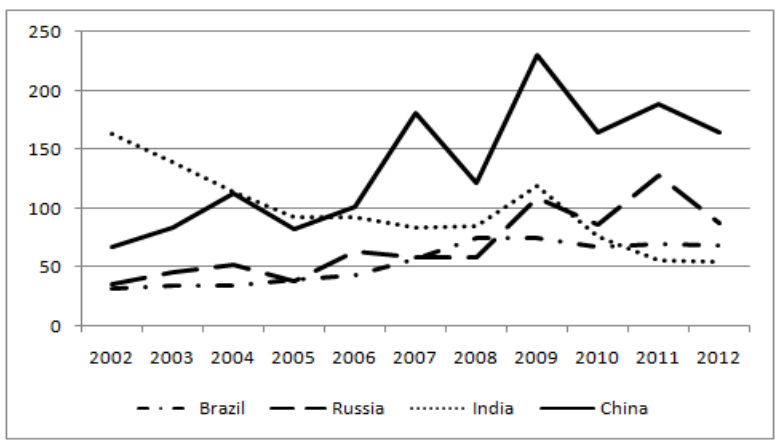

Figure 3. Stock turnover ratio in BRIC in 2002–2012 (%)

Source: own elaboration based on [The World Bank 2013].

Most important trends that could be observed were gradual increase in the turnover ratio in Brazil until 2008 and stabilization in later years, indicating considerable improvement. In Russia and China this ratio increased by even larger percentage which may also be treated as an indicator of growing ability to fulfill the valuation function. Nevertheless, in case of Russia another important factor should be taken into account – Russian stock market was characterized by a very high level of capitalization and turnover concentration [WFE 2014]. Therefore, positive changes in valuation function applied to a very limited share of listed companies. In China turnover ratio was particularly high during stock prices increases in 2007 and

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2009 (when stocks were traded very intensively – see Figures 2 and 3) but over the next years it started to decline. Situation in India was rather different. Despite positive changes in the institutional and regulatory environment high capitalization was not matched by trading which can be partially explained by remaining barriers for foreign investors and underdevelopment of the domestic institutional sector.

In order to fully evaluate and compare the stock market development levels it is necessary to incorporate the qualitative, often immeasurable features into analysis. Such comparison can be performed based on e.g. The Financial Development Report (Table 1).

Table 1. BRIC stock markets in *The Financial Development Report 2012*

Indicator	Brazil	Russia	India	China
Corporate governance	4.6 (26.)*	3.5 (61.)	4.3 (28.)	4.3 (31.)
Legal and regulatory issues	3.4 (46.)	2.4 (61.)	3.5 (40.)	3.8 (32.)
Regulation of securities exchanges	5.8 (6.)	3.4 (59.)	5.2 (19.)	4.3 (38.)

*1 – lowest development level, 7 – highest; in brackets places in the ranking (out of 62).

Source: own elaboration based on [WEF 2012].

Highest levels in aspects such as regulation of the exchanges or corporate governance were achieved by Brazil. Such a high position of Brazil is a result of deep changes in the financial supervision authorities and imposing stricter rules on stock manipulations (e.g. insider trading). Relatively high position in terms of corporate governance is linked with stock market segmentation system and popularity of segments with high requirements among companies and investors. Similar systems were introduced in India (also in the early 2000s) and on stock exchanges in mainland China, i.e. Shanghai and Shenzhen (most of them after the outburst of the global financial crisis – they were aimed at attracting investors leaving the market). Country with the biggest problems related to ensuring fair stock listing and trading conditions was Russia (one of the last places in the ranking). Most significant issues are: large amount of transactions conducted outside the control of stock market authorities, low share of companies operating according to corporate governance rules, and lack of adequate minority shareholders' rights protection [Rudaz 2010].

3.3. Stock markets in BRIC: transmission channels

According to the main financial development-economic growth theories, development of the stock market influences economic growth mostly through two transmission channels [Levine 1997]:

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- accumulation of capital (share issuance as one source for financing investments in the fixed capital, i.e. fixed assets),
- technological innovation (impact on productivity of the fixed capital).

First of the main stock market's functions mentioned in the previous sections of the article, i.e. mobilization, is linked with the first channel, whereas allocation and valuation ensure proper functioning of the second channel.

