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WORLD TRADE AND INVESTMENT: WHERE DO THE BRICs STAND?¹

Thomas Osang*

ABSTRACT

This paper examines the absolute and relative contribution by Brazil, Russia, India, and China (BRIC) on world trade and foreign direct investment over the past three decades. In addition, we briefly discuss major achievements as well as remaining shortcomings of the international trade and foreign investment policy reforms implemented by the BRICs over the same period. Empirical estimates of the long-run equilibrium relationship in exports between the BRICs and the G3 (United States, Japan, and Germany) as well as the role of the BRICs' economic performance within a larger cross-section time-series data framework are also presented.

I. INTRODUCTION

AT the time of Mao Zedong's death in 1976, very few, if any, political or economic commentators predicted that thirty-five years later, China would be a major economic player in the world market for traded goods and services as well as a major recipient and an important contributor of international financial capital. Yet, this is precisely what has happened. After many economic reforms that created a large private sector with modest regulation by the government, China is now the largest exporter of goods in the world with merchandise exports valued at \$1.58 trillion USD in 2010, the world's second largest trading nation with a total trade volume (exports and imports of goods and services) valued at \$3.35 trillion USD, the largest recipient of foreign direct investment among developing countries (\$185 billion USD in 2010), and an important contributor to foreign investment abroad with a total value of \$60 billion USD in direct investment abroad in 2010.²

1. I would like to thank S. Stuart Smith for excellent research assistance.

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2. Unless otherwise noted, here and throughout the remainder of the paper, trade data are taken from the WTO trade statistics data base, available online at

Similar but somewhat less dramatic changes have occurred in Brazil, Russia, and India over the past three and a half decades. In the mid-1970s, Russia was still heavily engaged in fighting the Cold War with the West, both in Europe and in other regions of the world. Russia's centrally-planned economy was skewed toward the production of investment goods, leading to an acute shortage of consumption goods. Moreover, its participation in the international division of labor was mostly confined to barter trade with other centrally-planned economies. In the 1970s, India's policy makers still believed in development through self-reliance, making it nearly impossible for foreign firms to gain access to India's economy through trade or foreign investment. Brazil, though more open than India and Russia at the time, favored a development strategy known as import substitution, which required the imposition of high tariffs and other trade barriers on foreign exporters to protect nascent domestic industries from the harsh winds of the world market.

Since then, Russia has transformed its economy from centrally-planned to market driven; India has changed its insistence on self-reliance and opened its economy to foreign trade and investment; and Brazil has abandoned its import substitution doctrine by dramatically lowering trade and non-trade barriers on goods and services from abroad. As a result of economic and, often, political reforms, the BRICs are now more involved in the international division of labor than at any other point during the last one hundred years. And given the scale of each country, both in terms of population and geographic size, the BRICs have become major players at the world level in terms of economic output, trade, and foreign investment.

The purpose of this paper is threefold. First, we will describe and compare the major economic reforms in the areas of trade and foreign investment that transformed the BRICs from relatively closed to comparatively open economies. Second, we will analyze the absolute and relative changes in trade and investment flows that occurred over the past two to three decades in each of the BRIC countries and compare the BRICs' performance in these areas to that of the G3. Finally, we tackle two empirical questions. First, we examine whether there exists a long-run equilibrium relationship between the export performances of the established leaders in globalization, the G3 on one hand and the BRICs on the other. Second, we investigate whether there is any evidence for a BRICs effect in economic performance within a sample of 120 countries and forty years of observations.

II. REFORM OF TRADE AND INVESTMENT POLICIES IN THE BRICS

Since the mid-1970s, each BRIC country has undergone a number of major economic reforms that have had a long-lasting impact on trade and investment flows with the rest of the world.

A. TRADE POLICY REFORMS

The Brazilian case is unique in that the country has had fairly liberal policies with regard to foreign investment flows since the 1970s, while at the same time restricting the importation of goods and services in accordance with the country's import substitution policy. Once Brazil realized that these restrictive policies did not yield the expected progress in terms of economic development, the country embarked on a radical paradigm shift. Between 1987 and 1997, major economic reforms drastically removed much of Brazil's trade barriers so that by the end of this reform period, the level of import tariffs was only one-tenth of that in 1987 (Ferreira and Rossi, 2003). Despite these impressive reforms, there is room to push the trade liberalization process even further. According to the recent World Bank estimates of the Overall Trade Restrictiveness Index (OTRI)—an index that measures both tariff and non-tariff barriers to trade—for the period 2006 through 2009, Brazil had the worst performance of the BRICs and was ranked 88th out of 125 ranked countries in the sample (*see* Table 1, Panel A).³ If only tariff barriers are considered (Table 1, Panel B), Brazil's ranking is even worse (93rd), with an average tariff of 9.3 percent.

For many decades after independence in 1948, India pursued a development policy that favored self-reliance over international specialization of production. Trade barriers were substantial and import tariffs were among the highest of any in the world. But starting in 1991, India embarked on a path that would lead the country away from the idea of autarkic development and towards greater openness with respect to foreign trade and investment. At the center of these reforms were substantial reductions in import tariffs (Ahluwalia, 2002). Nevertheless, given that India began its trade policy reform from such high levels of protectionism, it may not be surprising that its openness to trade today is still falling short of that of many other countries. In terms of the OTRI, India ranks 78th in the world today, ahead of Russia and Brazil but way behind the G3 and China (*see* Table 1, Panel A). The main reason for this poor ranking is that India's tariff rates are still very high. India's average import tariff stands currently at 12 percent (ranked 102nd in the world), far above those in the G3 and the other BRICs (*see* Table 1, Panel B).

The changes in Russia's trade policy since 1992 have been dramatic and far reaching but also more volatile than in the other BRIC countries over

3. For details on the construction of the OTRI and related trade restrictiveness indices, Kee et al. (2009).

the same time period (Bessonova et al., 2002; Tarr and Volchkova, 2010). Until 1992, international trade was centrally planned and consisted mainly of barter trade with other command economies of the Eastern Bloc. This changed radically in 1992 when the state monopoly on foreign trade was replaced with market driven trade. But, in the same year, the government introduced export taxes to generate revenues and granted import subsidies to protect struggling domestic industries. A year later, import tariffs were introduced as an additional protective measure. Import subsidies, however, were eliminated in 1994. The years 1995 and 1996 saw the reduction of certain import tariffs and the elimination of all export taxes in the context of the IMF-led stabilization programs. But two years later, the government reintroduced an export tax on oil exports, mainly as a way to increase its overall tax revenues.

