

THE PERSPECTIVE OF THE WORLD REVIEW

Volume 2 | Number 2 | August 2010

A National Agenda for Development

Wilson Cano

New Fractures, Old Wounds: Africa and the renewal of South agency

Carlos Lopes

The Financial Crisis: impact on BRIC and policy response

Ritwik Banerjee

Pankaj Vashisth

Global Climate Policy and Brazil: 2005-2010

Eduardo Viola

A Comparative Study on NIS (National Innovation System) in the BRIC Economies

Zheng Bingwen

Zhong Huibo

FDI in the BRICs: changing the investment landscape

Radhika Kapoor

Ritika Tewari



ipea 47 anos
Por um Brasil desenvolvido

Federal Government

Secretariat of Strategic Affairs of the Presidency of the Republic

Minister Wellington Moreira Franco



A public foundation linked to the Secretariat of Strategic Affairs of the Presidency of the Republic, Ipea provides technical and institutional support to government actions – enabling the formulation of numerous public policies and programs for Brazilian development – and makes research and studies conducted by its technicians available to society.

President

Marcio Pochmann

Director of Institutional Development

Fernando Ferreira

Director of Studies and Economic Relations and International Policies

Mário Lisboa Theodoro

Director of Studies and Policies of the State, Institutions and Democracy

José Celso Pereira Cardoso Júnior

Director of Macroeconomic Studies and Policies

João Sicsú

Director of Regional, Urban and Environmental Studies and Policies

Liana Maria da Frota Carleial

Director of Sectoral Studies and Policies, Innovation, Production and Infrastructure

Márcio Wohlers de Almeida

Director of Social Studies and Policies

Jorge Abrahão de Castro

Chief of Staff

Fabio de Sá e Silva

Chief Press and Communications Officer

Daniel Castro

Ombudsman: <http://www.ipea.gov.br/ouvidoria>

URL: <http://www.ipea.gov.br>

The Perspective of the World Review

An international publication by the Institute for Applied Economic Research (Ipea), a body belonging to the Presidency of the Federative Republic of Brazil. It was created to promote contemporary debates emphasizing the theme of development from a South to South perspective and seeks to formulate proposals for the development of public policies, as well as to encourage international comparison with a focus on the scope of political economy.

E-mail: tempodomundo@ipea.gov.br

Editorial Board

Members

Alfredo Calcagno (UNCTAD)

Antônio Carlos Macedo e Silva (UNICAMP)

Lytton Leite Guimarães (UnB)

Marcio Pochmann (Ipea)

Marcos Antonio Macedo Cintra (Ipea)

Milko Matijascic (Ipea)

Pedro Luiz Dalcerro (MRE)

Roberto Passos Nogueira (Ipea)

Stephen Kay (FRB, Atlanta)

Alternates

Gentil Corazza (UFRGS)

Luciana Acioly da Silva (Ipea)

Editor

Marcos Antonio Macedo Cintra

Co-editors

André de Mello e Souza

Flávia de Holanda Schmidt

Milko Matijascic

Technical and Administrative Support

Mariana Marques Nonato

Vinícius Lúcio Ferreira

THE PERSPECTIVE OF THE WORLD **REVIEW**

Volume 2 | Number 2 | August 2010

Brasilia, 2010

ipea

The Perspective of the World Review / Institute for Applied Economic Research. – v. 1, n. 1, (Dec. 2009). – Brasília: Ipea, 2009.

Triannual.

A publication also available in Portuguese.

ISSN 2177-0255

1. Economics. 2. International Economy. 3. Economic and Social Development. 4. Sustainable Development. 5. Public Policies. 6. Periodicals. I. Institute for Applied Economic Research.

CDD 330.05

The authors are exclusively and entirely responsible for the opinions expressed in this volume. They do not necessarily reflect the views of the Institute for Applied Economic Research or of the Secretariat of Strategic Affairs of the Presidency of the Republic.

Reproduction of this text and the data it contains is allowed as long as the source is cited. Reproductions for commercial purposes are prohibited.

EDITORIAL

It is well known that the term BRIC, coined a few years ago, represents a somewhat heterogeneous group of countries, namely Brazil, Russia, India and China, which bear significant similarities. The most salient ones are their vast territories, large populations, and ethnic and cultural diversity. Even among these common features, the differences, not the similarities, permeate the tone of a prospective analysis of the BRICs.

BRIC countries play an increasingly significant role in the planet's economy and their foreign transactions and products represent an ever growing share of the world's total. None of this was driven by economies with higher *per capita* incomes, but rather on the achievement of space and influence generated by decisions of the State *hacia adentro*, even though the dynamic component of increased gross domestic product (GDP) could be of the *hacia afuera* type. BRIC economies' impact is so great that world leaderships are increasingly focusing their attention on these countries and trying to predict, anticipate and adapt to the impact they are already generating.

The significant complementarity among BRIC economies is also noteworthy. Many of them, especially China, are major trading partners of the other countries in the bloc and, often, major buyers of some product traded with major presence in the international market. The emphasis conferred to these countries by the Editorial Board of *The World Perspective Review* is owed to this set of elements. The uniqueness of the development process is what should be worthy of proper attention and rekindle the hope of those who seek to tread its path.

Developing countries are also on focus, especially those facing the toughest challenges, such as African countries. Brazil and Latin America share a rapport with Africans, with deep cultural connections. Brazil is a typical Latin American country, and it is the one, along with Cuba and some Caribbean societies, whose identity is most deeply marked by the element whose origin was Sub-Saharan Africa. So it seems that seeking for greater participation of these peoples in the lives of the others may in itself be a factor of development.

By addressing development-related issues and topics concerning the promotion of South-South dialogue, as can be observed in the list of articles that are part of this number, *The Perspective of the World Review* begins to fulfill its purpose of promoting debate. This occurs, however, from a perspective that is different to that of central countries with guidelines specific to their cultures, reflecting a process of democratic construction, and not one imposed by canons that have little affinity with the problems under discussion.

SUMMARY

A NATIONAL AGENDA FOR DEVELOPMENT..... 7

Wilson Cano

**NEW FRACTURES, OLD WOUNDS: AFRICA AND THE RENEWAL
OF SOUTH AGENCY 41**

Carlos Lopes

THE FINANCIAL CRISIS: IMPACT ON BRIC AND POLICY RESPONSE..... 55

Ritwik Banerjee

Pankaj Vashisth

GLOBAL CLIMATE POLICY AND BRAZIL: 2005-2010..... 79

Eduardo Viola

**A COMPARATIVE STUDY ON NIS (NATIONAL INNOVATION SYSTEM)
IN THE BRIC ECONOMIES 115**

Zheng Bingwen

Zhong Huibo

FDI IN THE BRICS: CHANGING THE INVESTMENT LANDSCAPE..... 147

Radhika Kapoor

Ritika Tewari

A NATIONAL AGENDA FOR DEVELOPMENT

Wilson Cano*

The article discusses the “shortterm” alienation that has infected most of economists both in the university and government, and even the entrepreneur leadership in the last 30 years. It suggests a thought into a new long-term national project for the Brazilian economy. There is a first reflection, historical and theoretical, on crucial issues affecting the understanding of the key problems of underdevelopment. A second reflection highlights the main challenges for the resumption of development. A third outlines a broader study that allows us to upgrade the diagnosis and structure of the meaning and the main aspects – at the end of the text – that should guide the construction of a new national development project outside the boundaries of neoliberalism.

UMA AGENDA NACIONAL PARA O DESENVOLVIMENTO

O presente artigo discute a alienação “curtoprazista” que contaminou a maior parte dos economistas, na academia e no governo, e as próprias lideranças empresariais nos últimos 30 anos e sugere uma reflexão prévia para que se possa formular um novo projeto nacional de longo prazo para a economia brasileira. Uma primeira reflexão, histórico-teórica, aborda questões cruciais que afetam a compreensão sobre os principais problemas do subdesenvolvimento; uma segunda aponta os principais desafios para uma retomada do desenvolvimento; e uma terceira formula as linhas gerais de ampla pesquisa que nos permita atualizar o diagnóstico e estruturar – na parte final do texto – o sentido e os pontos básicos que deveriam orientar a construção de um novo projeto nacional de desenvolvimento, fora dos marcos do neoliberalismo.

1 INTRODUCTION

The drastic qualitative and quantitative changes observed in the formulation of economic policy and in the occurrence of study and research related to it in general, sectorial and regional levels in the end of the 1980s are relevant enough that it can be said that no future studios of recent Latin-American macroeconomic historiography, and most particularly Brazilian macroeconomic historiography, will be able to ignore the relevance of such shift. *Debt crisis, rising inflation, the many stabilization plans, the fiscal war and local development power* have dominated the aforementioned scientific production, and most economists and academics abandoned their long-term concerns regarding growth and development of that region, becoming “short-termists” and focusing their production on *exchange rates, interest rates, inflation, and the competitive city*. As of the 1990s we saw a particular prominence of studies on finance, inflation targets, potential output and equivocal analyses of the gross domestic product (GDP) of municipalities, which acclaimed a modelistic approach and a high dose of sterile econometrics. It is obvious that

* Head Professor at the Instituto de Economia da Universidade Estadual da Campinas (IE/UNICAMP).

very important changes occurred in the State to allow for such phenomenon to occur, especially in the elaboration and strict handling of its economic policy.

The major circumstances surrounding the international economy greatly contributed to this, among which one cannot neglect to mention, besides the *stagflation* of the 1970s, the international economic and technological restructuring, *globalization* and *neoliberalism*, the downfall of socialist economies - especially the Union of Soviet Socialist Republics (USSR) - and the expansion and transformation of much of the Asian economy which dominated the 1980s and 1990s; only recently, due to the “China effect” - after 2002 – did this scenario seem to foreshadow some new changes. One cannot ignore, above all, the radical changes observed in international geopolitics, which went from a scenario of bipolarity to one of unipolarity, and which only began to bring new doubts, challenges and discussions in terms of its power structures after the 2007 crisis in the United States.

Thus, if in the 1980s most economists were ommissive of the problems of long-term and of development, i.e. of the future of the country, they made things even worse since the 1990s by declaring their faith in neoliberalism. From omission they walked towards an overt participation in this sea of misconceptions, in lethal ignorance of the fact that we are underdeveloped - and not an “emerging” economy, as neoliberals have claimed. One cannot ignore, also, the crass “mistakes” committed in our privatization policy, or the nearly US\$ 200 billion we squandered, between 1995 and 2002, with our “smart and effective” exchange rate policy. If, between 1990 and 2002, presidentialism in fact obfuscated the power exercised by the Central Bank of Brazil (BCB), we must take into account that, after such date, this power was ostensibly publicized. This State and these economists ended up accepting denationalization, deindustrialization and the continuity of *de facto* power of the financial system as inevitable.

However, these behaviors were not restricted to analysis and to economic policy. They also mimicked, again, much of the bad content produced in theory: the role of neoliberal reforms (Washington Consensus), neoinstitutionalism, neostructuralism, international convergence models, most endogenous growth models and many of the “new theories” of development. From yesterday’s developmentists, those individuals proceeded to become the enemies of high growth levels and of industrialists; they conformed to accept the reprimarization of our export portfolio. They exchanged the strategy of a necessary protectionism by the folly of the international opening of the commodities markets in exchange for our vital domestic market of manufacture-intensive commodities. And, even more curiously, they strived to expand the Southern Common Market (Mercosur), while simultaneously endorsing the contradictory idea of *open regionalism*, the “impossible mission” of the new line of thought of the Economic Commission for Latin America and the Caribbean (ECLAC).

From 2003 to 2008, new milestones took place, such as the electoral victory of the Brazilian Labor Party - PT, whose banner (or one of its main banner) was that of being progressive and developmentist, but which continued to practice part of the same macroeconomic policy of the previous governments once it came into power: fiscal surplus, valuation of exchange rates, high interest rates, and short amounts of credit, except for “no-risk credit”, name given to the payroll loans given to workers and retirees. Only after 2006-2007 did long-term public lending - through the National Social and Economic Development Bank (BNDES) - grow more expressively, nurturing some small expansion in the investment rate. The BNDES, however, while previously focused on the industry, began to increasingly concentrate its investment on services and programs for exports of primary commodities and semi-manufactured goods. We must recognize as very positive initiatives the new position of the State with regard to the Brazilian Oil Company (Petrobras) - especially with the approach taken for the pre-salt layer - and the creation of the Sovereign Wealth Fund.¹

The government seems to understand as *inevitable* a policy of high interest rates and low exchange rates, which makes a better protection to the domestic market impossible, discourages investment and also reduces the competitiveness of industrial exports. In order to strengthen the great national enterprise and make it more competitive internationally, the government has been practicing a policy of “aggrandizement” of some of these businesses, including through the financing of foreign private investment by Brazilian companies, thinking to achieve through such strategy the increase of their foreign competitiveness. For that end, it may have borrowed, as external examples, from the famous conglomerates in Japan and South Korea, which were, however, raised and strengthened at another historic moment and under other international scenarios. Internally, it may have based its approach on the case of Petrobras - State-owned enterprise - and Vale - a privatized company which operates under a certain level of presence and power of the State -, both of which operate natural resources under oligopolistic corporate control and are funded with BNDES resources.

However, the current time is one of great uncertainty in the international economy and the risk of new denationalizations and defaults on several other companies is not ruled out. In the area of commodities, with few exceptions, the result of this effort is very difficult to obtain, in view of the international structure of large companies and conglomerates. In the industry area, this policy is further complicated by both groups and businesses that are even greater and by the deindustrialization and denationalization we currently undergo, and also by the policy of furthering the globalization of our economy. On the other hand,

1. Law nº 11,887, from December 24 2008, creates and regulates the structure, sources and applications of the Brazilian Sovereign Wealth Fund.

we are spending much of our modest long-term financing resources to grow the GDP and employment rates of other countries.²

It should be remembered that the State is not demanding these companies to establish any economic targets regarding production or exports, nor is it demanding any legal guarantee in order to allow the transfer of its controls to foreign capital. Even when there is such control - as is the case of Vale - the disaster has generally not been avoided: Vale recently ordered 3,000 rail wagons from China, an order it could have made to the Brazilian industry, and has recently sold control of its mines and plants (91% of *Alumínio do Norte do Brasil S/A – Alunorte*, 81% of *Cia. Alumina do Pará* and 51% of *Alumínio do Brasil S/A – Albrás*) as well as of its aluminum segment to Dutch company Norsky Hydro - in exchange for 22% of the stocks of that holding -, a deal which reached the sum of US\$ 4.9 billion (HYDRO, 2010). Moreover, this outward aggrandizement at the same time promotes stronger external bonds, which in turn increases the importance of external decisions and interests, leaving the question of to what extent such interest will not be predominant over those connected to the Nation.³

There are also strange decisions being taken in internal matters, such as the recent bid for the construction of the hydroelectric power plant of Belo Monte, won by a consortium of private and public companies. This consortium will lead the project, but will provide 49.98% of the capital while BNDES will provide 80% of the financing, in addition to an estimated 30% participation by pension funds of public institutions. It is worth asking: what resources will the private companies participating in the consortium actually contribute with? It is thus doubtful whether this would be a graceful form of privatization of public assets and resources. Moreover, to what strategy could the recent decision to capitalize the Brazilian Electric Power Company (Eletrobrás) be attributed to? Would it be an attempt to cheapen the price of power generation and to force down the current prices charged to final users, mostly practiced by private companies?

Even more recent is the announcement of the “resurrection” of the Brazilian Telecommunications Company (Telebrás), to expand access to broadband network with a view to increasing social inclusion. The point is that the connection of these networks with households will be undertaken by private companies, who will, as usual, keep the profits to themselves and burden the State with the costs. Only in places where private enterprises are not interested in working will Telebrás provide direct services to the public. These are important issues about which the public knows little or nothing.

2. The Central Bank of Brazil estimates that the foreign investments made by national companies in 2010 (US\$ 15 billion) will triple compared to 2009. Cf. *O Estado de S. Paulo*, São Paulo, March 23rd 2010, p. B3.

3. Incidentally, this important issue was the subject of extensive article by Magazine *IHU*, with seven relevant interviews with Brazilian intellectuals, on which some words of caution can be read regarding this official policy (A REESTRUTURAÇÃO..., 2010).

Also worth of highlight is the fact that the new government had the courage to implement some social policies, such as a minimum income program (*Bolsa Família*), the real increase given to the minimum wage and the institution of payroll loans to employees and retirees, which culminated in creating incentives to the internal market. In addition to the political purposes behind such policies, the higher growth of GDP - mainly in the exporting sectors and consumption - enhanced by these policies and the so-called “China effect” also contributed to the fostering of the internal market. The China effect, even though it has boosted exports of commodities, further extended the regression we have suffered in our export portfolio, the contents of which in 1985 had reached 55% of manufactured goods, stagnated until 2000 and from then retreated to numbers around 43% in 2009 and 41% from January to May 2010.

This new ideology and the cuts on public funds for research - notably collective research - also affected in the same way the production of studies and research in academia: “short-termism”, exchange rates, interest rates, inflation, neoinstitutionalism, globalization, pricing of the environmental issue, neostucturalism and “developmentist” models were the predominant themes. Academia as a whole was affected, although it has managed to preserve, at least in part, some of its traditional lines of research.

After 20 years of the importing of neoliberalism, its most perverse effects – insecurity, violence, denationalization, higher vulnerability to external factors, low growth rates, deterioration of labor relations, deficient health and education services, political corruption and corrosion, etc. - are now more serious, more perceived and more strongly felt by society. And that has encouraged us to revise our attitudes and our work to rethink the meaning of underdevelopment and the role of the State. From this, recent events have been timely encouraging of reflection on the academic field, through the increasing number of seminars to discuss this issue and our role in the formulation of new research proposals and the building of new alternatives for the national economic policy. Such efforts are also being undertaken by other institutions, such as the Center for Strategic Studies and Management (CGEE) linked to the Ministry of Science and Technology (MCT), the Regional Council of Economics of the State of Rio de Janeiro (Corecon/RJ) and also by government institutions such as the Ipea and the Secretariat of Strategic Affairs of the President’s Cabinet (SAE/PR).

In April and May 2010 statements were made by prominent economists, both here and abroad, that this crisis of capitalism, although not yet the “final crisis”, represents, however, the possibility of profound changes in the system, such as a return to financial regulation and more effective combat against financial speculation. They have also said the crisis would represent the “exhaustion of the troubled point currently reached by the financialization of capitalism”. However, the most recent facts knock such optimism down, as is shown below (subsection 4.1).

In view of the fact that the crisis, as I see it, can lengthen and deepen, and as I have advocated since 1990 for the rupture with the neoliberal model and the resumption of the developmentist State, I understand that one cannot keep “waiting for Godot.” Thus, the purpose of this text, and concomitantly with what I mentioned in two recent seminars, is to discuss and propose the content of what should be the new Agenda for Macroeconomic Research, whose ultimate goal is to examine what would be the *key challenges* for Brazil. Namely, it is the preparation of a macro-diagnosis that could allow us to formulate a more concrete agenda for a project of national development. It must be noted that, in proposing this macro examination, I’m not ignoring the micro plane. It is obvious that from the elaboration of a macro agenda a plethora of questions should inevitably arise that can only be investigated and clarified with the input from companies, entrepreneur leaderships, consultants and other institutions. But I insist: this can only occur after the establishment of a macro agenda.

The preparation and implementation of these efforts, however, is no simple task, given that the country is in crisis since 1980, and not only, as many think, in 2008-2009. Therefore, in consideration here are 30 years of delay in investment, technology, social reform and other issues which, together, form a puzzled skein of complex problems that require much thought to their fullest understanding. At the same time, we must restore some ideas that were discarded, such as that of planning and the active role of the State, and bring back those who have distanced themselves from these ideas and from the understanding of what is an underdeveloped economy.

Besides this introduction, this text also includes four sections. Section 2 tries to fill the need for prior discussion, theoretical and historical, on the issue of development and underdevelopment. Section 3 attempts to inquire about the nature of our main macroeconomic and political challenges. Section 4 proposes what I believe to be our major research themes. Section 5 outlines the main lines that should constitute an agenda for a new program for national development.

2 SOME THEORETICAL AND HISTORICAL ISSUES WHICH MUST PRECEDE THE DISCUSSION

2.1 Development, underdevelopment and the national State

We must recall that there is not, in the economic history of capitalism, any case of a country that has developed without significant assistance of its national State. And this role, internally, is fulfilled via induction, stimulus, fiscal, exchange rate and financial incentives, government procurement, technological research and development, etc. Externally, it translates into the defense of its national currency, its military force and its diplomacy. In the cases of Germany and Japan, the strong presence of the national State was unquestionable. In the case of the

UK, for ideological reasons, there are those who give credit to the market, but we cannot ignore the establishment of institutional, military, commercial and material foundations created by the two English revolutions of the 17th century, as well as the power of the British Navy, its currency, its diplomacy and its support of imperialism and colonialism.

Also in the case of the United States, the State was crucial for the enlargement of the bases of the national market, with initiatives such as: the Homestead Act (the world's largest agrarian reform in the 19th century); specific pieces of legislation; the Civil War which abolished slavery and the stimulus for the formation of large trusts and cartels of the late 19th century (the financial, industrial and railway trusts); its international military prowess - which is fed by the military-industrial complex that supports the US's imperialism; and also its currency and its diplomacy.

Except for the known cases of capitalist development that have emerged between the late 18th and 19th centuries, one can mention the following exceptions: *i*) the reconstruction of Japan and Germany at the end of the Second World War: at that moment we had a case of "development by invitation" from the United States, through military occupation and to meet their more direct interests, and *ii*) in the cases of South Korea and Taiwan, and more recently China, also "at the invitation of the United States", which involved, internally, strong presence and action of their own States.

Although all currently developed countries have had a long history marked by strong social injustices, inequalities, etc., as they consolidated their processes of industrialization and urbanization, those social constraints were markedly reduced, even if at the expense of strong anti-establishment social movements and their claims, but all with the seal of the State. The consolidation of the USSR, the "1929 Crash" and the new international geopolitics of the post-war era constituted a strong spur to this process.

2.2 Development: economy and politics

In very general terms, ideas and goals for growth, employment and improvement of living conditions are shared interests of different social groups - classes, regions, sectors etc. But when it is considered that *development* means not only growth but also structural changes that require different forms of taxation, appropriation and distribution of income and allocation of surpluses, *social conflicts* arise, and the economist needs to understand that this issue transcends Economics and ventures deeply into the field of Political Science and Sociology.

Culture, history and power are key issues to be examined in development processes, and constitute tools that are useful to the economist for the reflection necessary to the confrontation and solution of these conflicts. It is essential, for

example, to undertake a preliminary examination of power structures - national, regional, sectorial, class, etc. - without which the economist can hardly perform his duty of diagnosis and formulation of economic policy. That does not mean condoning with certain structures, but rather know them to reflect on possible ways to overcome these conflicts.

2.3 Is development possible for all peoples?

No, we were taught by Celso Furtado, who showed that underdevelopment is not a stage of development, but a historical process created from the way we are inserted into the international capitalist economy as producers of raw materials and food and buyers of manufactured goods, as colonial, and in most cases, slave-based economies, characteristics that have marked off our heritage and our power structures.

He also explained the neuralgic issues of underdevelopment: the unequal distribution of wealth, which fixates a certain profile of demand and supply structure; and the major structural imbalances: in the balance of payments, in fiscal and tax structures and in long-term financing, besides the colossal underemployment rates and dormant inflation.

Worldwide statistics show that, except in rare or episodic exceptions, developing countries have positive average growth rates, and our social indicators became less sufferable than in the past, but not only do average national statistics persist, but they also continue to reveal deep inequalities among members of their populations. These statistics, however, clearly show that although our per capita income has grown, the distance between it and that of developed countries has increased: in the early 1960s, average incomes - measured in current dollars - from Argentina, Brazil and India amounted respectively to 38%, 22% and 6% of that of the U.S., while in 2006 they had decreased to, in Argentina and Brazil, 13% and in India to meager 1.8%.⁴

This also allows us to conclude that there is little or no use to neo-classical theoretical constructs about the so-called “models of convergence” and most of the so-called “new theories of development” and their endogenous growth models. With our history, we have learned that we can grow and soften our ills, but not meet the standards of developed countries. There will always be a gap, primarily qualitative, between us and them, which has grown significantly over the past three centuries.

2.4 Historical heritage

Our great masters have taught us that developing countries suffer from cumulative historical processes that, in many cases, are the root of detrimental effects on our economy and society:

4. The sources are the Annual Reports of the World Bank (IBRD) and from the Organization for Economic Cooperation and Development (OECD).

1. The heritage of our underdeveloped origins, since colonization and the institution of slavery, and our insertion in international trade, within which, until the crash of 1929, we were exporting only primary commodities.
2. Between 1930 and 1980, we felt as if we were on the path of development and national sovereignty, a period that not only provided us with urbanization and industrialization, but also with the opportunity to transform the national State, put it in the service of development and allow it to aspire to higher standards of living. However, since 1980, when we entered the so-called “lost decade” and subsequently neoliberalism, we have already lost 30 years, and it might be worthwhile to ask, even if pessimistically, if from this moment on “the dream is not over” or, optimistically, if it would be possible regain our positive attitudes towards development, albeit within the framework of an underdeveloped economy.
3. The legacy of the military regime of 1964 - 1985, from which we inherited not only massive debt, but also a profound deterioration in the quality of urban life, education and public health and the corrosion of national political institutions.
4. The “lost decade” of the 1980s, which superimposed to the legacy of the perverse effects of the so-called Debt Crisis.
5. The neoliberal legacy that we carry from the end of the 1980s. About the matter, I recall that in 1997 I warned that the dynamics of the new model and the resulting economic policy made it impossible to obtain, in a persistent manner, high rates of growth of GDP and employment. I have also shown that that model not only debased our rate of accumulation but also deteriorated investment in qualitative terms. I explained at that time that such scenario resulted from the effects of unbridled openness, exchange rate valuation, privatization and denationalization, which deepened the current transaction deficit, only bearable via persistent and increasing and uninterrupted external funding, which, as we know it to be so, is impossible.⁵

Between 2002 and 2008, when the economy had achieved average growth rates higher than those verified between 1980 and 2002, the false euphoria tried to spread the idea that we had “resumed growth.” However, few realize that the new bases in which this “resuming” took place, through the “China effect” and the

5. See Cano (2000) for the verification of this statement and the theoretical macroeconomic outcomes for the average of Latin American and those specific to the seven countries studied: Argentina, Brazil, Chile, Colombia, Cuba, Peru and Venezuela.

growth of household consumption, cannot guarantee the persistence of the current external and internal commercial and financial bonanza in order to keep growth rates high and persistent, even if they may result in higher rates for a given period.

However, few wonder about the level and structural quality of investment, or care about deindustrialization: for verification of such fact, one needs little but to see the strong regression in the level of manufacture-intensive exports in our portfolio⁶, the strong rise in trade deficits of industrial products of medium to high technology,⁷ or even the pronounced decrease in the share of GDP contributed by the manufacturing industry, which, after going from about 19% in the 1950s to 36% in 1980, violently regressed to 19% in 1990 and to 15.6% in 2000. It is considered that the current crisis is already over. Such claim is made by individuals who are deceived by positive growth rates, with no assessment of its continuity and the main structural changes involved, such as investment, employment, industrial production and foreign trade.

3 WHAT ARE OUR MAIN CHALLENGES?

As in 1930, even if not under the same circumstances and structures, we are faced once more with a severe international crisis, for which great doubts arise concerning its effective overcome in the short term.⁸ Domestically, the improvement of various economic indicators has provided the very optimistic with a true “bed of roses” in the sense that the crisis had passed and we would have already returned to a new round of high growth rates, estimated at between 5.5% and 7.3% for 2010 according to the Brazilian Central Bank. However, the poor performance of the trade balance, the current deficit in the balance of current transactions, the small increase in the rate of inversion and the structure of industrial investment discourage the cautious from sharing the same optimistic views. Our caution is reinforced externally by the delay of the U.S. recovery and the recurrence of the crisis in Western Europe.

But these moments of crisis are precisely the ones that best allow for more significant changes in political structures and in the possibilities of formulating new economic policies. *New* in the sense of seeking to protect the economy from the crisis that affects it and allow for a look at the long term and a change of the route so far taken. In our case, the route in question has been that of an economic policy that, in its main bare essentials, has been supportive of neoliberalism. As will be discussed further ahead, my proposal is to break with this *neoliberal order* so that we can reassume, with the necessary sovereignty, control of our destinations.

6. About the internal determinations of this regression, see Pires de Souza (2010).

7. On this particular technological backwardness, see Alem (2009).

8. The main reasons - known by the end of 2009 - for this uncertainty are summarized in Cano (2009). Further along, recent data will be added regarding new facts made public.

Let us recall that, in the Crash of 1929, we gained some level of freedom in the management of our economic policy, through which we abandoned the liberal economy, built a developmentist State, and dared to outline some economic objectives and build long-term national development policies.⁹ We dared to pursue a route for us until then unknown: the transition from a liberal primary-commodity-export economy to one which saw stark State intervention as the only path to industrialization. Certainly, though this path has been abandoned, it is not impossible to try to resume it and update it.

But, for that end, there are many challenges we still must face. Let us briefly examine those we believe to be the key ones as far as the economy is concerned, not ignoring, however, that their resolution runs into (or can run into) serious external and domestic political constraints.¹⁰

3.1 External challenges

1. Although the post-2002 foreign policy has changed for the better, opening up new political horizons for the country, the Brazilian trade policy, albeit more active, requires new attitudes of negotiation that are more objective and radical, particularly with countries like China, Russia and India, given the changes and growing strategic role that these economies have been given in the international arena and their relations with Brazil.
2. We will need to establish a – hard – negotiation framework with China, given that *times have changed*. This country has already emerged at the forefront of nations trying to reverse their main form of growth to the scope of its domestic market. The China gravy trains (Chinese deals, as the expression goes in Portuguese) grew strongly in prices and quantities, and in recent years not only has Latin America turned into China's main supplier of commodities, but they also replaced part of their manufactured exports from Mexico, Central America and also from Brazil to the U.S. market.
3. China is now performing, in many developing countries, the reprise of the British role in the nineteenth century, creating new markets for their industrial products and large emporiums to buy cheap commodities. On that note, the Chinese state-owned enterprise State Grid recently bought from Spanish companies, for US\$ 1.7 billion, seven power plants in Brazil and, before that, had already bought part of Itaminas - Eike Batista's company - for US\$ 1.2 billion, for the building of the Port of Açú steel-

9. In that respect see Cano (2007a).

10. See Cano (2007b) for details of these major constraints and challenges. Ipea has recently produced a compilation on these issues, organized by Cardoso Jr. (2009).

works. Moreover, the Votorantim group recently signed on a US\$ 400 million deal - part of the US\$ 2.6 billion total future investment - with the Chinese for the sale of *Sulamericana de Metais* (South American Metals) and an iron ore mine, from which it estimates to generate an estimated 25 million tons / year of ore, about 20% of their current purchases in Brazil. Will we, besides all this, also lose the African market to China?

4. The current crisis has shown unequivocal signs. The sharp drop in oil prices subsided some of the great recent enthusiasm about ethanol and national biofuels. It also showed how volatile the sugarcane ethanol market can be, given the vicissitudes of the market for sugar. It may also probably encompass the expansion of our agricultural frontier in the Center-West and Northeast Regions, which, besides its employment-income effects, would also reduce the migratory flows towards it, directing them to São Paulo, or increasing pockets of poverty in the Northeast.
5. The opportunity that arose for Brazil to change the direction of its economic policy and external relations requires decisive leadership action in South America. Therefore, it is essential to imprint a faster and more responsible pace in the process of regional integration.¹¹ However, that integration also faces some serious problems:
 - a) defeated in their project for the Free Trade Area of the Americas (FTAA), the United States chose to “nibble around the edges” by signing the Free Trade Agreement (FTA) with several Central American countries and also Chile, Colombia and Peru, weakening the effective possibilities of vigorous expansion for Mercosur;
 - b) it must be remembered that much of the recent losses of our foreign markets was mainly of manufactured goods, and took place in our three largest foreign markets (U.S., European Union (EU) and Argentina), therefore demanding urgent management initiatives to try and recover those;
 - c) Mexico, which had in the U.S. market the destination of 65% of its exports before signing the North American Free Trade Agreement (NAFTA) in 1994, has today increased that number to about 85%. Moreover, its participation in NAFTA imposed its economy’s opening and its “welding” with the U.S. economy, shifting, therefore, most of the interests it had for the rest of Latin America, notably the Southern Cone countries;

11. It is important to recognize the significant change in the attitudes of the current government in terms of external relations, with growing Brazilian presence in the international arena, particularly in Latin America.

- d) integration with the other countries of South America - in the orbit of the Union of South American Nations (UNASUR) -, if thought of solely in terms of “market”, will not yield great effects, since the regional blocs consisting of underdeveloped countries have low rates of intra-bloc trade (5% to 15%) compared to their total exports. Thus, for that figure to grow and really represent an important source of growth for their nations, it takes much more than just thinking in “market” or “positive balance” terms;
- e) with regard to the physical integration now underway, we must distinguish between investments of the “export corridor” type to shorten the path of our commodities to the Pacific Ocean and those investments which can really streamline the directions of integration and development for the region;
- f) the crisis also affected, on the financing side, the achievement and timing of these works. Moreover, and paradoxically, the very discovery of Brazilian oil and gas in the pre-salt layer of the Santos Basin could derail the important project of the north-south oil pipeline from Venezuela to Argentina;
- g) also regarding the pre-salt layer, it is important to heed the warnings recently made by Ildo Sauer, from the University of São Paulo (USP), about the fact that some of these deposits are in the “200 mile” are not recognized by several countries, including the United States. Incidentally, to what extent does the recent (2008) reactivation the U.S. Navy Fourth Fleet (South) constitute (or not) a preventive and threatening attitude? The oil spill in the Gulf of Mexico is threatening the U.S. territory - and not only it - with major ecological disasters, and this could trigger heavy U.S. pressure on this activity in deep waters, even Brazilian ones. For that disaster, in fact, they have already imposed on British Petroleum a heavy fine of US\$ 20 billion;
- h) in the episodes of the coup in Honduras in 2009 and the earthquake in Haiti in 2010, the attitudes of the United States, partly ambiguous, resulted, in the first case, in the relegation of Brazil’s role to a secondary position, rather than protagonist of the solution for this problem. In the second case, in a country in which Brazil had until recently a military force of 1,300 people and led the actions of the body of peacekeepers of the United Nations (UN), the United States acted quite quickly, occupying and controlling the airport in Port-au-Prince and sending a military force of about 11,000 soldiers, much more that the total force of the UN (7,000). They will obviously not allow other countries to exercise leadership in that area,

located in the vicinity of the Dominican Republic, Cuba and Venezuela. The “humanitarian” mobilization for Haiti also comprised a large aircraft carrier, 33 aircrafts and many ships. Finally,

- i) we must also remember the pressures exerted by the United States in the Security Council of the United Nations, imposing serious sanctions on Iran, blocking most of the agreement signed shortly before between China, Brazil and Turkey on enriched uranium.

3.2 Internal challenges

1. Our perverse social inheritance shows great deterioration of public health, education, housing, sanitation, urban transport, and the dissemination of social violence. In 2000, we accumulated a housing deficit of 7.8 million households, of which 87% are from families whose income is no more than three minimum wages. This deficit, projected for the next 20 years, would shoot up to 25.8 million households. The investments required to eliminate this deficit stand at around R\$ 235 billion.¹²

In 2007, the deficit in sanitation, in terms of water services, represented 19% of Brazilian households. In sewage, our situation is calamitous. Only 40% of Brazilian households are provided with sewage services. Although garbage collection meets 91% of the population, 60% of the waste collected is accumulated in the open. To solve the problems of sanitation in the next 20 years, an estimated investment of R\$ 226 billion is required.

But the perversity of our crisis and underdevelopment is more starkly manifested, in all the regions of Brazil, in the area of public health, especially regarding major infecto-parasitic diseases, regardless of regional concentrations of production. Among our regions, the Southern one is the least affected, and the highest incidences were concentrated (in 2003-2004) in the following regions (the percentage number in parentheses represents the percentage of that region of the national total): *dengue fever* – North (17), Northeast (52), Southeast (14) and Center-West (15); *visceral leishmaniasis* – North (16), Northeast (55), Southeast (23) and Center-West (6); *malaria* – North (95) and Northeast (3); *leprosy* – North (22), Northeast (39), Southeast (19) and Center-West (15); *tuberculosis* – North (9), Northeast (29), Southeast (45), Center-West (4) and South (11).¹³

Thus, in health, the amount required would be R\$ 1,096 billion, and education, R\$ 783 billion. In urban transport investments are estimated at R\$ 1.5 billion.

12. All data on investment estimates were obtained from volumes I, IV and V of the Study of territorial dimension for planning (*Estudo da dimensão territorial para o planejamento*) (CGEE, 2008).

13. Data from 1st of July 2007, taken from the website of the Secretariat of Health Surveillance (SVS) / Ministry of Health (MS).

2. In infrastructure sectors, the situation is not any milder: in energy and transport, the country would need total investments of about R\$ 1.3 billion.
3. The sum of these investments estimated on annually averages for the next 20 years, would stand at around R\$ 269.3 billion, which amounts to about 85% of the total national annual investment, or 14% of our annual GDP.¹⁴ It is impossible to meet all these demands simultaneously, all the more so if we maintain our current economic policy, deregulation and disorderly openness.

It should be noted that the productive sector also lacks many resources, given the technological gap that we have accumulated over the past 30 years of crisis and 20 years of neoliberalism, especially in more complex sectors of equipment and electronics, which got hit the hardest by the deindustrialization process. Although several programs have been developed for industrial policy,¹⁵ the constraints caused by macroeconomic policies have hindered their success, given the *de facto* abandonment of the sectorial policy for this segment, and the even greater sin of not having any modern chip factory. To get a practical perspective of this problem, one could mention simply that our foreign trade deficit in chips in 2009 totaled US\$ 3.3 billion.¹⁶

Thus, an initiative designed to tackle these enormous social and economic problems would have to create a national strategy grounded on two main aspects:

- a) the strategy should map the main conflicts of interest arising from this decision. For that end, one must design a *de facto* “political engineering” to produce new national political consensus that can balance the conflicts between different social segments of the country;
- b) given that the amount of investment resources needed is very large in relation to the concrete possibilities of internal and external financing, we should also implement fiscal and tax reforms so that we can raise the investment rate. Still, it would be necessary to prioritize and scale these expenditures in time and space, because *there will be no resources for everyone and everything at the same time.*

14. At 2004 prices and percentages related to the 2004 GDP.

15. On industrial policy in the period 2003-2010, see Cano and Gonçalves (2010).

16. Moreover, during the negotiation with Japan in 2007 to adopt its system of high-definition (HD) for our digital TV, the government announced that these negotiations would lead to the deployment of a chip plant in Brazil, a promise that was not delivered. It is true that the federal government has been implementing, for 10 years, a small chip plant in Rio Grande do Sul, whose equipment, dating from 2000, were donated by US-based Motorola. This plant is to start its actual production in the coming months.

This strategy should be backed by clear definitions of what the main objectives for the country and its people are and on the decision to resume the use of control mechanisms for the exercise of national economic policy.

This, of course, will require rapid formulation and implementation of reforms, of real changes for the sake of national interests. As major indicators of these reforms, they should be explicitly focused on maximizing employment and foreign exchange savings and on significant reductions of interest on internal debt, to make room in today's inflexible taxation system.

In this sense, as a means to alleviate some of these conflicts, it would be important to employ efforts to ensure that forecasts - nor the most optimistic nor the most pessimistic - regarding the pre-salt layer are confirmed and that a substantial fraction of the surplus can be allocated to finance a good part of those investments. It would be a good alternative use of scarce resources, especially in a country where public investment was drastically reduced, and where the payment of interest of public debt absorb about 6% of GDP and the orthodox fiscal policy imposes high fiscal surpluses just to cover the cost of such interest.

4. In regional terms, we also have new problems to face. Although there was a modest convergence of state per capita income and agricultural and industrial decentralization, the most serious regional problems (the social ones) had no substantial improvement. It so happens that, with the fiscal crisis and the compromising of our budget with paying interest, funding for the regional area has shrunk, and consequently the formulation and implementation of regional development policies also dwindled, just as the regional development institutions have failed to rediscover their original meaning.

In the so-called political struggle for regional survival, little remained for subnational units (states and municipalities) to do other than intensify a suicidal fiscal war between all the territories, giving private capital scarce resources that should be given to the people.¹⁷

4 KEY CENTRAL ISSUES FOR THE RESEARCH AGENDA

One must understand that we are faced with the problems of two crises. The current international one, which erupted in mid-2007 and still shows uncertainty of its recovery, and the structural one, which plagues us since 1980 and, even if it has changed part of its structure - external public debt, for example - has accumulated perverse effects that are arduous to overcome. Thus, the itemization of proposed lines of research should be preceded by a discussion of the two crises.

17. About the fiscal war, see the recent doctoral thesis by Cardozo (2010). On the regional issue in the post-1970 era, see Cano (2008).

4.1 The current crisis¹⁸

Its nature is more complex than that of the previous ones - especially that of 1929 - due to the deepening of globalization and large financial deregulation that have taken place since the late 1970s and the exacerbation of the domain of the international financial system. Though its outbreak has taken place in the international economy, with its epicenter in the United States, this crisis reverberated unevenly in all countries. Thus, one has to consider it in the foreign and domestic plans of analysis.

4.1.1 In the international sphere

There are many uncertainties about the U.S. financial reform and the crisis in the European Union. Indeed, a recent (June 2010) law approved by the United States Congress created a consumer protection agency to better regulate mortgages, loans and other financial practices, as well as an oversight board on systemic risk, which would broaden the authority of the Federal Reserve on major financial institutions and rules so that the liquidation of financial institutions not be held at the expense of taxpayers' money. However, the measures do not affect nor correct, to the required depth, the liberality held by financial capital.

Moreover, the last meeting (June 27, 2010) of the G20 was at best frustrating for those who believed that there would be a general agreement to impose tough rules on the financial system. Europe, notably through the voice of Germany, called for coordinated action for countries to carry out a "sanitization" of their public finances between 2011 and 2013 (the old recession policies) and also impose taxes to discourage high-risk financial transactions. But the recessive suggestions (with the exception of the promises made by the UK and France), did not enthruse many European countries.

In turn, the United States, although they agreed with the proposal rhetorically, voted against it, arguing that it would be up to each country to decide on the matter. Brazil backed the U.S., arguing that the taxation of our financial system was already high and the current regulation was sufficient to control it. Interestingly, the creation of a global tax on international flows of capital was part of the Labor Party's electoral claims at least until 2002.