Indicator that can be used to assess the first transmission channel is share of fixed capital outlays financed by sale of issued shares through the stock exchanges. For Brazil, Russia and India data on expenditures of the private sector are available (excluding public sector's outlays) yet for China only reliable data are both on private and public outlays (thus they are not fully comparable with three other economies). Such data were gathered from World Development Indicators database [The World Bank 2013]. Data on capital flows from investors to companies issuing shares were estimated using annual and monthly information about each stock exchange in BRIC countries [WFE 2014]. However, for Russia no such data were available in certain years (most probably due to minimal value of domestic public stock offerings).

Second transmission channel was evaluated using fixed capital productivity indicator understood as GDP in a given period divided by average annual fixed capital stock [Bukowski et al. 2006]. Due to lack of data on fixed capital stock it was calculated by the author. For the initial year (here: 2002) steady-state method was used [Rapacki, Próchniak 2009]. It is based on the assumption of long-term equilibrium in which relation of capital to production is constant – production, investments and capital grow in the same rate.

$$K_0 = \frac{\mathrm{GFCO}_1}{g+d},$$

where: K_0 – estimated initial fixed capital stock; GFCO_1 – gross fixed capital outlays in $t = 1$; g – economic growth rate (GDP growth rate); d – fixed capital depreciation rate (7.5%, usually rates between 5 and 10% are used, thus middle of this interval was used).

For the following years fixed capital stock was calculated using the perpetual inventory method [King, Levine 1994; Rapacki, Próchniak 2009]:

$$K_t = K_{t-1} + \mathrm{GFCO}_t - (d \cdot K_{t-1}).$$

Until 2007 share of funds raised through stock issuance in expenditures on fixed capital increased in all BRIC countries (Figure 4). However, in 2008 it decreased in all countries apart from India (record-high value of stock offerings despite the beginning financial crisis is linked with offers prepared at the beginning of that year). It should be noted, though, that in 2009 and 2010 the value of offerings and their shares both rebounded – in 2010, in Brazil, they achieved the highest level in history,

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yet over the next two years they once again decreased significantly. Fall in the value (both absolute and related to capital outlays) of the stock offering in the final years of the analyzed period was caused mostly by poor global economic situation (euro-zone crisis and possible slowdown in emerging countries) which led to suspension of issuances.

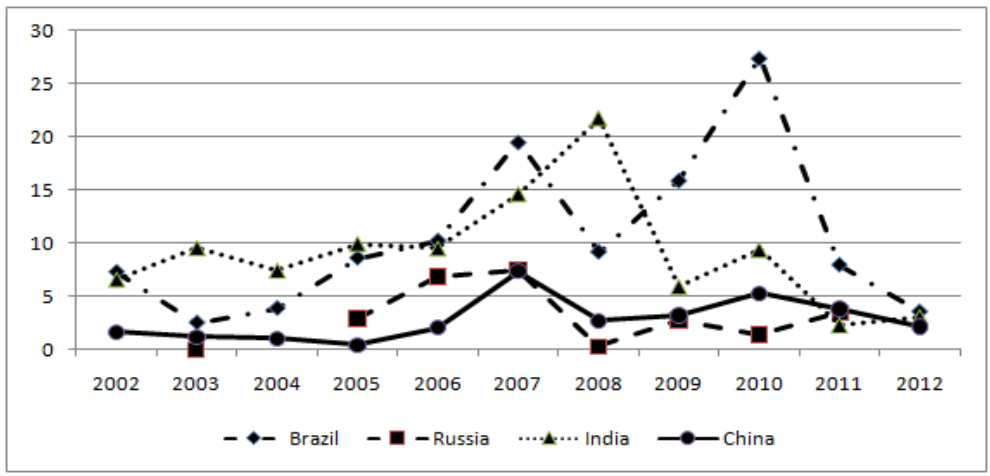

Figure 4. Stock offerings as a share of fixed capital outlays in BRIC in 2002–2012 (%)

Source: own elaboration based on [The World Bank 2013; WFE 2014].