In the early 2000s, there were more reductions in import tariffs that coincided with a movement toward a more uniform tariff rate. As Figure 1 demonstrates, the ups and downs of Russia's movement toward freer trade continued throughout the first decade of the new millennium. The tax rate on all types of international transactions (imports, exports, etc.) appears to increase through most of the decade before falling again after 2006. Russia's two-decade-long struggle with trade reforms and trade liberalization culminated in the approval of its WTO membership application in December of 2011. Similar to Brazil and India, Russia has substantial room for further rounds of trade liberalizations. It is currently ranked 84th in terms of its overall trade restrictiveness and 70th in terms of the restrictiveness of its import tariffs (Table 1, Panels A and B).

The economic reforms that gradually transformed China into an outward oriented economy began at least a decade earlier than in the other BRICs (Panagariya, 1993; Naughton, 2007). As a result, China enjoyed a substantial globalization head start, which may explain why the country plays a more important role in the world market for traded goods and investment than the other BRICs, as we will see below. Nevertheless, the Chinese trade miracle did not really begin until 1992, more than a decade after the first round of trade reforms. Compared to the other BRICs, China has also been more serious about the removal of trade barriers, both tariff and non-tariff. As Table 2 shows, this is particularly true for the 2000s. Whereas China was ranked 72nd in terms of its overall trade restrictiveness at the beginning of the decade, its ranking improved to 55th between 2005 and 2008, and even further to 28th by the end of decade. Not only did China distance itself from the other BRICs whose OTRI rankings remained more or less the same throughout the decade, China also moved ahead of Japan and Germany, leaving the United States as the only G3 country that restricts trade less than China (*see* Table 1, Panel A). China still has room to improve in terms of MFN tariff levels. At 5.3 percent between 2006 and 2009, they are still higher than those in the G3 and only marginally lower than those in Russia.

B. REFORMS OF FOREIGN INVESTMENT POLICIES

In contrast to its protectionist trade policies, Brazil's policies toward foreign investment inflows have been fairly liberal for a long time (Motta Veiga, 2004). During the 1990s, further reforms led to the opening of the IT sector to foreign investors and a simplification of the registration procedure for foreign direct investments. In the mid-1990s, a constitutional reform ended the state monopoly in the oil, gas, and telecom industries. As shown in Table 3, Brazil is by far the most open BRIC country with regard to foreign direct investment today. Brazil's overall FDI index in 2010 stood at 0.116, with 1 indicating a completely closed and zero a completely open economy with regard to FDI. Brazil's FDI index is even more impressive when compared to the average FDI index for all OECD countries, which, at 0.095, stands only slightly below that of Brazil.

Russia's policies toward FDI changed dramatically when the country began its transition toward a market economy (Bessonova et al., 2002; Tarr and Volchkova, 2010). Joint ventures were allowed as early as 1989, while fully foreign-owned enterprises became legal in 1991. During the process of privatization of government assets that began in the 1990s, foreign investors were officially allowed to participate, but faced significant levels of discrimination in the process. This ambiguous attitude toward foreign direct investment is reflected in the data (*see* Table 3). Russia's overall FDI index was 0.384, more than four times above the OECD average. Russia's index is pushed up due to a combination of equity and operational restrictions.

India's policies toward foreign direct investment changed along with their policies regarding foreign trade (Panagariya, 2008). Throughout the 1990s and 2000s, the country gradually opened more and more sectors to foreign investors, but often kept certain equity restrictions in place. Today, the country is second among the BRICs in terms of openness toward foreign direct investment, with an overall FDI restrictiveness index of 0.220 in 2010, about twice the level of Brazil but half that of China. The reason for the relatively high index number is due solely to equity restrictions. In the other dimensions that contribute to the overall score (screening, key personnel, and operational restrictions), foreign investment flows into India are essentially unrestricted. While India's FDI policies may be less proactive than those in China (*see* Huang and Tang, 2012), it has pursued comprehensive domestic reforms through explicit privatization and deeper financial liberalization, a fact that is often as important for foreign investors as the removal of direct investment barriers.

China has pursued a process of gradual foreign investment liberalization since the 1980s, but linked its reform process to two distinct FDI objectives: export promotion and technology transfer (Long, 2005). While export promotion was mandatory initially, today it is mostly neutral or even voluntary. From the perspective of investors from the advanced economies, the main issues with China's current FDI policies are its insistence on "indigenous innovation policies, forced technology trans-

fer requirements, [and a] porous intellectual property enforcement regime.”⁴ While public criticism of China’s FDI policies from Western policy makers or business leaders is rare, the following statement by Rob Atkinson, president of the Information Technology and Innovation Foundation, a Washington based think tank, appears to reflect the current sentiment of many foreign investors with ties to China: “There’s been a significant shift in top-level Chinese economic strategy away from attracting multinational foreign direct investment to unfairly supporting Chinese-owned companies.”⁵ Given the current level of restrictions that China imposes on foreign investors, it is not surprising that China’s FDI restrictiveness index, at 0.457, is by far the highest among the BRICs (*see* Table 3). The overall score is high due to comparatively large values in all four subcategories.

III. CHANGES IN THE INTERNATIONAL DIVISION OF LABOR OVER TIME

There is no doubt that the international division of labor has changed dramatically over the past three decades, and much of it has to do with the emergence of the BRICs as a major player in the global market place.

A. INTERNATIONAL TRADE

The BRICs have increased their value of total trade (exports and imports of goods and services) from \$615 billion USD in 1996 to \$4.5 trillion USD in 2010, a more than sevenfold increase. Over the same time span, world trade increased from \$10 trillion USD to \$30.1 trillion, a mere threefold gain (*see* Figure 2). Also, trade by BRICs fared better during the world financial crisis of 2008 and 2009. In 2009, BRIC trade shrunk by 18 percent, compared to a 23 percent decline for world trade. When trade rebounded in 2010, BRIC trade increased by 34 percent compared to a worldwide rise of 21 percent.