It is obvious, therefore, that such proposal was left for dead, showing in fact that there is no international political power for such disciplining of the financial market. In other words, capitalism continues to push the crisis forward. However, this increases uncertainty regarding the end of the crisis, and in fact represents an increased likelihood of the establishment of a "programmed recession" in Europe, which, in addition to further undermining the euro, could reverberate throughout

18. Cano (2009) discusses this crisis and its main effects on Brazil and Latin America.

the world, lengthening and deepening the crisis to the point where it could become a depression.

Our research and reflections should also seek to better understand the following issues:

1. There are serious outstanding issues in the United States: the stock market shows enormous uncertainty regarding the possibility of better pricing the remaining “toxic waste”; the form and source of financing of the fiscal deficits of the country in 2010-2012 are still uncertain; and speculation in the derivatives market seems to have returned.
 2. Furthermore, data shows that the debt and public budget crises in Greece, Portugal, Ireland, Spain and Italy are profound and severe, Greece being the worst, among other reasons, for its carrying out of financial transactions with Goldman Sachs, thus defrauding its true situation to the European Union. These facts not only undermined the euro but brought even greater reservations about the future of the EU, its economy and the credit and interest rate policies to come. The total funding of these debts with banks is estimated at about US\$ 1.5 trillion, and this fact, together with the return of financial speculation, led to an alert being issued by the Bank for International Settlements (BIS) on the possibility of a return of European recession. Accordingly, various recessive measures which have already been taken - cutting public spending, raising interest rates, cutting wages etc.. - are signs of an inevitable prolonging of the crisis. A likely rise in interest rates in the EU and a contraction of its capital outflows to developing countries would be bad for us and contaminate us rapidly.
 3. Could China take the role of “locomotive” in the international economy? Will China behave like the British Empire in the nineteenth century, trying to greatly expand the number of areas providing them with primary goods, lower their prices and further expand its overseas markets for manufactured products?
 4. What are the main reasons for the poor performance of our recent exports of industry-intensive goods, especially *manufactured* goods, and how can we overcome the problem?
 5. What are the possibilities for greater integration in South America and how can we expand the limited economic effects such integration has today?
- 4.1.2 In the national sphere, one has to ponder and reflect on the following:
1. If we focus on official GDP figures, they show a recovery beginning on the second half of 2009. The output of the manufacturing industry, although

7% lower in 2009 than that of 2008, slowed its fall at the year's last quarter. However, it would only reach pre-crisis levels in April 2010, and even so with a few indicators still showing figures below those of the pre-crisis period. The data shows, however, a somewhat slower growth, and the most affected sectors were the most complex branches, mostly those related to capital goods, hit hard in the previous decade. In other words, we are regressing with our industrial structure. Thus, if we want to regain international competitiveness, we must change our industrial structure, by restructuring investment and accelerating the incorporation of technical progress.

The current trade deficit for industrial average-to-high and high technology goods has gone from US\$ 18 billion to US\$ 23 billion, and the trade surplus for low-tech goods increased from US\$ 11 billion to US\$ 35 billion (ALEM, 2009). In electronics, the trade deficit in 2008 reached the figure of about US\$ 23 billion.

Our innovative skills are low, as has been verified by the Institute for Studies in Industrial Development (Iedi), which claims that, out of the total 4.4 million businesses, only six thousand perform research and development (R&D), and the reason for that lies in the frailty of our industrial policy. Iedi also shows that, out of the total amount of public resources allocated for that end, 61% comes from the Computer Act (a Brazilian law which provides fiscal incentives for computer electronics companies that invest in R&D) and represents, in reality, subsidies to keep the few remaining companies that are still here in the country so as to offset the high tax incentives granted to enterprises in the Zona Franca in Manaus (IEDI, 2010). It is not, therefore, a Science and Technology (S&T) Policy, but one of maintenance of delay.

The crisis that hit the automobile sector - with decreases of 12.4% between 2008 and 2009 - was not due solely to the internal market: between 2005 and 2008, while we increased production by about 900,000 vehicles, our exports were reduced by about 400,000. That is, part of the crisis was due much more to the currency appreciation policy than to the problems of the internal market. However, this sector was the one most privileged by policies to combat the crisis, having received the largest investments and big tax cuts.

Other sectors which enjoyed tax and credit benefits, such as that of durable consumer white goods (major appliances), building materials and the construction sector itself, also played an important role in this *recovery*. However, in late January this year, incentives were ceased for white goods producers; at the end of March, the benefit for the other subsidized products was also terminated - with exception to construction materials; consequently, in mid-May, the trade of consumer durable goods already presented negative figures. In April and May, indicators were already presented in the media which showed isolated contraction of production and sales in some sectors. Currently (June 2010), the auto industry advocates with

the government that it permanently reduce its Tax on Industrialized Products (IPI, a Brazilian VAT which is only charged on the manufacturing stage) for flex-fuel vehicles (running on ethanol and gasoline). The government complied extending the reduction until December 31 2010 for trucks, pick-ups and tractors.

However, the recovery process cannot be sustained, in the long term, just by household consumption. Such consumption has grown (besides the effects of the aforementioned credit expansion) mainly due to payroll loans granted by banks and the doubling of the average collection period (from 17 to 31 months), and also to a small improvement in income due to social policies, which caused an increase of the average debt capacity of households which has supposedly affected more than 40% of annual household income originating from work. One must wonder what limit there will be to this process, since it is estimated that defaults will increase in coming months. It is also relevant to point out that industrial unemployment had a record high in 2009 and, therefore, the recovery of gross employment numbers (all sectors average) that can be observed as of the second half of 2009 is basically due to the services sector, where, as we know, informal employment and low salaries proliferate.

Foreign trade data from 2009 compared to that of 2008 shows no recovery: total exports accumulated a decrease of 22.7%, and those of manufactured goods fell even more (27.3%), while total imports fell 26.2% - and did not decrease even further because of the strong currency appreciation. The results were not even worse thanks to the doubling of prices for sugar and the significant increase in the volume of exports of various commodities such as sugar, maize, soybeans, aluminum, cellulose and orange juice.

Only after the second semester could an improvement of various prices be verified, which allowed exports to rise 28.7% and imports by 40.2% between January and May 2010 compared with the same period in 2009; over 2008, however, exports grew only 0.1% and imports 4.7%, as a result of which the trade surplus shrank, amounting to meager US\$ 5.6 billion in the same period in 2010. This is worrisome because in the first quarter we sent a net US\$ 16.7 billion abroad as remittances of profits, interest rates and purchases of services, resulting into a deficit of current transactions of the order of US\$ 14.5 billion.¹⁹ This deficit is estimated at around US\$ 50 to 60 billion for 2010. The picture gets even worse given that, over the same period, foreign direct investment (FDI) is 11% lower than in 2009. Fearful of a disaster, the government launched in May this year a “package of kindness” to the export sector which consists of reducing taxes and tariffs, expansion of credit and creation of the Foreign Trade Guarantee Fund, hoping, thereby, to allay the perverse effects of exchange rate appreciation.

19. According to the Central Bank, remittances of profits went from US\$ 3.3 billion in 2000 to US\$ 33.8 billion in 2008.

2. But what sustentation and capacity for structural transformation can a recovery process have that is grounded on those incentives to expansion of household consumption, weak export performance and modest investment rate? To create more secure mechanisms for raising the effective demand it is necessary to not only move the investment rate sharply upward, but also to change its structural composition. However, in the public sphere, despite the increased investment in the first half of 2010, and even with the Growth Acceleration Program (PAC), the resources for doing so continue to be slim, and, in the private sphere, there is great uncertainty for investment in infrastructure and in the processing industry.

Let us recall, however, that our reversal rate (which had climbed from 20% in the 1960s to 25% in the next decade) dwindled after the debt crisis, decreasing even further after the adoption of neoliberal policies, to about 16%, leveling off at 18% in the 2006-2008 triennium. However, despite this quantitative problem, there is another, qualitative: that its structure has changed, services and other sectors becoming a growing part of it, and the processing industry on the other hand becoming increasingly smaller in proportion. Here lies part of the substantial delay in S&T mentioned above.

For example, for industrial investments estimated by BNDES for 2008-2011, residential construction would account for 44.1%, infrastructure for 19.1% and the rest of the industry 36.8%. However, out of the percentage for industrial investment, energy and mining sectors account for 68.2%, automotive 7.8% and industrial commodities 19.8%, while those areas that are - or should be - considered strategic, such as electronics, pharmaceuticals and software add up to only 4.9%.²⁰ Estimates for 2010-2013 show that, although the estimated total volume should grow, the structure of investments will present little change.²¹

3. Given these facts, how can we defend from China buying more primary commodities and being even more aggressive in industrial exports to developing countries? And how to accelerate the economic integration of South America?
4. Moreover, this *recovery* does not change the macro framework for the medium and long term: low average growth rates, high interest rates, continued reprimarization of the export portfolio, etc. We may, in 2010, grow somewhere around 5.5% - according to current estimates - but without changing that framework, we will not achieve sustained recovery with persistent elevated rates and the resuming of reindustrialization.

20. See Torres Filho and Puga (2009) on that regard.

21. See BNDES (2010) on that regard.

5. Moreover, a “recovery” that is so distorted and unsustainable detracts attention from relevant concerns with the long term and decreases the opportunities for structural changes in the current economic policy.
6. Optimists say we will not have major problems with our external accounts, not only because of high trade surpluses we have been achieving but also because of the large flows of foreign investment that entered the country in recent years, which increased our reserves to over US\$ 200 billion and made our net external public debt negative.

However, it is worth recalling some relevant issues. Our trade surplus rose between 2003 and 2007, when they reached US\$ 40 billion, but fell to about US\$ 25 billion in 2008-2009; decelerated in the last quarter of 2009 and were markedly reduced in the beginning of 2010, with forecasts for the future that can be considered (should the current policy of appreciation be maintained) bad. Spending on services and income - notably remittances of profits and income from government bonds - has grown strongly, given the international scenario. The result is that the balance of current transactions, which was almost zero in 2007, converted in 2008 and 2009 to US\$ 28 billion and US\$ 24 billion, respectively, and, as suggested, there are worse forecasts for 2010.

This deficit has been covered with leftovers: the sharp increase in direct investment verified since 2003, which reached US\$ 45 billion in 2008, but which plummeted to US\$ 26 billion in 2009; and the flood of portfolio investments, which went from US\$ 5 billion in 2005 to US\$ 48 billion in 2007, almost zeroed in 2008 and shot up to US\$ 41 billion in 2009. It is true that the external public debt, which stood at US\$ 88 billion in 2005, dropped to US\$ 69 billion in June 2009. However, private debt, on those dates, jumped from US\$ 82 billion to US\$ 130 billion, the result of which is that total debt - including the financing of companies - has actually increased from US\$ 188 billion in 2005 to US\$ 270 billion in June 2009. Considering that foreign capital on August 31st 2009 amounted to US\$ 212 billion in equities and fixed income bonds and that these documents, under certain circumstances, can be settled in 24 hours, I do not see reason for great optimism in the face of this colossal increase in external liabilities.

7. The current exacerbation of the stock market shown by the indices of the São Paulo Stock Exchange (Bovespa) is due, mostly, to the huge amount of foreign investment in equities and fixed income bonds, not only because of the feebleness observed in the international market - low asset prices, negative real interest rates, weak dollar, among other things - but mainly due to the magnanimity of the national interest and exchange rates. However, this pinnacle of market activity seems to be reaching its end, with the decline of the Bovespa index in recent months; also, if the bubble bursts, it is not difficult to foresee the explosion of interest and exchange rates. What should we do, in terms of macroeconomic policy, in the face of this possible scenario?

8. And, also, faced with a probable decline of international financial flows, what action may the State take to reorganize and refocus the public and private domestic credit in the long term?

4.2 The structural crisis: 1980 to today

The structural crisis is a cumulative process: new political and economic events that have occurred throughout the entire process amalgamate and accumulate on top of those responsible for its origin. Different dynamics of expansion and crisis are joined together and superimposed. Accordingly, the effects of the more recent crisis also add to the structural crisis. This causes more difficulties and demands more research work for its adequate understanding.

Given that there is a greater availability of studies on the international economy of the past three decades, I see no need to detail them in this study. But we must remember that their analysis is instrumental for us to fulfill our task. Domestically, it is imperative to know the “state of things”, namely the need to perform a broad diagnosis in terms of space, sectors and themes, and national and regional issues.

It is worth remembering, initially, that the structural crisis, which also contains the current crisis, *roughly* corresponds to the period from 1980 to today, one of low growth rates, and its division of periods could be subdivided into the following phases:

1. 1980s: corresponds to a period of high inflation, low growth and fiscal and financial crises in the State and in the balance of payments.
2. From 1989 to 2002: not only did the problems of the previous period accumulate, but some of them also amplified and new ones were created. Privatizations, trade liberalization, financial deregulation and currency appreciation are the main milestones of the period. Inflation would be contained after July 1994 – through the Real Plan – but at the expense of a five-fold increase in our real internal public debt, an enormous appreciation of exchange rates – activity for which we squandered US\$ 200 billion between 1995 and 2002 – and the placing of real interest rates at absurd levels. With the process of negotiating state and municipal debt with the federal government, the fiscal crisis spreads through subnational entities, bringing public investment down to insignificant levels. The labor market, which had already been deteriorating in the previous period, increases open unemployment and makes it even more precarious.

3. From 2002 to 2008: includes the recovery of international trade (“China effect”).²² GDP average growth rates were higher than in the previous period due to: *i*) a large expansion of exports of commodities, *ii*) the increase in payroll loans - mainly by public banks and primarily based in household consumption - which is almost without risk to bankers, and *iii*) an expansion, at the end of the period, of public long-term credit - through BNDES - which provided some form of boost to the investment rate. The absurd real interest rates and the scenario observed in the international market favored a stark increase in capital inflows marked by an increase in foreign investment, notably in services - financial, mainly - and in stock market speculation. The brighter side of economic policy was the social policies, with the considerable expansion of the minimum income program (Bolsa Familia) and of the real minimum wage, which decreased the levels of poverty and destitution and also provided for increased levels of household consumption.
4. After the end of 2008: includes the current crisis and contains many uncertainties, both internal and external, as those have been previously mentioned.

The cumulative effects of the bigger crisis are reflected in the economic, social and political structures. They are projected in the radical change of budgets and the pressure exerted on them by interest rates; in the extremely high regressivity of the tax burden; in the deterioration of national and regional development policies; and in the deindustrialization of the country. They implicate, ultimately, in the technological backwardness of the economic and social infrastructures.

It is noteworthy, in regard to production structures, that the openness and the crisis profoundly altered the structure of industrial production and investment. These facts, along with the fiscal crisis and the deterioration of long-term policies, have led states and municipalities to wage fiscal wars, distorting the (already spurious) process of decentralizing regional production. The “China effect” has provided for strong stimulus to global exports of commodities, and this prompted a great expansion of our mineral and agricultural frontiers, greatly exacerbating the seriousness of environmental issues and the urbanization process of the country itself.

Specifically on urbanization, I must mention the warnings I have made, since the 1980s, about the neglect of urban planning, the little attention given

22. It should be understood that the “China effect” is not just the expansive effect - direct and indirect - in the exports of commodities derived from the increase in real growth rates of the Chinese economy and of world trade, because this effect also takes place in a movement towards international financial speculation of bonds and commodities, which culminated in the international crisis that erupted in mid-2007.

to social investment and basic sanitation and the effects of the national housing policy inherited from the military regime, which provided for remarkable increases in urban speculation and would later exacerbate the current urban disasters (CANO, 1989). This would result in a “chaotic and volatile” urbanization, which drove the proletariat into marginal neighborhoods and occupied unsuitable spaces - hills, wetlands, conservation areas etc. - and whose foreseeable results was to be serious disaster, as, regrettably, we are witnessing in recent times. What we’re seeing now is deplorable statements made by political leaders attributing these disasters exclusively to the “imbalances of nature”, trying to exempt themselves from their responsibility on the matter.

4.3 Itemization of a research proposal

To conclude this section, it is fitting to list the major items that should comprise the Research Agenda, warning however that this is a tentative list which can include many other items or even the further development of some of the ones listed here:

- major structural transformations of the major productive sectors (agriculture, mining industry, processing industry, construction and services) and the segments of infrastructure; technology gaps, supply deficits, deindustrialization and strategic products;
- main national and regional effects of the expansion of agricultural and mineral frontiers;
- programs for the implementation of agrarian reform and their main purposes;
- regional decentralization of industrial production and infrastructure and its major economic, environmental, political and social effects;
- major changes in the labor market;
- major changes in the process of urbanization;
- assessment of the deficit – current and for the next 20 years – in housing and sanitation;
- major demographic changes, inter-regional movements and social conditions of the population;
- critical review of income distribution in Brazil, especially the incomes of properties;
- major structural changes of foreign trade: main products, destination and prices;

- public finance: fiscal effects of fiscal wars, increase in the regressivity of taxes;
- major changes in the national system for public and private funding, growing “privatization” of the public long-term financing system and major perverse effects on the macroeconomy;
- in-depth study of the international economy, its current scenario and key trends; and
- review of the main effects, advances and setbacks in the economic integration of South America.

5 MAIN LINES OF APPROACH FOR A NEW PROJECT FOR NATIONAL DEVELOPMENT

Radical optimists believe, in light of some positive economic data and on their impressions, that “the crisis is gone” and, from 2010 on, we would enter a new cycle of growth whose rates, they estimate, would be at least 5% annually, without questioning the quality of that growth, that is, the structural changes such growth would bring. For those individuals, there is little point in thinking about a new national project for development. Others, not so optimistic, but also believers in that recovery and in the market, at least see the urgent need to recover not only growth but also industrial competitiveness, badly shaken as it now stands. For those, a strategy is needed for this purpose, a “developmentist” one.

For critics, however, all this is necessary, but only as part of what should constitute the new project, which should have as its central policy vector a fully-fledged attack on our greatest inequalities and a real strategy of resumption of industrialization, with a view to achieving an economic growth that is grounded on an environment that can lend it sustainability. This is the content of the *proposal* here being formulated.

I emphasize even further that the current model, in addition to being isolated from industrialization, is unable to maintain annual growth rates that are *high and persistent in the long-term*. Let us go over the issue once more.

5.1 The inconsistency of the neoliberal model

In the macroeconomy which ran between 1994 and 2002, the stabilization policy was the flagship and was based on highly valued exchange rate, high interest rates and the tax base that provided for the payment of the interest rates of our public debt, which at the time amounted to around 8% of the country’s GDP. Thus, the resulting external imbalance has resulted in an accumulated deficit of current transactions – between 1995 and 2002 – of about US\$ 200 billion.

The more the GDP grew, the more net expenses in foreign currency - in services and payments of income - increased, and thus the consistency of the model was given by the presumption of continuity of large and growing inflows of foreign capital. But this continuity, as we know, is non-existent, given the circumstances of the international economy: crises, interest rate fluctuations, cycles in stock markets etc. Against the opinion of official economists, I discussed this fact in 1997, showing that the model was unable to ensure a high annual growth rate that was persistent in the long-term. The internal and external exchange rate crises of 1995, 1998, 1999 and 2001 demonstrated the reality, and the average growth rate of our GDP from 1989 to 2002 (2%) was as mediocre as those from the 1980s.²³

In 2003, another meager growth rate: 0.6%. From 2003 to 2008, average growth rates (4.5%) rose again, supported by the growing inflows of foreign capital which ensured high exchange rate expenditures and also allowed for a strong recovery of our reserves. The higher growth rate verified, however, was ballasted on a strong increase in exports (“China effect”) and in household consumption, but without recovering the investment rate. With the crisis (2008-2009), paradoxically, we further expanded our net external liabilities, given the international market situation, the generous interest rate and the paradise that the financial market had become, resulting in a manifold increase of capital inflows, especially for the stock market. The result accumulated between 2002 and 2009 is not auspicious, with the average annual growth rate of GDP at approximately 3.2%. But now, since early 2010, when capital inflows have shrunk, we once more envisage the looming threat of a worsened currency mismatch and cast doubts on the continuity of the current growth rate.

However, we repeat, there is another more serious issue, which is the form of growth of recent years. In addition to household consumption, exports were what drove the rise in GDP.²⁴ But these were predominantly of primary goods, and investment, albeit rising a few points, is still very low - about 18% of GDP. But it is not simply a matter of raising the investment rate: it is likely to rise - according to forecasts from BNDES - already in 2010-2012, by means of inversions that are being prioritized by the PAC for the 2014 World Cup and the Olympic Games of 2016, in addition to those scheduled for the pre-salt layer.

I am not opposed, obviously, to increasing our exports of commodities, and even less so to increasing household consumption and credit. What I criticize

23. See (CANO, 2000) for research and analysis on neoliberalism in the major countries of Latin America and in Brazil in 1997

24. Indeed, the economic recovery in late 2009 is due more to fiscal and credit incentives granted to the most affected sectors. Most of such incentives were due to end in the first quarter of 2010, and the government was to extend several of them.

is that investment moves upwards very little, and, moreover, little of it goes to the processing industry - except for the processors of exports. Needless to repeat the issues already mentioned, such as deindustrialization, reprimarization of the export portfolio, the inadequate supply of infrastructure and our backwardness in science and technology.

There are many economists who not only think that this reprimarization is beneficial, but also that industrialization is no longer as important as it once was. Some even praise the “Australian model”. They seem to ignore the difference between the deindustrialization of that country and ours; the differences between a developed country, whose per capita income is US\$ 44,000, and an underdeveloped one whose income is just US\$ 7,000, a figure from which we should discount the high exchange rate appreciation that inflates the number in dollars; and the fact that we have nine times the number of inhabitants that Australia does.

It is worth adding that the current type of growth, besides destroying manufacturing jobs, creates more jobs in the tertiary sector, predominantly low-income and low-skill positions, and therefore is also bad for the urban poor, who will continue to widen even more the so-called “urban swelling”. With such a model, we are not going to reduce hidden unemployment. Moreover, we must remember that this growth has narrow limits in face of the possibility of discontinuity of the current external resources and the expansion of consumer credit.

Among the political conflicts that we suffer in Brazil is the one which divides those who desire for high and fair growth and those who profess “stability at any cost”. All it took were some signs of recovery and promising estimates that we would grow 5% - or more - as of 2010, and the usual voices have claimed (and already obtained) the resumption of increasing interest rates, but still insist on credit control and on maintaining the fiscal surplus, “to prevent or contain the rise in inflation”. The Central Bank took steps, in February that same year, to resume previous levels of reserve requirements for means of payment for the banks, which will be extended from July 2010. In May this year, the annual SELIC rate²⁵ rose from 8.75% to 9.5%, and in June this year, to 10.25%; and this rate will rise even more. Moreover, the government has already announced a cut of US\$ 10 billion in the General Federal Budget (Orçamento Geral da União). With that, and with the end of most of the incentives created during the crisis, the economy was already showing signs of deceleration as of April this year, in face of which the government, paradoxically, has extended the term of the tax incentives. Namely, will we watch, again and “in full fanfare”, one more *forced landing* of the flight of the chicken?

25. Special Liquidation and Custody System (SELIC)

5.2 Summarized lines of a new development agenda²⁶

This proposal is part of a general assumption, which is the unavoidable necessity of regaining the management of our most sovereign economic policy, and for which there is no escaping the question of breaking with the current model. Such breaking is therefore made much-needed, without which we cannot think nor take the decisions necessary to achieve our goals of growth and social development. It is therefore necessary to regain our lost economic sovereignty.

Obviously, the design and implementation of a new project should be preceded by a transition strategy, which would allow us, in the shortest time possible, to deploy the new national project, i.e. a new model of growth with social redistribution of income and assets.

Given the complexity of social and economic crisis in Brazil and its major internal and external constraints, as well as the variety of stresses and demands of classes/sectors/regions/themes, it would be impossible to choose one only determinant and vector of production growth, be it the well-known “export driver” or the “mass internal market”.

Making a choice for the internal market would strongly affect public spending capacity for the next 20 years with the resources demanded, in face of the accumulation of public and private investments needed and not performed. The export driver vector, on the other hand, would not prevent the growth of imports of inputs and supplies - as well as external services and income - which could impinge upon external constraints.

It is important to remember that, given the conditions of the international economy, it would be impossible to expand our exports further enough to cope with the demand for imports. Much less so in a way through which we could make our exports the main determinant of income and employment.²⁷

That would require high-quality industrial production, specialized in large scales, which would require significant imports of goods and technology. As an attenuating factor, certain sectors that are less demanding of imports could be detected - or that generate high levels of exports - but it would still be very difficult to diversify and boost our exports to the necessary levels.

26. Since 1990, I have been seeking to build such a proposal, and a more detailed one than that which is presented here. See the proposal in Cano (2007b), of which this subsection is a summary. Among other proposals and discussions on the subject, see Gentil and Messenberg (2009), Magalhães (2009), Sicsú and Castelar (2009), Sicsú and Miranda (2009) and Velloso and Albuquerque (2010). The *Isto É* magazine (February 7 2010 edition) published an interview with Minister Samuel Pinheiro Guimarães from SAE/PR, featuring some of the topics that will be soon publicized by the government, such as the Brazil Plan 2020.

27. The more detailed version of this proposal (CANO, 2007b) includes an appendix with some considerations on the difficulties to increase exports at the current origin-destination framework of Brazilian foreign trade.

It is not difficult to deduce that any of the two vectors mentioned would impose serious financing problems in the long-term, internal or external, and, eventually, in inflation and in the balance of payments issues. Moreover, it must be made clear that the growth enabled by any of them alone is insufficient to handle the problem of employment, and even less so that of our social crisis.

That means one must define a strategy that is not excessively reliant on a single vector and which uses “a bit of everything”. Such strategy would include several sectors at the same time, giving priority to the technological upgrading of strategic segments, scaling the use of scarce resources in time (exchange rates and public finances). Even an “optimum” combination of sectors in time and space will not prevent our major needs for imports, and this, added to access to modern technologies, would impose pressure on our capacity to meet international payments, forcing us to strengthen an export policy.

The alternative proposed in this study will prioritize the vector of the internal market via growth with income distribution with a view to making use of and expanding our mass market. The main activities covered would be: the housing sector, focusing on the popular segment; sanitation; education; culture and public health; and basic goods.

The second main vector would be production of industrial exports, without neglecting, of course, commodity exports. This would require an accurate and timely strategic selection to recover what we have lost in terms of “potential products and markets”, and, in the medium term, the selection of products of higher added value and technological content to diversify our export portfolio and the external markets we can reach.

I am aware that the purposes set out and reforms itemized below may trigger external conflicts - with the United States, the International Monetary Fund (IMF), the IBRD, the World Trade Organization (WTO), international banks and other examples, as well as internal conflicts with national and regional elites, political parties, part of the entrepreneurs, the financial system, some unions etc. - which necessarily implicates the need for the prior construction of a new and difficult pact of political power. This pact will have to go through negotiations between *parties, the working class, businesses, regions and sectors*, requiring accurate and finely tuned political preparation for such end. Without this, it is hard to think of options within the limits of democracy.

It is instrumental to remember that these reforms must be implemented incrementally, in accordance with the prioritization set, with the complexity of external and internal constraints and with developments that may arise in the short, medium and long term. Finally, I present the concise set of policy actions –short,

medium and long term – and of structural and institutional reforms needed to implement the new agenda:²⁸

1. *State Reform*: greater administrative streamlining, realignment and upgrading of civil service; reassembly of the national system for planning; and reintroduction of selective capacity prioritization.
2. Study and proposal of *special portfolios* for exports and imports that can be created via special agreements for increased trade integration with Latin America and other peripheral countries, especially with the three other “continental” countries, China, India and Russia. These portfolios would have a complementary nature between Brazil and these countries, expanding trade in products who would normally have a lot of troubling entering - or growing in - other markets.
3. Addressing the *external debt and external liabilities service* to match both an exchange rate budget that sustains the resumption of investment and growth, and, mainly, that conditions our ability to amortize them in accordance with monetary and fiscal availabilities.
4. Addressing *domestic public debt* to better match public accounts to accelerated economic growth and contain the structural pressure exerted on the interest rate. Since the three spheres of government are financially compromised, this addressing should cover all those instances.
5. *Progressive fiscal and tax reforms* that could readjust public accounts and regional and local levels of competences, simplify the tax system and offer, in short, the financial conditions required for a modern, efficient and socially just State. It should be a priority to combat the current fiscal war.
6. *Long-term financing*, mainly for infrastructure and industry that are considered heavy or of high technological complexity, in addition to the recent strong efforts to expand long-term credit from public banks - notably by BNDES. Such financing is perhaps the most crucial question of our economic policy, given the enormity of its needs and limitations of its current sources. Thus, it is imperative to restructure the *financial system* to hinder speculation, strengthen the capital market and address the structural bottlenecks of long-term financing.
7. *Social reforms (agrarian, water supply, urban, public health, social security, educational and environmental)* designed both to tackle emergency problems of the poor and to reach the entire society in a long-term perspective.

28. This relation reproduces, almost to the letter, the reforms presented in Cano (2007b).

8. *Enterprise reform*, to allow business to adapt to the new administrative, productive, financial, and social requirements and to allow for greater transparency of their results, their efficiency and their social role in a modern and fairer society.

REFERENCES

- A REESTRUTURAÇÃO do capitalismo no Brasil. **Revista do Instituto Humanitas Unisinos**, n. 322, 23 mar. 2010. Available at: <<http://www.ihu.unisinos.br/>>. Accessed March 27th 2010.
- ALEM, Ana C. Uma reflexão sobre as restrições ao crescimento econômico brasileiro: uma abordagem alternativa à do produto potencial. *In*: GENTIL, Denise L.; MESSEMBERG, Roberto P. (Org.). **Crescimento econômico: produto potencial e investimento**. Rio de Janeiro: Ipea, 2009.
- BANCO NACIONAL DE DESENVOLVIMENTO ECONÔMICO E SOCIAL (BNDES). **Visões do Desenvolvimento**, Rio de Janeiro, n. 81, 21 maio, 2010.
- CANO, Wilson. Urbanização: sua crise e revisão de seu planejamento. **Revista de Economia Política**, São Paulo, v. 9, n. 1, jan./mar. 1989.
- _____. **Soberania e política econômica na América Latina**. São Paulo: UNESP, 2000.
- _____. Brasil: é possível uma reconstrução do Estado para o desenvolvimento? **Revista do Serviço Público**. Escola Nacional de Administração Pública (ENAP), ISSN 0034/9240, Brasília, p. 59-69, 2007a. Special edition.
- _____. Agenda para un nuevo Proyecto Nacional de Desarrollo. *In*: VIDAL, Gregorio; GUILLÉN, Arturo R. **Repensar la teoría del desarrollo en un contexto de globalización**. México: Clacso, Unam, Red Celso Furtado, 2007b.
- _____. **Desconcentração produtiva regional no Brasil: 1970-2005**. São Paulo: UNESP, 2008.
- _____. América Latina: notas sobre a crise atual. **Revista Economia e Sociedade**. Campinas, v. 18, n. 3, (37), dez. 2009.
- CANO, Wilson; GONÇALVES, Ana L. Política industrial do governo Lula. *In*: **Os anos Lula: contribuições para um balanço crítico 2003/2010**. Rio de Janeiro: Garamond, 2010. In press.
- CARDOSO JR., José C. (Org.). **Desafios ao desenvolvimento brasileiro: contribuições do conselho e orientação do Ipea**. Brasília: Ipea, 2009.
- CARDOZO, Soraia A. **Guerra fiscal no Brasil e alterações das estruturas produtivas estaduais desde os anos 1990**. Thesis (Doctorate) – Universidade Estadual de Campinas, Instituto de Economia, Campinas, 2010.

CENTRO DE GESTÃO E ESTUDOS ESTRATÉGICOS (CGEE). Ministério da Ciência e Tecnologia (MCT). **Estudo da dimensão territorial para o planejamento**. Brasília, 2008.

GENTIL, Denise L.; MESSENERG, Roberto P. **Crescimento econômico: produto potencial e investimento**. Brasília: Ipea, 2009.

GUIMARÃES, Samuel P. **Plano Brasil 2020**, São Paulo, n. 2100, 27 fev. 2010. Interview for *Isto É* magazine.

HYDRO. **Acordo entre Vale e a norueguesa Hydro cria gigante mundial do alumínio**. Available at: <www.hydro.com/p/A-Hydro>. Accessed May 3rd 2010.

INSTITUTO DE ESTUDOS PARA O DESENVOLVIMENTO INDUSTRIAL (IEDI). **Desafios da inovação – incentivos para inovação: O que falta ao Brasil?** São Paulo: IEDI. Available at <www.iedi.org.br>. Accessed Feb. 11th 2010.

MAGALHÃES, João P. A. **O que fazer depois da crise: a contribuição do desenvolvimentismo keynesiano**. Rio de Janeiro: Contexto, 2009.

PIRES DE SOUZA, Francisco E. Da reativação da economia ao crescimento de longo prazo: a questão da competitividade e do câmbio. *In*: VELLOSO, João P. R.; ALBUQUERQUE, Roberto C. **Na crise, esperança e oportunidade, desenvolvimento como sonho brasileiro**. Rio de Janeiro: Campus-Elsevier, 2010.

SICSÚ, João; CASTELAR, Armando (Org.). **Sociedade e economia: estratégias de crescimento e desenvolvimento**. Brasília: Ipea, 2009.

SICSÚ, João; MIRANDA, Pedro (Org.). **Crescimento econômico: estratégias e instituições**. Brasília: Ipea, 2009.

TORRES FILHO, Ernani T.; PUGA, Fernando P. Panorama dos investimentos na economia brasileira para 2008-2011. *In*: GENTIL, Denise L.; MESSENERG, Roberto P. **Crescimento econômico: produto potencial e investimento**. Brasília: Ipea, 2009.

VELLOSO, João P. R.; ALBUQUERQUE, Roberto C. **Na crise, esperança e oportunidade, desenvolvimento como sonho brasileiro**. Rio de Janeiro: Campus-Elsevier, 2010.

NEW FRACTURES, OLD WOUNDS: AFRICA AND THE RENEWAL OF SOUTH AGENCY

Carlos Lopes*

Over the last decades, the world has witnessed the African continent's transformation into an increasingly relevant actor in the global political arena, as part of the emerging South. The most remarkable aspect of such transformation in the global discourse points to the recognition of the economic potentialities of Africa, who gathers momentum as the "new frontier of development". This new level of visibility of the continent has led to the rise of a new "south agency", due to the increasing prominence of a number of African countries and thus South-South cooperation arises as a development opportunity for the globalized south. In that sense, this work endeavors to analyze the complexity of this new agency, the main trends for international cooperation and its role in building the history of the 21st Century.

NOVAS FRATURAS, VELHAS FERIDAS: A ÁFRICA E A RENOVAÇÃO DA AGÊNCIA DO SUL

Nas últimas décadas, o mundo testemunha o aumento da importância do continente africano no cenário político mundial, como parte do emergente Sul. O aspecto de maior destaque no discurso global aponta para o reconhecimento das potencialidades econômicas na África, que chama atenção como "nova fronteira de desenvolvimento". A maior visibilidade dada ao continente revela o surgimento de uma nova "Agência do Sul", devido à crescente importância de uma série de países africanos. Desse modo, a cooperação Sul – Sul surge como oportunidade de desenvolvimento para o Sul globalizado. Assim, este artigo tem por objetivo analisar a complexidade dessa nova agência, as principais tendências de cooperação internacional e seu papel na construção histórica do século XXI.

1 INTRODUCTION

Africa has recently come to the forefront of the world politics as part of the emerging South. Its increased prominence in the global discourse as a "new frontier of development" signals the recognition of its economic potential. Indeed, the continent has registered an average 5% annual GDP growth rate over the past decade. However, there is more than that. The rising profile of the African continent equally reveals the growing role of a number of its countries in the emergence of a new South agency.

It is argued that South-South cooperation is an opportunity. The discussion of the current situation in Africa will therefore be placed in this wider context.

* Senior UN official, director of the United Nations Institute for Training and Research (Unitar) and of the United Nations System Staff College (UNSSC).

The renewal of a South agency witnessed over the past decade is, somewhat, different from the trilateral alliance of Asia-Africa-Latin America formed in the wake of decolonization. Current mega trends demonstrate that the global South, driven by a number of regional powers, will play a vital role in shaping the 21st century history. Understanding the complexities of this renewed agency is vital for addressing old wounds that have marked the emergence of a South voice in the not so distant past.

1.1 The "return" of history

The decades following the end of the Cold War offered a tantalizing glimpse of a new kind of international order, with nation-states coming together or disappearing, ideological conflict melting away, cultures intermingling, and increasingly free trade and communications. The modern democratic world wanted to believe that the end of the Cold War did not just end one strategic and ideological conflict but all strategic and ideological conflicts. People and their leaders longed for 'a world transformed'. But that was partly a mirage. The world has not been completely transformed. In most places, the nation-state remains as strong as ever, and so, too, the nationalist ambitions, the passions, and the competition among nations that have shaped history. Despite perceptions the United States continues to be the sole superpower. Struggles for status and influence in the world and among regions have returned as central features of the international scene. Old forms of competition have also re-emerged, with the world's great powers increasingly lining up according to the nature of their regimes. As these struggles combine and collide, the promise of a new era of international convergence fades. Have we entered an age of divergence (KAGAN, 2008)?

It is apt to recall here that in the span of world history, developing countries are a relatively recent phenomenon that emerged about 150 years. At the beginning of the second millennium, in 1000 AD, Asia, Africa and Latin America, taken together, accounted for 82% of world population and 83% of world income. Their dominance, even if somewhat diminished, continued for the next eight centuries. Indeed, in 1820, less than 200 years ago, these three continents still accounted for about three-fourths of the world's population and about two-thirds of the world's income. The transformation of the world economy began around then (i.e. around 1820). It was driven by the industrial revolution in Britain, the advent of colonialism, and the revolution in transport and communication. The rise of Western Europe and the decline of Asia were outcomes of this process. The division of the world into industrialized countries, mostly in temperate climates, and developing countries, mostly in tropical climates, was clear around 1870. The next 80 years witnessed a rapid economic decline, particularly in Asia, as the share of developing countries in world output, manufacturing and trade collapsed (NAYYAR, 2009). Many believed, and most famously Francis Fukuyama,

that the world had reached a convergence point of its historical evolution with the Western model about to penetrate every single corner of the planet.

Over the past few years, however, both the economic weight and the influence of developing countries in global economic affairs have been growing significantly and changing the narrative. In 2003, the investment bank Goldman Sachs predicted in a study that the four countries – Brazil, Russia, India and China – may be among the five most dominant economies (along with US) by 2050. Their massive populations, incredible appetite for work and prodigious growth means that they are already responsible for around half of the world's economic growth. Their economies are growing 4 times faster than those of Western countries. Together, Brazil, Russia, India and China account for 40% of the world's population and more than one-quarter of its landmass, produce about 15% of the world's GDP and hold about 40% of the gold and hard currency reserves. As the world's workshops, they are pumping out billions of dollars' worth of exports each day, to rich nations and to each other.

Whereas the Goldman Sachs study focussed on the BRICs as the biggest emerging economies, the rapidly growing role of Africa in the current reconfiguration of economic power is also recognized. First and foremost, South Africa whose economy has, since 1994, been transformed through fundamental macro-economic reforms has enabled the majority of South Africans to participate in the mainstream economy. Today, South Africa is debt free and over 70% of its GDP is derived from manufacturing and services. Direct mining contributes only to around 6% of GDP, contrary to perceptions. Three million new jobs have been created since 2004. This is significant for any mature economy, but obviously still inadequate to tackle South African social gap.

It may be worth noting that according to the OECD the rate of return on FDI is higher in Africa than anywhere else in the developing world. The 2008-2009 crisis is already behind in terms of growth trends. Even though the global financial crisis did have a negative impact on economic growth in Africa, with its wealth in natural resources, improved macroeconomic indicators and greater political stability the region is expected to continue to recover quickly and to continue its relatively strong growth.

With the dream of post-Cold War era dividend dissolving, regional powers Brazil, India, China, or Egypt, and South Africa have enlarged their spheres of influence and struggles for status and influence, in the world and among regions that have returned as central features of the international scene. The world is still divided and distracted by issues both petty and profound. However, history has "returned", to the displeasure of Fukuyama's early theories, as he admits himself.

2 CATCH-UP AND RENEWAL

The economic recovery, or catch-up, of developing countries in the world economy, as a group, began around 1950 and this was attributable in part to strategies and policies in the post-colonial era. They created the initial conditions and laid the essential foundations for development. There was a rapid increase in the share of developing countries in international trade, industrial production and total output.

By 2005, the significance of developing countries in the world economy was about the same as it was in 1870. In the aggregate, the decline of developing countries in the world economy during the 80 years from 1870 to 1950 has been almost made up for during the 60 years from 1950 until now. For example, between 1990 and 2009, the real exports of developing countries nearly tripled, while those of developed countries grew by only 75%. Similarly, the share of developing countries in world exports rose from 24 to 37%. During the same period the developing countries' share of all inward foreign direct investment doubled, from 18% to 36%; and perhaps more surprisingly, their share of outward investment tripled, from 5% to 15%.

The geographical distribution of skills is also shifting. In 1990, for example, developed countries accounted for 40% of all technical tertiary enrolments globally; 10 years later, that share has dropped to 28%. Much of the catch-up is attributable to about a dozen countries among whom the most prominent are China, India and Brazil, as well as Mexico, Republic of Korea, South East Asian countries and South Africa. There still remains considerable scope for catch-up. Emerging economies accounted for 44% of global GDP in 2009; while projected GDP growth rate for major developed markets in 2010 is 2.3%, emerging markets are expected to grow at 6.3% on average.

As emerging powers “catch-up”, the American, Japanese and European share of influence will relatively shrink. Sooner or later – and this debate really is about “sooner” or “later”, not about “if” – we are going to witness major shifts in the global balance of power.

Whatever doubts there may be regarding the ability of the emerging powers to sustain, or even increase, their high growth rates over the medium term, one thing is certain, namely that China, India, Brazil, Republic of Korea and Africa in general have been first and fast in turning the crisis page and are now in the best position to realize their demands. It is also thought that by reaching agreements, coordinating policies and strengthening cooperation, emerging economies have the potential to lead the rest of the world out of the economic crisis. In any event, the renewal of South agency is already palpable.