Highest annual share of funds raised through the stock exchanges in fixed capital outlays was observed in Brazil in 2010 (Figure 4). Even though this result should be treated as on outlier (it was caused by the secondary offering conducted by Petrobras, Brazilian petroleum giant, largest in the history of all global stock markets), in other analyzed years Brazilian companies also gathered considerable funds this way. Brazil and India were two countries from the BRIC group in which values of the analyzed indicator were the highest; average values were: for Brazil 10.55%, for India 9.09%. It should be underlined that these results can be related to the relatively high level of capitalization in both countries implying that the development of the secondary market influenced positively ability of companies to raise funds through the stock exchange. Moreover, in case of both countries (especially in Brazil) qualitative aspects (e.g. improvement of regulatory environment) should also be taken into account. On the other hand, it can be observed that decisions to use this financing method are largely dependent upon general trends in local and global economy.

Role of financing through public share issuance in Russia was minimal – up to 2004 there were nearly no such offerings on the local stock exchanges (foreign exchanges, e.g. in London, were chosen instead), between 2005 and 2011 their average share in capital outlays amounted to 3.56%; after a strong increase until

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2007, in later years upward trend was stopped by the financial crisis and its consequences for the Russian economy, e.g. abrupt decrease and withdrawal of foreign equity portfolio investment (accelerated by the war in Georgia). Furthermore, problems such as lack of adequate legal and institutional environment and protection of investors discouraged potential providers as well as users of capital.

Average value of analyzed indicator in China was lowest among BRIC economies but (due to the outlined differences in data used for calculation of fixed capital stock) it cannot be directly compared with values calculated for other analyzed countries. Taking into consideration very high annual total fixed capital expenditures (nearly 50% of GDP in 2012 [The World Bank 2013]) role of the equity market was not negligible. This source of corporate financing was used mostly by state-owned enterprises. In contrast with Brazil and India, value of stock offerings in China after 2008 was relatively stable (despite a considerable decrease in stock prices after 2007 and, accordingly, capitalization – see Figure 1) which was a result of strict control of public authorities over the financing decisions and high demand for the issued securities of investors seeking returns higher than offered by local banks.

In order to ensure full comparability of estimated fixed capital productivity, instead of absolute values, analysis of changes in this indicator was performed (it was necessary due to estimation of initial value, based on presented assumptions). Value in 2002 was treated as 1.0 and calculated values in next periods were divided by the value in 2002 – based on data from this method, Figure 5 was prepared.

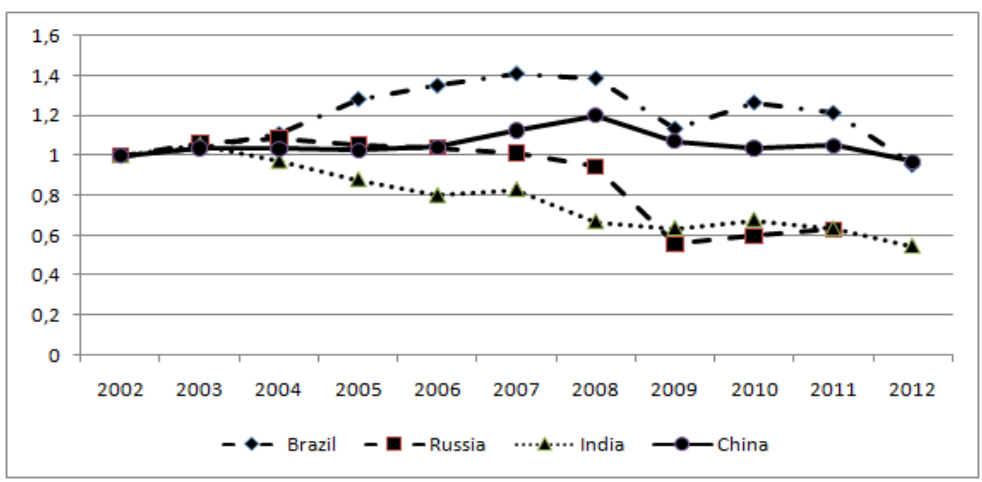

Figure 5. Fixed capital productivity in BRIC in 2002–2012 (2002 = 1)

Source: own elaboration.