An even more impressive picture emerges if one compares total trade shares⁶ for the BRICs with those for the G3 countries (Figure 3). All G3 countries have seen a more or less continuous decline in their trade shares over the past fifteen years. The United States’ share fell from 18 percent to 11 percent between 1996 and 2010, while Germany’s share declined more modestly from 10 percent to 8 percent. Japan saw its share tumble by about a third, from 7.5 percent to 5 percent. In contrast, the BRICs’ share in world trade has improved steadily since 2000 and reached an all-time high of 15 percent in 2010, while the G3 share hit an all-time low of 23 percent. If the BRIC-G3 shares continue to move in

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4. D.J. Ikenson, “Trade Policy Priority One: Averting a U.S.-China ‘Trade War,’” *Free Trade Bulletin* No. 47, The Cato Institute, March 5, 2012.
 5. “Focus shifts from China’s currency to its other trade policies,” *Los Angeles Times*, February 14, 2012.
 6. The total trade share is defined as the ratio between a country’s total trade volume and the volume of total trade of the world.

opposite directions, the two country groups will eventually reach parity in terms of their contribution to world trade.

As Figure 4 reveals, the trade performance of the BRICs was by no means uniform. While Brazil, Russia, and India improved their total trade volume from around \$50 billion USD each in the early 1990s to around \$500 billion USD each in recent years, their performances were dwarfed by the Chinese trade miracle. In 1992, China's total trade stood at \$165 billion USD, compared to a combined total for India and Brazil of \$103 billion USD, a ratio of 1.6 in favor of China. By 2010, the combined trade value for India and Brazil had increased to \$947 billion USD, but China's trade value had risen to \$2.974 trillion USD, three times that of India and Brazil.

But the BRICs are heterogeneous in other dimensions as well. When total trade is scaled by population size, three different patterns emerge (see Figure 5). Russia, the BRIC country with the highest per capita income, also has the highest trade per capita (also referred to as trade intensity) values over the past decade and a half. On the low side is India, whose trade intensity is substantially below that of the other BRICs. In the middle are Brazil and China, whose trade-per-capita ratios have been close to each other for the last ten years, but for very different reasons. While Brazil's trade intensity is driven by a fairly high per capita income but a low trade-to-GDP ratio, the exact opposite is true for China where a high trade share is combined with a relatively low GDP per capita.

When compared to the G3, the BRICs' trade intensity is still extremely low, despite the enormous increase in trade over the last fifteen years. In 2010, Germany's trade-per-capita ratio stood at \$28,600 USD compared to an average of \$1,600 USD for the BRICs, different by a factor of eighteen. Nevertheless, in 1996, Germany's trade intensity was forty-eight times larger than the average trade intensity of the BRICs, which amounted to only \$250 USD at the time. Despite this remarkable catch-up process, it will take a long time, if ever, for the BRICs to reach the trade intensity of the German economy. The per capita trade values of the United States and Japan are in between those of Germany and the BRICs, with the U.S. numbers higher due to the large value of U.S. imports. In terms of exports per capita, the ordering between Japan and the United States is reversed.

B. FOREIGN DIRECT INVESTMENT

Given the number of policy reforms in the financial sector that occurred in the BRICs over the last three decades, we should expect the BRICs to become more and more attractive destinations for foreign investors, in particular those who seek longer-term investments that include the elements of ownership and control (foreign direct investment). But, as shown in Figure 7, this is only partially the case. Between 1994 and 2000, the BRICs' share of FDI inflows fell from 14.9 percent to 4.8 percent. Since then, the FDI inflow share of the BRICs has risen steadily,

but it was not until 2008, when the share reached almost 18 percent, that it exceeded the 1994 level. So what happened? It turns out that the U-shaped graph in Figure 7 has little to do with investor confidence or a lack thereof in the BRICs; rather, it has to do with boom and bust periods in the advanced economies. During the 1990s, the technology and dot-com investment mania in the OECD countries caused an incredible rise in FDI inflows. Between 1994 and 2000, worldwide FDI inflows rose from \$259 billion USD to \$1.62 trillion USD, a six-fold increase. FDI into the BRICs rose steadily as well over the same time period, but it merely doubled, from \$38.5 billion USD in 1994 to \$77.5 billion USD in 2000.

As a result of this relative “underperformance” of the BRICs, their share of worldwide FDI inflows shrank by two-thirds between 1994 and 2000. But within the next five years, the BRICs were able to double their FDI inflows again, to \$153 billion USD in 2005. With the bursting of the technology bubble in 2000, foreign investment in the advanced economies fell substantially, and in 2005, it stood at only 75 percent of its 2000 level. As a result, the BRICs share in worldwide FDI was able to gain ground fast, reaching 12.6 percent in 2005. Finally, the bursting of the housing bubble in some of the advanced economies and the subsequent worldwide financial crisis of 2008 and 2009 was another blow to foreign direct investment in the OECD countries. As a result, worldwide FDI inflows increased by only 8 percent between 2005 and 2010. In contrast, the BRICs, whose economies remained relatively unaffected by the boom and bust cycle in the rich countries, continued to grow along their trend line and were able to double their FDI inflows again over the next five year period, reaching \$300 billion USD in 2010.

Once again, it is important to know whether FDI inflows were more or less homogeneous across the four BRICs. The answer is given in Figure 8. As is the case with international trade flows, China is also the biggest recipient of foreign direct investment among the BRICs.⁷ China’s share of worldwide FDI inflows varied from a low of 2.4 percent in 2000 to a high of 13.9 percent in 2010. China’s average annual share of FDI inflows over the 1994 through 2010 period was 8 percent, compared to 4.5 percent for the other BRICs (the BRIs). But these averages hide the substantial convergence in FDI inflows between China and the BRIs that occurred during this period. In 1994, China’s FDI inflow share was more than seven times that of the BRIs, while by 2008 the two shares were close to parity. Given its longstanding openness to FDI, it is not surprising that Brazil is the second largest recipient of FDI among the BRICs, with an average share of 2.3 percent over the sample period. But with the beginning of the natural resource boom in the mid-2000s, Russia has attracted more and more foreign investment, and between 2006 and 2009 surpassed Brazil as the second largest recipient of FDI among the BRICs. India, whose openness to FDI is a more recent phenomenon, is by far the

7. It is noteworthy that China’s FDI inflows would be even larger if its foreign direct investment policies were less restrictive (*see infra* Part II.B).

smallest FDI recipient among the BRICs, with an average share of less than 1 percent between 1994 and 2010.