3 AFRICA ON THE RISE

In the midst of the debate on the new powers on the rise and uncertainties about the achievement of the UN's Millennium Development Goals, the African continent has emerged as a "new frontier of development" (the term recently used by a member of the Africa Progress Panel and former IMF Managing Director Michel Camdessus) (LE MONDE, 2010). The JP Morgan says Africa has become one of regions with the greatest potential for economic growth that is expected to be sustained as the region is projected to have the youngest population (PANDIT, 2010) The Boston Consulting Group has recently come to a similar conclusion drawing on somewhat different data, namely Africa's export growth rate of 18%, comparable to the BRIC nations, and the growth rate of top 500 African companies at more than 8% a year, since 1998. The report points to the emergence of a group of so-called "African lions", by analogy with the Asian tigers, that comprises: Algeria, Botswana, Egypt, Libya, Mauritius, Morocco, South Africa, and Tunisia (whose collective per capita GDP of 10'000 USD is higher than the average for the BRICs), soon to be followed by Ghana and Nigeria. The fast growing companies cited in the report are mostly concentrated in eight countries and are portrayed as partners and rivals that are already regional players in mining, consumer industries and services. These companies are about to look "beyond the continent" (WALLIS, 2010).

The pattern of the recent African growth demonstrates a strong role played by private consumption. It accounts for 60% in the growth, as opposed to its negative contribution in the 1990s. Domestic demand has grown to reach 150% of the growth rate in 2007, as compared to 20% in 2000, mainly in form of public expenditures. Government deficit of around 3% in the late 1990s gave way to surpluses of around 1.9% in 2008. The average inflation rate was around 6.2% in 2008 as compared to the annual 30% in the 1980s. The currency exchange reserves increased from less than USD 50 billion in the late 1990s to USD 300 billion in 2007. FDI inflows increased from less than USD 10 billion in 1995 to USD 88 billion in 2008, with the total FDI stock on the continent at around USD 511 billion in 2008. Average external debt decreased from 70% of GDP in early 2000s to 23% in 2007 (KALUSIVIKAKO; LUMENGANESO, 2010). Africa's total merchandise trade increased from USD 217 billion in 1995 to USD 986 billion in 2008. Its share of global trade also increased from 2.2% in 2000 to 3.3% in 2008 (UNCTAD, 2010).

The global economic downturn has had an obvious impact on the continent. The African Progress Panel estimates that the number of working poor has increased from 57% to 66%. In sub-Saharan Africa, exports as a share of GDP decreased from 41.0% in 2008 to 31.2% in 2009 (FMI, 2009). 30–50% of Africa's 2008 export revenues were lost as a result of the crisis. The crisis has

affected negatively trade both through a decline in growth, and lower access to trade credit (AfDB, 2010). At the same time, forecasts for 2010 and 2011 are quite positive with expected growth rates at 4.7% and 5.9% respectively. Africa was among the first ones to emerge from the crisis with a positive, 2%, GDP growth rate in 2009, driven by the demand of the Asian economies rebound.

4 AFRICA AND SOUTH-SOUTH COOPERATION

South-South cooperation crystallized in the wake of decolonization and against the background of the Cold War. A number of institutional frameworks were set up such as the Non-Aligned Movement or the Group of 77. Their aim was to increase the bargaining power and advance the interests of developing countries through increased political mobilization (MORAIS DE SÁ E SILVA, 2010). After a decline during the 1980s, South-South cooperation has been growing significantly again. This is mainly due to the fast economic growth of emerging economies, as well as to the adoption of more outward looking development strategies, trade reforms, including the growing numbers of regional trade agreements (RTAs), as well as the common commitments regarding the MDGs. Disappointment over traditional North-South models of development cooperation also plays a role. This time, South-South cooperation has expanded to include new sectors such as education, health and social protection in addition to trade and industrial development (MORAIS DE SÁ E SILVA, 2010).

Current Africa-South cooperation is centred upon trade, investments, official financial flows, transfer of expertise and knowledge sharing, and often involves new formal institutional arrangements. UNCTAD recognizes that only in the 21st century South-South cooperation has shifted its focus from purely political issues and starts contributing more to Africa's economic and social development (UNCTAD, 2010).

The share of non-African developing countries in Africa's merchandise trade rose from 8% in 1980 to 29% in 2008 and their share in inward FDI flows to the region increased from 12% in the late 1990s to an average of 16% over the period 2000–2008. The proportion of the region's trade going to Europe and North America has declined. The EU's share of Africa's trade has fallen from around 55% in the mid-1980s to less than 40% in 2008 (UNCTAD, 2010).

The increase in Africa's trade with non-African developing economies has been mainly due to trade with Asia, and most prominently China. China has become Africa's largest source of imports and second largest trading partner after the United States. As a result of an almost tenfold increase over 2000–2008, the value of China-Africa trade totalled USD 93 billion in 2008. China's share of Africa's external trade is close to 11%. While Chinese activities in Africa in

the immediate post-colonial period were driven by political considerations, the reengagement of China with Africa (marked by the creation of the Forum on China-Africa Cooperation in 2000) signals a new type of partnership centred around trade, investments and concessional loans.

At the 2006 Forum on China-Africa Cooperation (FOCAC) meeting in Beijing, Chinese leadership pledged to implement an extensive development agenda including promises to double assistance to Africa by 2009, provide more loans, debt relief, technical assistance as well as to set up a China–Africa Development Fund.

China's development assistance most often took form of big concessional loans for infrastructure projects. Infrastructure and public works accounted for about 54% of China's support to Africa in 2002–2007. Chinese infrastructure finance commitments increased from USD 470 million in 2001 to USD 4.5 billion in 2007 (33% of Chinese infrastructure finance to sub-Saharan Africa over the period 2001–2007 went to electricity, 33% to transport, 17% to ICT, 14% to general projects and 2% to water) with Nigeria, Angola, Ethiopia, and Sudan as the main beneficiaries (UNCTAD, 2010).

Chinese investment flows to Africa have increased over the past 5 years. China's Ministry of Commerce estimated that Chinese investment inflows had reached USD 552 million over the first quarter of 2009, almost twice the value of inflows for the same period in 2008 (HERMAN, 2010).

However, the China-Africa partnership involving high-level meetings has expanded to cover technical cooperation and exchange of expertise in other areas. The last FOCAC meeting held in November 2009 discussed new measures of support to Africa in areas as diverse as climate change, science and technology, response to the financial crisis, poverty alleviation, environmental protection and health in addition to cultural aspects and "people-to-people exchanges" (UNCTAD, 2010).

Brazil's outward FDI flows to Africa have grown as well. Just two examples: oil giant Petrobras planned to invest more than USD 2 billion in Angola and Nigeria over the next 5 years and steel-producing Vale's investment in developing coal deposits in Mozambique is estimated at USD 1.3 billion (Laishley, 2009). In general, technology transfer through technical cooperation is a key component of Brazil's aid to Africa. It provides technical assistance through the Brazilian Cooperation Agency. In 2008, 43% of the resources for technical cooperation projects went to Africa, out of which 74% to five Portuguese-speaking African countries. Over the past years, Brazil has extended support to other African countries and currently has projects in 22 countries (UNCTAD, 2010). A notable area of technical cooperation is support to the production sectors, particularly agriculture.

Another interesting development is the significant increase in the volume of trade and investment flows between India and Africa. For example, Indian-African trade increased from USD 7.3 billion in 2000 to USD 31 billion in 2008. India's contribution to Africa's development included loans, debt relief, technical cooperation, peacekeeping and infrastructure finance. One example of technical cooperation is a Pan-African e-Network Project that aims to provide e-services in the area of education and medicine (UNCTAD, 2010).

India invested USD 1.8 billion in greenfield projects in Africa in the last 3 years. India reconfirmed its promises to provide USD 500 million in grants over the next 5 to 6 years and double lines of credit to USD 5.4 billion and to reduce import tariffs on a wide range of agricultural products from Africa. In South Africa alone, India's commercial relations have grown to more than USD 2 billion, and Africans have begun travelling to New Delhi and Mumbai (Bombay) to seek the kind of investment and expertise that they used to seek from the US and Europe. Bharti, an Indian telecommunications company, has recently purchased the African assets of Kuwait's Zain in India's second-largest ever cross-border deal for more than USD 10 billion. Bharti is expected to significantly lower the prices and serve the African poor by dramatically changing the lives of local entrepreneurs, while boosting a market that is the latest growing telephony in the world.

Finally, the example of South Africa shows that African countries are emerging and participating on an equal footing in South-South partnerships. Trilateral collaboration between South Africa, Brazil and India in such areas as public health, and energy security is very illustrative. South Africa and India have the 1st and 2nd largest number of HIV-positive people whereas Brazil has developed successful public policies to fight AIDS. Together, these countries managed to push forward the interpretive statement of the Doha Declaration indicating that TRIPS should not prevent countries from fighting public health crisis and an agreement that allowed developing countries to export local generics to other countries with epidemics of HIV/AIDS, malaria, and tuberculosis. Another area is a technology-sharing between India, the world's biggest sugar cane producer, and Brazil whose 62% of energy requirements are met through renewable sources and 10% of which by ethanol produced from sugar cane. India's capabilities in the solar photovoltaic area and South African technology of coal liquefaction could be of interest to each other (FLEMES, 2010). Moreover, these countries have been extremely active in the multilateral fora as a group.

To make Africa-South partnerships work for the benefit of Africa, the continent needs to take a proactive stance and mainstream South-South cooperation in its development policies. African countries should use their political leverage to reach the type of partnerships with emerging South actors

that would strike a balance between the economic and strategic interests of the Southern partners and the objective of promoting broader development gains and profound structural transformation of Africa's economy including through technological progress, and capital accumulation (UNCTAD, 2010).

5 RISING SIGNIFICANCE OF DEVELOPING COUNTRIES IN WORLD AFFAIRS

With their increasing economic weight, developing and emerging countries significantly enhanced their ability to influence global economic policy outcomes and to participate in international economic institutions. At the World Trade Organization (WTO) for example this has been achieved mainly through forming groups and coalitions (such as the African, Caribbean and Pacific Group, African Group, Caribbean Community, Developing Countries Group, etc) allowing for improved coordination and preparation of negotiations. The G-77 group of developing countries plus China is again playing a greater role in international fora after a sharp decline in influence in the 1980s and 1990s.

Backed by rapid economic growth, growing financial clout, growing populations, and a newfound sense of assertiveness in recent years, the emerging powers are a driving force behind an incipient transformation of the world economy away from an Anglo-Saxon dominated system and towards a multi-polar one. In recent years this multi-polarity in the economic sphere has translated into a new negotiating attitude on the part of the South. It started around common interests relating to trade and it became more comprehensive and sophisticated as time passed. The financial crisis and global recession of 2008 and 2009 created the opportunities for a more visible role of emerging and developing countries.

- International trade negotiations have demonstrated that developing countries have learned to work together in cohesive groups or coalitions based on their self-identified interests in a coordinated way to defend their interests. The G-20, the G-33, the NAMA-11,¹ the Core Group on Trade Facilitation, the African Group, the ACP Group, the Least Developed Countries Group, the Small Vulnerable Economies Group, all have clearly and distinctly pegged their positions in the WTO to a clear preference for linking negotiated concessions to their respective long-term strategic development objectives and ideas. The success of the trilateral alliance IBSA (India, Brazil and South Africa) includes public health, pharmaceutical patents, and government subsidies positioning within WTO. IBSA and China have formed the core of the Group of 22 (G22) bloc of developing countries, which preferred to let

1. A coalition of developing countries in the Non-Agricultural Market Access negotiations.

the negotiations break down rather than come to an agreement detrimental to its interests.

- Another example is a power shift on *international financial governance*. Whereas the emerging economies started voicing growing disenchantment with the Bretton Woods institutions by early 21st century, the current financial and economic downturn resulted in a call for the major reform of the IMF that was criticized for being not representative of the new fast-growing world economic powers. Until recently, China – which has grown so fast that it is now the world's second-biggest economy – had only the same number of votes at the IMF as Belgium. The 2008 reform of the IMF has somewhat strengthened the position of China and other emerging economies, with a total shift of 4.9% in quota shares for 54 countries, and tripled the basic votes that have an impact on the voting power of the low income countries. However, changes to the IMF quota and governance structure were clearly insufficient. The total share of sub-Saharan Africa increased only by 3% and remained at 1.4% of the voting share. China came at a third place with 3.81% of the voting share as compared to the United States and Japan whose shares are 16.73% and 6.23% respectively (FMI, 2008). In 2009, the International Monetary and Financial Committee urged that further reform of the quota and voting structure of the institution be implemented by January 2011. If the new package is to be adopted, China's quota share will rise from 6.38% to 7.47% and it will come ahead of Japan whose quota share will decrease to 6.99%. India's quota share will grow to 2.18%. However, the US will still hold the highest quota share – 17.8%, and the share of African countries will not change significantly (FMI, 2009).

Similarly, the much trumpeted reform of the World Bank governance approved last April will transfer only 3.3% of votes from rich to developing countries. China's share has increased from 2.77% to 4.42%, and it has become the 3rd largest shareholder after the United States and Japan. India's and Brazil's shares have increased respectively from 2.78% to 2.91%, and from 2.06% to 2.24%. However, the United States still remains the most influential player holding 16.85% of the total (BANCO MUNDIAL, 2010). More than one third of African countries had their shares decreased as a result of the reform. The reforms demonstrate growing influence of emerging economies, but they still fall short of reflecting the real weight of developing countries.

Today, many emerging economies not only do not need the current international financial institutions in terms of policy or funding, but they increasingly are even in a position to compete with them.² Emerging markets are now net providers of capital flows, financing the large current account deficits of the developed countries, and in particular that of the United States. The financial landscape has been redrawn by the new brokers – Asian and Gulf sovereign and petro-dollar investors, who have moved the power base further to the East and the South.

- In a similar vein, it is worth mentioning the position of the emerging economies as far as the *international monetary system* is concerned. While for much of its history, the international monetary system has been uni-polar, emerging economies such as Russia, Brazil and China are demanding an end to the dollar's dominance in the international monetary system and call for a new global reserve currency. While the dollar accounts for 65% of the world's foreign-exchange reserves, three-quarters of all reserves are in the hands of emerging economies. In short, a "coalition of the rising states" is flexing its muscles now to shape the debate on the need for the world to have its monetary exchanges based upon some international "spread" of currencies rather than upon a single one.
- Not less revealing were the negotiations held December 2009 on one of the most pressing issues of our time (climate change) that actually involved a decision-making by Heads of State in an international forum significantly different from a traditional UN negotiation. The fragile agreement reached in Copenhagen is the result of a more active participation of the developing countries in general and the strong arm twisting capacity of new emerging powers. Twice Africans blocked the preparatory negotiations completely in a show of force seldom demonstrated in these processes. Developing countries – led by China, Brazil, South Africa and G77 Chair group Chair, Sudan – demanded and received significant compromises from developed countries after changing the final outcome in an unprecedented manner. This case clearly illustrates how the "South agency" is already influencing the international landscape. Significantly the final agreement was reached through indirect representation that did not include Europe, despite the Conference being in Copenhagen, nor Japan.
- The shifts in *world leadership* represent another example of how the South agency is influencing or may influence world politics. It is true that the reform of the UN Security Council, under "open-ended" negotiation for

2. Saudi Arabia backstops Lebanon, Venezuela has helped Argentina repay the IMF, Chinese Development financing provides an alternative to World Bank lending in Africa.

almost 20 years is still unimpressive. In the last five years, though, it has gained considerable momentum – mostly due to the increasing clout and insistence of emerging powers. It still falls short of progress in redrawing the geographic composition of the body. However, emerging countries, as demonstrated by the example of India, Brazil and South Africa form alliances to back each other up in their bids as regional representatives to the UN Security Council. Where the progress has been more significant is the real replacement of the G7 by the G20, imposed by the recent crisis. Africa is challenging strongly the fact that G20 only includes one African state and has, so far, obtained that several others are “invited”. This is likely to change. The new model is already addressing issues that go beyond the responsibilities of any one organization, creating new forms of multi-polar legitimacy.

The current crisis has shown there is a need for new rules, institutions and services to help solve the world’s major problems and that there is no more world leadership without acknowledging a renewed South agency. As developed countries emerge weakened from the global economic crisis, there may be opportunities for developing and emerging countries to push for policy space with a view to creating greater transparency and inclusiveness in international affairs.

In this emerging reconfiguration, it is important for smaller African countries, and particularly LDCs, to develop strategic partnerships with the emerging economies so as to ensure their policy views are reflected and interests are properly represented (MALHOTRA, 2010).

6. CONCLUSION

6.1 New Opportunities

The digital technology revolution that eliminates barriers of geography, distance and time has a major impact on the global economy and represents a new window of opportunity for the South to increase its significance. Technology developments in the past few decades have significantly transformed the way people communicate, and businesses operate across the globe. Of the 6.5 billion people in the world, more than half have mobile phones and almost a quarter have internet access. In some areas, Africa is showing significant progress. Today, the African cell phone market is the fastest growing in the world. The African telecommunications sector is one of few where indigenous capitalist participation is significant, but it has also attracted attention of telecommunication giants outside the continent, most notably Indian firms that have recognized this dynamic.

Economies are becoming increasingly reliant on exploiting technologies to create or add value to existing resources. The technological innovation drive

obliges everyone to reposition themselves. And the South has come out better from this challenge, so far. Defining the boundaries and contours of intellectual property as well as designing a balanced intellectual property regime is where the real future battle lies, and this is not going to be easy.

Demography, migration and urbanization are other visible terrains of transformation and probable international polarization. And that would need to be addressed holistically, comprehensively and with increasing urgency. These are some of the trends in which South agency will have to manifest itself if the rise of economic power is to be transformed in a sustainable path for the future.

Since the beginning of this century a true African renewal is on the screen. Dramatic reduction of the number of civil wars, fortification of peace building and constitutional processes, advances in democratic governance (confirmed by both Harvard and Ibrahim indexes), historic reserves, one digit average inflation, rapid progress on MDG indicators. However, the negative narrative about the continent has not yet changed: ample resonance on the Darfur conflict, major disruptions emerging from Somalia, including piracy, or hunger looming as a result of food price increases. One can add the odd *coups* here and there, or some Presidents' theatrics as well. This is all true. It is also right to point to social differences or crime in South Africa as amplified by Western media during the World Cup. We can continue the list of bad news, basket cases and the like. The continent is doomed said "The Economist" 's cover a decade ago. Lets us quote one great African intellectual, Claude Ake:

at independence the form and function of the State in Africa did not change much for most countries...State power remained essentially the same: immense, arbitrary, and often violent, always threatening... colonial rule left most of Africa a legacy of intense and lawless political competition amidst an ideological void and a rising disenchantment with the expectation of a better life (AKE, 1996).

Claude Ake who left us prematurely wanted the historical context to be acknowledged. We can see truth in what he said. However, we have to admit, something is changing in the world and around the continent. Africa is about to have one billion people. Something is changing inside it. Let us be prepared to understand the complexities of these trends, without falling prey to the customary story line.

REFERENCES

AFRICAN DEVELOPMENT BANK (AfDB). **Africa in The Wake of the Global Financial Crisis**: challenges ahead and the role of the bank. Policy Briefs, 2010.

AKE, Claude. **Democracy and development in Africa**. 1996.

BANCO MUNDIAL. **IBRD 2010 voting power realignment**, 2010.

FLEMES, Daniel. IBSA: South-South Cooperation or Trilateral Diplomacy in World Affairs? *In: South-South Cooperation. The Same Old Game or a New Paradigm? Poverty In Focus*, **International Policy Center for Inclusive Growth**, n. 20, 2010.

FUNDO MONETÁRIO INTERNACIONAL (FMI). IMF executive board recommends reforms to overhaul quota and voice. **Press Release**, n. 8/64, March 28, 2009.

HERMAN, Hayley. South-South Relations: Sino-African engagement and cooperation. *Poverty In Focus: South-South Cooperation. The Same Old Game or a New Paradigm?* **International Policy Center for Inclusive Growth**, n. 20, 2010.

KAGAN, R. **The return of history and the end of dreams**. KNOPF, 2008.

KALUSIVIKAKO, Andy; LUMENGANESO, Olivier. L'Afrique est bien partie. **Les Afriques**, 3-9 June 2010.

LAISHLEY, Roy. Emerging economies hold promise for Africa. But governments must play smart to get the best deals. **Africa Renewal**, v. 23, n. 2, July 2009.

LE Monde Entier Commence a se Rendre Compte que la Nouvelle Frontiere de son Developpement, C'est L'afrique, Interview With Michel Camdessus by Cherif Elvalide Seye. **Les Afriques**, 10-16 juin 2010.

MALHOTRA, Kamal. South-South Cooperation: Potential Benefits for the Least Developed Countries. *Poverty In Focus: South-South Cooperation. The Same Old Game or a New Paradigm?* **International Policy Center for Inclusive Growth**, n. 20, 2010.

MORAIS DE SÁ E SILVA, Michelle. How Did We Get Here? The Pathways of South-South Cooperation. **Poverty In Focus: South-South Cooperation. The same old game or a new paradigm?** **International Policy Center for Inclusive Growth**, n. 20, 2010.

NAYYAR, Deepak. Developing Countries in the World Economy: the future in the past? **WIDER Annual Lecture**, n. 12, Feb. 2009.

PANDIT, Sonal. Afrique: un des plus grands potentiels économiques du XXI e siècle. **Le Temps**, 31 mai 2010.

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (UNCTAD). Economic Development in Africa Report 2010. South-South Cooperation: Africa and new forms of development partnership. UNCTAD, 2010.

WALLIS, William. Emerging groups make. African lions roar. **Financial Times**, London, 1 June 2010.

THE FINANCIAL CRISIS: IMPACT ON BRIC AND POLICY RESPONSE

Ritwik Banerjee*
Pankaj Vashisth**

The paper looks at the transmission channels by which the financial crisis affected the four emerging economies- Brazil, Russia, India and China, the degree and extent of the impact of the crisis, the subsequent policy interventions which enabled recovery and an assessment of how successful recovery has been in these economies. We conclude by noting that in the long term global recovery will necessitate a rebalancing of the world economy which in turn means that the hub of global consumption has to shift from the west to the global south, particularly to BRICs.

A CRISE FINANCEIRA: IMPACTO SOBRE O BRIC E AS POLÍTICAS DE RESPOSTA

Este trabalho trata dos canais de transmissão por meio dos quais a crise financeira afetou as quatro economias emergentes do bloco conhecido como BRIC (Brasil, Rússia, Índia e China). São avaliados o grau e a extensão do impacto da crise, assim como as políticas de intervenções subsequentes que permitiram a recuperação. Por fim, é feita uma avaliação sobre a recuperação dessas economias, em que se conclui que, a longo prazo, a recuperação global requererá um reequilíbrio da economia, com um novo centro de consumo mundial que se desloca do oeste para o sul, particularmente para o BRIC.

What we know about the global financial crisis is that we don't know much.
Paul Samuelson

...the economics profession went astray because economists, as a group, mistook beauty, clad in impressive-looking mathematics, for truth.
Paul Krugman

1 INTRODUCTION

Prior to the financial crisis, the global economy was going through a change. The erstwhile engine of global growth, the USA, was weakening and the new growth poles were emerging. BRIC was one of emerging growth poles that caught the imagination of the world. With a very large pool of physical and human resources and rapidly increasing share in global GDP growth, this group of heterogeneous economies were showing a great potential to replace US as an engine of global economic growth. This possibility was further vindicated during the financial crisis when BRICs managed to grow at a decent rate. Though, like other economies, this group also suffered from the indirect impact of financial crisis, the severity of impact felt in this block was much lesser as compared to many developed and developing economies. The downturn was shallow and recovery was relatively quick and strong. Against this backdrop, this paper at-

* Researcher at Icrier, New Delhi.

** Researcher at Icrier, New Delhi.

tempts an in-depth analysis of the impact of global financial crisis on BRICs and examines its potential role in rebalancing of global growth.

Broadly, the paper has been divided into seven sections. After providing a brief overview of BRICs economies in section two, section 3 deals with the impact of the crisis on BRICs. Section 4 discusses the monetary and fiscal policy response to the crisis, while section five provides a critical assessment of recovery and issues related to exit policy. Finally, before summarizing paper in section seven, section six makes few observations regarding the global imbalances and consumption pattern in BRICs.

2 AN OVERVIEW OF BRIC

In order to understand why BRIC constitutes an important block in the geo-politics of our times it is important that we put into perspective what BRIC means for the world economy at large. Brazil, Russia, India and China together constitute roughly 25% of the total land coverage on the planet and are home to 40% of the world population. More than one fifth of the world GDP originates from these four countries and this is only set to increase in the coming years. In fact what captured the world's imagination regarding BRIC was not what it was but the sheer potential it had in the coming decades. It is now widely believed that China will surpass US as the largest economy of the world by 2030; BRIC would become as big as the G7 by 2032 and India will become the second largest economy after China by the halfway mark of this century (GOLDMAN SACHS, 2007).

The recent financial crisis clearly demonstrated how resilient these economies were to external shocks. It is estimated that BRIC contributed 30% of the global GDP growth between 2000 and 2008 but its contribution to global growth since 2007 was roughly 45%. Furthermore while much of BRIC has returned to the trend growth rate, advanced economies are just beginning to pull themselves out of the recession. It is expected that the former will close the output gap, which has been the result of the crisis at least two years before the latter will.

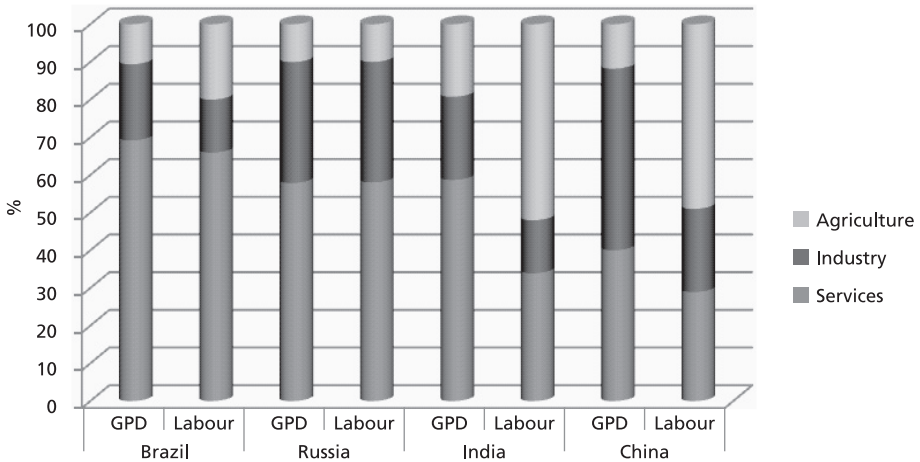
In spite of the rather stellar performance of BRIC vis-a-vis the crisis it is important to note that structurally the four economies are quite different from each other. While agriculture contributes roughly 18% (Figure 1) to India's GDP, it employs around 52% of labour; service sector on the other hand contributes bulk of the country's GDP (53.4%). Agricultural productivity in China, very much like India, is low as indicated from its low contribution to GDP and the large share of labour dependent on it. The distinguishing feature in the Chinese case is that the lion's share of its GDP comes from the manufacturing sector (48.1%) while it employs only 22%.

Brazil and Russia structurally are very different from India and China especially if one takes into account the role of agriculture in the economy. Ser-

ices play an important role in both these economies. Industry led by an overt dependence on oil production, makes industry crucial for Russia.

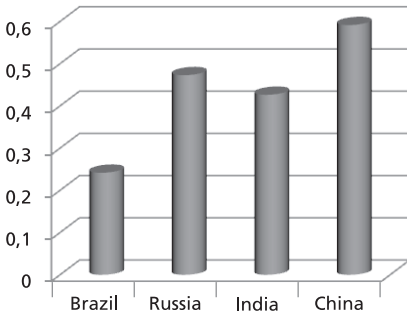
Figure 2A and 2B gives a clear picture of how important trade is in the respective economies and how important a role services play in their trade. While China's trade is almost 60% of its GDP, that for Brazil is low at 20%. Furthermore India is the only country among the four which is a net exporter of services and the significance of services for Indian trade is evident from the fact that 35% of her export constitutes of services. China's focus on manufacturing is clear from Figure 2B where we note only 8.3% of China's total export arises from export of services.

FIGURE 1
Sector composition of GDP and labor



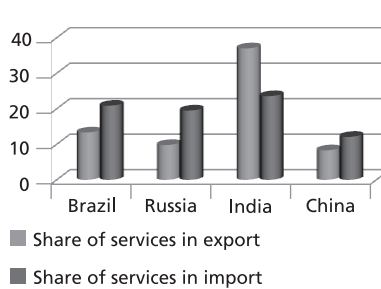
Source: National Sources.

FIGURE 2A
Trade GDP ratio (2008)



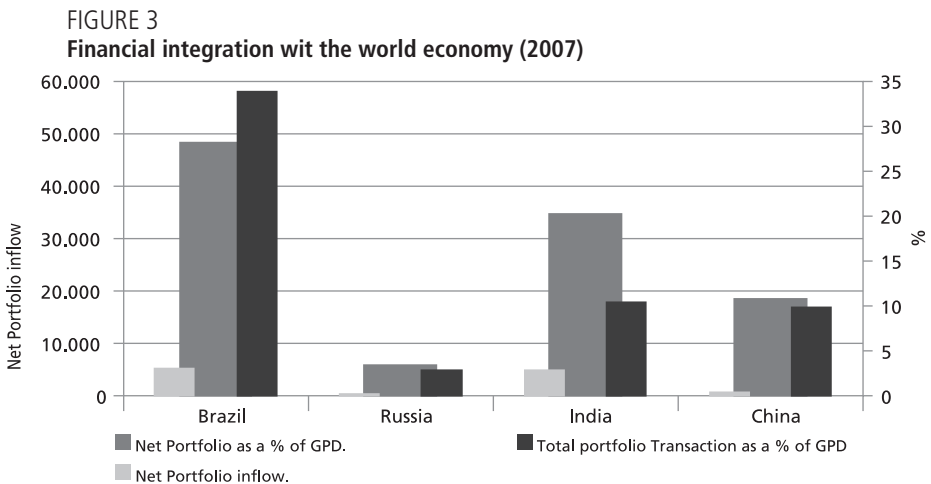
Source: International Financial Statistics (IFS) and International Monetary Fund (IMF).

Figure 2B
Share of services in trade (2008)



On umpteen occasions it has been argued that the impact of the financial crisis on a transition economy is often severe if there is a high degree of financial integration with the global economy. We take the ratio of total FII flow i.e. the sum of inflow and outflow to GDP as a measure of financial openness. The total portfolio transaction as a percentage of GDP varies widely across the four economies with the corresponding Figure for Brazil being 33%.

From the above discussion it is clear that Brazil, Russia, India and China the four economies under consideration are a very heterogeneous block with fundamental structural differences within the economies. Thus the causes and consequences and remedies for the impact of the crisis on the four economies will widely differ. This indicates that so far as panaceas are concerned a one-size-fits-all policy is best avoided.



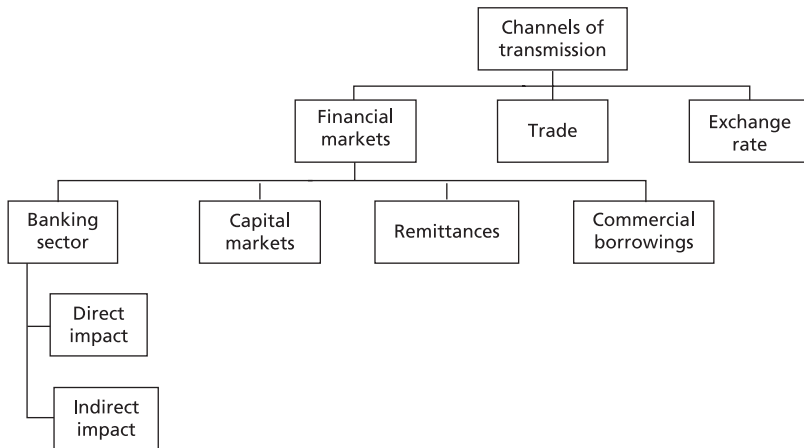
Source IFS and IMF.

3 TRANSMISSION MECHANISM

Two things are clear from the above discussion. First, the extent of structural heterogeneity within the economies was very high prior to the crisis. Second, the level of integration with the global economy was high for these countries especially in terms of trade and internal capital flow but these measures too varied across countries. The above facts imply that it was impossible for these economies to remain decoupled from the turbulence felt in rest of the world. But how did this shock, which emanated from the western shores of Atlantic get transmitted, to the BRIC?

The following schematic diagram might help us understand this phenomenon.

FIGURE 4
Transmission mechanism



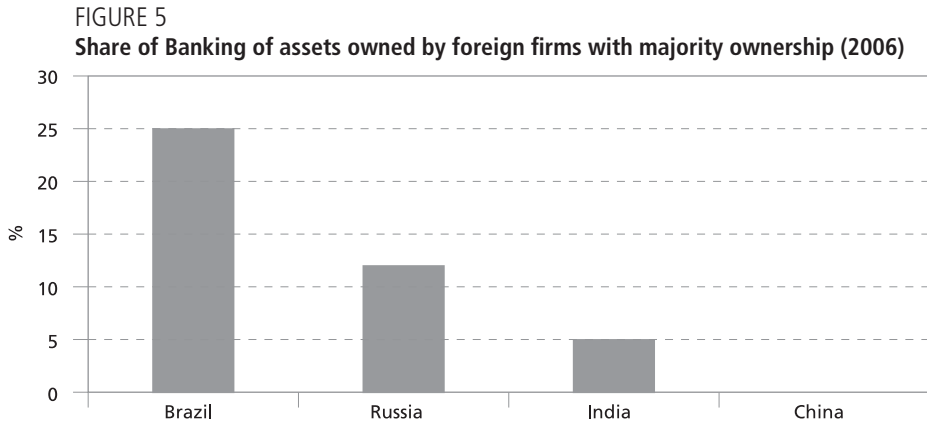
We shall analyse in detail each aspect. It is important to note at this point that direct impact on the banking sector refers to the impact caused by a bank’s holding of toxic foreign assets. However a bank may also be affected when credit expansion in an economy is hurt or short term interest rate rises or if the general level of expectation about the future in the economy is low. Such an impact is may be thought of as an indirect effect.

3.1 Banking sector

Banks and Non-bank Financial intermediaries faced limited impact due to the crisis. On one hand the exposure of these institutions to the complex financial instruments were limited creating an automatic buffer; on the other hand domestic deposits and liquidity was abundant giving a cushion to the banking sector, something which was hardly observed in the advanced economies. Sometimes it was the central banks which took proactive steps to increase countercyclical capital provisioning requirements. This was particularly true for Reserve Bank of India whose countercyclical initiatives under the leadership of YV Reddy prevented the firms from being exposed to the subprime crisis (VASHISTH; KUMAR, 2009).

Financial soundness may be measured by direct exposure which is measured in terms of the amount of foreign assets (toxic or otherwise) owned by the domestic banks or in terms of the share of domestic banks’ assets owned by foreign firms. Figure 5 below illustrates the latter. This share was highest for Brazil (25%) and Russia (12%) indicating that any shock in the global economy would more promptly impact them than it would in India and China whose corresponding shares are much less. In India only ICICI Bank was partly exposed to the crisis but a strong balance sheet and timely government intervention

helped it tide over the problems (VASHISTH; KUMAR 2009). Thus level of financial exposure in the case of Brazil and Russia far exceeded that of India and China by all measures.



There was however a decline in the financial soundness indicators, though not uniformly across the board, as evident from Table 1 which compares the 2005 values with the latest. The Capital Adequacy Ratio, which indicates how much cushion a bank has against potentially toxic assets, has risen across the board but mostly under statutory conditions. Other indicators like Return on Assets and Return on Equity have fallen except for India and China. Non-performing Liquidity Ratio has increased considerably for Brazil and particularly so for Russia. It has however decreased for India from 4.4% to 2.4% and for China from 8.6% to 1.2% indicating the overall financial health of Indian and Chinese financial sector is perhaps better than that of Brazil and Russia. A part of this reason can be traced to the proactive role of RBI in regulating. Reserve Bank of India was one of the few central banks in the world which introduced countercyclical capital provisioning requirements by increasing the provisioning requirements of the commercial banks lending to the real estate sector. This measure, it is widely believed, played a crucial role in India to prevent a potential real estate price bubble. It is also true that the Indian financial sector is far less developed than its Brazilian and Russian counterpart. Thus it is amply clear from the above discussion that the impact of the crisis on the banking sector has been varied among the BRIC. While India and China were hardly affected, the financial soundness indicators worsened, on some occasions severely for Brazil and Russia.

3.2 Foreign institutional investments

A strong reversal of trend was observed in the case of FIIs inflow into Brazil, Russia and India. While exodus of FIIs began from the Q3 of 2008 itself, that of India and Brazil began from Q4 2008. In Q4 2008 alone, Russia lost \$25 billion worth FIIs while Brazil saw \$20 billion dollar make a quick exit from their economy. The corresponding Figure for India was a little under \$ 6 billion. After the outflow of FIIs was arrested in Q1 2009, the economies saw the first positive inflow in 2009 Q2. FII into China was not in the least affected by the financial crisis. A major reason for this was the fact that like FDI, a substantial part of its FII inflow came rerouted from Taiwan and other similar tax havens.

TABLE 1
Solidity of financial indicators
 (Em %)

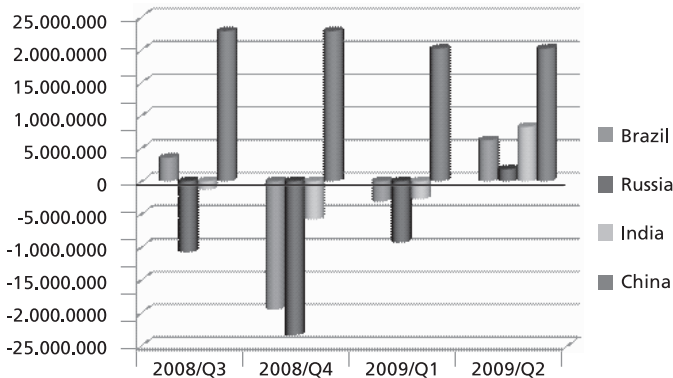
	CAR		ROA		ROE		NPL ratio		Liquidity ratio	
	2005	L	2005	L	2005	L	2005	L	2005	L
Brazil (October 2009)	17.89	18.2	2.9	1.5	29.5	13	3.5	4.5	55.32	53.9
Russia (November 2009)	15.98	20.9	3.2	0.7	24.2	4.9	2.6	9.6	28.45	27.5
India (March 2009)	12.8	13.2	0.9	1	13.3	12.5	5.2	2.4	11.92	11.3
China (November 2009)	2.5	10	0.6	1.1	15.1	17.1	8.6	1.6	NA	NA

Source: IMF.

3.3 Capital markets

The result of exodus of foreign institutional investment was immediately reflected in the stock markets. There was a general fall in the level of the market indices as is evident from the movements illustrated in Figure 7. We consider Indice Bolsa de Valores do Estado de São Paulo (Ibovespa) for Brazil, Russian Trading System Index (RTSI) for Russia, Bombay Stock Exchange (BSE) for India and Shanghai Stock Exchange (SSE) for China.

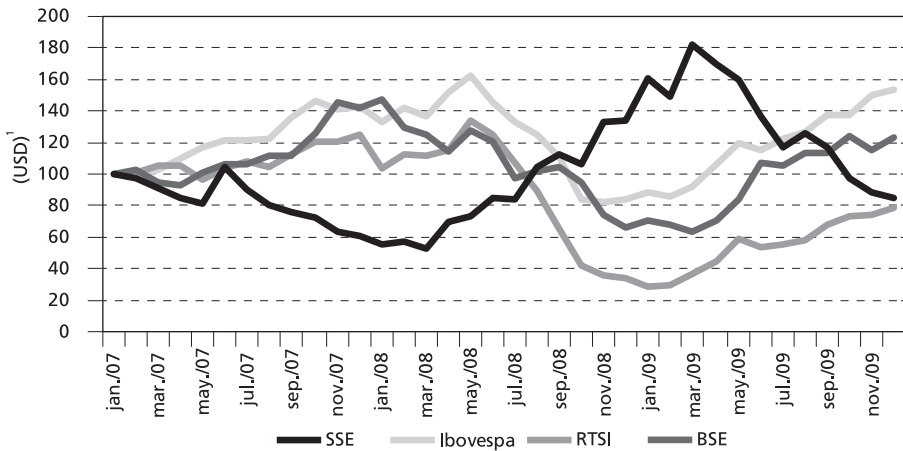
FIGURE 6
Foreign institutional investments



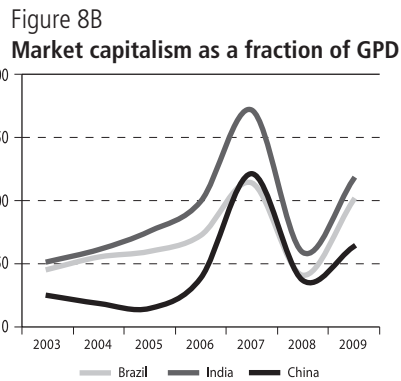
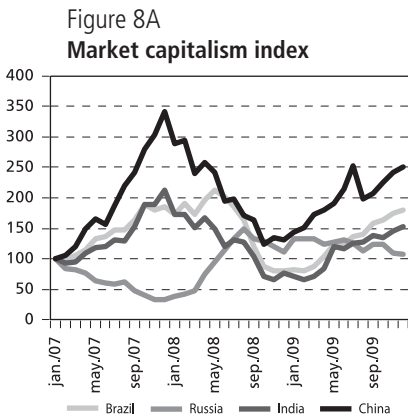
As expected, as FII outflow was very limited in China; the SSE continued a healthy run through the crisis period. For Brazil, Russia and India however the impact of the financial crisis is clearly felt in terms of the market indices. The downturn started somewhere around May 2008, when the market got the first hints from the US subprime crisis. Lehman collapse accentuated the effect further especially in India. Subsequently starting from April-May 2009 the stock markets have shown signs of recovery. This may also be the result of abundance of liquidity in the world. The excess liquidity always finds a way to invest itself in high return markets, which in the current context mean emerging market economies.

The collapse of the stock market indices saw a substantial drop in market capitalisation. The market capitalisation index for China dropped over 200 % between November 2007 and November 2008. But subsequently it increased and as Figure 8B shows that market capitalisation as a fraction of GDP collapsed after a steep increase in 2007 for all the BRIC countries.

FIGURE 7
Stock market indices



Note:¹ USD= Unites States Dollar.



3.4 Short term credit and FDI

Short term credit plays an important role in emerging market economies like the BRIC. The corporate sectors often find it difficult to generate sufficient investible resources domestically in order to expand. Short term credit can effectively bridge the gap and help make fresh investments possible. Furthermore an increasing number of companies emanating from emerging market economies are endeavouring to expand globally. The necessary resources required to help finance acquisitions and mergers abroad often come from the short term credit.