Over the analyzed period productivity of fixed assets changed in BRIC in varying ways. In Brazil it increased significantly between 2002 and 2007; even after

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decline in the next years, up to 2011 it was still notably higher than at the beginning of the period. As the stock market in Brazil was of largest macroeconomic significance in the fixed capital investments aspect in the BRIC group (proven by the highest average annual share of stock offerings in fixed capital expenditures), it can be assumed that, to a certain extent it positively affected productivity of fixed assets. In Russia, between 2002 and 2007, nearly no changes in productivity were observed. However, after 2008 it declined considerably and stayed on a much lower level. Due to the insignificant role of the Russian stock market (described above with reference to the first transmission channel) these changes can be linked to the stock market only to a very limited degree. Despite relatively high liquidity and turnover ratios of the Russian market, because of the other problems outlined in the text, it may be concluded that its impact on allocation and therefore productivity of capital could have been slightly negative. In India productivity declined significantly which may be linked to decreasing fulfillment of the stock market's allocation and valuation functions (particularly the second one) outlined in point 3.2. Productivity in China (apart from larger increase in 2007 and 2008) was rather constant despite considerable increase in stock market's liquidity and turnover ratio. Such situation may be explained in two ways: either the role played by the stock market in the Chinese economy as a whole was insignificant (despite the conclusions from the analysis of the first channel) or used stock market development indicators were misleading and other factors (e.g. considered in The Financial Development Report) were more important.

4. Conclusions

According to the comparison presented in the article stock markets in the BRIC countries differ both in quantitative and qualitative terms. Moreover, the development trends as well changes in the institutional and regulatory environment observed in the analyzed period varied. As a result, stock markets fulfilled their main macroeconomic functions and influenced the processes in the real economy (here: accumulation and productivity of the fixed capital) to lower or higher extent. In Brazil, financing through stock offerings was relatively important source of funds for companies and affected the productivity of fixed assets. In Russia, role of the stock market was rather insignificant and, despite some positive changes (e.g. increased liquidity), it cannot be perceived as an important part of the Russian economy. In the third BRIC country, India, stock market was used to raise funds (its average relative (i.e. divided by GDP) size was highest among BRIC economies) but the impact on productivity was rather negative. Role of the stock market in financing investments in China is difficult to compare with three other countries. Despite positive changes in allocation and valuation ability, productivity remained stable.

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Important directions for future research include: comprehensive evaluation of the stock market development level in BRIC (using more indicators and information about their institutions, structure, etc.), comparison of the role played by stock markets with banking sectors in the BRIC economies, evaluation of the productivity of investments financed by stock issuance (instead of the whole category of fixed assets; difficult to perform due to lack of required data), assessing impact of the stock markets on economic growth (due to reasons outlined in the text, it should be conducted with tools other than econometric models e.g. using the conclusions concerning impact on the two transmission channels) and quality of life. Conclusions from the analysis presented in this article can be the starting point for such research.

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RYNKI AKCJI KRAJÓW BRIC: POZIOM ROZWOJU I ZNACZENIE MAKROEKONOMICZNE

Streszczenie: Głównym celem artykułu jest omówienie zmian w poziomach rozwoju rynków akcji w krajach BRIC (Brazylia, Rosja, Indie i Chiny) i ich wpływu na sferę realną gospodarki. Zastosowaną metodą badawczą były studia przypadków oparte na danych ilościowych i jakościowych. W pierwszej części tekstu przedstawiono najważniejsze zagadnienia teoretyczne dotyczące roli rynku akcji w gospodarce. Część empiryczna rozpoczyna się omówieniem wyników analizy zmian poziomu rozwoju rynków akcji związanych z realizacją głównych zadań (okres badania to lata 2002–2012). Zaawansowanie rynków akcji w krajach BRIC jest zróżnicowane: najwyższy poziom zaobserwowano w Brazylii oraz Indiach, najniższy w Rosji; dla Chin wyniki są niejednoznaczne. Druga część empiryczna poświęcona jest oddziaływaniu rynków akcji na wzrost gospodarczy. Na podstawie przeprowadzonego badania można stwierdzić, że rynki akcji wpływały na sferę realną przede wszystkim poprzez zmiany w zasobach kapitału fizycznego, oddziaływanie na jego produktywność było słabsze. Wpływ ten był najsilniejszy w Brazylii oraz Indiach, w Rosji znaczenie było niewielkie, wyniki dla Chin nie są w pełni porównywalne z pozostałymi krajami.

Słowa kluczowe: BRIC, rynki wschodzące, rynek akcji, emisja akcji.

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