The importance of Brazil and, in recent years, Russia as destination countries for foreign investors becomes even more apparent when we scale FDI inflows by population size (Figure 9). Since 2003, Brazil and Russia have outperformed China and India in terms of FDI per capita. Over the sample period, foreigners invested \$125 USD per Brazilian each year, about the same as in Russia (\$124 USD). The corresponding numbers for China and India are \$61 USD and \$10 USD, respectively. This gap in FDI intensity between the more advanced economies of Russia and Brazil on the one side and the less developed economies of China and India on the other is quite striking.

As Figure 10 shows, the BRICs are not yet major players in the world market in terms of direct investment abroad (DIA) or FDI outflows. This is not unexpected because all four of the BRICs are classified as developing countries by the World Bank, and as such should be major destinations and not sources of international direct investment. On average, the Eurozone countries and the United States account for close to 60 percent of worldwide DIA over the sample period, compared to 4.4 percent for Japan and 3 percent for the BRICs.⁸ Interestingly, while Japan's share has been fairly constant between 1994 and 2010, the share of the BRICs has increased steadily and has exceeded the Japanese share since 2003. The rise in DIA by the BRICs has been driven by Russia and China. In the case of Russia, this partly reflects the rising capital flight by the nation's oligarchs in response to uncertainty about the country's political and socio-economic stability in the near future.⁹ In contrast, resource-scarce China has stepped up its foreign investment into resource rich economies in Africa, South America, and Australia in recent years to secure the necessary raw materials for its fast-growing energy and manufacturing sectors.¹⁰

IV. EMPIRICAL INVESTIGATION

This section tackles two different empirical questions related to the BRICs. First, we investigate whether there exists a long-run equilibrium relationship in exports between the G3 countries and the BRICs (*see* Figure 11).¹¹ If such an equilibrium were to exist, it would be further evi-

8. These numbers appear to contradict the large-scale purchases of U.S. Treasuries by China and other Asian, as well as Middle Eastern, countries over the past fifteen to twenty years. But these international investments are classified as foreign portfolio investments, which are tracked separately from foreign direct investments.

9. "Russia's Capital Flight Intensifies," *The Wall Street Journal*, January 13, 2012.

10. "China's Investment in Africa to Increase to \$50 Billion by 2015, Bank Says," *Bloomberg*, February 22, 2011.

11. We are also interested in the related issue of the existence of a long-run equilibrium relationship in FDI between the G3 and the BRICs. Unfortunately, to investigate this hypothesis requires longer time series data for FDI than are currently available for the BRICs. But some time series evidence on FDI in the BRICs has recently begun to emerge (*see, e.g., Vijayakumar et al., 2010*).

dence that the BRICs have been able to hold their own when compared to the world leaders in globalization. Second, we test the hypothesis that the BRICs, as a group, made a larger contribution to economic performance (measured by GDP per capita) than other countries in the world over a forty-year period. Finding such an effect would strengthen the belief that the BRICs will indeed be the engine of growth in the world for the foreseeable future.

A. LONG-RUN TRADE EQUILIBRIUM BETWEEN BRICs AND G3

In order to test the hypothesis of a long-run equilibrating relationship in exports between the BRICs and the G3, we first need to determine whether the two time series variables are stationary or non-stationary. That is, whether the autoregressive process that characterizes their movement over time contains a unit root (non-stationary) or not. To do this, we perform two tests that are frequently used in the unit root literature: the augmented Dickey-Fuller test (ADF) and the Phillips-Peron test (PP).¹² Both test statistics show that we cannot reject the null hypothesis of non-stationarity for both time series at the 1 percent significance level. We then transform the data by taking first differences and retest both time series. This time, both test statistics reject the unit root null hypothesis for both time series. Based on the unit root tests, we conclude that both export time series are best characterized as I(1) processes.

We can, therefore, proceed to our next question, namely whether there exists a combination of these two non-stationary time series such that the combined time series is stationary. To find out, we need to estimate the long-run (cointegrating) relationship between the two variables using a cointegration estimation procedure. Among the many possible choices, we report the widely used parametric estimation method by Johansen (Johansen, 1991; Johansen and Juselius, 1990). The results are given in Table 4. With two time series, there are three possible outcomes. The tests' results of the Johansen approach may reveal that no cointegration vector exists, the existence of a single cointegrating vector, or the existence of two cointegrating relationships (two cointegrating vectors). The last case implies that the two variables are not integrated of order 1, while the first one reveals that the non-stationary variables are not cointegrated. Therefore, the only case that provides evidence for the existence of long-run equilibrium in exports between G3 and BRICs is the single cointegrating vector outcome. There are two Likelihood Ratio (LR) tests, the max eigenvalue (or max lambda) test and the trace test, each of which is used to determine the number of cointegrating vectors in our two time series system.

As shown in Table 4, both tests reject the null hypothesis of no cointegrating vectors in favor of the alternative (1 or 2 cointegrating vec-

12. All estimations in section IV.A were performed using EasyReg International (Bierens, 2012). The unit root test results are available from the author upon request.

tors) at the usual levels of significance (20%, 10%, 5%). Furthermore, both LR tests cannot reject the null hypothesis of a singly cointegrating vector (compared to the alternative of 2 cointegrating vectors). We thus conclude that the empirical test results of the Johansen procedure point to the existence of a single cointegrating vector and in turn a long-run equilibrium relationship in exports between the G3 and the BRICs. The estimate of the cointegrating relationship coefficient, based on the simple regression of G3 exports and BRIC exports (with heteroscedasticity consistent t-statistics in parentheses), is given at the bottom of Table 4. It implies that for every additional dollar in exports by the BRICs the G3 increase their exports by \$1.43.

B. BRICs AND ECONOMIC PERFORMANCE

Given the strong and well-documented economic performance of the BRICs, it should be straightforward to demonstrate a “BRICs effect” on economic development using a data set comprised of more than one hundred and twenty countries and covering more than forty time periods. The dependent variable is GDP per capita (in constant USD) and the regressors comprise a list of variables covering the quality of government institutions, the economy’s connection to the rest of the world (globalization), and measures of geography. To estimate the full model, we use both random effects (RE) and Hausman-Taylor (HT) estimators.¹³ In addition, we use the fixed-effect (FE) estimator to control for unobserved time-invariant country-specific effects. Note that in this case the coefficient estimates of the time invariant regressors—such as the geography measures—are lost. The data set covers the period from 1960 to 2000, with the annual data transformed into decadal averages to account for business cycle and other long-term time effects.