Table 2¹ shows that there has been a decline in short term credit for each of the BRIC economies. Russia in this regard was the hardest hit, with a very large decline in short term borrowing, especially in 2008 Q4 and 2009 Q1. The extent of decline has declined substantially over the next three quarters but continues to be negative. Similarly short term debt declined substantially in Brazil. India was not affected to the extent Russia and Brazil was, is evident from the ECB figures. It was \$-457million in 2009 Q2 and recovered soon after. China too was affected briefly in the second semester of 2008, though the short term credit has not returned to the pre crisis level.

The significance of FDI in growth of the emerging market economies has been well documented (BORENSZTEIN; GREGORI; LEE, 1998). The period of moderation was accompanied by a steady rise in FDI in these economies and this is believed to be one of the important reasons for the stellar performance of these economies in terms of economic growth. While this was not true for Russia, Brazil, India and China have seen a steady rise in FDI in a wide range of sectors. The onset of the global crisis meant the growth rate of FDI plummeted. It is estimated that for Russia in particular, it will be at least 2013 before it reaches the pre-crisis levels of FDI.

1. As different countries often follow different accounting procedures, the definition of short term credit differs from country to country. Here we take for each country, what comes closest to short term credit.

It is interesting to note at this point that impact of all of the above has been reflected in the exchange rates. Brazil, Russia and India experienced notable appreciation in their respective currencies, with the notable exception of China. In fact the combined currency appreciation for Brazil, Russia and India from 2008 Q3 to 2009 Q1 has been 38.6%, 34.72% and 13.7% respectively, but for China it has been only 0.25%. The figures clearly reveal what is now a well known secret that the Renminbi is hugely undervalued. The extent of undervaluation has been debated, estimates ranging from 25% to 40%. This in fact has been dubbed as an obvious form of protectionism and is being taken up at many multilateral forums. Significantly the above trend has been reversed subsequently; the next three quarters has resulted in depreciation of the currencies except for India

TABLE 2
Short term credit in BRICs
(In millions of dollars)

	Russia: short term borrowing	Brazil: short term debt	India: ECB	China: short term credit
2008Q1	12921	-56	4,827	
2008Q2	44049	-50	1,467	46727.68
2008Q3	29990	217	1,690	
2008Q4	-26178	108	3,884	-49,830.78
2009Q1	-16698	-3568	1,117	
2009Q2	-3687	-9610	-457	2304.16
2009Q3	-9927	-10737	1,209	
2009Q4	-10254	-1175	1,538	NA

Source: National Sources

3.5 The great trade collapse

The global financial crisis led to what is widely acknowledged to be the steepest fall in trade since the World War II. Figure 10 illustrates the extent to which growth rate in total trade fell. We include the growth rate for the world as well to enable us to compare how the BRIC have performed when compared to the world average. The trade collapse began from Q3 2008 and lasted till Q3 2009. Q4 results indicate that recovery from this contraction has at least begun.

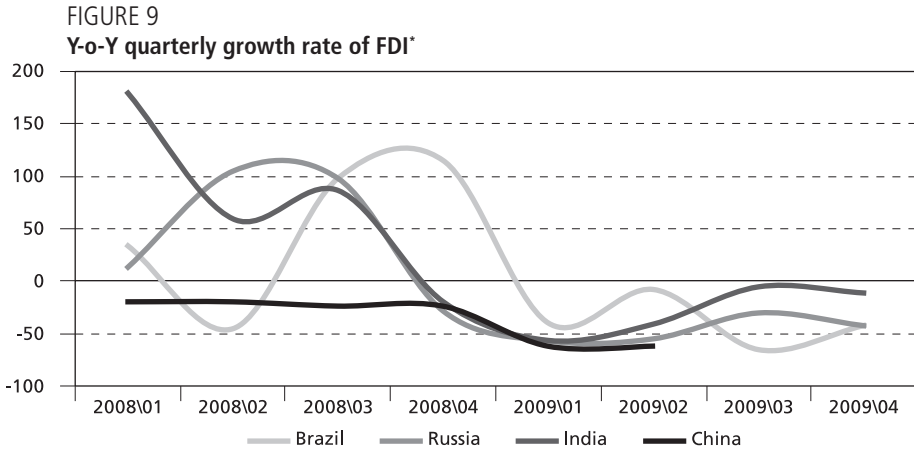
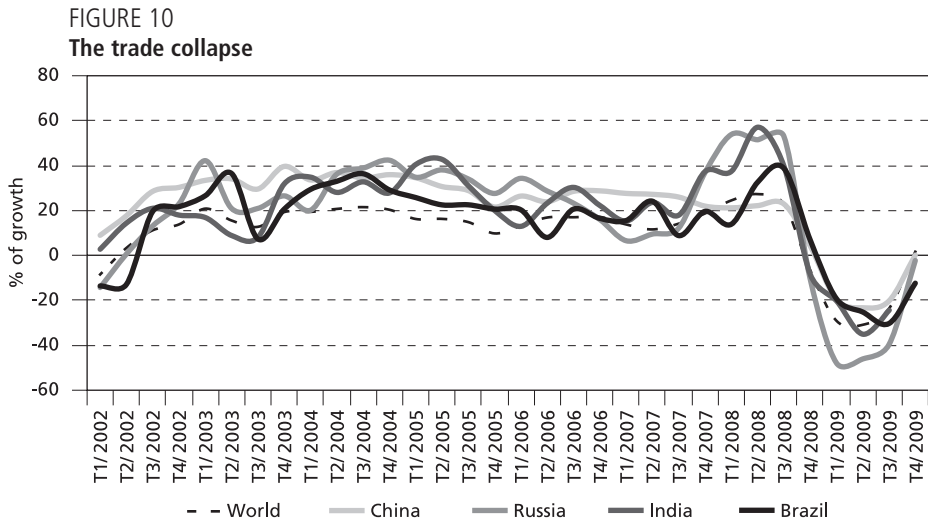


TABLE 3
Exchange rate fluctuations and foreign exchange reserves (2008-2009)

	Exchange rate		Foreign exchange reserve	
	2008 Q3-2009 Q1	2009 Q2-2009 Q4	2008 Q3-2009 Q1	2009 Q2-2009 Q4
Brazil	-38.61	16.22	7.85	-16.00
Russia	-34.73	3.34	32.35	-2.93
India	-13.69	-4.40	12.94	-1.77
China	-0.26	0.05	-2.53	-12.54

Source: IFS and IMF.

The severest impact of the trade collapse is observed in Russia. It is true that trade collapse in Russia has been acutely felt. However a part of the reason for this decline can be traced to the high base effect during the same time in the previous year. Q3 2007 to Q3 2008 was the halcyon days for Russia since it was riding high on the back of a global crude oil price rise. The export values for Russia were thus inflated which next year resulted in the high base – a phenomenon we discussed above.



This is further evident from Table 4. Growth Rate of export hovered around 68% each quarter for the first three quarters for Russia. It however plummeted to -52.4% in the first quarter of 2009. This dip continued for three quarters in succession. Note that the drop in export was led by drop in export of goods, primarily export of crude oil. In fact it was not so much the volume of petroleum export that was affected but the value of it. The sharp decline in international prices of crude oil led a sharp decrease in the value of oil exported from China. The fact that share of services in total export continued to rise during the peak of the crisis period also suggest that it is the drop in export of goods which led to the sharp decline in export for Russia.

A similar phenomenon is observed in the case of China. Growth of export declined to -22.2% in the first semester of 2009. However during this period the share of services in total export increased to 0.11 from 0.10 indicating that growth of export of manufactured products has declined at a greater rate than that of services.

For India services constitute the major part of its export basket. While export did drop in India, the decline is much less than that observed in others, especially Brazil and Russia. This is primarily due to the fact that decline in services export has been rather mitigated. Export growth in services saw maximum dip of -14% in Q3 2009. Given that services play by far the most significant role in India's export basket, one may conclude that the limited impact on India's trade may be attributed to the cushioned effect on its services sector. However here are some indications that there has been a lagged effect on export of services.

TABLE 4
Quarterly exportation growth rate (2008-2009)

Country	Brazil			Russia			India			China		
	Growth of export	Growth of export of services	Share of services in total export	Growth of export	Growth of export of services	Share of services in total export	Growth of export	Growth of export of services	Share of services in total export	Growth of export	Growth of export of services	Share of services in total export
2008Q1	13.8	25	0.19	68	34.7	0.09	25.8	3.3	0.61	22.4	29	0.08
2008Q2	32.5	31.6	0.13	67.2	42.9	0.1	37.4	22.5	0.47			
2008Q3	38.8	38.8	0.14	69.3	36	0.1	30.3	47	0.57	13.6	13.1	0.1
2008Q4	6.9	15.5	0.17	1.2	11.8	0.12	-11.9	9.3	0.7			
2009Q1	-19.4	-6.5	0.22	-52.4	-18.8	0.15	-7	-6.9	0.61	-22.2	-23.8	0.11
2009Q2	-25.4	-14	0.15	-51.3	-19.7	0.16	-22.8	-10.4	0.54	NA	NA	NA
2009Q3	-30.5	-15.2	0.17	-45.6	-22.4	0.14	-14.4	-14.4	0.5			
2009Q4	-12.5	-0.1	0.19	-13.8	-12.3	0.12	19.8	-9.3	0.53			

Source: payroll balance of each country's central bank.

3.6 Effect on the real sector

The BRIC economies were cruising along well until the financial crisis hit the world economy. As is clear from Figure 11.a the growth rate ranged from a moderate 6 per cent to a high 11 per cent. From 2008 Q3 onwards the impact of the crisis was felt by each economy in a distinct way. While on hand China and India weathered the crisis pretty well with growth rates remaining above the 5 per cent mark throughout and peaking up sharply subsequently from 2009 Q4, on the other hand quarterly GDP growth rate for Brazil and Russia in particular plummeted. In fact for three subsequent quarters beginning from 2008 Q4 the GDP growth rate hovered around -10 per cent. The same for Brazil was in red until 2009 Q4 when it showed the first signs of recovery.

When we analyzed the structural differences in the four economies, we noted that the degree of financial integration (as distinct from real sector integration) differed widely in the four economies. While Brazil and Russia was highly integrated, India and China was not. No wonder then that the latter was not hit as hard as the former. Greater financial integration for Brazil and Russia meant that the numerous transmission channels which were at work more readily affected them than it did the rest.

Figure 11.b compares the quarterly growth rates of the BRIC economies with that of the Emerging Economies, Advanced Economies and the world. Q4 2008 and Q1 2009 was the period when the economies were hardest hit and advanced economies grew at around -8 per cent for the two quarters. The trough is clearly evident for the world economy and the emerging market economies as well, however the BRIC economies as a whole have clearly escaped the magnitude of recession experienced by the others. Whatever little dip we see in the growth rates are because of the effect on Brazil and Russia. This comparative picture illustrates the resilience of the BRIC economies in the face of an acute global economic meltdown.

FIGURE 11A
Y-o-Y quarterly GDP growth

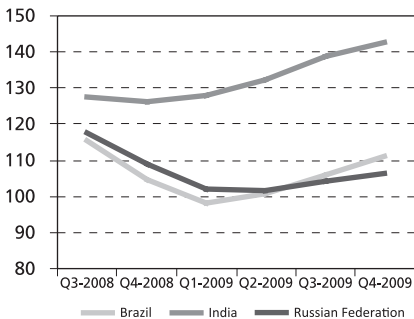
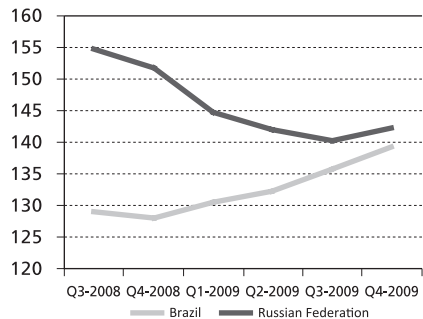


FIGURE 11B
Comparing BRICs with the world



4 POLICY RESPONSES

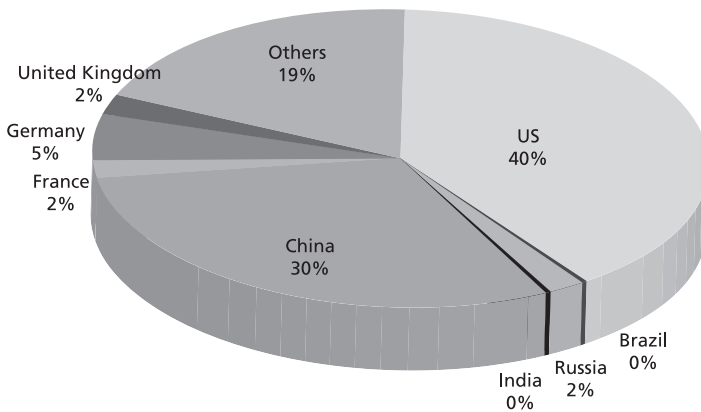
4.1 Fiscal policy response

It was agreed by the world leaders that a coordinated fiscal response was required to pull the world economy out of the recession. After decades of irreverence, Keynesian policies and its variants came to dominate the centre stage of world economic policy formulations.

The extent and depth of fiscal policy interventions have been a matter of debate. However we distinguish here between financial packages from offered by various countries from fiscal responses, unlike many other papers. This distinction is important since financial packages offered by various countries to banks and other financial institutions posing systemic risks to the economy essentially aim at asset swaps, bank injections, loan guarantees. The impact of this, in terms of spur in general demand of the economy, is indirect. Fiscal stimulus on the other, by way of tax cuts and public spending on goods and services, aim directly at inducing demand in the economy.

We consider here the direct fiscal responses by the BRIC economies and contrast them with that of some of the advanced economies in Figure 11.

FIGURE 11
Decomposition of world fiscal stimulus



Source: International Labour Organization (ILO).

Note: Compiled by Sameer Khatiwada.

The size of the aggregate global fiscal stimulus is about \$1957.97 billion, roughly 3.16% of world GDP. Out of this United States’ and Chinese response constituted of a whopping 40% and 30% respectively. Us and China were by far the largest contributor to the aggregate stimulus. Germany pledged 5% and UK, France and Russia pledged 2% each of the world total. India and Brazil pledged

only 0.3% of the world total. In terms of their 2008 GDP Brazil, Russia, India and China put forth a stimulus of 0.3%, 1.7%, 0.5% and 6.9% respectively.

What is interesting to note here is that the nature of the stimulus in the four countries differed in terms of whether the stimulus was tax cut induced or spending led. The impact of the two has been known to be different. Alesina and Ardagna (2009) found from data starting from 1977 to 2007 that in US tax cut induced fiscal measures have contributed to growth more than direct spending. Table 5 shows us that while Brazil and Russia predominantly went the tax-cut way, India and China preferred direct public spending. Brazil in fact took this opportunity to extend the widely hailed and highly successful Bolsa Program; the minimum wage was increased by 12% and a host of tax concessions to spur private consumption demand.

China invested massively in rural infrastructure, railways, airport, power grids etc. It endeavoured to extend social security to much of its population by way of increasing the number of pension funds, offering farm subsidies and providing low rent housing to its citizens. It however also offered direct tax concessions to nine of its major industries.

Incidentally the Indian Union budget 2008-09, announced in March 2008, was an expansionary one. It was essentially electoral considerations which led to pay commission rewards and major food and fertiliser subsidy. Substantial part of the outlay was earmarked for National Rural Employment Guarantee Scheme and farm loan waiver scheme. It was fortuitous that months before the crisis hit the world, India was already on an expansionary drive, rendering post crisis fiscal intervention less necessary. However, it did offer fiscal stimulus by investing in infrastructure and providing indirect tax concessions and giving assistance to the export industry.

TABLE 5
Fiscal responses and classifications

Country	Fiscal stimulus			Classification of fiscal measures		
	USD amount (bb)	Percent 2008 GDP	Tax cut/ spending	Public spending on goods and services	Stimulus aimed at consumers	Stimulus aimed at firms
Brazil	5.1	0.3	T		extension of the Bolsa Program; increase in minimum wage by 12%; tax cuts on consumer loan and personal income to boost sales	tax cuts to auto manufacturers
Russia	30	1.7	T		tax cuts	tax cuts

(Continue)

(Continuation)

Country	Fiscal stimulus			Classification of fiscal measures		
	USD amount (bb)	Percent 2008 GDP	Tax cut/ spending	Public spending on goods and services	Stimulus aimed at consumers	Stimulus aimed at firms
India	6.5	0.5	S	spending on roads, ports and infrastructure		cut in excise duties for export and labor intensive sectors
China	586	6.9	S	massive investment in rural infrastructure, railways, airport, power grids etc.	increase in the number of pension funds, farm subsidies, low rent housing development	direct tax cuts for 9 industries(steel, telecom, auto included), removal of loan quotas on commercial investors

Source: International Institute for Labour Studies(IILS), Bloomberg and National Media.

Note:¹ Compiled by Sameer Khatiwada.

²T = Stimuli in the form of tax cuts.

³S = Stimuli in the form of government expenditure.

4.2 Monetary policy response

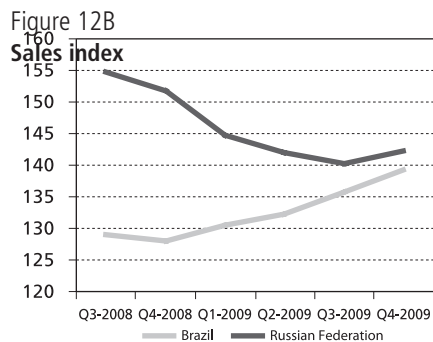
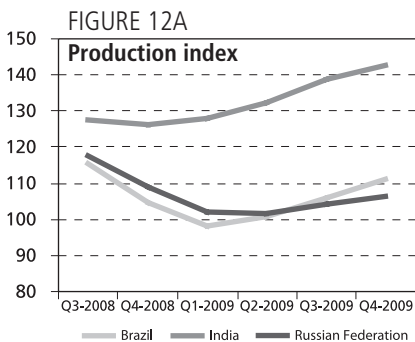
The overarching objective of the monetary response had been to inject credit into the system and thus spur aggregate demand and growth. The Bank Rate of People's Bank of China reduced from 4.14% to 2.79% in December 2008 and has stayed at that for quite some time now. Reserve Bank of India slashed reverse repo rate from 6% to 3.25%, repo rate from 8% to 4.75%, CRR and SLR too were reduced from 9% to 5% and 25% to 24% respectively in the immediate aftermath of the crisis. Russia drastically reduced its required reserve ratio from 7% in September 2008 to 0.5% in November 2008 to pump liquidity into the economy. The SELIC Policy rate in Brazil was brought down to a historic low of 8.75%. It is important to note at this point that Brazil and Latin American economies in general, have an inherent tendency to overheat resulting in inflationary trends. Inflation targeting has always been an important objective for the central bank and a high interest rate regime has been maintained in Brazil. Though over the years the equilibrium interest rate has been declining, this extent decline has been unprecedented. We shall evaluate the impact of the above mentioned monetary policy interventions on credit in the section below.

5 RECOVERY AND EXIT POLICY

As discussed above following the financial crisis, there was a coordinated effort by the major economies to give a fillip to aggregate demand in the economy by means of fiscal and monetary response. The world economy recovered earlier than expected. United States registered a positive GDP growth of 2.2% and 5.6% in the third and fourth quarter of 2009 respectively. The green shoots of recovery in the global economy were evident from the third quarter itself. Let us examine

how the BRIC economies fared.

Figure 12.a and 12.b gives us an indication of the extent of recovery in terms of production and sales. The production index of Brazil has gone up from Q1 2009 after a notable decline. For India the production index had plateaued during the peak of the crisis in Q3 and Q4 3008 but has since then shown a steady rise. The increase in Russian production index has been very gradual post Q2 2009. This may be explained in part by the fact that the sales index for Russia has not picked up significantly. While demand from consumers in Brazil have clearly picked up, whatever little increase in production in Russia may be entirely from replenishment of depleted inventory.

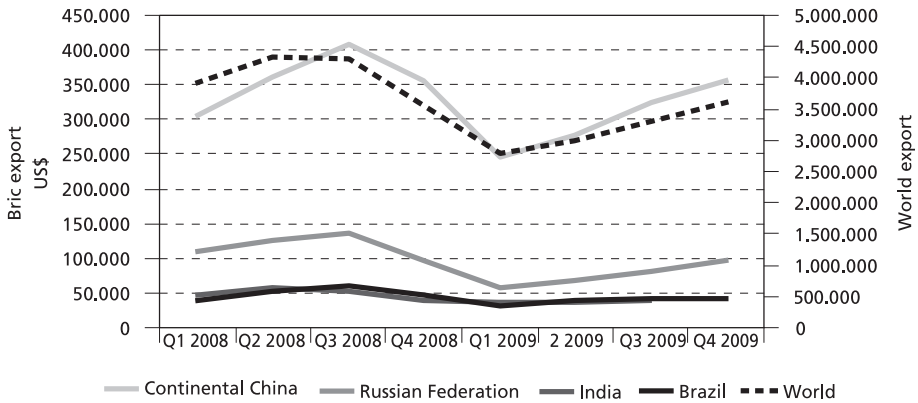


Source: OECD.

The world recovery has been accompanied by a substantial increase in world trade. World and Chinese export have risen sharply to the pre-crisis levels after a sharp dip. The export from Russia has also picked up; the major part of this has come from an increase in oil price though.

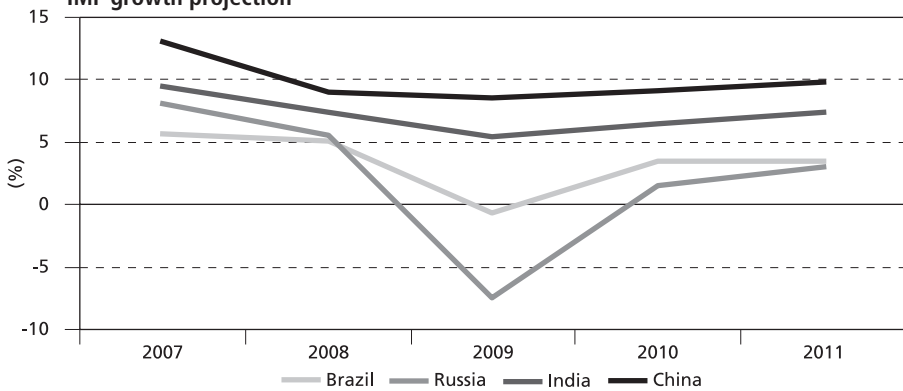
The consensus view on world growth is that double dip is unlikely to happen, but the recovery will be gradual. The same has been forecast for BRIC as well. While India and China has already reached their trend growth rate, Brazil and Russia will do so by Q3 2010. Figure 14 clearly shows that Russia has been the hardest hit in terms of GDP Growth rate and will take the longest to close the output gap.

FIGURE 13
Export: BRIC and the world



Source: IFS and IMF.

FIGURE 14
IMF growth projection



Source: IMF.

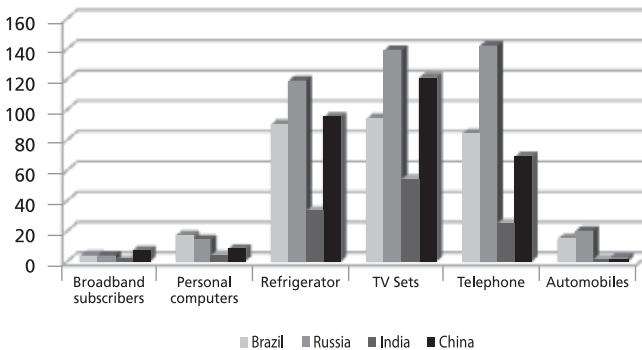
6 GLOBAL IMBALANCE AND CONSUMPTION PATTERN IN BRIC

Of the many reasons which have been attributed to the causes of financial crisis, it is widely believed by economists that global imbalances have played an important role. It has certainly played a role in perpetuating the crisis if not causing it directly. United States has historically had a current account deficit of around 6.5% of its GDP. Post crisis, following a drop in international crude oil prices, slow growth and falling imports the current account deficit has fallen and it is expected to be 4% in the near term. However according to an estimate from Peterson Institute for International Economics, in the long term it is expected to

be \$5 trillion annually, more than 10% of US GDP.² What continues to drive this current account deficit in US?

The answer may be found in the consumption pattern in US. Personal and Government consumption together constituted 88.7% of GDP and personal consumption itself constituted around 70.7% of GDP in the US in 2008. Economists argue that this high level of consumption in the US and its natural corollary a corresponding high level of saving in emerging economies, particularly China and other oil exporting countries is unsustainable. What is necessary thus is global rebalancing. We will examine if BRIC can play a role in causing this shift in consumption from the west towards the emerging market economies.

FIGURE 15
Penetration of goods

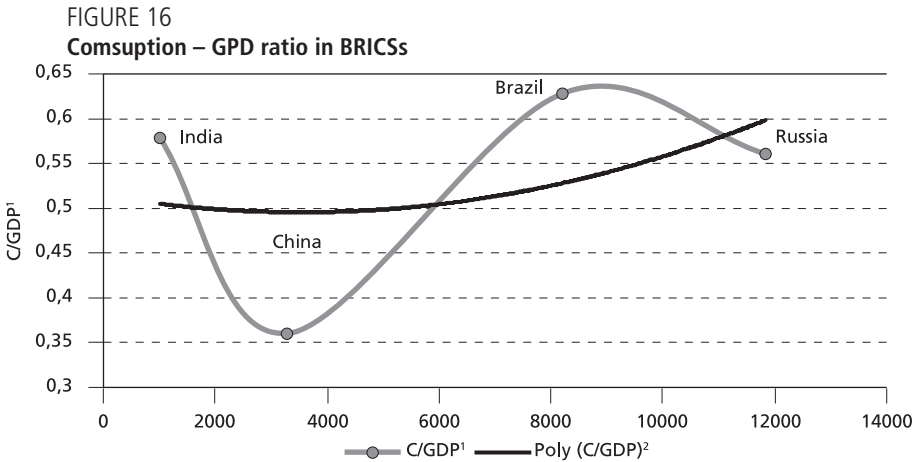


Source: Goldman Sachs.

It is clear from Figure 15 that penetration of goods (number of a particular good per hundred people) as estimated for the six different product groups in the four countries has been rather low. Russia is by far the most mature consumer market. Brazil is a close second. This is evident from the fact that the per capita income of the India and China are much lower than that of Brazil and Russia. Penetration of goods is the weakest in India. The level of penetration in the case broadband and personal computers is very low for the all the four countries indicating a potential in the near future. While there are about 19 and 17 automobiles per hundred people in Russia and Brazil respectively, that for India and China is negligible. Though India is a laggard in all respects, it is currently experiencing phenomenal growth rates in some consumer goods sectors like mobile telephony, personal computing, internet and cars.

2. Available at: <<http://www.iie.com/research/topics/hottopic.cfm?HotTopicID=9>>.

As per capita income continues to rise in the BRIC, the burgeoning middle class, especially in India and China will drive the consumption and result in its shift from the rich countries to the emerging market economies.



Source: IFS and IMF.

Economic theory suggests that at low levels of income, people consume more and save less. This is driven by the fact that a only when a bare minimum level of subsistence consumption is met, one intends to address issues like inter temporal consumption and thus saving. As income rises, consumption levels fall relative to income and finally when income exceeds a threshold level, the consumption to income ratio rises again. The economic rationale of the third stage lies is that when at higher levels of income the basic necessities of living are taken care of and there exists a well knit social safety net individuals tend to consume higher end products leading to a rise in the consumption income ratio.

The above theorisation is empirically validated as well. The relation between per capita GDP and Consumption GDP ratio has been found to be a U shape. Low PCI countries tend to have a higher C/GDP and this is set to decrease initially and finally increase again where high per capita income countries consume more relative to their income. Figure 16 suggests this relationship holds true for BRIC as well. While Brazil and Russia lies on the right of the trough of the U, India lies on the left and China at the bottom of the U. Thus for China the consumption-GDP ratio is all set to increase while India has not even begun to traverse the cycle. Evident thus is the fact that consumption China is set to increase in the coming days. For India the consumption level in itself is set to rise, however India’s GDP is set to increase at an even higher rate. Thus the Consumption GDP ratio will initially decline and then rise again.

A vexing question still remains. Why has the consumption relative to income not risen to the same extent as income itself? Milton Friedman's permanent income hypothesis professes that transitory or short term changes in income does not change the level of consumption, what changes the consumption level is the long term income expectations. It is possible that the consumers in the emerging market economies perceive the increases in income as transitory; once this rise gets a seal of permanence, the consumption levels are going to rise. On an aggregate thus a rise in consumption-GDP ratio follows a rise in income level but with a lag. Possibly this is the phenomenon we are observing in emerging markets in general and BRIC in particular. One must note though that Brazil to some extent and Russia in particular does not share the consumption characteristics of India and China and the consumption potential in the former is much less than that in the latter.

Rebalancing in the world economy, inter alia implies shift in the consumption from advanced economies to the emerging market economies. This ipso facto means a reduction in savings in the emerging economies and a corresponding increase in saving in the west. Our analysis shows that this transition from high-saving low-consumption to moderate-saving high-consumption phenomenon is feasible in the transition economies and BRIC can play an important part in it.

7 CONCLUSIONS

In line with the global experience, BRICs also suffered from the financial crisis that gripped the global economy toward the end of 2008. However, the severity of the impact was not uniform across all these economies. With a higher level of financial integration, Brazil and Russia suffered the most while India and China experienced only a moderate slow down in their GDP growth. Depending on the fiscal space all BRIC economies announced fiscal stimulus to abort the contagion of financial crisis. The biggest fiscal stimulus was announced by China followed by Russia, India and Brazil. Apart from size, the fiscal responses of these economies also differ in nature. While Brazil and Russia went for tax rebate to shore up the private demand, India and China opted for direct public spending on infrastructure development. Interestingly Brazil took this opportunity to extend its widely hailed and highly successful Bolsa Program and raised the minimum wage by 12 percent. The monetary policy response was rather simple and uniform. All economies reduced interest, with Russia going for most the liberal monetary policy regime.

The liberal monetary policy along with fiscal expansion helped BRICs to recover sooner rather than later. The recovery was first observed in India and China during the first quarter of 2009 when these economies witnessed a turnaround in their GDP growth. Brazil also embarked on the path of recovery

in the fourth quarter of 2009 followed by Russia in the first quarter of 2010. However, in case of Brazil and Russia, the economic recovery is still fragile and hence government should continue with expansionary policies. In the long run it is imperative that the global economy is rebalanced and BRIC has to play an important role in ensuring that the rebalancing takes place.

REFERENCES

- ALESINA, Alberto; ARDAGNA, Silvia. **Large Changes in Fiscal Policy: Taxes Versus Spending**. Cambridge, MA: NBER, 2009 (NBER Working Paper, n. 15438).
- BANCO MUNDIAL (BIRD). **Russian Economic Report**, Washington, DC, n. 20, Nov. 2009.
- . **Russian Economic Report**, n. 21, Mar. 2010.
- BORENSZTEIN, Eduardo; DE GREGORIO, José; LEE, Jong-Wha. How does foreign direct investment affect economic growth? **Journal of International Economics**, v. 45, n. 1, p. 115-135, 1 June 1998.
- China Quarterly Update**. Mar. 2010.
- GOLDMAN SACHS. **Goldman Sachs BRIC Reports**.
- . **Dreaming with BRICs**, 2003.
- FUNDO MONETÁRIO INTERNACIONAL (FMI). **Global Financial Stability Report**. Washington, DC, Oct. 2009.
- . **Global Economics**, n. 99/152, 2007. Disponível em: <<http://www2.goldmansachs.com/>>.
- . **Global Financial Stability Report**. Washington, DC, Apr. 2010.
- MOHAN, Rakesh. Global financial crisis and key risks: impact on India and Asia. *In*: IMF-FSF HIGH-LEVEL MEETING ON THE RECENT FINANCIAL TURMOIL AND POLICY RESPONSES. Washington, DC, 9 Oct. 2008.
- VASHISTH, Pankaj; KUMAR, Rajiv. **The Global Economic Crisis: Impact on India and Policy Responses**. Tokyo: ADBI, 2009 (ADBI Working Paper, n. 164).

GLOBAL CLIMATE POLICY AND BRAZIL: 2005-2010

Eduardo Viola*

This paper has five sections. In Section 1, it explores the links between the economic crisis and the climate crisis, and the recent dynamics - in terms of negotiating position and climate policies - of the three great climate powers - USA, China and European Union - and the ten middle climate powers - India, Russia, Brazil, Japan, Indonesia, Mexico, South Korea, Canada, South Africa and Saudi Arabia. Section 2 provides an overview of the evolution of climate policy in Brazil in the 2005-2008 period. Section 3 analyses how major changes in the positions of the governments of the Amazonian states, of a significant group of large Brazilian companies, and of governmental and civil society players, produced a major shift in climate foreign policy in the second half of 2009. Section 4 evaluates the outcome of COP 15 and its aftermath in the first half of 2010, when all major countries pledged to achieve the targets of the Copenhagen Agreement. Finally, Section 5 summarizes the deep changes that took place at the national and international level in 2009 and 2010 and speculates briefly about the coming year.

A POLÍTICA CLIMÁTICA GLOBAL E O BRASIL: 2005-2010

Este artigo possui cinco seções. Na seção 1, analisa-se a inter-relação entre a crise econômica e a crise climática, e a dinâmica recente – em termos de posição de negociação e políticas climáticas – das três grandes potências climáticas – Estados Unidos, China e União Europeia – e das dez potências climáticas médias – Índia, Rússia, Brasil, Japão, Indonésia, México, Coreia do Sul, Canadá, África do Sul e Arábia Saudita. Na seção 2, apresenta-se uma síntese da evolução da política climática brasileira no período 2005-2008. Na seção 3, analisa-se como mudanças importantes no posicionamento dos governos dos estados amazônicos, de um grupo significativo de grandes empresas brasileiras, de atores governamentais e da sociedade civil, produziu uma importante mudança na política externa climática no segundo semestre de 2009. Na seção 4, avalia-se o resultado da COP 15 e de seus desdobramentos no primeiro semestre de 2010, em que todos os principais países se associaram com metas ao Acordo de Copenhague. Por último, na seção 5, sintetizam-se as profundas transformações acontecidas no plano nacional e internacional durante 2009 e 2010 e especula-se brevemente sobre as perspectivas para os próximos anos.

1 CLIMATE CRISIS, ECONOMIC CRISIS AND RECENT EVOLUTION OF THE CLIMATE POWERS

Greenhouse gas emissions grew 3% during the first decade of this century. According to information from the Netherlands Environmental Assessment Agency,¹ including deforestation data from various partial sources for Brazil and Indonesia, the largest emitters in 2008 were: China accounting for 23% of the

* Head professor of the Institute of International Relations at the University of Brasilia (UnB), coordinator of the Network on Climate Change and International Affairs and senior researcher at the National Council for Scientific and Technological Development (CNPq).

1. The most important institute producing data on GHG emissions in the world.

world total - and annual growth of 5%; USA with 20% of total emissions – and annual growth of 0.8%; European Union (27 countries) with 16% of the total – increasing 0.3% a year; India with 6% of the total - increasing 5% a year; Russia with 6% of the total and annual growth of 5%; Brazil accounting for 5% of the total - growing 4% a year until 2004, with a sharp reduction between 2005 and 2009, Indonesia with 4% - growing 5% a year; Japan with 3% - growing 0.4% a year; Mexico with 2.5% of the total - growing 2% a year, Canada with 2% of the total - growing 1.5% a year; South Africa with 1.5% of the total - growing 2% a year, South Korea with 1.5% of the total - increasing 0.7% a year, and Saudi Arabia with 1.5% of the total - growing 6% a year.

These 13 countries - considering the 27 European Union countries as a unit - are responsible for more than 80% of global emissions and are the two critical groups of great climate powers and middle climate powers. There are three great climate powers: the United States, China and the European Union, which add up to nearly 60% of global carbon emissions. No new agreement is possible without the full engagement of these countries, which have veto power over the whole or any part of a new agreement. In these three countries, there is currently a gap between the economic, political, military level on one side, and climate on the other. Indeed, there is an economic, political, military and cultural alliance between the United States and the European Union. Such alliance is not mirrored on the climate side - the European Union is isolated in the defense of an effective global architecture for a rapid transition to a low carbon economy. The United States and China are resisting a new effective global agreement, even though their rhetoric has changed in the last year. There are ten middle climate powers: India, Russia, Brazil, Indonesia, Japan, Mexico, Canada, South Africa, South Korea and Saudi Arabia. None of them in isolation or even in pairs - or even in groups of three or four, except for India, Russia, Brazil and Japan combined - has veto power over a new agreement, but the entire group of countries plays a key role in moving towards a new agreement.

Today, the main gap in the climate arena is not between developed and developing countries, as a large share of the media oversimplifies. In 2010, the reformist camp is made up of: European Union, Japan, South Korea and Mexico, and the conservative camp is composed of the United States, Canada, China, India, Russia, Indonesia and Saudi Arabia. In the middle are Brazil and South Africa, which are now in the reformist camp for their emission reduction targets, but are in the conservative camp for their international negotiation position, to the extent that they maintain their alliance with China and India (IBSAC) and their association with the G-77.²

2. The G-77 is a group of developing countries established in 1964 with the aim of coordinating the activities of developing countries in multilateral fora. Currently, the group has more than 130 participants, though it has kept the same name.

The dramatic deepening of the US financial crisis after the collapse of Lehman Brothers on September 15, 2008, and its rapid descent into the deepest global financial crisis in history, had multiple impacts on climate change mitigation prospects. The attention of the world's public opinion and elite decision-makers as regards the urgency and severity of climate change has partially decreased, and the severity of the economic crisis - particularly in the US, European Union and Japan - has created additional obstacles to the negotiation of a new climate change treaty (STERN, 2009b).

The severity of the economic crisis has opened a limited window of opportunity for the transformation of values in developed and developing countries towards the reduction of consumerism and immediacy, leading to increased perception of the severity of the climate issue (GORE, 2009). Since the economic crisis is systemic, the recovery process currently underway does not mean a return to a situation similar to that existing before September 2008.

Unlike what most economists and international observers would have imagined in mid-2008, a substantial part of the economic stimulus packages started in November 2008 in several key countries, was intended to drive the transition to a low carbon economy: 65% of the increased spending in South Korea, 35% in China; 20% in the UK, 20% in Germany and 15% in the US. (STERN, 2009b). However, Brazil, India, South Africa, Indonesia and Russia performed very poorly regarding this issue.

Below, we present an analysis of the climate policies of the great climate powers.

1.1 The United States

The United States remains the most important country for any agreement, as it is the second major emitter and still has the greatest global technological innovation potential towards low carbon (GUIDENS, 2009). The United States has a population of 305 million inhabitants, a gross domestic product (GDP) of US\$ 14.5 trillion and a per capita GDP of US\$47 thousand. The country emits 5.8 billion tonnes of carbon dioxide equivalent, representing 20% of total emissions, 19 tonnes per capita and 0.4 ton of carbon per thousand of GDP. It is one of the countries with the highest emissions per capita in the world, only surpassed by Australia, Canada, Luxembourg and the small oil-exporting countries of the Persian Gulf. It is an economy with relatively high energy efficiency and low carbon intensity overall, but it is among those of highest intensity among developed countries - surpassed only by Canada and Australia - due to the combination of energy sources based on coal and oil with high utilization of aircraft and individual automobiles for transport. The US emissions grew 0.8% a year this century. After leading the negotiation of the Kyoto Protocol with the European

Union, during the Clinton administration (1993-2000), the US government was extremely irresponsible during the Bush administration (2001-2008). The Democratic opposition to Bush was constantly critical of the Executive's position, although without significant impacts on the federal level. On the other hand, several states have implemented policies to reduce emissions, especially California and New England, which have already approved regional caps and trade systems³ (VIOLA, 2009).

The first four months of the Obama administration gave out clear signs that the new administration focused on the economic and climate crises as interrelated processes that should be addressed simultaneously, in a decisive move towards de-carbonizing the economy. The emergency economic program for short term recovery of the economy was compatible with the medium and long-term goals of Obama's platform: expansion of renewable energy; upgrading of the national electricity transmission network to increase efficiency and absorb the enormous aeolic potential of the North Dakota-Texas corridor; promotion of public transport - particularly high-speed trains - in metropolitan areas; and encouraging all economic sectors to create new "green" jobs. The emergency program was different from a classical public spending expansion program and was synergistic with the strategic aim of increasing energy security. The cabinet's entire energy area focuses on encouraging renewable energy and nuclear power (FRIEDMAN, 2008).

The supra-ministerial position of Carolyn Browner - linked to Al Gore - on climate issues guaranteed the submission of the caps and trade proposal to Congress early on in the new administration, deepening and ensuring national reach for the laws already in force in California and New England. As a clear indication of this, Obama signed an executive order allowing the states of New England and California to fully implement their state laws, which establish stricter energy efficiency standards for automobiles, reversing Bush's previous contrary order (SPETH, 2010).

The Waxman Act on climate and energy - which enforces a system of carbon emission caps and quotas - was passed by the House of Representatives in June 2009, but was paralyzed at the Senate in the second semester due the Obama administration's focus on the health reform. In the first half of 2010, prospects of the Senate passing the law gradually declined and were finally abandoned

3. The term «caps and trade» quickly became widespread in the area of climate change after the Kyoto Protocol, which set caps on emissions for 2008-2012 for industrialized countries (Annex 1 Countries). The Protocol also established trade in emission quotas among Annex 1 countries, i.e. companies in countries that have emissions below their cap for the period 2008-2012 would have carbon credits they could sell to companies in countries whose emissions exceed their cap. Something similar happens in the Clean Development Mechanism (CDM), under which companies that exceed their emission cap under national legislation for the sector can buy carbon credits from companies in non-Annex 1 countries that are reducing emissions beyond business as usual and that have no legal obligations to do so.

officially by the Democrats in July 2010. Several factors explain this failure: extreme bipartisan polarization of the US Congress resulting in legislative paralysis and a governance crisis; high unemployment rate eroding Obama's popularity; the Democratic Party's defeat in the elections for Massachusetts state senator in January 2010 and resulting loss of the 60% supermajority of senators; the Republican attack on the Intergovernmental Panel on Climate Change (IPCC) because of some mistakes in the 2007 report and dubious procedures in building consensus; wave of extreme cold in the winter of 2010 on the East Coast, which was demagogically used by the Republican Party as a "demonstration" of excesses in the assessment of the dangers of global warming; aggressive lobbying by oil, coal, cement, steel and electricity companies against passing of the law because it would allegedly lead to loss of competitiveness for the US industry; and several surveys showing strong growth of the share of American population that believes the risk of global warming is overstated.

The expectation in Europe at the beginning of Obama's administration was that the United States could play a shared leadership role with the European Union. This expectation seemed about to materialize in May 2009, but when finally the Waxman Act on energy and climate was approved by the Chamber of Representatives in June 2009, the scenario was less favorable, as the commitment undertaken was to reduce emissions by only 3% over the base year of 1990, well below the 20% of the European Union, and negligible compared to the 30% to 40% reduction demanded by the IPCC.

Significant resistance was expressed at the US Congress with respect to sharper reduction commitments, mostly derived from the lack of reduction commitments by large developing countries, particularly China. There is also more structural resistance led by economic sectors strongly associated with fossil energy sources: states that produce coal, oil, steel, and coal-based thermoelectric power plants. On the other hand, almost all large low-carbon companies support significant emission reductions: information and communication companies, such as Google, Apple, Microsoft, Oracle and CNN, biotechnology, renewable and nuclear power companies, such as General Electric and major retail chains such as Wal-Mart, producers of "green building" inputs etc.

The United States has an important margin for reducing emissions through: change of thermoelectric technology to "clean coal" (cleaner technologies) and use of "carbon capture and storage"; expansion of wind, solar, biofuel and nuclear energy; reduction in size and increased efficiency standards for cars; and modernization of the electric transmission network and setting of new green standards for construction - buildings and houses designed or renovated to reduce emissions (SACHS, 2008).

1.2 The European Union

The European Union (27 countries) has a population of 490 million inhabitants, a GDP of US\$ 17 trillion and a GDP per capita of US\$ 35 thousand. It emits 4.2 billion tonnes of carbon, accounting for 15% of the world total, 8 tonnes per capita and 0.3 ton of carbon per thousand of GDP. The EU is very heterogeneous, both in terms of per capita emissions - from 22 tonnes in Luxembourg to 4 tonnes in France and Portugal - and in carbon intensity: low in the Nordic countries, Germany, UK and France; average in Spain, Belgium and Italy, and high in Poland, Czech Republic, Romania, Bulgaria and the Baltic countries. The EU emissions grew 0.5% a year as a result of the nearly stable emissions of Germany, UK and Sweden, and the accelerated growth of emissions from Spain, Portugal, Greece and Eastern European countries - even though the latter are still below the 1990 baseline.

The main political leaders of the European Union in recent years have been in favor of strong action to mitigate global warming, particularly the governments and public opinions of the United Kingdom, Germany, Sweden, France and Denmark, followed - albeit with a lower profile - by the Netherlands, Belgium, Finland and Ireland. Attention should also be drawn to the recent change in Spain's position, recognizing the growth of its emissions over the last decade. In recent years, the British government took the lead in the European Union with the approval in parliament, in November 2008, of a law establishing the carbon budget, and the launch of the Transition Plan to a Low Carbon Economy, in July 2009. With this plan, the UK pledges to reduce emissions by 34% by 2020, considering the base year of 1990 (BRITISH GOVERNMENT, 2009). The plan sets out detailed measures and targets for all sectors of the economy, including a number of public policies that encourage important behavioral changes. In the new coalition government, which started in June 2010, the presence of the liberals ensures the policy's continuity, albeit at a slower pace due to the severity of the economic crisis.

1.3 China

China has a population of 1.3 billion people, a GDP of US\$ 4.5 trillion and a GDP per capita of US\$ 3.5 thousand. It emits 6.5 billion tonnes of carbon, corresponding to 23% of global emissions, 6 tonnes per capita and 1.5 ton of carbon per US\$ 1000 produced. This is a very carbon intensive economy, with an energy mix strongly based on coal and oil. Although its GDP has fallen 5% a year in the last decade, China still has a carbon intensity ten times higher than Japan and four times that of the United States. Contrary to common sense, per capita emissions from China are average and not low. China's total emissions grow at a startling rate of 8% a year. The cost of reducing emissions in China is high, if

the current model of industrialization is maintained, but it would be feasible if it shifted to a model based more on productivity growth rather than increase in gross production, and with international cooperation in technology from developed countries. In 2007, global emissions of greenhouse gases grew 3.3% in relation to 2006, and 50% of that growth occurred in China. In turn, two thirds of growth in China occurred because of the burning of coal. Reducing the burning of coal is more important for the world than reducing oil consumption, therefore, a drastic change is needed in the way Chinese - and Indian - coal is consumed. Carbon capture and storage, "clean coal" and nuclear power technologies are very important for China. The Chinese government's position - on its national climate and energy policies, as well as international negotiations - was slack until 2006, but since then there have been changes based on assessments of China's vulnerability to climate change. The government encouraged strong growth in wind and solar energy and announced its goal of reducing the growth rate of emissions. This goal was reflected in the National Plan for Climate Change and the anti-crisis economic stimulus package approved in November 2008, with a 35% share of public spending directed to the transition to a low carbon economy. There is a gap in China between globalist and nationalist forces, the power of the former growing continuously and becoming increasingly focused on shifting the Chinese position towards global responsibility.

However, the Chinese international negotiation position remained backward compared with its new energy policy. At the UN General Assembly in September 2009, President Hu Jintao announced that the country was willing to undertake concrete responsibilities in the fight against global warming, and announced a Chinese target to reduce the carbon intensity of its GDP by between 4% and 5% a year in the 2005-2020 period. However, China continues to refuse to make commitments with an emissions peak and a year of stabilization prior to 2020 - as demanded by the international scientific community and the European Union, the United States and Japan - which is a factor that increases the weight of conservatives in the US Congress. In the technological field, 2009 was a year of great technological advancement and efficiency and productivity gains of Taiwanese photovoltaic solar energy companies and the formation of joint ventures in China for massive investment in a broad program called low carbon cities. As of 2009, one can say there are two Chinas in terms of carbon: on the one hand, a strongly prevailing traditional China that is a carbon emission producer and exporter; on the other hand, a new low carbon China, still a minority, but growing at an extraordinary rate due to high savings and investment capacity of the country and that will create a new low carbon business sector with conflicting interests with traditional China.

1.4 The middle climate powers

In this subsection we will discuss the middle climate powers, with the exception of Brazil, which will be discussed in section 2.

Ranking fourth among the major emitters, India has a population of 1.1 billion people, a GDP of US\$ 1.4 trillion and a GDP per capita of \$1,200. The country emits 2.5 billion tonnes of carbon, corresponding to 6% of total global emissions, with 2.1 tonnes of carbon per capita and 1.8 tonnes per US\$ 1,000 of GDP. India is a country of great contrasts, being the second demographic giant, with 17% of the world's population, therefore it is key in all comparative statistics. However, it has a low rate of per capita emissions, since it is a country with low per capita income and high carbon intensity, owing to low energy efficiency and high share of coal and oil in its energy mix.

However, it has developed solar photovoltaic and wind power at rates well above those of Brazil, albeit lower than in China. India has partially developed ethanol production as the largest sugar producer in the world, although most of this production is intended for human consumption. India's emissions grew 8% annually, and the country, during this decade (2010), will replace China as first ranking in growth of percentage participation in total emissions. The Indian government's position has historically been negligent, as the Chinese, and has not changed until today (KASA, 2007). Some academics and government sectors in India have developed a conspiracy doctrine based on historical resentment against the West, particularly against the British, called *carbon colonialism*, under which the proposed carbon constraint in developing countries would be a means to keep the status quo of underdevelopment. Some comparisons should be made between India and China, as the behavior of their societies is crucial for the present and the future, due to the dramatic growth of their contributions to global warming (LEIS; VIOLA, 2008). India is much more vulnerable to climate change than China, considering that a key part of its population depends on water that springs in the Himalayas under Chinese sovereignty. China is increasingly tempted to divert rivers for the use of its huge population, and its glaciers are shrinking because of global warming. Moreover, India has a significant share of its population living in low lands subject to monsoons and devastating shocks between land and ocean atmospheric circulation.

India has a democratic system - even though it is of low quality due to the caste legacy - with the presence of a major environmental movement, which challenges, with ambivalence to this day, the official position. The average Indian population has a less materialistic orientation than the Chinese because of religion and is therefore more sensitive in terms of values related to the state of the planet. India's government is highly fragmented and inefficient, making a shift towards

less carbon intensive than China much less likely. About 18 ministries act directly on issues relating to climate change, without any clear leadership. In mid 2009, internal divisions within the Indian government became public and a significant number of decision makers began to openly question the traditional view of the Indian government. They did so always remembering rightly that India, with 2.1 tonnes of carbon per capita, should not be pressured internationally to the same extent as China - 6 tonnes per capita - and Brazil - 8 tonnes per capita - so there is still significant carbon space to be occupied at the expense of developed countries and middle income countries.

Russia has a population of 142 million inhabitants, a GDP of US\$ 1.4 trillion and a GDP per capita of US\$ 10 000. It emits 1.4 billion tonnes of carbon, representing 5.5% of global emissions, 10 tonnes per capita and a ton of carbon per US\$ 1,000 of GDP. It has an economy with high per capita emissions and high carbon intensity, giving it a unique profile among the world's major economies. It is a society that has become much richer in the last seven years, but it has low energy efficiency and an energy mix heavily based on fossil fuels, and is a major exporter of oil and gas. Russia has a very particular position in the global framework for the following reasons: *i*) the architecture of the Kyoto protocol totally favors it in terms of emission parameters because, in the base year of 1990, the Soviet Union was a high-carbon economy with very low energy efficiency, *ii*) as an economy whose main asset is the abundance of fossil fuels, it sees itself as losing in the transition to low carbon intensity, and *iii*) among all major emitters, it is the only country where an important part of the elites and opinion leaders realize - at least until the extremely hot summer of 2010 - that global warming could be favorable for the country because it would dramatically increase farmlands and *iv*) it is favored by the Kyoto architecture and will tend to strongly oppose an agreement that restricts the use of fossil fuels in the world.

Japan has a population of 127 million inhabitants, a GDP of US\$ 5 trillion and a GDP per capita of US\$ 39 thousand. It emits 1.4 billion tonnes of carbon, corresponding to 3.5% of world total, with 10 tonnes per capita and 0.15 ton of carbon per US\$1,000 of GDP. Japan is - together with European Union countries such as France, Sweden and Denmark - the economy with the lower carbon intensity in the world due to high energy efficiency and the key role of nuclear energy in its electricity generation. Japan's public opinion and a significant part of its business sector - Honda and Toyota - are in favor of mitigating climate change, but the country's leadership role in the international arena is unfulfilled due to its low profile foreign policy and its special relationship with the United States. The plan Cooling the Earth 2050, launched by Japan in 2007, is the first approved by the government of an important country to show a consistent and comprehensive path for a country to transition to a low carbon economy. The historic victory of

the Democratic Party in Japan in August 2009 and the formation of the new Japanese government changed the country's position in the international system by announcing a commitment to reduce emissions by 20% to 25% over the base year of 1990.

Indonesia increased its emissions during the first decade of the 21st century, due to widespread deforestation of peat forests with high carbon stock. The country developed a rather inconsistent plan to reduce emissions by 2020, conditional on hypothetical large-scale international aid that is unfeasible even if developed countries behaved highly responsibly. Canada has the worst performance among the developed countries that signed the Kyoto Protocol and is far short of meeting its commitments. The government declared in 2009 his wish to withdraw from the Kyoto Protocol, if the United States did not sign and developing countries did not undertake commitments. The large growth in oil production in Alberta - and the fact that the exploitation of natural resources is regulated at the provincial and not federal level - is the main reason for Canada's setback. Mexico adopted an advanced national plan for climate change in 2007 under President Calderón, and took a leading international position, as opposed to Fox's conservative administration. South Africa announced stabilization and emission peak targets in 2008, taking the lead among the big emerging countries of the G-77. South Korea has maintained throughout the decade the most reformist profile among countries not belonging to Annex 1 of the Kyoto Protocol.

1.5 Recent developments

As a product of the combination of economic and climate crises, uncertainty in the international system has become quite high and comparable to other crucial moments in history, such as the oil shock and stagflation started in 1973 and the collapse of communism in 1989-1991 (GORE, 2009). There are powerful forces moving in opposite directions: on the one hand, traditional economic interests influence national governments to protect various economic sectors from the risk of collapse and call for measures that may have an indirect effect of trade protectionism and stagnation of globalization (MABEY, 2008; KEOHANE; RAUSTILA, 2008).

On the other hand, innovative economic, social and cultural forces seek to influence governments to implement deep reforms of the international system, developing global governance and restricting carbon emissions in order to initiate the transition into the low carbon economy (BIERMANN, 2007; HURRELL, 2007; TICKELL, 2008; BARRET, 2010).

In short, on the one hand, stagnation of globalization and increased conflicts in the international system, and on the other hand, reform and increased

governance of globalization. Until November 2009, the crisis pushed towards the latter: the constitution of the G-20 as a global governance structure, continuous coordination of the monetary authorities of major countries, the expansion of the G-8 to G-14. However, since December 2009, expressions of conflict in the international system have increased: greater pressure from major countries for China to let its currency float and the conflict between US and Chinese officials at the Copenhagen conference.

The core issue in the international scenario in 2009, from the perspective of the Copenhagen conference, was the ability of the United States, European Union and Japan to undertake ambitious emission reduction targets for 2020 and persuade other major emitters - China, Brazil, India, Russia and Indonesia - to accept the establishment of different emission peaks and years of stabilization - before 2020 for middle-income countries like Brazil, Russia, China and Mexico (TIMMONS, PARKS, 2007; STERN, 2009a). Towards the end of the second half of 2009 it became apparent that this scenario will not happen because of Obama's inability to substantially change the US negotiating position, due to internal resistance.

2 ECONOMIC AND POLITICAL FORCES FAVORABLE TO A TRANSITION TO LOW CARBON IN BRAZIL

Brazil has a population of 190 million inhabitants, a GDP of US\$ 1.7 trillion and a GDP per capita of US\$ 8 thousand. It emits about 1.8 billion tonnes of carbon, corresponding to approximately 5% of global emissions, 9 tonnes per capita and 1.1 ton of carbon per US\$ 1,000 of GDP. Brazil's emissions in the 2005-2009 period dropped sharply in relation to 2001-2004, owing to the dramatic fall in the rate of deforestation in the Amazon, from an annual average of 20,000 km² to an average of 12,000 km², reaching a very low figure in 2009 (7,000 km²).

Calculations of emissions in Brazil are among the most complex of the biggest emitters because of the high proportion of carbon dioxide emissions from deforestation in the Amazon - Cerrado and the importance of emissions from livestock, whose calculation is much more complex than emissions from energy, industry and transportation. At the same time, the system for calculating emissions in Brazil is more reliable than other emerging countries - China, India and Indonesia - because Brazil is a consolidated democracy and has a strong scientific community (LEIS; VIOLA, 2008). Brazil's carbon emissions - according to the first national communication officially made in 2004 - were of 1.4 billion tonnes of carbon in 1994.

2.1 Brazilian policies in the recent past

Until mid 2009, public policies for mitigation and adaptation to climate change were very limited. The resources allocated to the Ministry of Science and Technology (MCT) and the Ministry of Environment (MMA) to address the issue have been minimal. The 2007 Multiyear Plan (PPA) has not allocated significant resources to mitigation and adaptation. It was only in 2007 that a secretariat on climate change was established in the MMA, with very limited capacity and restricted budget. In June 2008, the Executive sent to Congress a draft Climate Change Bill that did not internalize the issue of climate change in the Brazilian legal architecture, as some developed countries have done. Internalizing climate change in the legal framework means to clearly define greenhouse gases as pollutants, even if they are different from other local impact pollutants that affect human health.

The 2001 electricity blackout generated a huge increase in energy efficiency in Brazil - about 20%, according to best estimates - and public awareness regarding energy conservation. Unfortunately, this gain has not been absorbed in public policy as part of a larger framework to reduce carbon emissions. The small and necessary diversification of the electricity mix promoted in recent years as a result of the blackout leaned towards fossil fuel power plants, rather than biomass power plants and wind and solar networks.

On the positive side, there has been a reduction of deforestation in the Amazon and the emergence of the ethanol diplomacy. Brazil was extremely successful in the significant reduction in Amazon deforestation during the 2005-2009 period, compared to the 2001-2004 period, which had maintained the high pace of deforestation of the previous decade. The average annual deforestation dropped from 20,000 km² to an average of 12,000 km². This produced a dramatic reduction in emissions from Brazil between 2004 and 2009, of approximately 25% of the total (MOUTINHO, 2009).

There is no other case of emission reductions of such magnitude, except in Eastern Europe and the former Soviet Union in the first half of the 1990s, but in this case, there was a collapse of economic activity. In the Brazilian case, the emission reduction occurred in a context of economic growth of 3.5%, higher than the historical average of the previous two decades.

Deforestation reduction had five main drivers:

1. Increased institutional capacity and implementation of the law by the national government through the coordinated activity of monitoring, enforcement and repression agencies.
2. Creation of large protected areas – national parks, ecological stations, ecological reserves, etc. – mainly by the federal government between 2002 and 2007, but also by some state governments.

3. The presence of large non-government organizations (NGOs) and national organizations that conducted an intensive awareness raising campaign on public opinion and among the importers and traders of developed countries. One of the outcomes of this campaign was the moratorium on Amazon soybean purchases and a moratorium on the purchase of cattle from areas deforested by large meat processing companies, the latter with less success than the former.
4. Gradual cooperation of several state governments in the Amazon with the federal government on control of deforestation, albeit heterogeneously.
5. Some periods of decline in soybean and beef prices helped reduce the deforested area, but the reduction was maintained later when prices started to increase; there was a break from the historical correlation between deforestation and the price of soybeans and beef.

Reducing deforestation broke two myths in Brazil: the myth of powerlessness in relation to Brazilian society's ability to control deforestation in the Amazon and the inevitability of immediacy in the use of natural resources, originated in the almost total destruction of the Atlantic and Araucaria forests in the twentieth century. Beyond the exaggerated propaganda around this reduction by the national government, it will probably have deep and favorable long-term consequences, ending the "curse" of national impotence in the Amazon.

On the other hand, since 2006, President Lula has understood how strategic the establishment of a global economy of biofuels is for Brazil. The ethanol diplomacy is advanced from the standpoint of national interest, but it contradicts Brazil's position as ally of China, India and Indonesia in climate change negotiations. What Brazil needs in order to consolidate the ethanol policy is to assure the world that the transition to biofuels in Brazil, with global effects, it will not take place through deforestation.

This demonstration is relatively easy when it comes to ethanol, but it is much more difficult with respect to biodiesel, since soybean is one of its key raw materials, and its cultivation has expanded considerably in the Amazon. Brazil has vast arable land and does not need to clear any land at all for ethanol. But many Europeans argue that increased ethanol production in the Midwest and Southeast pushes the soybean and cattle frontier towards the Amazon. It is therefore crucial for Brazil to make significant progress in reducing deforestation in the Amazon. This is a necessary requirement, but not enough, to turn ethanol into a global commodity.

The announcement of the pre-salt oil find in late 2007 produced, at first, a narrow triumphant attitude in the Brazilian government. In this view, Brazil

would become a major exporter of oil, which would have a central place in the country's economy. But this attitude is not linked to the issue of transition to a low carbon economy advocated by the ethanol diplomacy. More recently, the government's discourse has been raising - focally in the MMA - that pre-salt oil should be exploited with state-of-the-art technology that includes carbon capture and storage (CCS).

2.2 The National Plan for Climate Change

The National Plan for Climate Change, announced in December 2008 on the eve of the Poznan Conference (COP 14), had an ambiguous meaning. On the one hand, it did not result from focused and consistent effort of key ministries to centrally internalize climate change mitigation and adaptation in their policies. Neither does it propose the creation of a unified "Climate and Energy" Ministry as has occurred in several countries, indicating that this will be the prevailing trend of the future. On the other hand, it means a break from the historical discourse of the Brazilian state with regard to the Amazon, in proposing measurable deforestation reduction targets and an implementation schedule.

The plan was greeted enthusiastically in the international community and with many doubts in the Brazilian climate community, since it was announced at the last minute and only after its first version suffering heavy national and international pressure and criticism. Minister Carlos Minc, who led the advances in the plan, is committed with it, but the government core showed resistance and, like President Lula himself, had a history of low sensitivity to the issue.

The MCT is responsible for producing the national emissions report, a basic tool for defining a national climate policy. For a variety of reasons, the production of the second emissions report was slow – considering how important the climate policy had become in Brazil and the country's relevance in international negotiations – as other middle-income countries submitted their reports in 2007 or 2008 - for example, Argentina, where the climate policy has very little relevance, submitted its report in 2007. The reasons for the delay are numerous: *i*) the MCT's limited budget for this item;⁴ *ii*) conflict with the MMA with respect to certain methodological issues; *iii*) formal deadline in the Convention Secretariat ends only in 2010, which means that, from a formal point of view, the country was still on schedule; *iv*) informal agreement with China and India to submit the report on the same date, as happened in 2004, despite the Brazilian report being substantially completed in 2002; and *v*) pressure from more conservative sectors of government to delay delivery due to the high growth in emissions between 1994 and 2004.

4. Amazingly, much of the funding for the Brazilian inventory has come from developed countries, since the Brazilian government has not allocated sufficient funds for such a strategic task for the country.

Due to this delay, two initiatives concluded in October 2009, one by the University of São Paulo (USP) and other by the Ministry of Environment, produced estimates for 2005 (the first) and 2007 (the second). In fact, the MMA estimates were based, fundamentally, on provisional data accumulated by the work of the MCT, complemented by some academic institutions. According to the estimates produced by the team led by Carlos Cerri, emissions in 2005 were of 2.020 billion tonnes of CO₂ equivalent distributed as follows: 1.140 billion tonnes of CO₂ attributable to deforestation and changing land use (54.5%); 467 million tonnes generated by agriculture (23.1%); 354 million attributable to energy (17.5%) and 37 million to the industry (1.9%).⁵

According to the USP estimate, Brazil still has very unique emission profile, since approximately half its emissions are derived from deforestation in the Amazon and the Cerrado, something unusual for middle-income countries (CERRI, 2009). This profile is due to an energy mix of low carbon intensity, high proportion of hydropower in electricity generation, and the growing importance of biofuels, particularly the substitution of gasoline for ethanol. Moreover, the regional distribution of emissions is very unbalanced, with Amazon states representing approximately 40% of emissions, with 12% of the population and only about 7% of GDP. The rest of Brazil has 60% of emissions, 88% of the population and 93% of GDP. The asymmetry of the regional distribution of emissions in Brazil is one of the largest in the world. Emissions per capita and carbon intensity of the Amazon region are among the highest in the world.

Between 15% and 18% of global carbon emissions come from deforestation and land use change, and the Amazon plays a key role in the global carbon cycle.⁶ With approximately 2% of global emissions from that source, Brazil is the second largest emitter due to deforestation and land use change after Indonesia - which accounts for about 4% of global emissions from the same source. A very unfavorable aspect for Brazil is that its per capita income is US\$ 8000, while Indonesia's is US\$ 2000.

Much of the fixed capital that will be in place in Brazil in 2050 has not been built yet and that means a huge opportunity in terms of the key dimensions of

5. Carlos Cerri is head professor at the Center for Nuclear Energy in Agriculture (Cena), University of São Paulo. A few weeks after the release of the Brazilian emissions report, Professor Cerri won the Ernesto Illy Trieste Science Prize. The prestigious award is the highest offered jointly by the Academy of Sciences for the Developing World (TWAS) and the company Illycaffè, acknowledging outstanding scientists from developing countries.

6. The world's leading source on the role of emissions from deforestation is the 2006 Stern Report, which estimated them at 18%. The Brazilian government has questioned the validity of this data by proposing an alternative estimate of total emissions of about 11%, arguing that Stern overestimates, with political motivation, the role of deforestation in global warming. However, most of the Brazilian scientific community tends to agree with an estimated weight of deforestation of between 15% and 18%. Anyway, this is an area where data are poor and precarious, since a significant number of deforesting countries are poor and/or on the brink of bankruptcy. Brazilian data on deforestation are now of excellent quality compared to the rest of the world, except for Costa Rica.

climate change mitigation and adaptation: urban planning that promotes public transportation and avoids development in vulnerable areas - slopes or too close to beaches; road and rail infrastructure resilient to climate extremes; ethanol duct network; hydroelectric plants that take into account rainfall changes generated by global warming; and agricultural varieties more resistant to pests. These processes are still rarely discussed, and there is a general lack of public awareness regarding the critical importance of climate risk studies. Brazil⁷ is planning to produce a new wave of hydroelectric plants without having included the impact of climate change on rainfall regimes in the feasibility studies. Thus, a fixed capital designed to last a century can have a significantly drop in productivity in three or four decades.

Between 1994 and 2009, the industrial structure of production and transportation of commodities went through enormous changes. Emissions in 1994 were 1.4 billion tonnes of CO₂ equivalent, with 75% of these emissions caused by deforestation in the Amazon. According to calculations by the Ministry of Environment announced in October 2009, emissions from energy, industry, agriculture and waste increased 40% between 1994 and 2007, while emissions from deforestation decreased by 20%, amounting to 1.8 billion tonnes of CO₂ equivalent in 2007.

2.3 Brazil's advantages and disadvantages for the transition

Monetary stabilization, trade liberalization and privatization in the 1994-1999 period caused a first wave of structural change. With the consolidation of the new macroeconomic tripod as of 2000, based on inflation targeting, floating exchange rates and primary fiscal surplus, there was a new round of structural change and expansion. Automobile production grew 220% between 1994 and 2008. The production of commodities exploded with the expansion of international trade, with a negative impact on deforestation rates in the 2000-2005 period. The changes introduced in the energy mix by the Lula administration, with a significant increase of fossil fuel-based electricity generation, changed the carbon intensity of the energy mix. The decline in deforestation between 2005 and 2009 changed the composition of the carbon intensity of GDP, significantly reducing the carbon intensity of the amazon's GDP and increasing the carbon intensity of non-Amazon GDP. However, the latter is still lower than that of all middle and low income countries – in most of the latter, carbon intensity is very high due to low energy efficiency.

In evaluating the advantages and disadvantages of the country's transition to a low carbon economy, it is important to think of the potential of various

7. Brazil has, among certain elites, some insight into the problem, and has recently been encouraged by its competitiveness in biofuels, both in terms of natural advantages and technological development.

sectors of the Brazilian economy. The leaders of several of these important sectors demonstrate potential and interest in the transition to a low carbon economy:

1. Hydroelectricity generation companies and related companies, as well as the entire chain of the construction industry and capital goods connected to it; and electricity distribution companies that do not depend on fossil fuel-based electricity generation.
2. Nuclear power plants and the entire production chain linked to the construction and operation of nuclear facilities and uranium enrichment. In recent years, the nuclear sector in Brazil has been used systematically and extensively the issue of climate change to influence public opinion and decision makers in their favor.
3. The ethanol production chain: sugar producers, alcohol plants, municipalities whose economic activity is focused on ethanol, public bureaucracies associated with the regulation of ethanol and scientific-technical community linked to research on first and second generation ethanol - from cellulose.
4. The public transportation productive chain: bus assembly companies, railway and subway cars; urban reform companies and related services. In general, it is estimated that those who use individual cars emit 15 times more than those who use public transportation. The issue of climate change compounds the public transportation deficit, which has historically been a major problem in Brazil in terms of well-being of the population and traffic congestion. The industry has strong lobbying in several cities. In the Brazilian metropolitan areas, traffic and transportation have become less and less efficient. The issue of slow traffic tends to intensify the issues of urban pollution and carbon emissions, tipping the scale towards public transportation. It is clear today that solutions such as rotation, implemented in Sao Paulo, are precarious and short lived.
5. The incipient wind power complex, including the final producers and in particular equipment producers; producers of rotor blades, a sector in which Brazil is a major world exporter.
6. The sector related to planted forests, both the highly developed complex sector for the production of pulp and paper as the incipient sector for production of charcoal.
7. The eco-tourism industry that attracts people with a post-materialist orientation and willingness to pay to reduce their climate footprint, could expand with improved public security. But this sector is contradictory because, on the other hand, it uses the air transportation, which is very

intensive in emissions. Tourism is the sector that has the greatest growth potential in the world.

8. The steel sector is a potential winner in the transition to a low carbon economy, due to the potential for lower carbon intensity of the entire Brazilian production chain compared to the rest of the world: electricity from hydropower; very favorable iron ore transportation and logistics; and more favorable proportions of charcoal and coal. A key issue here is the replacement of native forests with planted forests in steel production. This is a clear case of a sector whose business leaders have so far been rather conservative and have had many difficulties in realizing the potential advantages of their industry.
9. The food and beverage production sectors that are less carbon intensive, are more rational in the use of water and are energy efficient. Associated with these, there are more modern and efficient retail chains in terms of logistics, transportation and energy efficiency.
10. Export sectors that concentrate their exports in mature markets where there is growing differentiation of consumer preferences depending on carbon intensity of the product production chain. In these markets, there will be increasing pressure for the establishment of customs barriers against carbon-intensive imports. The Brazilian exporters would gain doubly from a change in Brazil's position, with increased competitiveness and resulting technological modernity in terms of image among consumers.
11. The information and communication sector and parts of the service sectors related to education and health, all strongly "tuned" to the newest trends in the world, realize the comparative advantage of Brazil's transition to a low carbon economy. The case of the cosmetics company Natura is a very advanced example of internalization of the transition to a low carbon economy.
12. Some banks, led by HSBC and Real - now absorbed by Santander - have created several products associated with the economics of sustainability and transition to low carbon.
13. The production sector of aluminum from recycling and more generally all the producers of aluminum for export, since it has comparative international advantages in terms of carbon intensity due to the use of hydroelectric power.
14. The whole recycling sector in Brazil, a major absorber of unskilled labor.
15. The automobile industry has, in general, a conservative approach and promotes the expansion of car sales, regardless of their energy efficiency,

as was clearly shown in the pressure for tax cuts in late 2008. But in this sector, Honda, Toyota and Renault-Nissan stand out for producing more efficient cars, following the policy of their respective headquarters.

16. Overall, the more modern and internationalized economic agents, both subsidiaries of multinational and domestic companies, started in the last two years a process of internalizing the issue of carbon intensity of production chains in their decision making processes and planning.

The sectors that are more resistant - although to varying degrees - to the transition to a low carbon economy are:

1. The entire illegal and semilegal economic sector associated with logging in the Amazon.
2. Electricity producing or distributing companies that depends on coal and oil.
3. Coal producing companies.
4. Companies associated with the production of oil, in spite of their reformist discourse, mostly resist the transition to low carbon. Petrobras has a conservative position, even though there are reformist minorities in it that favor the use of CCS.
5. The cattle raising industry, and particularly beef processing companies and retailers that buy meat from illegally deforested areas in the Amazon.

By combining two variables - carbon intensity of economic activity and type of mentality - and their high or low manifestation, we have four major groups of companies regarding the transition to a low carbon economy. First, at one end we have companies that have high carbon intensity and a conservative mentality of their directors, constituting the *conservative* group. Most companies linked to the oil, coal, cement and beef processing chains are in this group.

Secondly, there are companies that have potential for low carbon intensity and a conservative mentality of their directors, comprising the *moderately conservative* group. Steel producing companies are in this group.

Thirdly, we have companies that have high carbon intensity, but with reform-minded directors, constituting the *reformist* group of companies. Examples include: Vale, Shell and ArcelorMittal.

Fourthly, on the other end, we have companies that are low carbon intensity and have reform-minded directors, being the *forefront* group of companies. Examples of this group are: Natura, Brazil AES, CPFL, Light, Klabin, Walmart, HSBS and Santander.

3 RECENT CHANGES IN THE BRAZILIAN CLIMATE POLICY

During 2009, there were many relevant facts in the climate area. A law on land tenure in the Amazon, quickly prepared by the Secretariat for Strategic Affairs, was passed by Congress and signed by the president. The law, which legalizes, to different degrees, ownership of land and illegal deforestation in the Amazon until 2005, generated strong resistance from the environmental movement, which considers it an award to economic agents that violated the law - particularly in the period after 1999, when the legal framework began to severely restrict deforestation - and an incentive for continued illegal logging. However, other economic agents and analysts consider that, if combined with a strict and severe punishment of illegal logging by government agencies, the law could establish a broad coalition of economic agents that are legal owners of property and therefore favorable to full rule of law in the Amazon. The coming years will provide an answer to this question.

3.1 Various alliances formed in 2009

The governments of the Amazon states - under the leadership of Amazonas and Mato Grosso and supported by the Strategic Affairs Secretariat of the federal government - formed the Amazon Forum and requested, in July 2009, a change of Brazil's position in relation to forests, more specifically acceptance on the part of Brazil that avoided deforestation become part of the Clean Development Mechanism or any other new market mechanism - such as Reducing Emissions from Deforestation and Degradation (REDD) - involving carbon credits that could emerge from negotiations in the next COPs. This request - which refers to the fundamentals of the Brazilian position since Kyoto - is supported by the MMA and strengthens the capacity of the Ministry of Foreign Affairs and the MCT to continue defining Brazil's foreign policy on climate.

In the months from June to September, three business coalitions were formed demanding changes in the Brazilian climate policy. They differ in the combination of sectors coming together and the degree of reform proposed for the domestic and external energy and climate policy. Several companies belong to two coalitions and a couple of them belong to the three coalitions.

The first coalition of Brazilian Companies Alliance for Climate is very heterogeneous, bringing together federations and associations of agribusiness companies that have very different carbon intensities and managerial mindsets. This is the least reformist of the three coalitions, and basically it demands a reduction of deforestation in the Amazon and acceptance of market mechanisms for avoided deforestation. In terms of the four groups defined above, companies in this alliance belong to the conservative and moderately conservative group, which are only interested in obtaining international resources to shift their productive

activities. However, three associations of this coalition – Bracelpa, Unica and Brazilian Association of Planted Forest Producers (ABRAF) – are formed by leading or reformist companies that also belong to the second and/or third coalitions.

The second coalition is Open Letter to Brazil on Climate Change, led by Vale, Instituto Ethos, Pão de Açúcar and CPFL, comprising 22 large national companies, and is the largest in terms of weight in national GDP. Its proposal is a formal commitment of the country in climate negotiations and consistent policies for reducing the emission growth curve, emphasizing energy efficiency, control of deforestation, reforestation of degraded areas and acceptance of market mechanisms for avoided deforestation with offsets for emissions of developed countries. The companies of this alliance are committed to publishing annually an inventory of greenhouse gas (GHG) emissions and include the choice of investment options that promote GHG emission reduction in processes, products and services as a strategic guideline in investment decision making. Another fundamental commitment of this alliance is to work with the supply chain to reduce emissions of suppliers and customers. It should be noted that the carbon-intensive and polluting supply chain with illegal components in terms of deforestation is a point of vulnerability for many large Brazilian companies.

The Business Climate Coalition – led by AES Brazil, Shell, AmBev and the Brazilian Foundation for Sustainable Development – has made similar demands as the second coalition, but with greater depth and precision, suggesting that Brazil should make a defined commitment to reduce emissions in 2020 with the base year of 2007, and not only reducing the emissions growth curve as in the case of the second coalition.

Despite the advanced positions of the second and third coalition, the Federation of Industries of São Paulo (FIESP) and the National Confederation of Industry (CNI) spoke out in October against Brazil undertaking quantifiable commitments before other major emitters do so. The agribusiness coalition, CNI and FIESP called for a change in the Brazilian position, but did not recommend that the country take a leadership position in the negotiations. FIESP and CNI are traditional associative structures in which the position of the institution tends to be given by the positions of its more conservative members. However, there was a change recently in May 2010, when the CNI presented its proposals, of which one of the pillars is low carbon, to the presidential candidates.

The Open Letter to Brazil on Climate Change calls for a substantial change and for Brazil to take the lead in negotiations, while the Business Coalition for Climate demand a radical change, included Brazil's incisive leadership in the negotiations. For this coalition, Brazil should fully support the transition to a low carbon economy because the vast majority of its economic agents would benefit.

In October 2009, the Center for Sustainability Studies, Getulio Vargas Foundation, launched the Business Platform for Climate, designed to create the regulatory bases in the process of internalizing climate change mitigation and adaptation. The program provides to participants tools and guidelines for GHG emission management practices and sustainability for business. By joining the platform, companies commit to publish their GHG inventories in accordance with the methodology of the Brazilian Program GHG Protocol, and develop policies and GHG management plans that ensure competitiveness and innovation, while encouraging a position in favor of a low carbon economy in the country. Twenty-eight large companies had joined the platform by the end of 2009.

3.2 The change in the Brazilian official position

In August 2009, for the first time in history, statements from leading Brazilian decision makers and negotiators - Ambassador Sergio Serra, Minister Luis Figueroa, secretary Susan Kahn, ministers Minc and Amorim - indicated the possibility of Brazil undertaking emission reduction targets for 2020, conditional to developed countries undertaking ambitious targets.

The traditional position of the Brazilian government in negotiating climate was increasingly challenged by economic and social groups and interests, particularly in the South and Southeast. The inclusion of the climate issue in the agenda of the 2010 presidential elections tends to explain this trend.

In fact, until July 2009, it seemed that the climate issue would have no relevance in the 2010 presidential election campaign. On one side was the consolidation of the officialist candidature of Dilma Roussef, whose performance in the Lula administration is characterized by low sensitivity to climate issues and preparation of a public investment program – the Growth Acceleration Program (PAC) – based on the carbon-intensive economic model. On the other hand, José Serra, the favorite candidate of the opposition, has greater sensitivity to the climate issue owing to his political and intellectual history and the fact that he is from a state where there is greater public awareness and sensitivity on this issue. In June 2009, the city of São Paulo sanctioned an advanced climate bill, which sets emission reduction targets for 2020. In November 2009, the Legislative Assembly of the State of São Paulo approved a climate bill from the Executive establishing an obligatory target of 20% emission reduction in 2020, considering 2005 as base year.

However, the axis of Serra's presidential platform was also an acceleration of economic growth, and his dispute with the officialist candidate would take place mainly in relation to managerial efficiency and questioning of the use of the state apparatus to meet partisan interests. In August 2009, a new development of

crucial importance took place with the announcement of the probable candidature of Marina Silva - former environment minister of Lula's administration - to the Presidency of the Republic by the Green Party. Just the announcement was enough to impact the election scenario, because it introduced a new player with a strong background in two issues that are important for the middle classes: ethics in politics and sustainable development. In addition, Marina Silva also has prestige among segments of the poor population.

The consolidation of the presidential candidature of Marina Silva, who is reaching 7% to 11% of voting intentions in several polls, has changed the content of the agenda of the election debate, raising the importance of sustainability issues and the transition to a low carbon economy. This new phenomenon in Brazilian politics has forced Lula and his candidate Dilma Rouseff to increase the importance of the climate issue in the national public debate. The change in the electoral scenario accelerated and intensified the movement towards a change of Brazil's official position in climate negotiations.

After significant efforts of the environmentalist bloc in parliament, the House of Representatives approved, in October 2009, the Climate Change Bill, an improved version over the original bill by the Executive, which partially internalizes climate change in the Brazilian legal framework, although it does not set emission targets. The bill was addressed in the Senate in November under the impact of changes in the Brazilian climate policy. Senator Marina Silva introduced an amendment establishing as mandatory the targets on diversion from the normal curve of emissions announced by the Brazilian government on November 13, 2009. The bill passed the Senate in early December 2009, but Marina Silva's amendment was rejected.

In October 2009, minister Carlos Minc has increased pressure to change the Brazilian position in the negotiations. After intense negotiations, in which the MRE and the MCT resisted such proposals, on November 13 the government's new position was announced. This presentation was made jointly by Ministers Minc and Rouseff, revealing the deep impact of Marina Silva's candidature had on the officialist candidature. It should be noted that minister Dilma Rouseff's opposition to various initiatives of the then Minister Marina Silva was the main reason for the latter's resignation from the Ministry of Environment in May 2008.

Brazil's commitment announced on November 13, 2009 has the following features:

1. It is voluntary and so far there is no express commitment to adopt this model in an international treaty.
2. It referred to the deviation of the growth curve of emissions in relation to

expected future emissions in a business as usual scenario and not a binding target with respect to the 1990 base year, as in existing commitments by the European Union, Japan, South Korea, Switzerland and Norway. Conservative members of government argued that Brazil is not obliged to undertake legally binding targets related to the 1990 base year.

3. Brazil has committed to reduce emissions by 36% to 39% in relation to expectations of projected emissions for 2020 in a business as usual scenario. In the latter expectation, it is assumed that Brazil's emissions in 2020 would be of 2.7 billion tonnes of CO₂ equivalent. In the voluntary commitment, these emissions are reduced to 1.6 billion, which would mean in effect a reduction of approximately 20% with respect to 2005 emissions and a reduction of approximately 10% compared to 2008 - that year's emissions were well below those of 2005 because of the dramatic drop in Amazon deforestation.

The government's technical experts made a projection of what would be Brazil's emissions in 2020 based on different periods for different sectors. The only clear basis for projection is deforestation in the Amazon, where emissions are derived from a base period that is the average of the 1996-2005 period, when emissions were extremely high because the annual deforestation rate was over 20,000 km². For other sectors there was not enough transparency with respect to the methodologies used, but there is the assumption that different base periods were used, which creates significant problems of consistency for the whole methodology.

In government projections, most of the reduction of the emission growth curve would result from a drop in deforestation - somewhere between 21% and 25%. The rest comes from other areas, particularly changes in agricultural production, through measures such as increased direct seeding - which reduces emissions derived from decomposition of organic material - reversal of the recent increase in thermoelectric power generation and greater emphasis on systemic energy efficiency.

Pressured by changes in the Brazilian position, the Minister of Science and Technology Sergio Rezende, officially announced a partial and interim emissions report at a Senate hearing on November 25, 2009. This report is largely coincident with that used by the Ministry of Environment to propose the Brazilian targets (BRAZIL, 2009).

The announcement of the Brazilian targets was the product of business and societal pressure on a government decision-making process lacking transparency in which the core of government - President Lula, Dilma Roussef and Minister Celso Amorim - opposed, until the month of July, the undertaking of quantifiable emission targets for 2020. Therefore there were no systematic and consistent studies to produce an appropriate and precise plan to reduce emissions.

It was unclear what proportion of the voluntary commitment would depend on funding by developed countries due to the different positions of the Ministry of Science and Technology, which conditions the Brazilian targets to substantial international funding, and the Ministry of Environment, which proposes that most targets could be met without international funding. This is a very important point, considering the inflated expectations of the government and Brazilian society in relation to the amount of funding that may be offered. Such estimates ignore the basic fact that the developed countries most willing to contribute intend to direct much of this funding to poor countries such as India and Indonesia, and not to middle-income countries like Brazil, Mexico and China.