The results are presented in Table 5. The first three columns show the RE, FE, and HT estimation results, respectively, for the full empirical model including the BRICs dummy. As noted above, in the FE model the time-invariant BRICs dummy must be dropped from the regression due to the inclusion of the country dummies. While the estimated coefficients of the variables measuring institutions, globalization, and geography are statistically significant at the 5 percent level and carry the expected signs, the BRICs dummy coefficient estimates in columns two and three are not significant and carry a negative sign. We therefore conclude that for the full sample period and after controlling for important determinants of development, there is no evidence that the BRICs performed better or worse than the rest of the countries in the sample.

At first glance, this result is somewhat surprising; after all, Brazil, Russia, India, and China became the BRICs due to their high-growth per-

13. For a discussion of the Hausman-Taylor estimator, as well as variable definitions and data sources used in the panel model estimations, see Jacob and Osang (2011; available at http://www.faculty.smu.edu/tosang/pdf/jacob_osang.pdf). Estimates are generated using the STATA11 statistical software.

formance, which made them attractive destinations for international investors. But because the sample period begins in 1960 and the BRICs' high-performing years are skewed toward the end of the sample, a BRIC dummy that covers all four decades may not be able to capture the uneven growth performance of the BRICs over the sample period. Therefore, in columns four through six, we replace the overall BRICs dummy with a dummy that only measures the impact of the BRICs in the 1990s, a decade where the BRICs' economic growth rate was clearly more noticeable. While the HT estimator in column six still shows a negative, insignificant effect, the results from the other two panel estimators now exhibit a positive and statistically significant coefficient estimate for the BRICs during the 1990s.

V. SUMMARY AND CONCLUSIONS

Several results emerge from our investigation. First, we find that despite dramatic changes toward greater openness in trade and investment, the BRICs can push their trade and investment reforms even further, although the degree of future changes in openness varies from country to country. Second, we find that the absolute and relative growth rates in trade and investment flows that occurred over the past two to three decades in each of the BRIC countries have been substantial and appear to be sustainable. Third, we find evidence for a long-run equilibrium relationship in exports between the BRICs and the established leaders in globalization—the G3; this is further evidence that the BRICs are on their way to a shared leadership in world trade with the G3. Finally, we find no evidence for a BRICs effect in explaining GDP per capita using panel data models covering the 1960 to 2000 period. But if the BRICs dummy is restricted to the last decade in the sample, there is evidence that the effect is positive and statistically significant, thus lending credibility to the view that the BRICs will be the growth engine of the world economy for years to come.

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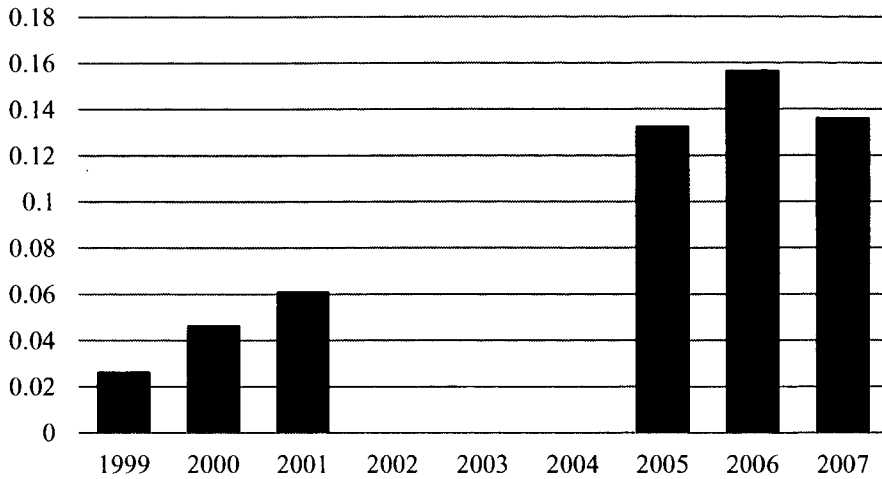
World Development Indicators CD-ROM, 2009, The World Bank, Washington, D.C.

Table 1: Trade Restrictiveness Indicators: G3 and BRIC, 2006-2009

Panel A: Ranking by OTRI*		
Country	OTRI Rank	
U.S.	15	
China	28	
Germany	30	
Japan	59	
India	78	
Russia	84	
Brazil	88	
Number of ranked countries:	125	
Panel B: Ranking by MFN Tariff**		
Country	MFN Tariff Rank	MFN Tariff Rate
U.S.	9	2.20%
Germany	25	4.10%
Japan	57	4.80%
China	63	5.30%
Russia	70	6.10%
Brazil	93	9.30%
India	102	12%
Number of ranked countries:	125	
*OTRI: overall trade restrictiveness indicator; ** MFN tariff: most favored nation tariff		

Source: World Trade Indicators 2009/10, The World Bank, online database.

Figure 1: Russia's Taxation of International Trade (1999-07)



Source: World Development Indicators 2009, The World Bank, CD-ROM.

Table 2: OTRI Ranking of BRIC, 2000-2009

	2000-04	2005-08	2006-09 Latest
Brazil	82	86	88
Russia	81	85	84
India	88	84	78
China	73	55	28

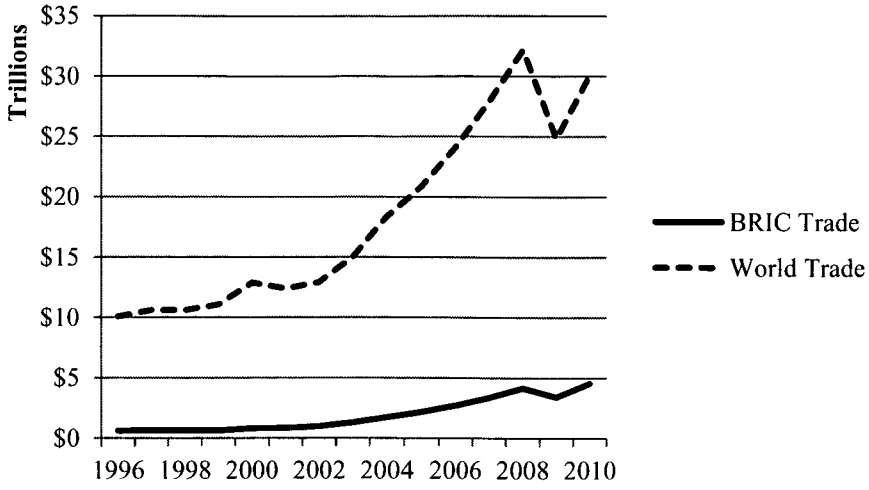
Source: World Trade Indicators 2009/10, The World Bank, online database.

Table 3: FDI Restrictiveness Ranking of BRIC in 2010
(1=closed, 0=open)

Country	Equity Restrict.	Screening	Key Personnel	Operational Restrict.	Total FDI Index
Brazil	0.08	0	0.005	0.033	0.116
Russia	0.216	0.04	0.005	0.122	0.384
India	0.191	0.025	0.005	0	0.22
China	0.226	0.135	0.048	0.069	0.457
OECD	0.059	0.024	0.001	0.013	0.095

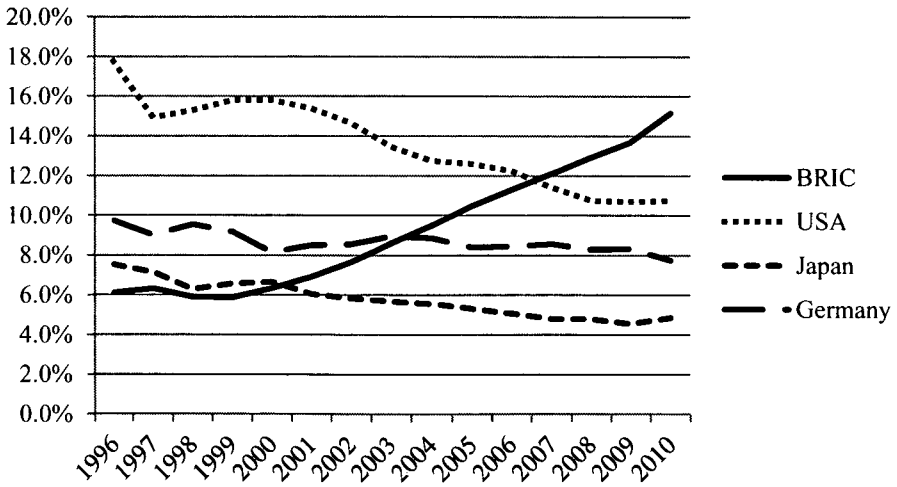
Source: OECD's FDI Restrictiveness Index (Kalinova et al., 2010).

Figure 2: BRICs and World: Total Trade (in trillion USD)



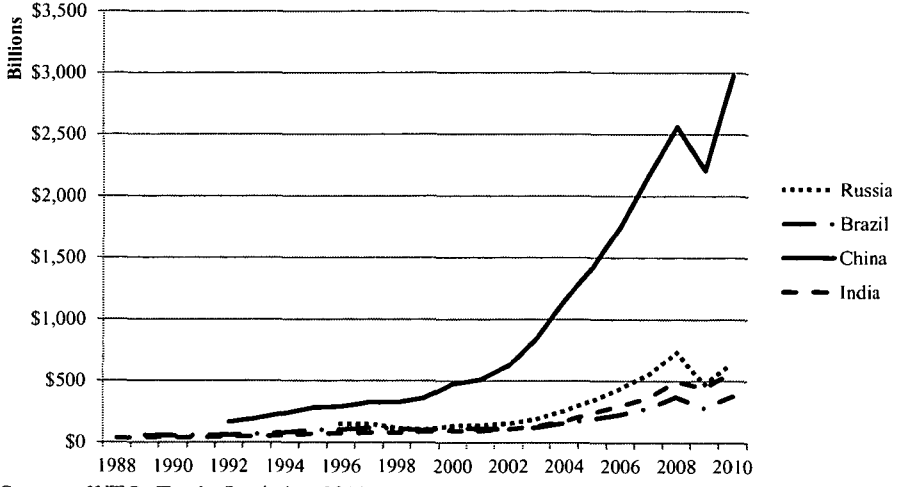
Source: WTO, Trade Statistics, 2011.

Figure 3: BRICs and G3: Total Trade (as % of World)



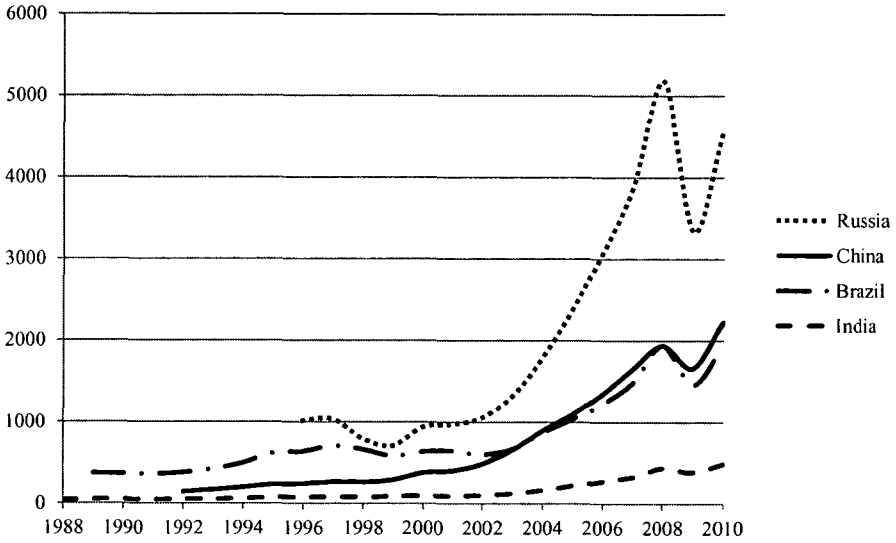
Source: WTO, Trade Statistics, 2011.