Even with all the caveats and uncertainties that surrounded it, the announcement implied a fundamental change in the history of Brazil's foreign policy on climate and a strategic defeat of the two ministries that defined Brazil's position between 1996 and 2009 - the MRE and the MCT. On the other hand, it meant a victory for the MMA, which has been challenging the traditional position since 2006 and keeping a very incisive position since 2008.

4 THE CONTRADICTIONARY MEANING OF COPENHAGEN

In the negotiations for COP 15 developed in Bonn (March, June and August 2009), Bangkok (September 2009) and Barcelona (November 2009) there was little progress. The European Union and Japan were the only relevant players that committed to significant emission reduction targets. In both cases, the reduction target of 20% in 2020 relative to 1990 base year are insufficient from the standpoint of the IPCC, which promotes a reduction of 30% to 40% for all developed countries.

Shortly after the meeting in Barcelona on November 13, Brazil joined the group of major emitters with significant targets, which in an optimistic scenario can lead to emission reductions of 10% in 2020 compared to 2008. On

November 15, contradictory events took place at geographic ends of the world. On the positive side, France and Brazil announced, in Paris, a strategic partnership for a final effort towards a substantial agreement in Copenhagen, criticizing the conservative positions of the United States and China. This agreement between Lula and Sarkozy meant - for the second time in two days - a dramatic change of Brazil's position, indicating the end of the historic alliance with China and India and an alliance with the European Union.

Simultaneously, on the same day in Singapore, the countries of the Asia Pacific Economic Cooperation (APEC) – led by the United States and China – together with Denmark's prime minister – rejected the commitment to sign a legally binding emission reduction treaty in Copenhagen, because they considered it unrealistic. On the one hand, Denmark moved away from the European Union and submitted to the conservative logic of the United States, China and India. On the opposite side, Brazil held out the possibility of joining the responsible reformist positions of the European Union.

The Singapore declaration generated a strong negative reaction from European governments and several non-Annex 1 countries, in global civil society and in the important segment of transnational corporations. As a result, there was a setback in the following days and finally a cascading announcement of emission reduction targets that would be taken to Copenhagen by several of the largest emitters.

In late November, the United States announced a reduction target of 4% in 2020 compared to the 1990 base year, even though said target is still pending Senate approval. China committed to reducing carbon intensity of GDP by 40% to 45% between 2005 and 2020, but continued to refuse to establish an emissions peak and a stabilization year. For influential leaders of the US Senate, China's reduction of carbon intensity of GDP will still allow it to continue to increase its emissions significantly for at least 15 years. India said it would increase its efficiency, but continued to refuse to undertake any kind of commitment. Russia announced a commitment to increase energy efficiency, but refused to undertake emission reduction. South Africa has set 2025 as the year for stabilization of its emissions. Mexico has proposed that all developed countries undertake reduction targets of 40% in 2020 and that emerging middle income countries commit to stabilization years before 2020, but undertook only a diffuse commitment regarding its own emissions. Indonesia indicated an unrealistic commitment of 20% emission reduction compared to 2007, conditional on massive financial assistance from developed countries, which is very unlikely.

Earlier in 2009, South Korea announced the most advanced position among non-Annex 1 countries - emission reduction of 10% in 2020 with base year of

2008. The UK - whose target is diluted in the European Union average - is the only country whose commitment corresponds to the IPCC - emissions reduction of 34% in 2020 with 1990 base year.

On the eve of COP 15, on November 28, representatives from Brazil, China, India, South Africa and Sudan - President of the G-77 - met in Beijing to establish a common and uncompromising position, based on four essential points: rejection of mandatory emission reduction targets, refusal to submit their climate policies to international scrutiny if they are not funded by developed countries, rejection of the definition of a peak for growth of their emissions and rejection of the imposition by developed countries of any climate-related tax on their exports. With this, Brazil began to backtrack in its commitment undertaken on November 13 and its strategic partnership with France. The meeting in Beijing means the victory of conservative forces within the large emerging countries, and particularly a victory for China, India and Sudan over Brazil and South Africa

Since the beginning of the final phase of negotiations in Copenhagen in the first week of December, it became clear how difficult it would be to achieve a substantive legally binding agreement to mitigate climate change. Of the three great climate powers - US, China and European Union - only the last supported the agreement with targets that would have significant impact for mitigation, even if insufficient from the standpoint of the IPCC. The Obama administration needed to obtain significant concession from China in terms of peak of emissions and stabilization year in order to improve prospects for success in the battle led by Kerry and Graham in the Senate and improve the targets approved by the Chamber of Representatives in June.

China proved to be intransigent both with respect to consistent targets and with respect to international verification of compliance. This mirrored the typical behavior of Soviet communism on the major issues of disarmament during the Cold War - refusal to submit to international verification of compliance with the agreements. This verification is a sine qua non condition of credibility in international treaties. On the US side behavior was timid, frustrating the European Union's expectations of a bold position that could change the balance of power among the great climate powers and compel China to change its position. Obama's timidity can be explained by US domestic policy: an increased proportion of the population believes the risk of climate change is exaggerated; aggressive conservative lobbying by fossil fuel-intensive companies; fear of rising unemployment and declining competitiveness of the US industry against the Chinese industry; loss of popularity of Obama and his government; and priority to health care reform and reform of the financial system.

COP 15 culminated on December 19, 2009, after two days of difficult and confusing discussions among leaders of great climate powers and middle climate powers, and the presence of around a hundred leaders of limited relevance. Of the three great climate powers, only one, the European Union, took a clear position to promote an effective agreement, while the other two - the United States and China - were resistant. Obama's government was timid, unable to create the conditions for an agreement: ambitious targets of the European Union and the United States that would force China to establish an emission peak and a year of stabilization. Canada, India, Russia, Indonesia and South Africa maintained conservative positions. Brazil partially toned down its conservative position, when Lula announced that Brazil would contribute to a fund to help the poorest and most vulnerable countries in the adaptation process (VIOLA; MACHADO FILHO, 2010).

In addition to the superficial last minute negotiations, in Copenhagen, the European Union, Japan and South Korea were on one side with national targets and negotiating positions that favored a substantial agreement, and China, United States, Canada, India, Russia, South Africa and Indonesia were on the opposite side, with national targets and negotiation policies that blocked an effective agreement; and in the middle were Brazil and Mexico with ambivalent positions. Brazil, with targets to reduce emissions that ostensibly placed it in the reform group and negotiating positions that were closer to the conservative group, albeit with some differentiation with respect to the most obstinate, for example, trying to persuade China to accept international inspection. Mexico has no clear national targets for reducing emissions, which placed it in the conservative camp, and an international negotiation position that placed it in the reformist camp.

During the conference, the G77 + China almost disintegrated due to the extremely divergent and contradictory behavior of three subgroups: the Alliance of Small Islands, IBSAC (Brazil, South Africa, India and China) and the African group. A historically unique meeting - for the way it started and for the behavior of participants - among members of IBSAC and the United States produced the Copenhagen Agreement. This agreement states that it is necessary to avoid an increase of more than two degrees in the average temperature of earth and leaves a blank final annex for countries to define, by the end of January 2010, what mitigation targets they would commit to. In an extremely conservative position, China flatly refused both to set a target of a 50% reduction of global emissions by 2050 and the setting of a specific target for developed countries to reduce emissions by 80% by 2050. In preparing the Copenhagen Agreement, China proved to be the most conservative and antagonistic player and among the great powers, which drew sharp criticism from the European Union, the United States and Japan, and tolerance on the part of middle-income countries like Brazil,

Mexico, South Korea and South Africa, which had a much more advanced position than the Chinese.

In early February 2010, United States, European Union, Canada, Japan, Mexico and South Korea joined the Copenhagen Agreement without reservation. Brazil and South Africa joined with reservations, emphasizing that the key would be the continuation of the Kyoto Protocol and China and India adhering, but not formally joining.

During the month of February, Brazil and South Africa clarified some questions about its adherence and explained that they were formally associated with the Copenhagen Agreement. This posed a challenge to China and India, which finally announced that they were formally associated in early March. Russia joined the agreement in late March this year.

The Copenhagen Agreement became, with these formal adhesions, the most representative global political agreement on climate since the entry into force of the 1994 Convention on Climate Change. In March 2010, the agreement was formally supported by about 110 countries, including all major carbon emitters in the world. The agreement represents approximately 80% of global GHG emissions. But it has no legal value, unlike the Kyoto Protocol, which has legal value and very limited effectiveness. The Copenhagen Agreement need not be ratified by any Parliament, and depends entirely on the fulfillment of what each country has pledged. It is a very unique and uncertain situation in the history of international treaties.

The United States emphasize that they never signed Kyoto because the agreement does not establish requirements for middle and low-income countries and support a new treaty which could be based on the Copenhagen agreement. IBSAC Countries feel very comfortable with Kyoto because it does not set any targets, emission peak or stabilization years for them. The Kyoto agreement in 2010 covers less than 20% of global GHG emissions - European Union, Japan and Canada - while the Copenhagen Agreement, supported by the United States, European Union, Japan, Canada, Australia, South Korea, China, India, Brazil, South Africa and Indonesia, covers approximately 80% of greenhouse gas emissions. It is not legally binding, but could become the basis for a new global agreement that places the entire planet under carbon constraints, albeit with some differentiation.

For those analysts who used only the word “failure” to characterize the Copenhagen Conference, the August 2010 framework appears to be much more complex. For the first time, the United States, Australia, China, Brazil, India, Indonesia, South Africa, Mexico and South Korea are undertaking a political commitment to reduce their emissions or the growth curve of their emissions,

and that commitment comes with figures attached. The targets that are being recorded are far below the levels required by science. In all, they involve a reduction of approximately 10% of emissions in 2020 compared to 1990 for developed countries and a 60% increase compared to 1990 by major low and middle income emitters. The agreement also involves the possibility of significant progress with respect to technology transfer and Reduction of Emissions from Deforestation and Degradation (LA VIÑA, 2010).

The law on climate change approved in the Brazilian Senate in early December 2009 was enacted in January 2010 with vetoes by President Lula, particularly to Article 10, which provided for incentives to renewable energy sources. Also eliminated was an important goal for the transition to a low carbon economy, which is the phasing out of fossil fuels. However, environmentalists have managed to reduce the ten vetoes requested by opponents of the law to just three. Some forces in the Lula government are resistant to this regulation. Therefore, the Ministry of Environment has adopted a strategy of modest and selective regulation, even at the expense of leaving various sections of the law without the possibility of enforcement due to lack of regulation. Until August 2010, there had been little or no progress regarding the regulation. The climate fund also needs to be regulated, which will be a complex process that is likely to be controversial and lengthy.

The Government of Brazil has informed the Secretariat of the Climate Convention - in a letter dated January 29, 2010 - the following “nationally appropriate mitigation actions” that it wishes to undertake:⁸

- Reduction of deforestation in the Amazon - estimated extent of reduction: 564 million tonnes of CO₂ equivalent in 2020.
- Reduction of deforestation in the Cerrado - estimated extent of reduction: 104 million tonnes of CO₂ equivalent in 2020.
- Recovery of pastures - estimated extent of reduction: 83 to 104 million tonnes of CO₂ equivalent in 2020.
- Crop-Livestock Integration (ILP) - estimated extent of reduction: 18 to 22 million tonnes of CO₂ equivalent in 2020.
- Direct seeding - estimated extent of reduction: 16 to 20 million tonnes of CO₂ equivalent in 2020.
- Biological fixation of N₂ - estimated extent of reduction: 16 to 20 million tonnes of CO₂ equivalent in 2020.

8. Available at: <http://unfccc.int/files/meetings/application/pdf/brazilcphaccord_app2.pdf>.

- Energy efficiency - estimated extent of reduction: 12 to 15 million tonnes of CO₂ equivalent in 2020.
- Increased use of biofuels - estimated extent of reduction: 48 to 60 million tonnes of CO₂ equivalent in 2020.
- Increased supply of energy by power plants - estimated extent of reduction: 79 to 99 million tonnes of CO₂ equivalent in 2020.
- Alternative energy sources - estimated extent of reduction: 26 to 33 million tonnes of CO₂ equivalent in 2020.
- Steel works - replacement of coal from deforestation for coal from planted forests - estimated extent of reduction: 8 to 10 million tonnes of CO₂ equivalent in 2020.

As indicated in the National Policy on Climate Change, adopted after the COP 15 in December 29, 2010, through Law 12.187/2010, it is estimated that the sum of these actions will lead to a reduction of approximately 36% to 39% with respect to Brazil's projected emissions in 2020.

Contrary to analysts' earlier forecasts, according to provisional deforestation data from August 2009 to July 2010, deforestation continues to decline in 2010. Yet the extraordinary increase of fires in August 2010 compared with the same month last year indicates a probable increase in the deforested area and hence an increase of emissions in 2011. In the areas of energy, transport, industry and agriculture, it is likely that emissions will increase significantly in 2010, while economic growth is estimated at around 7%. Considering that there was no economic growth in 2009 and there was a significant decline in deforestation in 2009 and 2010, Brazil had a significant reduction in emissions in 2009, contrasting with the limited decline in developed countries due to recession and the strong increase of emissions in China and India on account of continued high economic growth.

There are strong indications that in the years 2009 and 2010 Brazil will continue to have a very favorable performance in terms of emissions, probably the best in the world. However, Brazil's negotiating position changed only partially in Copenhagen and in the months immediately following it. The Lula administration, particularly the Foreign Ministry and the MCT, continues to value the alliance with IBSAC and misses an excellent opportunity to take on a position of global responsibility and co-leadership next to the European Union, Japan and South Korea. Brazilian emissions will tend to increase in 2011 because there is hardly room to keep up the decline in deforestation in the Amazon in the short term, and there will certainly be a significant increase in emissions from energy, transport, industry and agriculture.

So a crucial question about the future of the transition to a low carbon economy in Brazil has to do with the speed and consistency of the regulation and implementation of the climate change law in 2011.

5 FINAL CONSIDERATIONS

In 2009 deep changes took place in the international political economy of climate change. The legacy of Kyoto, which left the United States and major emerging countries outside the carbon constraint, crumbled (LADISLAW, 2010). The Copenhagen Agreement is extremely weak from a legal standpoint, but is almost universal in terms of constraints on carbon emissions. It is practically impossible to make progress towards a new comprehensive legally binding treaty - as some countries, particularly developed countries wish - before the United States passes a climate bill mandating quantified emission reductions. Given the current political dynamics, this is hardly likely, at best, before 2013, assuming Obama's re-election in November 2012. Another factor that concerns the prospects for a global agreement is the tension between the US and the EU on one side and China on the other, due to China's refusal to revalue the Yuan significantly.

The issue of revaluing the Yuan might be generating an anti-Chinese coalition by countries that consider themselves "invaded" by Chinese goods, thanks to the continuation or increase of its export capacity. Countries threatened by the Chinese export machine include most members of the G-20. Brazil, as a strong exporter of commodities to China is in an intermediate position: its mineral and food production industries are favored by Chinese dynamics, while its manufacturing sector suffers.

The dimensions of economy and security of the international system have a decisive impact on the climate dimension, and must be taken into account in any realistic analysis of the future of climate negotiations. Tensions between deficit and surplus countries in international trade, particularly in relation to China, may limit or even stop the progress of global economic governance in the G-20 during 2009. The international system may be reversing the dynamics of depolarization that took place in 2008 and 2009. If a moderate increase of conflict in the international system prevails in the coming years, this will be enough to halt progress towards a new international climate treaty, even if a consistent climate law is passed in the United States in 2013.

In this context, the global transition to a low carbon economy will be very slow and one of its main international instruments will be the establishment of barriers to trade in carbon-intensive products. In the case of Russia and India, most sectors would be threatened. In China's case, the scenario would be more complex, since the proportion of low-carbon products - which is far too low

today – would tend to increase rapidly in the portfolio of Chinese exports, owing to major advances in wind and solar power.

If a tendency towards cooperation and continued depolarization in the international system prevails over the next year, and Obama is reelected in 2012, is likely that the US position will change from that of great conservative power to great reformist power. It is also likely that in alliance with the European Union, Japan, Canada, South Korea, Brazil, Mexico and South Africa, the United States will manage to “persuade” China, Russia and India to establish emission peaks and different stabilization years - before 2020 for China and Russia and between 2025 and 2030 for India, given that Russia’s per capita emissions are almost twice those of China and five times larger than India’s, and China’s emissions are three times larger than India’s.

In an international system dominated by forces of convergence, China’s more globalist and de-carbonizing forces are favored. From the standpoint of low carbon technology, there are some small countries that will impact the world for being very technologically advanced: Israel, Taiwan, Singapore, Switzerland and Norway. The main trigger to increase cooperation and produce a de-carbonizing agreement in the international system is to increase intellectual property flexibility in the area of low carbon technologies. It is not a simple issue, since some emerging countries are in the forefront of low carbon technology in some areas. For example, China would need to increase flexibility in the field of nuclear energy and second-generation ethanol, but not in wind and solar power, where many middle and low-income countries need Chinese-Taiwanese technology transfer. Brazil would need more intellectual property flexibility in the areas of wind and photovoltaic solar energy, but would be at the forefront and transferring technology to of low and middle income countries in the areas of hydropower and first generation ethanol.

Alongside the international level, in 2009 there was a crucial change in the history of climate policy in Brazil. Amazonian governors, led by Amazonas and Mato Grosso and supported by the Strategic Affairs Secretariat, consistently worked for Brazil to support the inclusion of avoided deforestation in a new treaty, as a market mechanism and with right of offset by developed countries. A key part of the business community has formed three coalitions demanding changes in the Brazilian position, of which two call for a paradigm shift in the Brazilian climate policy.

Marina Silva’s arrival as a presidential candidate quickly brought the issue of transition to a low carbon economy to the agenda of the 2010 election campaign. The National Congress passed a more advanced climate bill than the one sent by the Executive in 2008, and that partially internalized the issue of climate

change in the national legal framework and established “voluntary” emission reduction targets. The Ministry of Environment has raised its profile consistently since August 2009, forcing greater awareness on the part of President Lula and his candidate Dilma, which led to a historic defeat of the Ministries of Foreign Affairs and Science and Technology, with the announcement of the change in Brazil’s position to include quantitative very important targets to reduce the curve of expected emissions in 2020, something that few analysts believed possible in June 2009.

There are still many questions about the future implementation of the reduction commitment in Brazil, but the new law and the targets set by the country in the Annex to the Copenhagen Agreement are a very important step for the future path of its foreign, economic, energy, agriculture, forestry and climate policies. A new and major question is how long the gap between climate policy with emission reduction targets and the negotiation position that maintains the country linked to China and India - which have a much more conservative climate policy - will last in Brazil. Depending on the interests and relative power of various economic sectors in Brazil and the dynamics of public opinion, it is likely that this gap will not last long and that Brazil’s negotiation position will converge with that of the European Union, Japan and South Korea.

REFERENCES

- BARRETT, Scott. Contrasting Future Path for an Evolving Climate Regime. **Global Policy**, London, n. 1, 2010.
- BIERMANN, Frank. Earth System Governance as a Cross-cutting Theme of Global Change Research. **Global Environmental Change**, v. 17, n. 3/4, p. 326-337, 2007. Articles.
- BRASIL. Ministério da Ciência e Tecnologia (MCT). **Inventário de emissões, valores preliminares**. Brasília, 25 nov. 2009.
- BRITISH GOVERNMENT. **Low carbon economy transition Plan**. London: U.K., 2009.
- CERRI, Carlos Clemente. **Redução de emissões na agricultura**. Rio de Janeiro: FBDS, 2009.
- FRIEDMAN, Thomas. **Hot, Flat and Crowded**. Why we need a Green Revolution and how it can renew America. New York: Farrar, Strauss and Giroux, 2008.
- GORE, Al. **Our Choice**. A Plan to Solve the Climate Crisis. New York: Rodale Press, 2009.
- GUIDENS, Anthony. **The Politics of Climate Change**. London: Polity Press, 2009.

HURRELL, Andrew. **On Global Order**. Power, Values and the Constitution of the International Society. New York: Oxford University Press, 2007.

KASA, Sjur; GULLBERG, Anne; HEGGELUND, Gorild. The Group of 77 in the International Climate Negotiations: recent development and future directions. **International Environmental Agreements: Politics, Law and Economics**, v. 8, n. 2, p. 113-127, 2007.

KEOHANE, Robert; RAUSTILA, Kal. **Towards a Post-Kyoto Climate Change Architecture**: A Political Anasysis. Harvard Project on International Climate Agreements. Cambridge, 2008 (Discussion Paper, n. 1).

KHANNA, Parag. **The Second World**. New York: Randon House, 2008.

KLARE, Michael. **Rising Powers, Srinking Planet**. The New Geopolitics of Energy. New York: Metropolitan Books, 2008.

LADISLAW, Sarah. **A Post-Copenhagen Pathway**. Washington: Center for Strategic and Interntional Studies, 2010.

LA VIÑA, Antonio. **Ways Forward after Copenhagen**: Reflections on the Climate Change Negotiations Process by the REDD-plus facilitator. Manila: Foundation for International Environmental Law and Development, 2010.

LEIS, Héctor; VIOLA, Eduardo. **America del Sur em el Mundo de las Democracias de Mercado**. Buenos Aires: Homo Sapiens, Cadal, 2008.

MABEY, Nick. **Delivering Climate Security**. London: Institute of Strategic Studies, 2008.

MOUTINHO, Paulo. **Desmatamento na Amazônia**: desafios para reduzir as emissões brasileiras. Rio de Janeiro: Fundação Brasileira para o Desenvolvimento Sustentável, 2009.

SACHS, Jeffrey. **Common Wealth**. Economics for a crowded Planet. New York: Penguin, 2008.

SPETH, James Gustave. **A new American Environmentalism and the New Economy**. Washington: National Council for Science and the Environment, 2010.

STERN, Nicholas. **The Global Deal**. Climate Change and the creation of a new era of progress and prosperity. New York: Public Affairs, 2009a.

_____. **Global Green Recovery**. London: London School of Economics, 2009b.

TICKELL, Oliver. **Kyoto 2**: How to Manage the Global Greenhouse. London: Zed Books, 2008.

TIMMONS, Roberts, J.; PARKS, Bradley. **A Climate of Injustice**. Global Inequality, North South Politics and Climate Policy. Cambridge: MIT Press, 2007.

VIOLA, Eduardo. **Brasil na arena internacional de mitigação da mudança climática**. Rio de Janeiro: Cindes, 2009.

VIOLA, Eduardo; MACHADO FILHO, Haroldo. **Os BICs (Brasil, Índia e China) e as negociações de mudança climática**. Rio de Janeiro: Cindes, Breves 35, 2010.

A COMPARATIVE STUDY ON NIS (NATIONAL INNOVATION SYSTEM) IN THE BRIC ECONOMIES

Zheng Bingwen*

Zhong Huibo**

The BRIC (Brazil, Russia, India and China) are the developing countries with the most prospective economic growth in the next generation. Many factors, such as natural resources, land and a large and cheap labor market contributes to the economic growth of these countries. However, in a knowledge-based economy, innovation is far more important than land, physical capital, or labor as the primary factor affecting a nation's economic growth and development. Thus, given the importance of the studies of NIS (national innovation system) in the BRIC countries, this research is to characterize and compare the NIS of the four countries pointing out differences and similarities, common bottlenecks and complementarities, as well as identifying current and potential connections. Particular attention will be given to discuss policy implications and put forward policy recommendations, extract lessons that can be useful not only for these countries but also for other developing countries.

ESTUDO COMPARATIVO SOBRE SISTEMAS NACIONAIS DE INOVAÇÃO NAS ECONOMIAS BRIC

O bloco Brasil, Rússia, Índia e China (BRIC) é formado pelos países em desenvolvimento com os maiores potenciais de crescimento econômico para a próxima geração. Muitos fatores, como recursos naturais, terra e mão de obra farta e barata, contribuem para o crescimento econômico destes países. No entanto, em economias do conhecimento, a inovação é muito mais importante enquanto fator de crescimento e desenvolvimento econômico de uma nação do que terra, capital físico ou mão de obra. Assim, dada a importância dos estudos sobre Sistemas Nacionais de Inovação (SNIs) nos países do BRIC, esta pesquisa tem como objetivo caracterizar e comparar o SNI dos quatro países, apontando diferenças e semelhanças, gargalos comuns e complementaridades, bem como identificar conexões atuais e potenciais. O estudo dedica especial atenção à discussão das implicações e das recomendações sobre políticas, e às lições úteis, não apenas para estes países, mas também para outros países em desenvolvimento.

1 INTRODUCTION

It is well known that the BRIC consists of the four largest developing countries – Brazil, Russia, India and China – with the world's best economic growth prospects for the next generation. Together, in 2009, they generated 22.3% of the global GDP (PPP), shared 28.9% of the geographical area and represented 43.2% of the world's population. The huge potential of BRIC's economic growth can be attributed to advantages in affluent natural resources and land, combined with a large and cheap labor market, and a high density of foreign direct investment.

* Prof. Zheng Bingwen is the Director General of the Institute of Latin America Studies (ILAS) at the Chinese Academy of Social Sciences (CASS).

** Dr. Zhong Huibo is a senior research fellow at ILAS/CASS.

However, in a knowledge-based economy, innovation is considered far more important than land, physical capital or labor when taking into account a nation's economic growth and development. Studies on the NIS (national innovation system) of the BRICS are important, especially when considering that effective innovation management is key for corporate success, technological prowess and national economic sustainable development.

This research will characterize and compare the NIS of Brazil, Russia, India and China, pointing out differences and similarities, common bottlenecks and complementarities, as well as identifying current and potential connections. Particular attention will be given to policy implications and recommendations, extracting lessons that may be useful not only for the BRIC, but for other developing countries as well.

Section 2 develops a conceptual framework that analyzes NIS in these countries, including a broader and systemic understanding of these systems. Section 3 compares several of the key economic parameters and social indicators between the four countries, summarizing a few broader economic and institutional characteristics. Section 4 examines several of the support system's chief indicators, including production, trade, investment and education. Section 5 outlines the characteristics of the main players of innovation (including enterprises, research institutes, technology talents and universities) under three aspects: quantity, structure and innovation. Section 6 analyzes the U.S. Patent and Trademark Office granted patents and indexed data of the four countries between 1979 and 2006, focusing on innovation performance characteristics - innovation, field and innovative pattern - while attempting to discover the causes of the differences in performance. Finally, section 7 reviews the lessons that may be drawn from this comparison and the evaluation trends of BRIC national innovation systems.

2 NIS (NATIONAL INNOVATION SYSTEM): A CONCEPTUAL FRAMEWORK

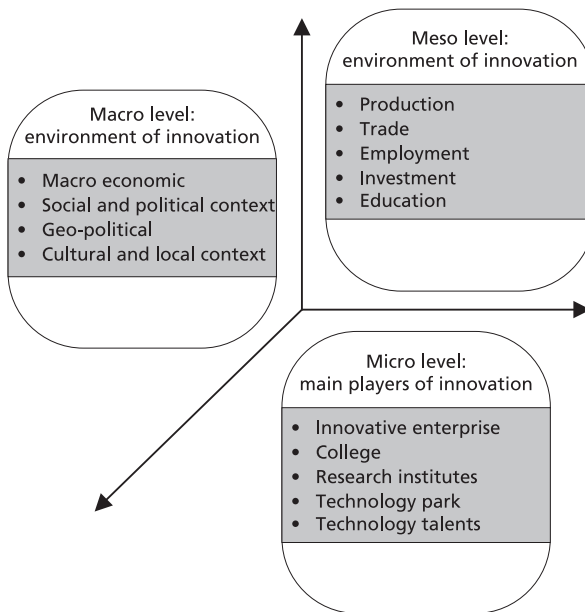
The concept of *national innovation systems* – NIS – was introduced by Freeman (1982, 1987) and Lundvall (1985). This concept stresses the interactivity between production and innovation, the importance of incremental and radical, technical and organizational innovations, as well as their different and simultaneous sources. Enterprises are seen as organization embedded within specific socio-economic-political environments that reflect particular historical and cultural trajectories. Over ten years ago, Chinese scholars introduced this conceptual analysis, producing results and publications on NIS (BINGWEN, 1998; BINGWEN; DUARCOURT, 1994).

Since the beginning of the 1990s this concept has been used as an analytical tool and framework for policy analysis in both developed and undeveloped countries. As a result: (1) research and policy activities, which explicitly focus on systems of innovation, may be found in most countries and a rapidly growing number of studies on specific national systems of innovation have been produced; (2) most countries, BRIC included, have been discussing and implementing public and private policies that focus on innovation, learning and capacity building.

In our opinion, NIS is part of the social system, contributing to the development, dissemination and sustainability of technological innovation. This System encompasses three sub-systems; the first is the micro-level innovation sub-system, including innovative enterprises, universities, research institutes, technology parks, technology, human resources, among others. The second is the meso-level innovation support subsystem, including the structure of production, trade, industry, employment, the financing platform, infrastructure, etc. The third is the macro-level innovation environmental subsystem, including population, economic output, economic growth and income distribution. These three subsystems interact and promote each other, forming a systematic national innovation system. Figure 1 presents the three subsystems of NIS. These will be considered when comparing the NIS between BRIC economies.

Under this analytical framework, a broader and systemic understanding of the innovation process is instrumental when avoiding an overemphasis on R&D, encouraging policy-makers to take a far-reaching perspective on the opportunities for learning and innovation. Considering the historical dependence of the formation and evolution of a national innovation system, deeply rooted in the economic and social environment, emphasis is put on interactions and the role of the historical process. These account for the differences between socio-economic capabilities, development trajectories and institutional evolution, creating systems of innovation with very specific local features and dynamics.

FIGURE 1
Structure of NIS



Source: International Development Research Centre. Available at: <http://brics.redesist.ie.ufrj.br/proj_idrc/>.

3. SUB-SYSTEM: INNOVATION ENVIRONMENT

3.1 Basic Economic and Social Indicators

A large population is a common characteristic between the BRIC countries. China and India are the two most populous countries in the world, accounting for 20% and 17.5% of the population, respectively (Table 1). Brazil has the fifth largest population in the world accounting for almost 2.9%, and Russia has the seventh largest population accounting for 2.13% of the global population. Large population and labor supply are major factors leading to BRIC's rapid economic growth. Considering the development process and its trend, there are several aspects to be discussed: (1) *Child Dependency Ratio (CDR)*. The CDR has obviously decreased during the last two decades. However, CDR in India and Brazil is relatively high, 37.7% and 47.9%, respectively, while Russia and China are significantly lower, 20.8% and 27.7%. The decrease in the CDR indicates that these two latter countries are gradually experiencing the aging of their population, which means that a labor-dependent economy would not be an advantage in the future, especially for China. As we may see, economic growth has no other choice than to rely on the quality of labor; therefore, China must achieve sustainable economic development based on innovation. In India the improvement of

education is very important, it's estimated that in 2007 adult illiteracy rate reached 34%; (2) *Rate of Natural Increase (RNI)*. During the past two decades the RNI in India surpassed the world's average, while the other three countries are below this average. Russia's population witnessed negative growth, annually reducing by 750 thousand people; (3) In Brazil and Russia, the proportion of urban population was 50% higher than the world's average, 86.5% and 72.8%, respectively. When compared to Brazil and Russia, India and China are still in the process of urbanization. Considerable space and resources, besides urbanization, inevitably achieve increasing returns and market size effects, which, in the next twenty years, will be a new driving force for economic growth in both countries. The accumulation of resources in a given space, arising from the urbanization of the population, inevitably affects income and the size of markets, which constitutes a new driving force for economic growth in both countries over the next 20 years.

TABLE 1
Basic economic indicators in Brazil, Russia, India, and China

	Brazil	Russia	India	China	World
People					
Population (millions, 2007)	190.1	141.9	1164.7	1329.1	6670.8
Population as Share of Global Population (%)	2.85	2.13	17.46	19.92	
Urban population (% of total, 2010)	86.5	72.8	30.1	44.9	50.0
Child dependency ratio (1990)	58.5	34.3	64.9	42.9	53.8
Child dependency ratio (2010)	37.7	20.8	47.9	27.7	41.2
Old age dependency ratio (1990)	7.4	15.1	6.6	8.3	10.0
Old age dependency ratio (2010)	10.2	17.9	7.7	11.4	11.6
Rate of natural increase (% , 1990-1995)	1.6	-0.2	2.0	1.2	1.6
Rate of natural increase (% , 2005-2010)	1.0	-0.4	2.0	0.7	1.3
Adult illiteracy rate (% aged 15 and above, 2007)	10.0	0.5	34.0	6.7	
Life expectancy at birth (2007)	72.2	66.2	63.4	72.9	
Human development index					
1995	0.734	0.777	0.511	0.657	
2007	0.813	0.817	0.612	0.772	
Poverty and inequality					
% below \$1/day poverty line (200-2007c)	5.2	<2	41.6	15.9	
% below \$2/day poverty line (2000-2007c)	12.7	<2	75.6	36.3	
Richest 10% to poorest 10% (2007)	40.6	11.0	8.6	13.2	
Gini index (2007)	55	37.5	36.8	41.5	
GDP					
GDP (US\$ billions, 2007)	1313.4	1290.1	1176.9	3205.5	54583.8
GDP (PPP US\$ billions, 2007)	1833.0	2087.4	3096.9	7096.7	64909.7

(Continues)

(Continuation)

	Brazil	Russia	India	China	World
GDP as share of global GDP (2007 PPP, %)	2.82	3.22	4.77	10.93	
GDP per capita (PPP US\$, 2007)	9567	14690	2753	5383	8182.5
% Annual growth rate at constant prices (1990–2007)	1.2	1.2	4.5	8.9	1.6

Source: Unesco, *Human Development Report* (2009a).

Poverty and inequality strongly affect consumption patterns and demand structures. For example, poorer families tend to acquire products and services of lower quality and price, which are compatible with their diminished power of purchase. Demand trends affect a country's technology choice by determining the productive pattern. Therefore, poverty and inequality affect technological innovation. The BRIC, particularly India, suffers from poverty, where 41.6% of the population is below the \$1/day poverty line. In China this rate is 15.9%, in Brazil 5.2%, while Russia is better off with less than 2% of its population below the poverty line. According to the Gini index of 2007, Russia and India are at a relatively reasonable range, around 37%, while China and Brazil's income distribution gap exceed the "Alarm level".

BRIC's economic growth rates varied greatly between 1990 and 2007. China has grown at a faster rate over a longer period of time than any of the other three countries. As a result, although China's economic growth was smaller when compared to the other three countries during the 1980s, its gross domestic product (GDP) in 2007 was almost three times that of India, Brazil or Russia. When considering the GDP per capita, Russia's is almost three times that of China, while Brazil is 56% higher than China; however, China is almost twice that of India. All four are still considered developing countries, at three different levels of development. In terms of their GDP per capita, Russia and Brazil are classified as a high income developing economy; China is classified as a lower middle income economy and India as a low income economy.¹

Brazil had high growth rates from the mid 1960s until 1981, when it was severely affected by the Latin American debt crisis and the first oil shock. The country basically lost two decades of growth as a result of major macroeconomic imbalances that ensued, and only managed to stabilize its economy during the current decade. Even now, its growth rate trails China and India. In the last two decades, especially during the 1990s, the Russian economy was in a recession due to a series of errors in economic policies and reform strategies, situation which improved when Putin came to power. Russia and Brazil's annual growth rate at constant prices between 1990 and 2007 was 1.2%. On the other hand, India, since the 1980s, has shown more consistent growth rates, between 5 and

1. These are based on the classifications made by the World Bank.

6%, except for a severe financial crisis in 1991, which forced the country to liberalize the economy and eventually reach a higher growth rate. During the last four years, the country has been growing at more than 8% per year, closely approaching China's growth rates.

3.2 Broader Economic and Political Characteristics

This section examines some of the broader macroeconomic and political issues, including inflation rate, savings and investments, telecommunication infrastructure, administrative efficiency, political system and the role of government.

Inflation

At the macroeconomic level, Brazil is the most unstable country within the BRIC, having experienced twenty years of high inflation rates between 1980 and 2000. At the beginning of the 1980s, when the country began to face the effects of the second oil shock and the rise of interest rates in the international financial market, the process of industrial development planning, that characterized the previous decades, was abandoned. Throughout the 1980s, the Brazilian economy evolved under extremely high inflation rates: in 1988 this rate was nearly 400% per year, and rose to 2000% in 1990, increasing to 2700% in 1993. Russia faced macroeconomic instability in the 1990s, when the inflation rate reached 1468%; nonetheless, in 1999 it decreased to 36.5%. Since 2000, the Russian inflation rate has been under 20 percent; however, it still remains relatively high. In a high inflation economy, financial engineering and managing supplier's credits and receivables is more important than reducing production costs, improving quality or developing new products, factors which apparently reduce the incentives for innovation. In turn, when considering macroeconomic control, China is the most stable country within the Bric, maintaining a low inflation rate since 1980s. In the past three decades, China's inflation rate witnessed a 3% for the period. When compared to Brazil and Russia, India has a relatively stable macroeconomic environment, nevertheless not as good as what may be expected from the Chinese.

Saving and investment

Since 1990 and during most part of the period, China's Gross National Savings/GDP and Gross Domestic Investment/GDP have exceeded 40% (Table 2). For example, in 2003, China's savings rate was more than twice that of Brazil, nearly twice that of India, while Russia is close to 65% of China's rate. Thanks to high savings rate, Chinese investment rate has been, for a while, one of the highest in the world. During the last decade, China's investment rate was almost twice as high as the other three countries. The "three highs": high savings, high investment and high growth have been the main characteristics of China's economy over the past three decades. High savings, however, also has a negative influence on the

economy. In China's economy, high savings and corresponding low consumption would be the key cause of an over-dependency on exports and investments.

TABLE 2
Saving and investment of BRIC

Country	Gross national savings/GDP (%)				Gross domestic investment/GDP (%)			
	1983	1993	2002	2003	1983	1993	2002	2003
Brazil	–	20.2	18.5	20.7	16.7	20.8	19.8	20.1
Russia	–	33.7	28.6	28.9	-	27	20.2	20.6
India	18.4	23.1	26.3	24.4	19.7	21.3	22.8	23.8
China	35.1	41.8	43.2	47.6	33.8	43.3	40.4	44.4

Source: World Bank. Available at: <www.worldbank.org>.

Information and communication infrastructure

Dissemination and use of knowledge are the major functions of the innovation system and require the support of the information infrastructure. When compared to the other three countries and considering its huge population size, China's information and communication infrastructure is more efficient and modern (see Table 3). China manifests its advantages, especially when compared to India, which has almost the same population. Except for a small number of indicators, such as information and communication technology (ICT) expenditure and price basket for internet, the numbers presented by India represent approximately one third of China, or less. Russia's indicators are slightly ahead of Brazil, however in 2005, when comparing the ICT expenditure it represented less than half of Brazil and the lowest of the BRIC countries.

TABLE 3
Information and communication infrastructure of BRIC

Actual	Brazil	Russia	India	China
Total telephones per 1,000 people (2004)	587.10	773.10	84.50	499.40
Main telephone lines per 1000 people (2004)	230.40	255.80	40.70	241.10
Mobile phones per 1,000 people (2004)	356.70	517.30	43.80	258.30
Computers per 1,000 people (2004)	105.20	132.20	12.10	40.90
Households with television (%) (2004)	90.00	98.00	37.00	91.00
Daily newspapers per 1,000 people (2000)	46.00	–	60.00	59.00
International internet bandwidth (bits per person) (2004)	149.30	99.90	11.40	57.40
Internet Users per 1,000 people (2004)	119.60	111.20	32.40	72.50
Price Basket for Internet (US\$ per month) (2003)	28.00	10.00	8.70	10.10
ICT expenditure as % of GDP (2005)	7.82	3.58	5.91	5.28

Source: World Bank. Available at: <www.worldbank.org>.

Bureaucracy and transaction costs

All four countries have complicated government procedures. Although there are different procedures for different needs, deriving from specific functions, we can see that India has the highest transaction costs. The cost of registering a business in India is the highest of the four countries, 7% of GNI per capita, 7.4 times that of Brazil, 7.9 times that of China, and 27.3 times that of Russia. It's well-known that Brazil has the lowest level of efficiency in relation to bureaucratic procedures, starting a business needs 152 days, that is to say 124 more days than Russia and 117 more days than in China and India.

TABLE 4
Compare of bureaucratic transactions costs of BRIC

Bureaucratic transactions costs	Brazil	Russia	India	China
	High	Low	Very high	Medium
Cost to register a business as % of GNI per capita (2006)	9.9	2.7	73.7	9.3
Days to start a business (2006)	152	28	35	35
Cost to enforce a contract (% of debt) (2006)	15.5	13.5	35.7	26.8

Source: World Bank. Available at: <www.worldbank.org>.

Role of government

During the period of planned economy, everything was controlled by the Chinese government. Since the 1980s, the Chinese government began a market-oriented reform, accelerating the process after entering WTO in 2001. Many state-owned enterprises closed or restructured during this period, private enterprises developed fast, while private property was officially recognized in 2007. By the end of 2007, the number of private enterprises exceeded 70% of the total number of enterprises in the country. Nevertheless, China's share of state-owned economy is still one of the highest in the world. In 2009 the output value of state-owned enterprises accounted for 67.1% of the GDP. An active private economy and a strong state-owned economy coexistence as the two engine of sustained rapid economic growth in the country. An important manifestation of China's government role is that it controls and regulates the macro economy through state-owned enterprises.

India became a democracy after its independence, however, during the early years it mainly remained a government-controlled economy. The Soviet's five-year economic plan was opposed to large businesses and the government restricted the growth of large private enterprises. In the 1980s, these restrictions were loosened and since the 1990s have led to further liberalization. Although India's economy has been partly privatized, the state continues to have a strong presence

in industry and services. Russia experienced a rapid period of privatization between 1991 and 2000, including energy, banking and so on. After President Vladimir Putin came into power in 2000, Russia chose a government-led market economy, which completely controls the country's economic lifeline - such as energy, the military, communications and aeronautic, among others. Brazil is the most market oriented of the three economies. Nevertheless, during the military government, the State had a strong role in the economy, including the creation of many large state owned enterprises, in critical areas. During the 1990s, there were significant privatizations in Brazil; however, the State still is an important presence in the service sector (DAHLAM, 2009).