Figure 4: BRICs: Total Trade (in billion USD)



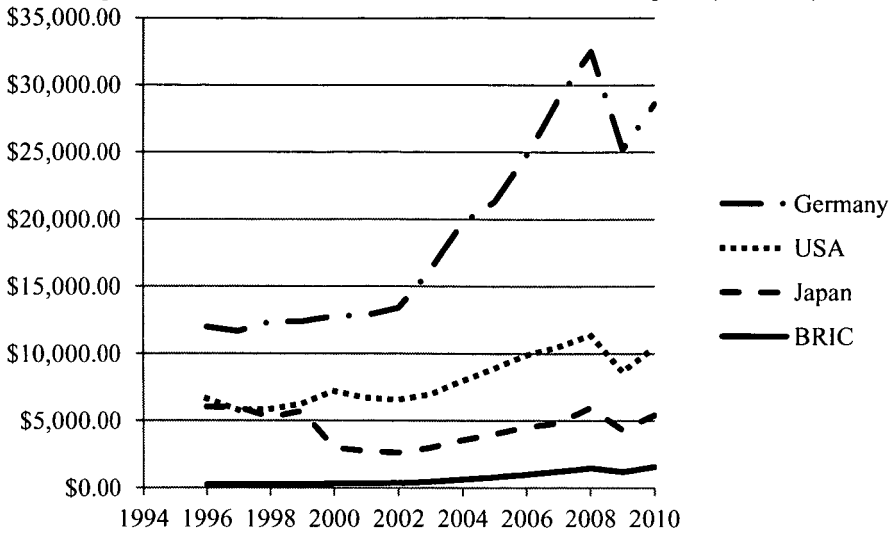
Source: WTO, Trade Statistics, 2011.

Figure 5: BRICs: Total Trade per Capita by Country (in USD)



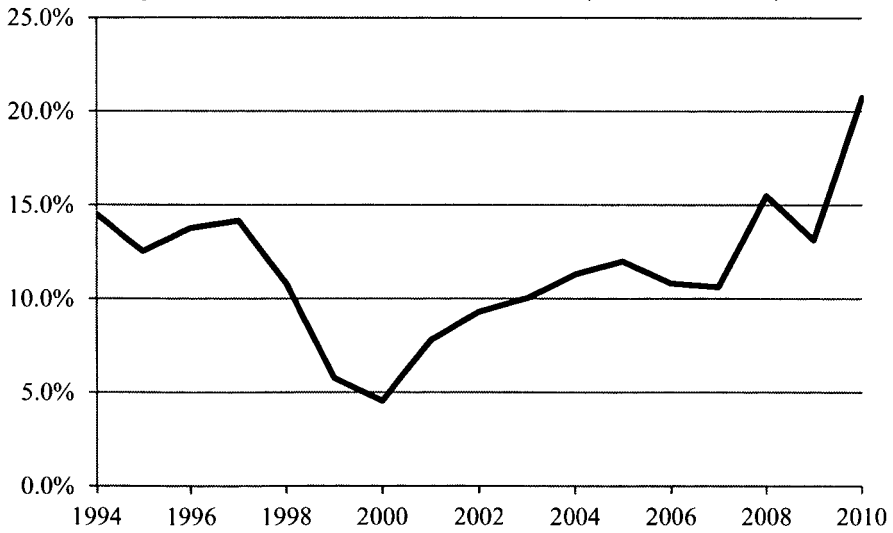
Source: WTO Trade Statistics 2011; World Development Indicators 2012, World Bank.

Figure 6: BRICs and G3: Total Trade Per Capita (in USD)



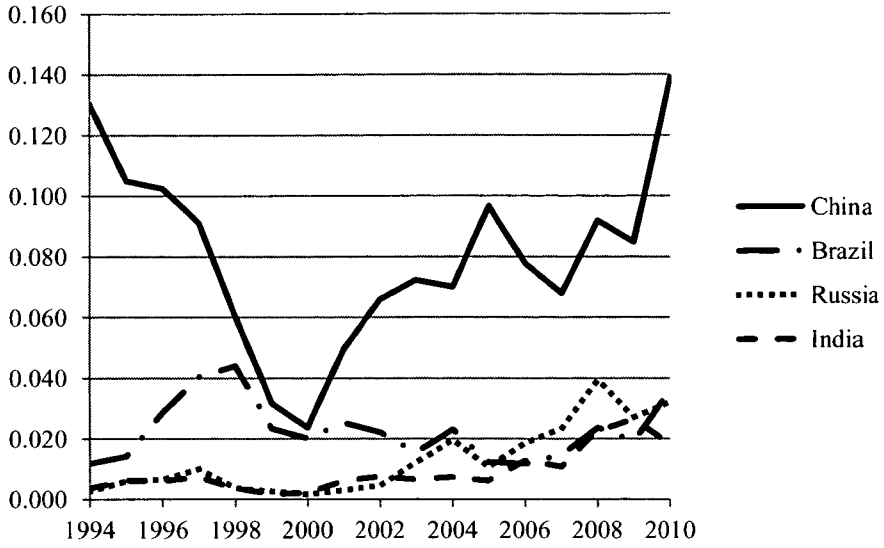
Source: WTO Trade Statistics 2011; World Development Indicators 2012, World Bank.

Figure 7: BRICs: Total FDI Inflows (as % of World)



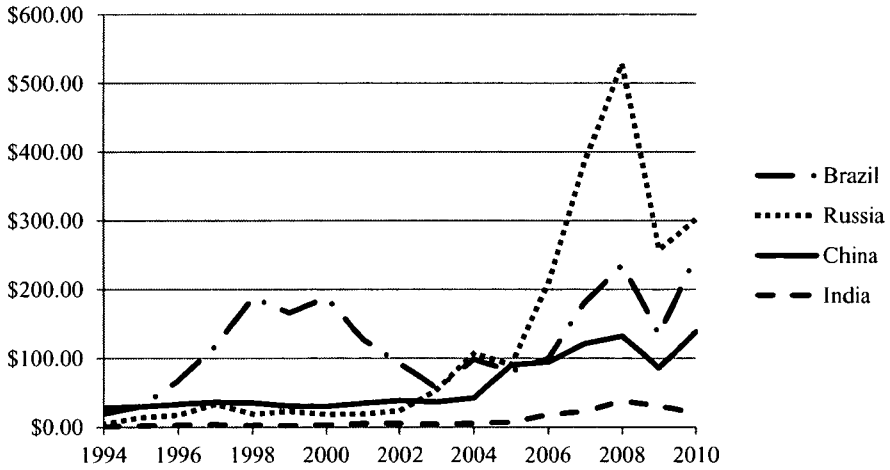
Source: World Development Indicators 2012, World Bank.