4 SUB-SYSTEM: SUPPORT SYSTEM OF INNOVATION

For developing countries, technological progress comes mainly from two sources: Opening up of international technology spillovers and domestic innovation. Large numbers of studies suggest that trade and investment liberalization generated from the spillover of technology - including learning, imitation, demonstration and competition effects - are an important source of technological progress for developing countries. Meanwhile, international experiences also show that opening to technology spillovers would produce a "threshold effect". Technology spillovers can become a reality only if the host country has a specific technical base and level of human capital; these two aspects are related to the productive structure and the level of education in the country. Trade, FDI, production and education are the support system of innovation.

4.1 Production structure of BRIC comparisons

As Table 5 shows that Brazil's industrial structure has changed significantly since 1985. The industry's share in total GDP declined, while services were in high growth. The industry's and service share of the total GDP in 2003 represented 19.11% and 75.12%, respectively. It's worth noting that agricultural products play an important role in Brazilian international trade, even though its share in GDP declined from 10.9% in 1985 to 5.77% in 2003.

In India, the agriculture sector showed a downward trend in its share of the total GDP, reaching 22.21% in 2003 compared to 36.6% in 1985. In the past twenty years, the manufacturing industry maintained its contribution rate to the total GDP, averaging around 26%. The service sector is the fastest growing sector in India, especially when considering IT sectors. The share of services in GDP grew from 37.6% in 1985 to 51.2% in 2003.

In Russia, the share of the agriculture sector fell from 14.9% in 1985 to 5.16% in 2003. The participation of the manufacturing sector in the total GDP declined from 62.3% in 1985 to 34.17% in 2003 (and remains highly concen-

trated on heavy industries – oil, energy, metallurgy and machinery). The share of services in the total GDP increased from 22.8% in 1985 to 60.67% in 2003.

China's industry led its evolution in a different way. The share of the manufacturing industry has improved greatly and exceeds 50% of the total GDP, 44.6% in 1985, to 52.29% in 2003. Although most of the labor force still resides in the rural area, there is a huge drop in the agricultural GDP share, from 33% in 1985 to 14.62% in 2003. The share of services in the total GDP grew from 22.4% in 1985 to more than 30% in 1990, remaining at the same level ever since.

TABLE 5
BRIC – value added by sector
(% of GDP)

Country	Year	1985	1995	2000	2002	2003
Brazil	Agriculture	10.90	7.60	7.28	5.84	5.77
	Industry	44.00	41.60	27.97	20.61	19.11
	Manufacturing	33.20	25.00		12.40	11.40
	Services	45.10	50.80	64.75	73.55	75.12
Russia	Agriculture	14.9	8.30	6.43	5.75	5.16
	Industry	62.3	44.60	37.95	33.75	34.17
	Manufacturing	–				
	Services	22.8	47.10	55.62	60.50	60.67
India	Agriculture	36.60	31.00	24.62	22.67	22.21
	Industry	25.80	26.30	26.60	26.61	26.59
	Manufacturing	16.30	16.10		15.60	15.80
	Services	37.60	42.80	48.78	50.72	51.20
China	Agriculture	33.00	19.90	16.35	15.38	14.62
	Industry	44.60	47.40	50.22	51.09	52.29
	Manufacturing	36.50	34.50		35.40	39.30
	Services	22.40	32.70	33.42	33.53	33.08

Source: World Bank, World Development Indicators Database.

4.2 Trade

When considering the total amount of imports and exports and their trends, China has a closer integration with the global economy than the other three countries. Tables 6 and 7 show the exports and imports of the BRIC in current US\$ and as a percentage of world exports and imports, during 2000 and 2004. After a phase of stagnation between 2000 and 2002, world exports grew significantly from US\$ 6,481 billion in 2002 to US\$ 9,123 billion in 2004. Imports also followed the same trend. The participation of the BRIC has varied significantly.

TABLE 6
BRIC – Foreign trade

(In millions of US\$ current and share of GDP – %)

Countries	Exports + imports				Exports + import/GDP				
	1970	1980	1990	2002	1970	1980	1990	2002	2006
Brazil	8,719	25,412	61,212	133,196	13.0	10.3	14.0	28.9	27
China	4,833	38,919	114,710	696,909	5.3	12.9	29.9	55.0	74
India	4,792	28,839	51,144	156,581	7.9	15.7	15.8	30.8	38
Russia			349,249	206,358			36.1	59.7	

Source: United Nations Statistics Division. Available at: <<http://unstats.un.org/unsd/default.htm>>.

TABLE 7
BRIC – Merchandise trade, 2000-2004

(Billion of current US\$ and share in world total %)

Exports	2000		2002		2004	
	Value	%	Value	%	Value	%
World	6,446.61	100	6,481.17	100	9,123.52	100
Brazil	55.09	0.85	60.36	0.93	96.47	1.06
China	249.20	3.87	325.59	5.02	593.37	6.50
India	42.38	0.66	49.25	0.76	72.53	0.79
Russia	105.57	1.64	107.11	1.65	183.19	2.01
South Africa	29.98	0.47	29.72	0.46	45.93	0.50
Imports	2000		2002		2004	
	Value	%	Value	%	Value	%
World	6,705.87	100	6,718.23	100	9,458.27	100
Brazil	58.63	0.87	49.60	0.74	65.90	0.70
China	225.09	3.36	295.17	4.39	561.42	5.94
India	51.52	0.77	56.52	0.84	95.16	1.01
Russia	44.66	0.67	60.22	0.90	94.83	1.00
South Africa	29.70	0.44	29.27	0.44	55.20	0.58

Source: United Nations Conference on Trade and Development (UNCTAD). Available at: <www.unctad.org>.

The most notable fact is the well-known increase in China's participation in international trade: its exports, when compared to the total amount of the world exports, grew from 3.9% in 2000 to 6.5% in 2004 (a 67.9% growth rate) and imports rose from 3.4% to 5.9% of the total world imports during the same period (76.8% growth rate). As may be observed from Table 3, Chinese imports almost doubled in two years (from US\$ 295 billion in 2002 to US\$ 561 billion in 2004). Its worth highlighting the strong role of primary goods in imports,

which also benefits countries specialized in these goods. China is a typical export-oriented economy. Table 6 illustrates that the share of imports and exports in China was 74% of the total GDP in 2006, compared to a 38% in India and only a 27% in Brazil. Purchases of foreign products and services are a key way to gain access to knowledge embodied in those goods and services. In China, trade is an important support for the National Innovation System.

India and Russia experienced a mild growth in both exports and imports. Brazilian imports decreased their relative share of the world imports during the period (from 0.87% to 0.70%), even if the absolute value increased from US\$59 to US\$66 billion.

4.3 Foreign direct investment

Table 8 provides a comparison between 1990 and 2008 of the FDI annual overview across BRIC economies and the FDI as percentage of Gross Fixed Capital Formation (GFCF). It is clear that among the BRIC economies, China tops the annual FDI inflow, followed by Russia, Brazil, and India. However, in terms of FDI as percentage of GFCF, Russia tops the table, followed by Brazil, India and China. According to the growth rate, over the past 20 years Russia's FDI had the fastest growth rate in 2008, it was 35 times that of 1990. Table 9 provides a comparison of FDI inward stocks across BRIC economies and FDI inward stock as a percentage of the GDP. It is clear that since 2000 China leads in terms of FDI stocks inflow, followed by Russia, Brazil and India. However, in terms of FDI inward stocks as a percentage of GDP, Brazil tops the list followed by Russia, China and India. Overall, Tables 8 and 9 show that FDI inflow to Bric economies grew significantly between 2006 and 2008, with few exceptions.

TABLE 8
Comparison of foreign direct investment – overview across BRIC economies

FDI inwardn flows	Millions of US\$				Gross fixed capital formation (%)			
	1990-2000 (annual avg.)	2006	2007	2008	1990-2000 (annual avg.)	2006	2007	2008
World	492674	1461074	1978838	1697353	8.2	13.5	16.6	12.8
Brazil	12000	18822	34585	45058	10.8	10.5	14.8	15.1
China	30104	72715	83521	108312	11.9	6.4	6.0	6.0
India	1705	20336	25127	41554	1.9	6.9	6.5	9.6
Russia	1941	29701	55073	70320	3.3	16.2	20.2	19.5

Source: UNCTAD (2009).

TABLE 9

Comparison of foreign direct investment – inward stocks across BRIC economies

FDI inward stocks	Millions of US\$				Gross fixed capital formation (%)			
	1995	2000	2007	2008	1990	2000	2007	2008
World	2915311	5757360	15660498	14909289	9.1	18.1	29.1	25.0
Brazil	47887	122250	309668	287697	8.5	19.0	23.2	18.3
China	101098	193348	32 087	378083	5.1	16.2	9.7	8.7
India	5641	17517	105429	61765	0.5	3.7	9.2	9.9
Russia	5601	32204	491232	213734	–	12.4	38.4	12.7

Source: UNCTAD (2009).

China is far more attractive for FDI than any of the other three countries, the reasons are listed below. First, China opened its regulatory regime for Foreign Direct Investment more extensively than India and 10 years before. With the development of investment, the Chinese government has introduced tax incentives and other such policies to attract FDI. Second, China's larger and richer market has been an important pull factor, even surpassing Russia and Brazil. Third, China has many cost advantages over the others countries, although its labor costs are now generally higher than India's. Fourth, China has a better infrastructure and a more efficient administrative system. Fifth, China has a more stable macro economy, over the past twenty years, low inflation, interest rates, exchange rate fluctuations has created a good environment for investment. As a result, China has been very attractive not only as a production platform for global markets, but also the Chinese market is the world's fastest growing market. This strong pull towards producing in China has also permitted the government to encourage strong competition among foreign multinational firms so they may bring the very best technologies when locating in China, even though they are aware of poor intellectual property protection and the risk that their technology may be pirated. The most important contribution of FDI to China has not been capital, once China has had high levels of savings and investment rate. More important has been the access to advanced technology and management through FDI. Equally important is the entry into global markets, once foreign investors integrate their Chinese operations into their global supply chains (DAHLAM, 2009).

4.4 Education

Education is the basis for using new technologies, the basis for innovation. The more education people get, the faster mastering new technologies are. Empirical studies show that education leads to higher productivity and higher growth and also show that they lead to higher earnings for individuals.²

This section will compare education across the four countries by comparing basic education attainment, followed by secondary and higher education enrollment rates and a few concluding comments on life long learning.

Basic education

Thirty years ago, as a very poor developing country, China's education level was very low. Nevertheless, China made huge investments in education and implemented a nine-year-compulsory education plan in 1986. The rate of adult literacy in China, the world's most populous country, is 90.9%, less than Russia; however it's a great achievement to attain a 30% higher rate than India (table 10).

Tertiary education

Since the mid 1990s, China conducted a national expansion of higher education aiming to repair the higher education system, severely damaged during the Cultural Revolution (1965 to 1975). By 2005, China's higher education enrollment rate reached 19%. Due to its huge population base, the number of students in higher education in China is higher than the U.S. and 40% of the students are concentrated in engineering and science. Since the 1950s, India has created seven Institutes of Technology and later several Institutes of Management, producing a critical mass of well educated English speaking professionals, who have been instrumental in India's development of software and ICT enabled services. Despite India's efforts to expand enrollment rates in higher education, in 2005 there was a gap of more than 7%, when compared to China. Also, the quality of higher education is poor. The low quality of tertiary education and the regulatory constraints on expanding institutions of high quality will be a major bottleneck for India's continued rapid growth of knowledge intensive services. Brazil is well ahead of China and India in relation to tertiary education; however, it has expanded the least, albeit being slightly ahead of China in tertiary enrollment rates (DAHLAM, 2009, P. 18-20). On the other hand, when considering higher education these three countries are far behind Russia, which has an enrollment rate of 68.20%.

2. There are other benefits from more education. Many analyses show a positive causal relationship between higher educational attainment better mental and physical health, and lower rates of unemployment and to get jobs with higher income. With higher income they can spend more on health. Education can increase a person's self-esteem, problem-solving and social skills, and the capacity to respond to adversity. In addition, research has shown a positive relationship between literacy and participation in voluntary community activities, and between greater civic knowledge and higher levels of civic participation (OECD, 2006).

TABLE 10
Education indicators of BRIC

	Brazil	Russia	India	China
Adult literacy rate (% age 15 and above) (2006)	88.6	99.4	61.00	90.9
Average years of schooling (2000)	4.88	10.03	5.06	6.35
Gross secondary enrollment (2004)	102.00	92.90	53.50	72.50
Gross tertiary enrollment (2004)	22.30	68.20	11.80	19.10
Internet access in schools (1-7) (2006)	3.60	3.80	3.80	4.00
Public spending on education as % of GDP (2005)	4.0	3.8	3.2	2.2
Quality of science and math education (1-7) (2006)	2.90	4.50	5.70	4.10
Extent of staff training (1-7) (2006)	4.20	2.90	4.80	3.40
Quality of management schools (1-7) (2006)	4.10	3.60	6.00	3.40
Brain drain (1-7) (2006)	3.90	3.50	3.70	3.80

Source: World Bank.

Obs.: First, countries are ranked from best to worst, using their scores on each variable. Then the scores are normalized on a scale of zero to ten for all countries.

Education quality

According to the data divulged by the World Bank in 2006, when considering Internet Access in Schools, China has the best performance, scoring 4. When considering the Quality of Science and Math Education, India ranked the best at 5.9, which is twice that of Brazil. When examining the Extent of Staff Training, Russia scored the lowest, only a 2.9, while the other three countries are above 4. Considering the Quality of Management Schools, India scored 6, higher than Brazil who rank second (Table 10). This may be due to the fact that English is India's official language. When analyzing the Brain Drain phenomenon, there is a slight difference between these four countries. Its noteworthy that the GDP share of Chinese investment on education is 1% less than India, which is alarming when considering that the lack of government investment in education may in the long-term affect human resources and China's international competitiveness.

5 SUB-SYSTEM: MAIN PLAYERS OF INNOVATION

Innovations and new emerging knowledge always result from the efforts of research institutions. Research institutions in enterprises, government and universities are the main players of innovation. This section will make a comparative study of the quantities and distribution of researchers, and the innovation efforts carried out by research institutions belonging to the government, enterprises and universities.

5.1 Researchers

Table 11 reveals that China dominants when considering the quantities of researchers, representing 1/5 of the total amount in the world. When it comes to the research expenditures per researcher, the level in China is very low. However,

it has increased in 51% between 2002 and 2007. Although it is 50% higher than Russia, it is only 58% of India and 50% of Brazil. During 2002 and 2007, the number of researchers increased by 75.6% in China, 64.8% in Brazil, 33.6% in India, while a decreasing trend was observed in Russia. Russia's proportion of the total researchers in the world has decreased in 2% during the period, representing 1/3 of the total amount of researchers in China. However, when taking into account the amount of researchers per million inhabitants, the rate was highest in Russia, three times that of China, five times that of Brazil and 24 times that of India. Possibly due to a well-developed higher education system, the foundation for research in Russia is still strong.

TABLE 11
Researchers in BRIC (2002 and 2007)

	Researchers (thousands)		World researchers (%)		Researchers per million inhabitants		GERD per researcher (thousands PPP\$)	
	2002	2007	2002	2007	2002	2007	2002	2007
Brazil	71.8	118.3	1.2	1.7	400.7	624.8	167.8	146.6
China	810.5	1423.4	14	20.1	629.1	1071.3	48.7	73.7
India	115.9	154.8	2.3	2.2	110.8	136.5	102.8	126.7
Russia	491.9	469.1	8.5	6.6	3365.8	3291.8	32.5	50.1

Source: Unesco (2009).

Table 12 compares the the distribution of BRIC researchers by sector of employment. In sum, enterprises in China holds the largest group of researchers with a 62.3%, while the universities hold 19.8% of the total and the remaining 17.9% are in the government. In India, 49% of the researchers were in government institutions of, 37% in enterprises and 14% in the universities (the smallest rate of the four countries). It is different in Brazil, where 56.3% of the researchers are in universities, and 37.6% in enterprises, only 5.3% in government. The situation of Russia is similar to China. About 51.2% of the researchers are gathered in enterprises, while the proportion of governments and universities were 33.3% and 15.2%, respectively. According to changing trends, the proportion of researchers' distribution in enterprises has increased in China, while the amount in government has decreased, contrary to Russia. In India, the amount of researchers in enterprises between 2000 and 2005 increased in 7%. During the same period, the percentage of researchers in universities and the government decreased in 5% and 2%, respectively. In Brazil this rate decreased slightly and was similar to India.

TABLE 12
Researchers by sector of employment, full-time equivalents

	Researchers - Total		Business enterprise (%)		Government (%)		Higher Education (%)	
	2000	2005	2000	2005	2000	2005	2000	2005
Brazil	64002	109420	31.4	37.6	7.4	5.3	60.5	56.3
Russia	506420	464577	57.2	51.2	28.1	33.3	14.3	15.2
India	115936	154827	30.0	37.0	51.0	49.0	19.1	14.0
China	695062	1118700	50.9	62.3	27.8	17.9	21.3	19.8

Source: GDP: World Bank (*World Development Indicators*, as of February 2009), and UIS estimations.

Population: United Nations Population Division; *World Population Prospects: The 2006 Revision*, and UIS estimations.

5.2 Domestic innovation effort

Table 13 shows that the expenditures on R&D in China increased rapidly from 2002 to 2007. The Gross Expenditure on Research and Development (GERD) was 104.9 billions in 2007, compared to 39.4 billions in 2002, increasing by 3 times. The percentage of R&D expenditures in the world also increased to 10% in 2007, which was higher than 2.2% in India, 2.1% in Russia and 1.6% in Brazil. China's ratio of R&D expenditures to GDP was 1.5% in 2007, coming in first place among the developing countries (while the data for Russia was 1.1%; for Brazil, 0.8%; and for India, 1.0%). However, there's a large gap when compared to developed countries. Although R&D expenditures per capita increased rapidly in China, it was still far below the level the OCDE countries and even lower than several developed countries. In 2007, the data was less than 1/2 of Russia, and lower than Brazil. It was only higher than India, which represented 1/4 of China's expenditure.

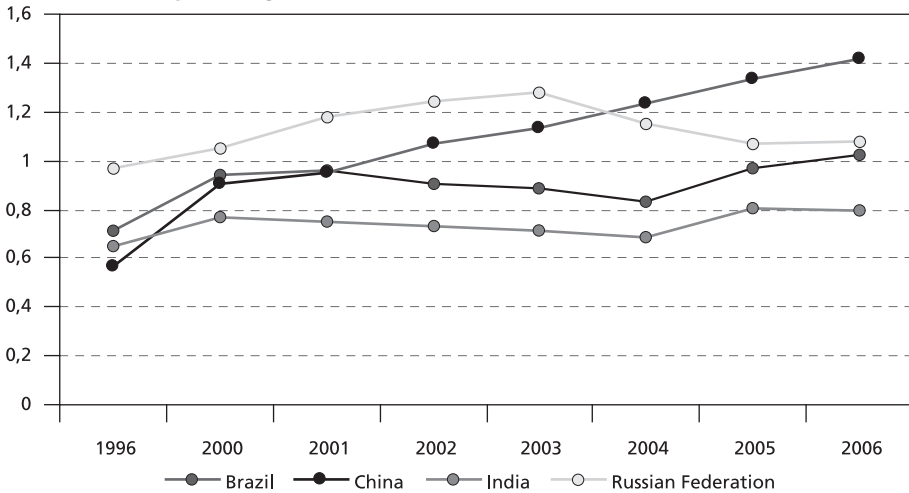
Figure 2 shows that the ratio of R&D expenditures to GDP has increased since the mid-1990s, and that this trend is continuous. In Russia, the process developed in two stages: an increase during 1990 and 2003, and a decrease between 2003 until the present. In Brazil and India trends were similar, after a period of oscillation there's been an increase in this ratio over the past three years.

TABLE 13
R&D expenditure (GERD) of BRIC (2002 and 2007)

	GERD (in billions PPP\$)		GERD (% world)		GERD (% of GDP)		GERD (per capita in PPP\$)	
	2002	2007	2002	2007	2002	2007	2002	2007
Brazil	12.1	17.3	1.5	1.6	0.9	1.0	67.2	91.6
China	39.4	104.9	5.0	9.2	1.1	1.5	30.6	79.0
India	12.9	24.8	1.6	2.2	0.7	0.8	11.9	21.2
Russia	16.0	23.5	2.0	2.1	1.2	1.1	109.4	164.8

Sources: GERD, researchers data and related indicators: Unesco Institute for Statistics (UIS) estimations, May 2009.

FIGURE 2
GERD as a percentage of GDP

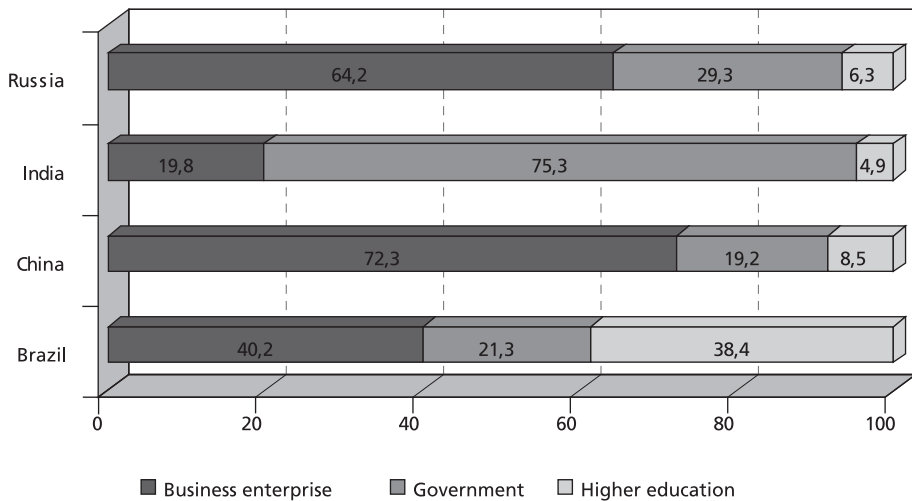


Source: Unesco (2009a).

When analyzing the sources and flow directions of R&D expenditures, one may observe that the real flagships have always been enterprises, with the exception of India. According to the distribution of the sources of R&D expenditures, there are a few market economy characteristics in China. Enterprises are the main source of R&D, 72.3% of the R&D expenditures are made by enterprises. Only 8.5% of the expenditures come from universities. In Russia and India, the R&D expenditures invested by universities was only 6.3% and 4.9%, respectively. At the same time, the R&D expenditures of universities were rather high in Brazil, around 38.4%, close to the rate of enterprises. With a share of 75.3%, India's government made the largest investments in R&D.

FIGURE 3
GERD by sector of performance – 2007

(In %)



Source: Unesco (2009b).

6 CHARACTERISTICS OF INNOVATION PERFORMANCE

We realized a comparative study on the innovation system considering the environment, supporting system, main body and the innovation efforts. This section will compare the innovation performance of the four countries under three aspects: innovation capability, innovational configuration and innovation strength.

6.1 Innovation capability

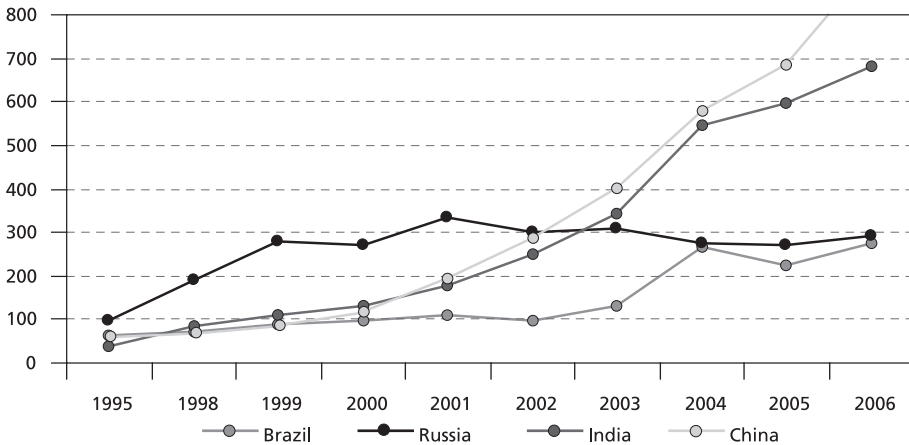
We used patent count and citation ratio to evaluate innovation capability. The patent and citation data used in this study consists of all patents granted by the U.S. Patent and Trademark Office (USPTO) to BRIC inventors between 1976 and 2006.

Figure 4 compares the patent counts for the BRIC countries between 1995 and 2006. Before 1995 there are no significant changes, however the changes realized after this date may be divided into two stages. The newly authorized patents of each country were always less than 100 per yea, only Russia manifested a significant increase of the patents, while the other three countries remained as they were. Since 2001, the increase of new patents in China and India has been a dominant and continuous trend, which coincided with economic development in both countries. At the same time, the number of new patents decreased in Russia. During 2002 to 2004, there was a rapid increase of new patents in Brazil, after which it entered a period of stagnation.

When analyzing the total amount of new patents between 1976 and 2006, China is in first place with the number of 4745 and India follows with a total amount of 3679. The amount was 3029 and 2134 in Russia and India. Considering that between 1995 and 1999, the quantity of authorized patents were approximately the same between China and Brazil, the gap between them has increased. Since 2000, the discrepancy between China and Brazil has been continuously growing, considering they were at the same level in 1995. This becomes clearer than ever after 2005.

Since the qualities of patent are very different, citation ratio has been used to evaluate the qualities of similar patents (SCHANKERMAN; PAKES, 1986). Citation ratio is defined as the average number of a country’s patents cited by later patents. As Table 1 shows, the citation ratios respectively are 5.3, 4.7, 3.6, and 3.6 for Russia, Brazil, India and China in 2006.

FIGURE 4
Number of utility patents given for U.S. origin patents



Source: Tseng (2009).

TABLE 14
Citation ratio of BRIC – 1976-2006

Country	Patent count	Cited by later patents	
		Citations	Citations ratio
Brazil	2134	10014	4.69
Russia	3029	15948	5.26
India	3679	13424	3.65
China	4745	16857	3.55

Source: Tseng (2009).

6.2 Innovation configuration

The differences in innovative configurations may be mapped based on constructs of “fundamental vs. applied innovation” and “incremental vs. radical innovation”.

According to Tseng, the following two methods may be employed to examine the differences in innovation configurations among BRIC countries. Organizations whose patents cite many scientific papers are assumed to be partial to fundamental innovation. Conversely, organizations with lower scientific linkage ratios are assumed to focus more on applied innovation. Incremental or radical innovation is usually used to define the overall impact of innovation. In radical innovation, the properties of a product suddenly change and significantly alter market dominance, competitiveness and the overall industrial landscape. Incremental innovation impacts the existing capabilities of organizations and the existing knowledge and demand structures in the environment. A self-citing ratio can be used to distinguish between incremental and radical innovation (TSENG, 2009).

Table 15 summarizes Science Linkage for the four countries. The indicators of Science Linkage show that Russia (5.46) ranks higher than the other countries in scientific research. It is expected that technological innovation in Russia reflect the latest scientific developments. Restated, Russia is partial to fundamental innovation. In comparison, Brazil and China have relatively lower Science Linkage ratios and are assumed to be more focused on applied innovation.

The right side of Table 15 compares self-citing ratios between BRIC countries. Russia (17.1%) and India (15.4%) tend to favor incremental innovation, while Brazil (9.5%) and China (8.8%) tend to engage in radical innovation. That is, Brazil (90.5%) and China (91.2%) are mostly building on other countries' technologies.

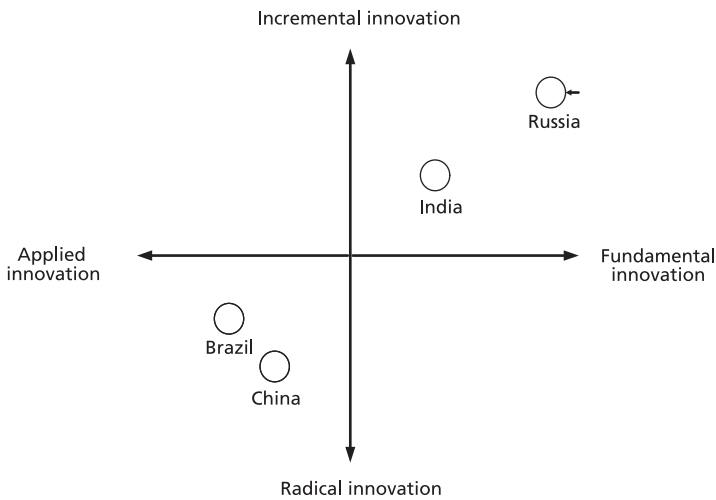
TABLE 15
Comparison of science linkage and self-citing ratio among BRIC – 1976-2006

Country	Citing scientific journal papers and conferences		Citing all previous patents				
	Total citations	Science linkage	Total citations	Citing its own patents	Self-citing ratio (%)	Citing other patents	Other-citing rate (%)
Brazil	4651	2.18	22987	2188	9.5	20799	90.5
Russia	16541	5.46	42782	7314	17.1	35468	82.9
India	13873	3.77	41762	6428	15.4	35334	84.6
China	14125	2.98	60591	5319	8.8	55272	91.2

Source: Tseng (2009).

Figure 5 compares the innovation configuration among BRIC countries on the basis of data consisting of Science Linkage and a self-citing ratio, through the standardization process. Obvious differences in innovation configuration are apparent in the BRIC countries. Russia appears to be highly focused on both fundamental and incremental innovation; India is working closely with applied and incremental innovation, while Brazil and China tend to focus on applied and radical innovation.

FIGURE 5
Innovation configurations differ between the BRIC countries



Source: Tseng (2009).

6.3 Innovation strength

Table 16 presents innovation strength in 30 technological fields for BRIC countries between 1976 and 2006. Innovation strength analysis includes both absolute and relative innovation strength. Absolute innovation strength is measured by the number of patents invented by a country when compared to BRIC countries, in a specific technological field. Relative innovation strength is measured by the number of patents in a specific technological field compared to the total number of patents in the country.

TABLE 16
Comparison of innovation strengths of BRIC countries in 30 technological fields

Technological fields	Brazil		Russia		India		China		Total	
	Patents	(%)	Patents	(%)	Patents	(%)	Patents	(%)	Patents	(%)
Electrical engineering	108	5.1	190	6.3	151	4.1	939	19.8	1,388	10.2
Audiovisual technology	54	2.5	280	9.2	555	15.1	377	7.9	1,266	9.3
Telecommunications	77	3.6	161	5.3	659	17.9	155	3.3	1,052	6.8
Information technology	75	3.5	148	4.9	474	12.9	224	4.7	921	6.8
Semiconductors	33	1.5	163	5.4	308	8.4	252	5.3	756	5.6
Optics	79	3.7	241	8.0	155	4.2	244	5.1	719	5.3
Control technology	134	6.3	73	2.4	52	1.4	348	7.3	607	4.5
Medical technology	114	5.3	144	4.8	112	3.0	200	4.2	570	4.2
Organic chemistry	133	6.2	164	5.4	74	2.0	115	2.4	486	3.6
Polymers	102	4.8	57	1.9	179	4.9	121	2.6	459	3.4
Drugs	79	3.7	133	4.4	11	3.0	90	1.9	412	3.0
Biotechnology	34	1.6	104	3.4	187	5.1	85	1.8	410	3.0
Materials	46	2.2	177	5.8	33	0.9	148	3.1	404	3.0
Food chemistry	53	2.5	91	3.0	144	3.9	114	2.4	402	3.0
Basic materials chemistry	67	3.1	164	5.4	58	1.6	68	1.4	357	2.6
Chemical engineering	20	0.9	34	1.1	60	1.6	225	4.7	339	2.5
Surface technology	119	5.6	105	3.5	42	1.1	55	1.2	321	2.4
Materials processing	116	5.4	68	2.2	21	0.6	97	2.0	302	2.2
Thermal processes	140	6.6	38	1.3	19	0.5	103	2.2	300	2.1
Environmental technology	75	3.5	82	2.7	14	0.4	117	2.5	288	2.1
Machine tools	7	0.3	101	3.3	24	0.7	136	2.9	271	2.0
Engines	115	5.4	34	1.1	20	0.5	78	1.6	247	1.8
Mechanical elements	95	4.5	45	1.5	22	0.6	79	1.7	241	1.8
Handling	61	2.9	47	1.6	20	0.5	104	2.2	232	1.7
Food processing	80	3.7	42	1.4	47	1.3	58	1.2	227	1.7
Transport	13	0.6	45	1.5	46	1.3	118	2.5	222	1.6
Nuclear engineering	33	1.5	9	0.3	44	1.2	21	0.4	107	0.8
Space technology	44	2.1	14	0.5	12	0.3	37	0.8	107	0.8
Consumer goods	23	1.1	18	0.6	9	0.2	14	0.3	64	0.5
Civil engineering	5	0.2	26	0.9	15	0.4	9	0.2	55	0.4
Others	0	0.0	31	1.0	10	0.3	14	0.3	55	0.4
Total	2,134	100	3,029	100	3,679	100	4,745	100	13,587	100

Source: United States Patent and Trade Mark Office. Available at: <www.uspto.gov>.

By analyzing Table 17, the absolute innovation strength and relative innovation strength of the four countries can be defined clearly. It is obvious that BRIC countries markedly differ in the technological fields in which they exhibit innovative strength.

TABLE 17
Comparison of absolute and relative innovation strength of BRIC countries

Country	Absolute innovation strength (Top Five)	Relative innovation strength (Top Four)
Brazil	Surface technology, materials processing, thermal processes, engines, mechanical elements	Thermal processing, control technology, organic chemistry, and surface technology
Russia	Organic chemistry, drugs, materials, basic materials chemistry, and civil engineering	Audiovisual technology, optics, electrical engineering, and materials
India	Audiovisual technology, telecommunications, information technology, semiconductors, polymers	Telecommunications, audiovisual technology, information technology, and semiconductors
China	Electrical engineering, optics, control technology, medical technology, chemical engineering	Electrical engineering, audiovisual technology, control technology, and semiconductors

Source: United States Patent and Trade Mark Office. Available at: <www.uspto.gov>.

7 CONCLUSIONS

7.1 Lessons learned

The *first* lesson is the importance of effectively tapping into the global economy. China has done this extremely well, in many ways. With the opening to the overseas market, especially the entrance to WTO and tariff and non-tariff barriers reduction, China has been continuously opening its domestic market. International trade and investment are the key strategies for China's economic globalization. During this process, we can absorb and consume new knowledge and enhance technological capabilities.

The *second* lesson is that effective use of FDI is more important than the amount of FDI. China's capability of absorbing and effectively using FDI, results from low labor costs and the development of a large domestic market, which strengthens bargaining power. Along with these advantages, China extended its range of options regarding projects and technologies. Another important factor is that China, after a long period of innovation and opening to foreign markets, has developed a sound base of human resources capable of absorbing the spillover of technologies.

The *third* lesson is the importance of competition. Foreign enterprises in China operate in both the domestic and international market, which results in the following: (1) foreign-investment attracts the best technologies and management experiences to China, considering that these enterprises compete in the global market; and (2) domestic enterprises in China must compete with foreign enterprises, incentivizing the enhancement of technologies. After joining the WTO, China's creativity has improved significantly, attesting the importance of open policy and competition.

The *fourth* lesson is the importance of education. In China, the high literacy rate and low labor costs are prime attractions for FDI. Investments in high-level human capital have been critical for Brazil's excellence in aeronautic technology, deep oil exploration, and agricultural research. Nonetheless, good education alone may not be effective. Russia has the best education among BRIC countries and the highest percentage of higher educated population, however the effectiveness of innovation has been low. One may conclude that innovation is a kind of systematic engineering.

Fifth is the importance of macroeconomic conditions. China has a relatively stable macroeconomic environment, including low inflation, low interest rates and stable exchange rates. This has created a predictable business environment which, both, domestic and foreign investors like. Since the 1980s, India also has had a relatively stable macroeconomic environment, except during the financial crisis of the late 1980s, which culminate in 1991. Brazil, on the other hand, went through a period of macroeconomic instability between 1980 and the early 2000s, when it finally attained stability. This also happened in Russia, which experienced a very turbulent 1990s.

The *sixth* lesson concerns the importance of continuous effort. An emblematic case is that of the aeronautics' industry in Brazil, whose development has been included in national strategies and has received continuous investment since the 1930s.

The *seventh* lesson is high investment rates. China has grown faster than any of the other three countries because its investment rate is around twice as high. While it is true that much of this investment has been inefficient, it is also true that high rates of investment allows for new technologies.

Eighth is the importance of the role of government. We do not refer to the amount of the R&D expenditures invested by government, but the definition of policies and laws for innovations. In China, enterprises are the main executors of innovation. At the same time, the government has been the leading proponent of political liberalization, absorbing of foreign capital, the construction of special economic zones, the construction of high-tech development zones, the creation of a tech-business incubator and the Torch Programme for developing new/high tech industries.

Ninth is the attention given to the variation of the population. Along with innovation and opening up to the world, there is a family planning policy in China that plays an important role in the development of the economy. India's population has increased, while Russia's population has decreased, resulting in the depression of the economy.

7.2 Economic implications for BRIC

There are predominant individual characteristics and commonalities among the BRIC countries regarding the construction and evolution of the innovation system. The similarities in future trends are explained below.

Open approach

The process of trade liberalization provides access to the global economy, knowledge and advanced technologies, increasing national capacity for innovation. There are three tasks at hand. The first is to enhance education and develop high-tech human resources to improve learning and the competing abilities of national enterprises. The second is to improve the ability to negotiate with foreign capital and make reasonable choices regarding productive or technological factors, maintaining a balance between the protection of domestic industries and opening to the world market. Finally, create a good local system, law environment and infrastructure that attract foreign high-tech company investment. An attractive investment destination may arouse competition between different projects, where capital and technologies will be filtered.

Construct a competition system

It's crucial to construct a system capable of absorbing foreign advanced technologies and incentivizing domestic enterprises to invest in innovation. Nationally, the competition system may drive domestic enterprises to keep learning and absorbing new knowledge and carry out innovations. Internationally, competition may motivate foreign enterprises to bring the most advanced technologies to the local market.

Government leadership

As Lundvall (1985) observed, institutions (such as enterprises, research institutes or universities), rather than individuals, promote innovation in the economy by interacting with each part of the innovation system and generating mutual influences within the social system. The government is the first instance to promote activities among these interactive activities. The success of a country's innovation policies is based on the continuous efforts of public and private elements, as well as national intervention. Under this model, the government may guide development and promote the creation of new knowledge and its applications. Undoubtedly, government intervention doesn't mean that the government should invest in R&D directly, but that it should formulate and implement better innovation policies and promote cooperation among governments, enterprises, research institutes and universities, motivate enterprises to invest in and implement R&D. Meanwhile, the government should also supply the necessary public goods that promote innovation.

Emphasis on enterprises

In a system of market economy, enterprises are the main players, while the innovation of technologies promotes economic progress. Simply follow this rule and there will be a market-driven path to innovation, moreover market demand will be met. Enterprises should take the lead in R&D investment, technical innovation and its application. Within the BRIC countries China leads in NIS, whereas the other three countries, especially India, still have a long way to go.

From the standpoint of individual characteristics, there are many advantages and disadvantages of the BRIC's innovation systems. In China a stable macroeconomic environment, a powerful government, a large market, economic globalization and the continuous increase in investment in innovation support the national innovation system. The disadvantages are the increase of labor cost and the bottleneck of environmental resources. In India the main advantages are abundant human resources, which have shown an increasing trend, while the development of education is a weakness. In Russia there is a sound higher education system, many natural resources and a strong technology base, however, the continuous decrease of the population, the lack of innovation expenditures and the fluctuation of the macroeconomic environment are its weaknesses. The main advantages of Brazil reside in its reasonable industrial structure and advanced aeronautic industry technology, while its disadvantages are the unfair distributions system and low levels of R&D expenditures.

Likewise, the differences in the configurations of the NIS among BRIC countries allow for complementarities and possibilities of cooperation. On one hand, Russia tends to focus mostly on fundamental innovation, unlike India, while Brazil and China have preferred to pursue applied innovation. On the other hand, Russia and India tend to exhibit incremental innovation systems, while China and Brazil tend to pursue radical innovation systems. The four countries can make full use of each other's comparative advantages and carry out activities of cooperation; otherwise, there are large discrepancies among their innovation strengths.

REFERENCES

BASKARAN, Angathevar; MUCHIE, Mammo. Foreign Direct and Internationalization of R&D: The Case of BRICS Economics. *In: ASIALICS INTERNATIONAL CONFERENCE: FROM MANUFACTURING TO SERVICES: CHANGING ROLE OF INNOVATION SYSTEMS*, 5., Bangalore, India, April 2-4, 2008.

BINGWEN, Zheng. The Key for Reconstructurding the SNIs is the State-From Point of View of Economics, in *Acknowledge-based Economy and National Innovation Systems*. **Publishing House of Economic Management**, 1998.

BINGWEN, Zheng; DUARCOURT, Pierre. Review on SNIs, in Economic Perspectives (Jingjixue Dongtai), **CASS**, n. 12, p. 53-57, 1994.

DAHLMAN, Carl. **Innovation Strategies of three of the BRICS: Brazil, India and China-What can we learn from Three Different Approaches?** Sanjaya Lall Programme for Technology and Management for Development. University of Oxford Department of International Development, 2009 (Working Paper, n. 23).

FREEMAN, Christopher. **Technological infrastructure and international competitiveness, draft paper submitted to the OECD ad hoc group on science, technology and competitiveness.** Paris: OECD, 1982.

_____. **Technology policy and economic performance: lessons from Japan.** London: Frances Pinter, 1987.

GOKHBERG, Leonid; GORODNIKOVA, Natalia. Russia's Innovation System in Transition – BRICS National Innovation Systems, IDRC. *In: SEMINAR COMPARATIVE STUDY OF THE NATIONAL INNOVATION SYSTEMS OF BRIC COUNTRIES*, Rio de Janeiro, 2010.

GOLDMAN, Sachs. Dreaming with BRICs: The path to 2050. **Global Economics Paper**, New York, n. 99, 2003.

JOSEPH, K. J. National System of Innovation: India, IDRC. *In: SEMINAR COMPARATIVE STUDY OF THE NATIONAL INNOVATION SYSTEMS OF BRIC COUNTRIES*, Rio de Janeiro, 2010.

KAPLINSKY, Raphael. **Globalization, Poverty and Inequality: Between a Rock and a Hard Place.** Cambridge: Polity Press, 2005.

LALL, Sanjaya. **Reinventing Industrial Strategy: The Role of Government Policy in Building Industrial Competitiveness.** Oxford: Queen Elizabeth House, Oct. 2003 (Working Paper, n. 111).