Figure 8: BRICs: FDI Inflows by Country (as % of World)



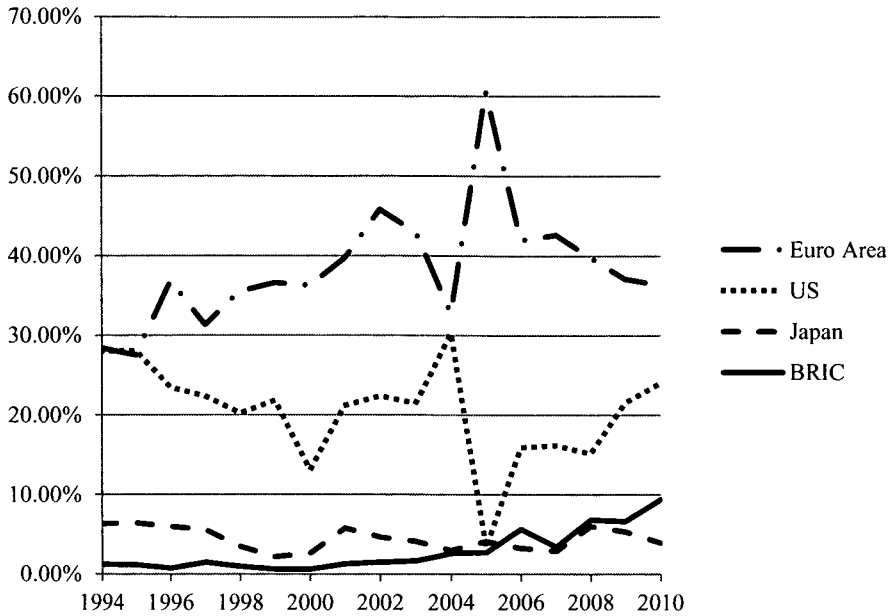
Source: World Development Indicators 2012, World Bank.

Figure 9: BRICs: FDI Inflows per Capita by Country (in USD)



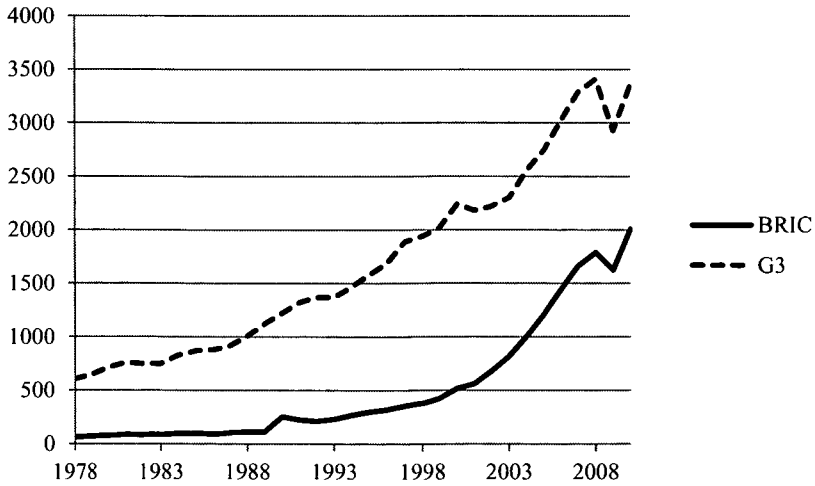
Source: World Development Indicators 2012, World Bank.

Figure 10: BRICs, Euro Area, US, Japan: FDI Outflows (as % of World)



Source: World Development Indicators 2012, World Bank.

Figure 11: BRIC and G3: Exports of Goods and Services (in constant 2000 USD)



Source: World Development Indicators 2012, World Bank.

Table 4: Johansen's Cointegration Analysis

LR test (Lambda max test)		Critical values		Critical values		Critical values	
	Test statistic	At 20% level	Conclusion	At 10% level	Conclusion	At 5% level	Conclusion
Null: r=0 coint vectors	14.4	10.1	Reject Null	12.1	Reject Null	14.0	Reject Null
Altern: r=1 coint vectors							
Null: r=1 coint vectors	1.0	1.7	Accept Null	2.8	Accept Null	4.0	Accept Null
Altern: r=2 coint vectors							
LR test (trace test)							
	Test statistic	20%	Conclusion	10%	Conclusion	5%	Conclusion
Null: r=1 coint vectors	1.0	1.7	Accept Null	2.8	Accept Null	4.0	Accept Null
Altern: r=2 coint vectors							
Null: r=0 coint vectors	15.4	11.2	Reject Null	13.3	Reject Null	15.2	Reject Null
Altern: r=2 coint vectors							

*No cointegrating restrictions on the intercept parameter imposed; Var(p) order: p=2
 Estimated cointegrating (long-run) relation (heteroscedasticity-consistent t-stats in parenthesis):
 G3 = 9.4E11 (13.5) + 1.43 (16.4) BRIC.

Table 5: Panel Estimates with Dummy for BRICs

Dependent Variable: log GDP per Capita (in 1996 PPP Dollars)						
VARIABLES	FE	RE	HT	FE	RE	HT
log Nbr Veto Players (it)	0.039	0.054	0.039	0.032	0.046	0.045
	(2.60)**	(3.66)***	(2.61)***	(2.10)**	(3.09)***	-1.56
Rule of Law (i)		0.71	0.894		0.722	0.882
		(12.37)***	(7.81)***		(12.59)***	(6.62)***
log Trade Share (it)	0.241	0.076	0.241	0.229	0.078	0.252
	(4.94)***	(2.32)**	(4.96)***	(4.72)***	(2.41)**	(4.34)***
Malaria Ecology (i)		-0.037	-0.03		-0.036	-0.03
		(-4.64)***	(-2.77)***		(-4.52)***	(-2.66)***
Dummy for BRICs		-0.412	-0.104			
		(-1.26)	(-0.26)			
Dummy for BRICs in 90s				0.365	0.348	-0.308
				(2.35)**	(2.20)**	(-0.26)
Constant	5.591	5.031		7.255	7.899	
	(10.35)***	(8.47)***		(38.17)***	(55.94)***	
Observations	340	340	340	340	340	340
Number of countries	122	122	122	122	122	122
R-squared	0.13		0.983	0.151		0.982
t-statistics in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						