LIU, Xielin; LV, Ping; TiePen. China's Innovation System in Transitions in Transition-BRIC National Innovation Systems, IDRC. *In: SEMINAR COMPARATIVE STUDY OF THE NATIONAL INNOVATION SYSTEMS OF BRIC COUNTRIES*. Rio de Janeiro, 2010.

LUNDEVALL, Bengt-Ake. **Product innovation and user-producer interaction.** Aalborg: Aalborg University Press, 1985.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD). **Education at a Glance 2005.** Paris, 2006.

PELTOLA, Kaisa-Kerttu. Russian innovation system in international comparison: Opportunities and challenges for the future of innovation development in Russia. **Electronic Publications of Pan-European Institute.** Nov. 2008.

RUSHING, Francis W.; BROWN, Carole G. (Org.). **National Policies, or Developing High Technology Industries: International Comparisons.** Boulder: Westview Press, 1986.

SCHANKERMAN, Mark; PAKES, Ariel. Estimates of the value of patent rights in European countries during the post-1950 period. **The Economic Journal**, n. 96, p. 1052-1077, 1986.

SOARES, Maria C. C. Description and Dynamics of the Brazilian Innovation System, IDRC. *In: SEMINAR COMPARATIVE STUDY OF THE NATIONAL INNOVATION SYSTEMS OF BRIC COUNTRIES*, Rio de Janeiro, 2010.

TSENG, Chun-Yao. Technological Innovation In The BRIC Economies. Research. **Technology Management**, Mar./Apr., p. 29-35, 2009.

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (UNCTAD). **World Investment Report.** Geneva, 2009.

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION (UNESCO). **Human development report.** Paris, 2009a.

_____. **Science and Technology Report.** Paris, 2009b.

_____. **GERD, researchers data and related indicators:** UNESCO Institute for Statistics (UIS) estimations. Paris, 2009c.

UNITED NATIONS POPULATION DIVISION. **World Population Prospects: the 2006 Revision**, see. New York, 2006. Disponível em: <www.un.org.>.

WALZ, Rainer; OSTERTAG, Katrin. Absorptive Capacities for Sustainability Technologies: Perspectives from the BRICS and China. **Chinese Journal of Population, Resources and Environment**, China, v. 7, n. 2, p. 3-10, 2009.

YAO, Xuening; WATANABE, Chihiro. Co-evolutionary Dynamism between innovation and Systems in the BRICs. *In: CONFERENCE PAPER OF JAPAN ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY.* 2007. Disponível em: <https://dspace.jaist.ac.jp/>. Acesso em: 2008.

_____. Co-evolutionary Dynamism between innovation and Systems in the BRICs. *In: CONFERENCE PAPER OF JAPAN ADVANCED INSTITUTE OF SCIENCE AND WORLD BANK, World Development Indicators*, Washington DC, 2009.

<<http://unstats.un.org/unsd/default.htm>>.

<www.uspto.gov>. YALLAPRAGADA, Ram Mohan; PARUCHURI, Madhu R. Foreign Direct Investment in India: A Lost Opportunity. **Southwestern Economic Proceedings**, St. Louis, Missouri, v. 30, n. 1, 2001.

ZHANG, Kevin H. Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America. **Contemporary Economic Policy**, v. 19, n. 2, p. 175-185, 2001.

_____. **Foreign Direct Investment and Economic Growth in China: Panel Data Study for 1992-2004**. Illinois: State University, 2006.

FDI IN THE BRICS: CHANGING THE INVESTMENT LANDSCAPE

Radhika Kapoor*

Ritika Tewari**

The economic and financial crisis seems to have altered the global investment landscape considerably. The BRIC economies, in particular, have emerged as the most favoured destination for foreign direct investment (FDI). So, in this paper, attention will be given to one of the key drivers of their economic might – their trade and investment potential, in particular foreign direct investment. Thus, this paper will look at the global scenario in FDI inflows, present a sectoral breakdown of the inward FDI in the BRIC economies, analyse the factors that make the BRIC economies attractive for FDI inflows, examine the relation between economic growth and FDI and also outline relevant policy issues.

INVESTIMENTOS ESTRANGEIROS DIRETOS NAS ECONOMIAS BRIC: MUDANDO O CENÁRIO DE INVESTIMENTO

A crise econômica e financeira parece ter alterado consideravelmente o cenário de investimento global. As economias do bloco Brasil, Rússia, Índia e China (BRIC), em particular, têm surgido como destino preferido para investimentos estrangeiros diretos (IED). Assim, este trabalho analisa um dos principais motores da força econômica destes países – seus potenciais comerciais de investimento, especialmente o investimento estrangeiro direto. Dessa forma, o documento investiga o cenário global de fluxos de entrada de IED, apresenta a distribuição desse fluxo por setores nas economias BRIC, analisa os fatores que tornam as economias BRIC atraentes para o IED, examina a relação entre crescimento econômico e IED e aborda questões relevantes relacionadas a políticas.

1 INTRODUCTION

Geography has made us neighbors. History has made us friends.

Economics has made us partners, and necessity has made us allies.

John Fitzgerald Kennedy

In the context of the BRIC economies, this is so true. It is the combined economic might of Brazil, Russia, India and China that has brought them together to form the BRIC block. Neither of them are part of the developed world and all four have witnessed spectacular economic growth in recent years. Today they constitute 15% of the global GDP and Goldman Sachs has argued that by 2050, the combined income of BRIC economies will exceed the combined income of developed countries.

* Indian Council for Research on International Economic Relations (Icrier).

** Indian Council for Research on International Economic Relations (Icrier).

The economic and financial crisis seems to have altered the global investment landscape considerably. It is now the developing countries that are taking the lead in attracting investments as well as investing globally (UNCTAD, 2009). The BRIC economies, in particular, have emerged as the most favoured destination for foreign direct investment (FDI). Governments of the BRIC economies are investing heavily in infrastructure, industry, education, healthcare, housing and tourism, with the realisation that they have the opportunity to attract FDI, increase GDP, substantiate growth of import and export trade at the same time as increasing local employment and wealth. As these four states gain importance on the global stage, the international community will increasingly look to the BRIC nations to stabilize the world's economic system. If the BRICs can productively work together today, it should bode well for the future economic order. Together, they will continue to build their economic strength. In this paper, we will look at one of the key drivers of their economic might – their trade and investment potential, in particular foreign direct investment.

The structure of the paper is the following. Section 1 looks at the global scenario in FDI inflows and examines the trends in each of the four BRIC economies in detail. Section 2 presents a sectoral breakdown of the inward FDI in the BRIC economies. Section 3 analyses the factors that make the BRIC economies attractive for FDI inflows. Section 4 examines the relation between economic growth and FDI. Section 5 discusses the rise of outward FDI from BRIC economies. Section 5 outlines the relevant policy issues and Section 6 presents the conclusions.

2 GLOBAL SCENARIO

Amidst a sharpening financial and economic crisis, global FDI inflows fell from a historic high of \$1979 billion in 2007 to \$1697 billion in 2008, a decline of 14%. Importantly, the decline posted globally in 2008 differed among the three major economic groupings i.e. developed countries, developing countries and transition economies - reflecting an initial differential impact of the current crisis. In the first half of 2008, developing countries weathered the global crisis better than developed countries as their financial systems were less closely interlinked with the banking systems of US and Europe. Their economic growth remained robust supported by rising commodity prices. And their FDI inflows continued to grow, though, at a much lower pace than in previous years, posting only a 17% increase to \$621bn in 2008. In a sense, the crisis changed the investment landscape with developing and transition economies share in global FDI flows surging to 43% in 2008.

TABLE 1
Share in FDI inflows

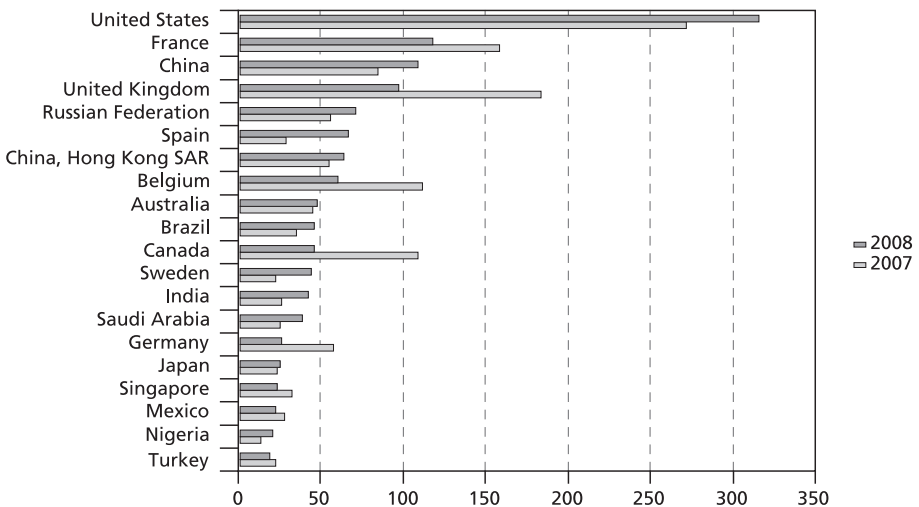
Regions	2003	2004	2005	2006	2007	2008
Developed economies	63.9	56.4	63	66.6	68.7	56.7
Developing Economies	32.6	39.5	33.8	29.7	26.8	36.6
Transition Economies	3.5	4.1	3.2	3.7	4.6	6.7

Source: UNCTAD (2009).

A look at the global FDI inflows into the top 20 economies for the period, 2007-08 indicates that while the United States maintained its position as the largest home country in 2008, many transition and developing economies, in particular the BRIC economies, emerged as large recipients of FDI inflows. A number of European countries saw their rankings slide in terms of FDI inflows. For instance, the United Kingdom lost its position as the largest recipient country of FDI among European countries.

CHART 1
Global FDI inflows

(In US\$ billion)



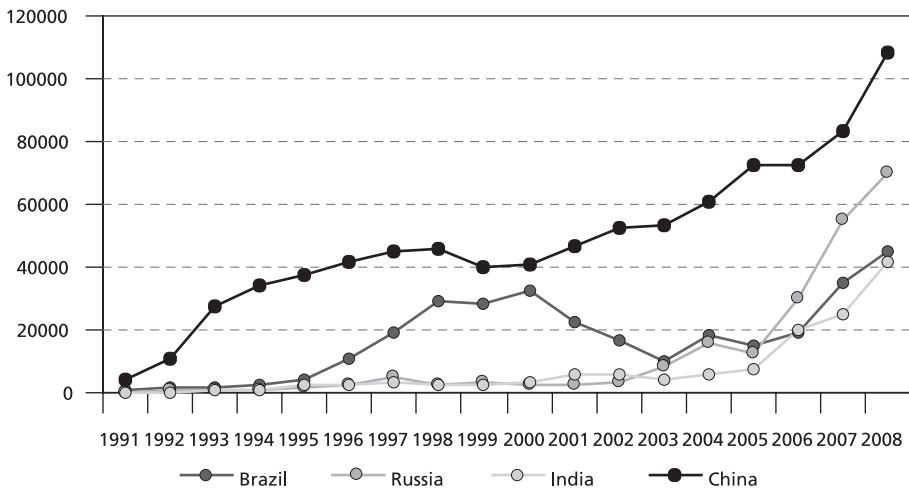
Source: UNCTAD (2009).

In 2008, China emerged as the third largest FDI recipient in the world, with FDI inflows reaching a historic high of \$108 billion. In fact, China has been the fastest growing among the BRICs from 1994-2008. Russia received \$55 billion in FDI in 2007, an 85 % increase over the previous year. Brazil, which traditionally underperformed in the FDI sphere relative to its size and resource endowment, experienced a near doubling of inbound foreign investment between

2006 and 2007 from US \$19 billion to US \$35 billion. India, however, remains the laggard of the BRIC group attracting \$20.3 billion inbound FDI last year. With inflows of \$42 billion in 2008, it ranked the 13th largest FDI recipient in the world.

By the end of 2008 and early 2009, the global economic downturn began to catch up with developing and transition countries as well, adversely affecting their inflows. The slide continued into 2009, with added momentum. Data from the World Investment Report (2009) points to a general decline across all economic groups, with inflows expected to fall below \$1.2 trillion.

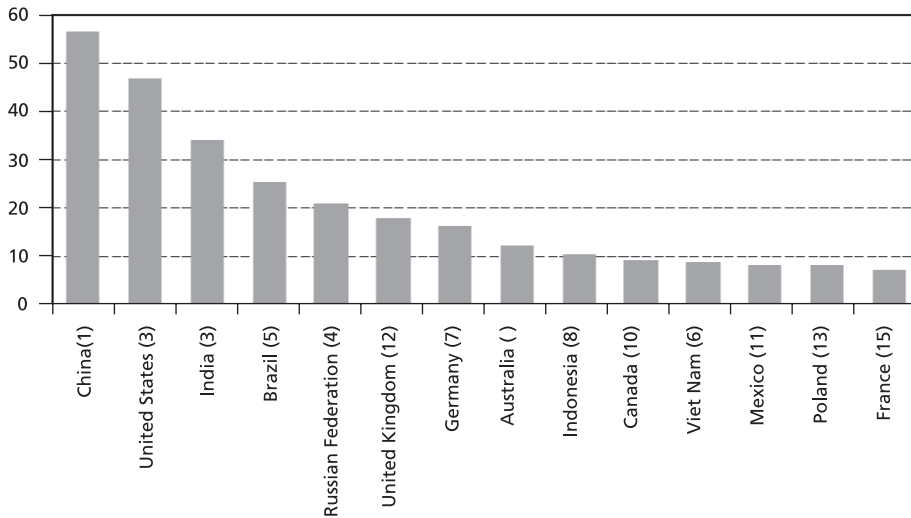
CHART 2
FDI inflows in BRIC
(In US\$ billion)



Source: UNCTAD.

The World Investment Prospects (WIP) Survey predicts that the recovery of these flows is expected to begin slowly in 2010 and reach up to \$1.4 trillion. It is expected to gather further momentum in 2011 when the level could approach an estimated \$1.8 trillion—almost the same as in 2008. Furthermore, the WIP Survey predicts that it is the BRIC economies along with the US that are likely to lead the future FDI recovery. It has ranked China and India as first and third respectively, among the most attractive locations for FDI.

CHART 3
Outlook for 2011: US along with BRIC likely to lead in future FDI recovery
 (In %)



Looking at the global scenario, the main inference we draw is that the investment landscape is changing with the share of developing and transition economies’ (in particular BRIC countries) in global FDI increasing. And trends seem to point towards the increasing importance of these economies even in the future.

3 SECTORAL BREAKDOWN

While the preceding section outlined the overall trends in FDI in the BRIC economies, it is imperative that we analyse the sectoral pattern of this inward FDI. Each of the BRIC countries has had different models of economic development. Brazil is a domestically oriented service economy. Russia’s economic development is heavily dependent on energy and raw material resources. Indian economy is essentially service-led. And China’s economic development is driven by manufacturing exports and investment.

Interestingly, the sectoral distribution of foreign investment roughly mirrors its GDP composition in BRICs. In Brazil, Russia and India; currently the tertiary sector receives the most inward FDI on an average , while the primary sector receives the least and the secondary sector is in the middle. But China, has a special industrial pattern of inward FDI i.e. the secondary sector gets the majority of the inward FDI and the primary and tertiary sectors receive much less.

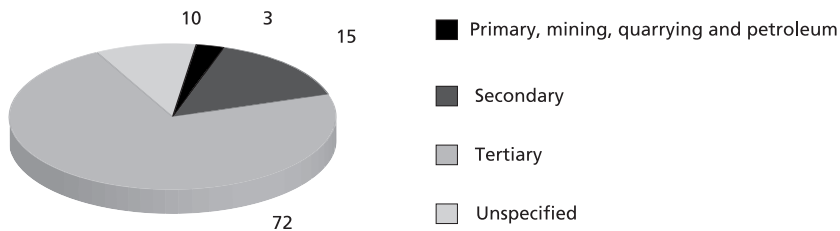
We will now discuss each of these in detail.

3.1 Brazil

Brazil has performed impressively in attracting FDI inflows and this is mainly because of the open investment regime with no restrictions on remission of profits and repatriation of capital registered with the Central Bank. The efforts of the Brazilian government and the private sector have greatly encouraged foreign investors to consider Brazil as a prime investment option. It's relative attractiveness in relation to other emerging market destinations, like India and Russia comes from its strict adherence to the principles of protection of property rights and free trade. Due to these factors, foreign multinationals own approximately 45% of the 500 largest companies in Brazil and been successful in raising capital locally.

CHART 4
Shares of Sectors in FDI inflows in 2000

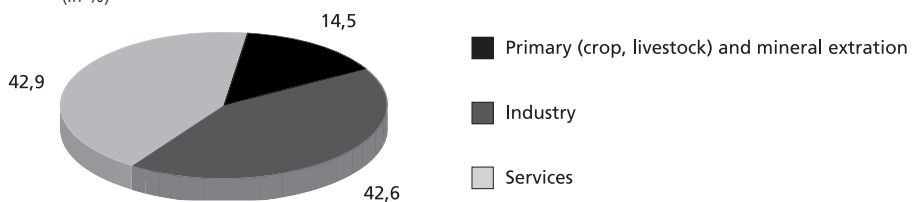
(In %)



Source: BCB.

CHART 5
Shares of Sectors in FDI Inflows in 2009

(In %)



Source: BCB.

The sectoral distribution of foreign direct investment in Brazil has changed significantly during the period of 2000 to 2009. In 2000, the tertiary sector was the major recipient of inward FDI as it received 72 percent of the total inward FDI in 2000. However, in 2009, the share of tertiary sector in total inward FDI declined to 43 percent. The tertiary sector's loss in the pie of total inward FDI was compensated by the gain in shares of primary and secondary sectors. The shares of primary and secondary sectors jumped from 3% and 15% respectively in 2000 to 14.5% and 43% in 2009 in the total inward foreign direct investment.

Considering the services sector specifically, which attracts approximately half of the foreign direct investment, most of it is directed towards financial intermediation, retail, electricity, gas and water. In the retail business, the giants like Wal-Mart and Carrefour announced their aggressive expansion plans with later announcing acquisition of supermarket chain Atacadao for US\$ 1.1 bn in 2007. In the primary sector, the dominant segments are hydrocarbons and mining. In the case of industries, whose share is more or less the same as the services sector in total inward FDI, the sub sectors that attract most of the foreign inflows are metallurgy (including iron and steel), chemicals segments, automotive, cellulose pulp and paper segments. The sectors that are expected to show strong investment growth in future are automotive, telecommunications and mining.

3.2 Russia

The services sector of Russia has been the major destination for the foreign direct investment as it commanded 58 % of the total inward foreign direct investment in 2007, followed by the manufacturing sector, at 25 % and mining & quarrying with a share of 17%. The investment scenario for the sectors has been more or less static since 2003 (Table 2).

As is evident from Table 2, the services sector of the country has attracted most of the foreign direct investment and hence accounts for 50-60% of the flows during 2003-2007. In the case of industries, the natural resources sector and manufacturing are the major players in attracting foreign investment. This is due to the rich natural endowments of the country which consists of deposits of large number of metals and minerals (apart from oil reserves) like iron, copper, nickel, zinc, tin, gold, silver and so on. In case of the energy sector, its contribution to the total foreign investment corresponds to its share in the total earnings of the country. Similarly the foreign direct investment coming into the manufacturing sector reflects its share in the GDP of Russia. However, in order to ensure that the rise in FDI inflow sustains in the long run, Russia needs to reform its legal framework and further has to intensify the reform process for energy related sectors like natural gas. Even though significant liberalization was observed in the energy related areas like the electricity sector, which is currently attracting large FDI inflows from EU companies such as the German E.ON Ruhrgas AG and the Italian Enel (which now owns major parts of the Russia's electricity generation industry), the natural gas sector is still dominated by the state controlled quasi-monopoly Gazprom and, therefore, needs to be reformed. Apart from the natural gas sector, the other outstanding issues and questions that need to be sorted out are investments in 'strategic sectors'. These are the sectors that are strategic to national security of the country and the 'subsoil law'. There are Russian laws pertaining to the use of natural resources of the country

and the lengthy procedures to approve the laws for these two areas (areas strategic to national security and subsoil law) in Russia. The investment climate of the country is also affected by other aspects like protection of property rights and corruption in the country. According to the World Bank's latest global survey of business regulations and their enforcement, Russia performs the worst in areas like licensing requirements, dealing with workers and trading across borders. Therefore, Russia should improve its legal framework and the investment climate. The need is especially stronger in natural resources and energy-linked sectors, if it has to boost the level of foreign direct investment in the economy.

TABLE 2
Destinations of foreign investment inflows into Russia
(In %)

Sectors	2003	2004	2005	2006	2007
Agriculture, hunting and forestry	0.5	0.3	0.2	0.6	0.3
Mining and quarrying	19.3	24.5	11.2	16.6	17.3
Mining and quarrying of energy producing products	17.3	21.6	9.6	14.1	16
Mining and quarrying, except of energy producing products	2	2.9	1.6	2.5	1.3
Manufacturing	22	25.3	33.5	27.5	24.6
Manufacturing of food products	3.4	2.3	2.2	2.5	2.5
Manufacturing of chemicals and chemical products	1.2	1.9	2.7	2.8	1.2
Manufacture of metals and fabricated metal products	10.3	12.6	6.4	6.8	12.6
Manufacture of transport equipment	0.7	2.1	1.8	2.6	0.9
Manufacture of coke and mineral oil	0.6	0.2	15.1	7.2	3.8
Services	58.2	49.9	55.1	55.3	57.8
Construction	0.3	0.6	0.4	1.3	1.2
Wholesale, Retail, Retail Activities	36.1	32.9	38.2	23.7	42.3
Transport and communication	3.8	5	7.2	9.6	6.5
of which communication only	2.3	3.4	6.1	8.5	2.9
Financial intermediation	2.6	2.5	3.4	8.5	2.4

Source: Russian Federal Service of State Statistics.

3.3 India

The sectoral distribution of foreign direct investment for India has undergone significant changes. As is evident from Table 3, the share of secondary sector has declined substantially from 45% in 2000 to 27 % in 2009 in total inward FDI.¹ The services sector has emerged as the most favored location for the foreign investors as its share in total inward FDI surged from 16.5% in 2000 to 61%

1. See Satyanand and Raghavendran (2010).

in 2009. The primary sector meanwhile has increased its share in the total inward FDI from negligible 0.12 % in 2000 to 9% in 2009. According to the Department of Industrial Promotion and Policy (DIPP), the sectors that attract most of the inward foreign direct investment apart from the services sector are computer software and hardware, telecommunications, housing and real estate and construction activities. The services sector of India has attracted impressive overseas investment interest in the recent years. As per a report by UNCTAD, in 2007, the services sector has become the main destination for off-shoring of most services as back office processes, customer interaction and technical support. However, the Indian services have also started venturing into new territories like reading medical X-rays, analyzing equities, and processing insurance claims.

The significant change in the foreign investment scenario was mainly due to the fact that the industry was the first sector to be opened up for the foreign investors as early as in 1991, while the services sector was opened to foreign investment much later, around the late 1990s. During 1991 policy paradigm shift, industry was the first one to benefit as it resulted in changing the overall system. In the entire process, the procedures for investing in non priority industries were streamlined and at the central level, the Foreign Investment Promotion Board was set up for negotiating with the large multinationals or international firms and for expediting the required clearances. In addition to all this, a large number of government restrictions, licensing requirements and controls on corporate behaviour were eliminated. This benefited the industries in terms of attracting foreign direct investment. But in the subsequent decade of 2000, India's IT success story was making global players take note of this sector's vast potentials. Thus, with the aid of sizeable English speaking IT professionals, this sector emerged as the most favored location for investment to the foreign investors, as is evident from the table above. The manufacturing sector lags behind as a destination for foreign direct investment due to the poor state of the country's infrastructures and acute labour market rigidities.

TABLE 3
India: Sectoral Breakdown of FDI inflows – percent of total inflows

Sectors	2000	2008	2009
Primary	2.8 (0.12%)	1420.9 (4.3%)	2397 (8.86%)
Secondary (manufacturing)	1051.8 (44.8%)	10156.4 (30.8%)	7223.1 (26.7%)
Automobile industry	279.7	1134.1	1338.4
Computer software & hardware	194.4	1828	717
Power	110.7	1339.3	1643.3
Services	388.2 (16.5%)	19812.1 (60%)	16598 (61.4%)

(Continue)

(Continuation)

Sectors	2000	2008	2009
Financial services	43.3	8043.8	1570
Telecom services	79.7	539.3	782.8
Information & broadcasting (including print media)	79.7	539	782.8
Consultancy services	4.9	364.7	420.1
Hotel & tourism	12.2	539	592.9
Housing & real estate		2679	3198.8
Unspecified other sectors	904.2 (38.5%)	1639.8 (5%)	825.5 (3%)

Source: Secretariat for Industrial Assistance, DIPP, GOI.

3.4 China

In China the sector that has always been most lucrative for the foreign investors is the manufacturing sector. This sector had the lion's share of 54.7% in the total inward FDI in 2007, followed by the tertiary sector, 38.7%. And this trend was prevalent in the beginning of this decade, implying that the manufacturing sector has always been the major attraction for the foreign investors. One of the most significant impacts of China's economic reform and opening up of the domestic economy to the world has been the impressive inflow of foreign investment. Since 1979, the FDI restrictions have been gradually liberalized and in addition to this the commitments of the government to further open up the economy have greatly enhanced the investment climate of the country. The prospects of exploiting a huge domestic market, a pool of relatively well educated and low cost labour has made China one of the most favourable locations to the foreign investors. One important development in context of FDI was China's accession to WTO in December 2001. After negotiating for 15 years China agreed to remove restrictions on FDI ,specifically, in services and improve the intellectual property rights apart from the removal of trade related restrictions (tariff and non tariff). This accession of China to WTO provides ample opportunities for foreign investors to invest in country's capital intensive and technology intensive manufacturing industries. If WTO commitments are furthered by China, then it would mean further relaxation of controls on foreign ownership, direct transactions of cross border mergers and acquisitions, particularly, the state owned enterprises and also improvement of the IPRs. Thus, foreign capital will continue to flow increasingly to China's capital and technology intensive manufacturing industries. As is evident from Table 4, the agriculture sector in China attracts a very small percent of the total inward FDI, and this is in line with the sector's contribution to the national economy. China's agricultural land tenure system and the traditional small scale, family based agricultural production pattern have

acted as the main hurdle for foreign investment seeking large scale and technology intensive production. Hence, the country would not be able to attract large amount of foreign investment into agriculture unless it fundamentally changes the land tenure system and reforms the farming pattern. China's services sector, after the manufacturing sector, is most attractive to foreign investors for making direct investment (from the table above). Prior to the accession to WTO, China's services sector was relatively closed to foreign participation for protecting the state monopolies. China has made concrete commitments that gradually it will open up the services sector to foreign investors and so it is expected that with full implementation of such commitments, China would be able to attract more FDI inflows to this sector.

TABLE 4
China: sectoral breakdown of FDI inflows – percent of total
(In US\$ 10,000)

Sectors	2000	2007
Farming, forestry, animal husbandry and fishery	67594 (1.7%)	92407(1.2%)
Manufacturing	2584417(63.5%)	4086482 (54.7%)
Electric power, gas and water production and supply	224212 (5.5%)	107255 (1.4%)
Construction	90542 (2.2%)	43424 (0.6%)
Services	944719 (23.2%)	2897601 (38.7%)

Source: National Bureau of Statistics, China.

4 WHAT MAKES THE BRICS ATTRACTIVE FDI DESTINATIONS?

It is evident from the preceding sections that the BRICs have emerged as a major destination for FDI inflows. There are several factors responsible for this.² The single most important reason for their attracting large capital is their large potential consumer market. Market size is generally measured by Gross Domestic Product (GDP), GDP per capita income and size of the middle class population. For instance, India's 300 million large middle class provides a huge potential market for foreign investors. Furthermore, the stable macroeconomic conditions in these countries coupled with high and sustained growth rates also make them an attractive FDI destination. Investors prefer to invest in more stable economies that reflect a lesser degree of uncertainty. Higher GDP growth rates affect FDI inflows positively. Labor costs are another extremely important determinant of FDI inflows. Higher labor costs result in higher cost of production and are expected to limit the FDI inflows. The low wage rates in BRIC economies make them attractive for FDI. The flexibility of their labour market is also an important determinant in attracting FDI. [This is discussed in detail in the India-China comparison.] The availability of quality infrastructure (electricity,

2. See Vijakumar (2010).

water, transportation and telecommunications) is critical to FDI inflows. The trade openness of these economies is also a key determinant of FDI since much of FDI is export oriented and may also require the import of complementary, intermediate and capital goods. In either case, volume of trade is enhanced and thus trade openness is generally expected to be a positive and significant determinant of FDI. The strength of a currency (exchange rate) is used as proxy for level of inflation and the purchasing power of the investing firm. Devaluation of a currency results in reduced exchange rate risk. As a currency depreciates, the purchasing power of the investors in foreign currency terms is enhanced. Thus, we can expect a positive and significant relationship between the currency value and FDI inflows.

China has emerged as the leader in attracting FDI. There are lessons to be learned from China's strategy and experience by the other BRICs, in particular India, which has been the laggard in attracting FDI. Therefore, it would be appropriate to identify the key features of China and India's strategy before proceeding further.

China and India have adopted very distinct strategies and trajectories of growth. While China embarked into vigorous reform process in 1978, India on the other hand lagged behind in reforming its closed domestic economy and it was not until the decade of 1990 that reforms were initiated. While China adopted liberalisation and modernisation of its socialist, centrally planned and non market economy in 1978; India initiated reform much later. And hence, it was left far behind China in terms of economic performance. Consequently, China became exceedingly successful than India in attracting foreign investment.

China has been successful in attracting foreign direct investment by creating a congenial business climate, providing strategic infrastructure and implementing strategic policy initiatives³. Strategic infrastructure implies location, content and intent to organise economic activity efficiently in an emerging market. The infrastructure should be strategic to reflect on the existing demographic realities. It should be strategic to the extent that sectoral composition complements demographic realities like age, availability and educational skill set of labour force are aptly reflected. It should have connectivity with the hinterland to obtain continuous supply of cheap labour from backward areas. It should have the advantage of proximity to the largest global markets and connectivity with the global shipping network. An example of such strategic infrastructure has been demonstrated with the creation and development of Shenzhen Special Economic Zone. Shenzhen used to be small village and a fishing area (70,000 residents, 325 sq miles area) but due to the reforms initiated over the last twenty five years it is one

3. This discussion is drawn from Sinha et al (2007)

the most modern places in the world. Modern Shenzhen has 7 million population, area of 2020 kilometers, produces \$40 billion in GDP, has 120,000 foreign TNC's in active operation, and is the sixth largest port in the world. Shenzhen is the only city in China that has a land port, sea port, airports, and stock exchange of its own.

Strategic policy initiatives refer to the policy initiatives for supporting the above stated strategic intent – creating economic freedom, facilitating openness, inviting diaspora involvements and formulating flexible labor laws. Strategic policy initiatives taken by the Chinese government provided economic freedom and created openness during the period 1978-2005. The government allowed joint ventures between diaspora and local residents, gave incentives and tax holidays, promoted exports, and wages were kept low allowing free competition. Lease and ownership rights were provided to foreigners. Tax exemption on importing machinery, free movement of goods between SEZ designated areas, rebates on export duty, liberal entry and exit policies were adopted. Foreign currency transactions were allowed in SEZ designated areas. Foreign firms could form Wholly Foreign Owned Enterprise (WFOE) in China from 1986 onwards. Bilateral tax treaty also helped in attracting investment. Cheng and Kwan (2000) found that there is a positive relation between SEZ and regional income in attracting FDI to China. River boat transportation and 'industrial clusters' helped in reducing infrastructural bottlenecks and reducing costs. Share of foreign affiliates increased from 9% in 1989 to more than 50% in 2005. Therefore, freedom and openness adopted by China had a positive impact on FDI inflows into the country.

India, however, needs essential structural changes in the economy to be able to attract foreign direct investment. The piecemeal structural changes that India has adopted so far need to be consolidated and more focussed now. Successful stories like Delhi Metro Rail Corporation Ltd. Expressway Network (Golden Quadrilateral) need to be replicated in other metros and major cities of the country; and expressways need to connect all the parts of the country. Another major concern of the country is power and electricity reform. The successful case of privatisation of Delhi Power board needs to be replicated in all other state capitals. Interestingly, China is expected to face a problem of ageing population and India can take advantage of this to develop its own manufacturing sector and become the next major production hub of the world, since it has the largest young working population in the world. In order to do, not only will it need to overcome the above-mentioned infrastructural bottlenecks, but also eliminate the inherent rigidities in its labour market, which make it difficult for the business constituency to derive maximum benefits from this huge supply of labour. Labour laws should be relaxed to boost the mass production in India. Importantly, India needs to overcome its services sector myopia. The impressive performance of the services sector needs to be complemented with growth in the manufacturing sector as the latter has huge potentials to absorb the idle labour force in India.

5 FDI AND GROWTH

There are two primary channels through which FDI effects growth. The first is that FDI generates an inflow of physical capital to the host country. As the size of the host country's physical capital increases, the productive capacity of the host country also increases. Unfortunately, the growth enhancing effect of an ever growing stock of physical capital is not endless. Even though additional capital has important effects on economies with a low capital-labour ratio, diminishing returns imply that accumulation of physical capital cannot be a permanent source of long run per-capita growth. The second channel through which FDI effects growth is that of technology spillovers. These are an externality that can occur through several different channels including imitation, reverse engineering and supplier linkages. It is argued that it is primarily the positive externalities from technology spillovers that allow FDI to enhance the rate of economic growth. The emergence of theories of endogenous growth provides a framework that show how positive externalities can improve long run economic growth. Positive externalities provide non-diminishing returns to capital and therefore enhance growth in long run. In addition to benefits like capital and technology, FDI brings with it higher wages, access to markets, more competition and cheaper goods and services for consumers.

However it is important to bear in mind that the mode of FDI, i.e. Greenfield FDI (GFDI) or Brownfield FDI (BFDI), plays an important role in determining the growth enhancing ability of FDI inflows. In the case of GFDI, Multinational Enterprises (MNEs) construct new facilities of production, distribution or research in the host country. This results in an increase in the host country stock of physical capital that can be substantial, especially for developing economies that tend to be capital scarce. In the case of BFDI, MNEs acquire existing facilities in the host country; this typically results in a limited increase in the stock of physical capital since there is only a change in ownership. However, Javorcik (2004) argues that BFDI in the form of merger or joint venture maximizes the potential for technology spillovers.

Empirical research has indicated that the impact of FDI on economic growth depends on host country conditions. Borensztein et al (1998) and Bengoa & Sanchez-Robles (2003) find that in developing countries, FDI has a positive effect on growth but magnitude of the effect depends on the amount of human capital available in the host country. Zhang (2001) argues that economic growth is enhanced by FDI, but host country conditions such as trade regimes and macroeconomic stability are important. Olofsdotter (1998) finds that an increase in stock of FDI is positively related to growth and that the effect is stronger for host countries with a higher level of institutional capability as measured by degree of property rights protection and bureaucratic efficiency in the host country.

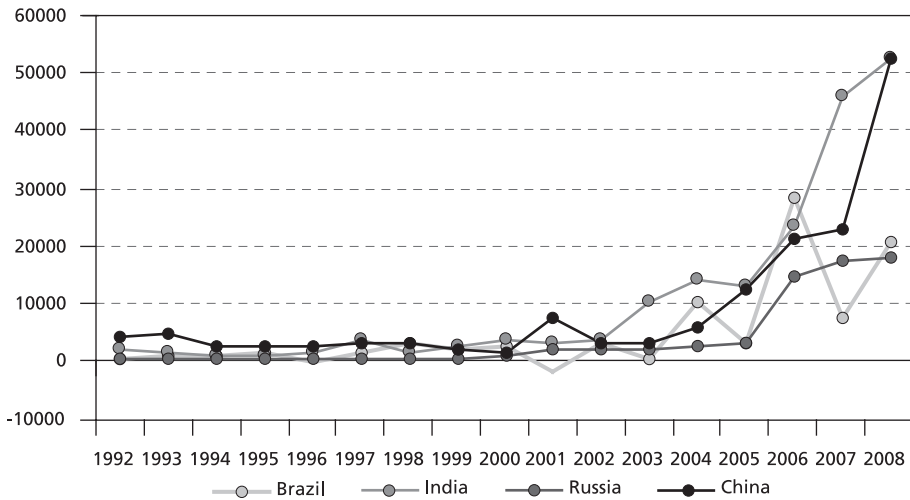
Johnson (2005), using panel data analysis, shows that FDI inflows enhance economic growth in developing economies but not in developed economies. He argues that it is technology spillovers that have the strongest potential to enhance economic growth in host countries.

Importantly, the causality between economic growth and FDI runs in either direction. Not only does FDI bring with it benefits of capital formation and technology, which translate into growth; but FDI also flows into countries with faster economic growth. In a study on BRIC economies, Sridharan et al (2010) find that growth leads FDI bi-directionally for Brazil and Russia, while FDI leads growth unidirectionally for India & China.

6 OUTWARD FDI

The importance of BRICs as FDI destinations is undisputable. But what is particularly interesting is that these economies are emerging as important sources of outward FDI as well. Firms from BRICs are increasingly undertaking direct investment abroad; in developed countries as well as in other emerging markets. This is primarily a consequence of the desire of these firms to increase their competitiveness by acquiring portfolios of locational assets (assets which owe an important part of their value to their location, such as an assembly plant located in a country with lower labor costs than other possible plant locations). OFDI from South, East and South East Asia rose by 7% to \$186bn in 2008, due mainly to large outflows from China. China gained ground as an important source of OFDI. It ranked 13th in the world and 3rd among all developing and transition economies. OFDI from China reached \$52bn in 2008, 132% up from 2007. In early 2009, outflows from the country continued to rise. Indeed, significant exchange rate fluctuations and falling asset prices abroad as a result of the crisis have created M&A opportunities for Chinese companies. India is becoming an important investor, though FDI outflows remained almost at the same level as in 2007. FDI outflows from South America soared in 2008, up by 131%, the strongest increase was registered in Brazil (189%), where outflows reached \$20bn.

CHART 6
FDI outflows from BRIC



6.1 The Chinese experience⁴

The Chinese experience in this context has been particularly interesting. In 2002, a new dimension was added to the Chinese development model by allowing and actively promoting outward direct investment ‘Go Global Policy’. In 2008 global FDI fell by around 20 percent, while outward FDI from China nearly doubled. OFDI from China reached \$52bn in 2008, up by 132% from 2007. It is widely believed in the existing literature that China has considerable catch up potential and is set to outpace the other BRICs and emerge as a major source of global FDI⁵.

There are several drivers of China’s outward FDI. One of the most commonly cited motivations is China’s need to secure natural resources to fuel rapid growth. However, this is actually not the most significant area of China’s outward investment. Instead, it is the service industry. While most of China’s exports are from foreign-owned enterprises, large domestic firms also export large volumes and for this they need services like shipping and insurance. The latest figures published by China’s Ministry of Commerce (MOFCOM) in February 2009 show that the tertiary sector predominated, and accounted for over 70 % of total outward FDI at the end of 2007. The predominance of services is the result of China’s export boom and the extension of China’s financial services overseas to utilize the wealth of the Chinese diaspora, learn advanced techniques and diversify

4. See Davies (2009).

5. See Jaeger (2009).

earnings sources. Also, China's major enterprises are also acquiring global brands (like Lenovo's acquisition of IBM's personal computer business or the SAIC and Nanjing purchase of MG Rover). Moreover, large state-owned enterprises (SOEs) are losing their monopoly position at home and are diversifying internationally. And finally some enterprises – despite China's ample labour supply are moving their labour intensive operations to cheaper overseas locations like Vietnam and Africa. Interestingly, Africa is emerging as one of the most important destinations of OFDI from China and India. China's OFDI stock in Africa increased from \$49.2 million in 1990 to \$1.6 billion in 2005 and that of India rose from \$296.6 million in 1996 to \$1.96 billion in 2004. This increase is driven not just by an appetite for natural resources but also by the fact that there is a potential consumer market, particularly in South Africa, with a large middle-income group.

6.2 The Indian experience

In the early 1990s, India's share in OFDI from developing economies was the lowest compared to the four large emerging market economies, considered as its competitors (Brazil, China, Mexico, and South Africa). Over the ensuing years, India's share has grown rapidly. India's share in total developing economy FDI outflows remained below 0.5 percent throughout the 1990s, but increased rapidly thereafter, reaching nearly 6.0% in 2007.

Over the past two decades, the government policy in India relating to OFDI has made a palpable transition from the cautious and restrictive approach that prevailed over the first four decades of the post-independence era to one of facilitation and encouragement. Outward FDI is now considered an effective tool of economic advancement through harnessing global technological know-how, building trade support networks for enhancing the international competitiveness of local firms, and opening new market channels for promoting exports (Government of India 2009). The extent to which outward FDI has so far contributed toward these national development goals remains an unexplored empirical issue.

The motives for outward FDI from India differ across industries and over time. However, certain factors stand out as the main drivers. The increasing number of home-grown Indian firms (e.g. Tata Group, Infosys, Ranbaxy) and their improving ownership - specific advantages, including financial capability, are among the key drivers. In addition, the growing competitiveness of Indian firms involved in providing outsourced business and IT services to foreign clients has provided a push for these firms themselves to go offshore to operate near their clients and to expand their growth opportunities in markets abroad. The success of Indian firms as service providers in the outsourcing of IT services, BPO and call centres by developed-country companies has exposed them to knowledge

and methods for conducting international business, and induced outward FDI through demonstration and spillover effects. Indian firms are investing abroad also to access foreign markets, production facilities and international brand names. For instance, Tata Motors Ltd acquired Daewoo Commercial Vehicle Company (Republic of Korea) in 2003 for \$118 million for accessing the South-east Asian market and the Korean firm's production facilities.⁶ Access to technology and knowledge has been a strategic consideration for Indian firms seeking to strengthen their competitiveness and to move up their production value chain. In 2003, WIPRO acquired Nerve Wire Inc (United States) for \$18.7 million to gain deep domain knowledge and other IT related benefits, including access to markets.⁷ Securing natural resources, is also becoming an important driver for Indian outward FDI. For instance, in 2003 Hindalco acquired two copper mines in Australia and Oil and Natural Gas Commission (ONGC) Ltd.

7 POLICY ISSUES

The rising importance of BRICs as a destination and source of FDI is undisputable. However, these economies face some critical policy issues as their investment potential increases. In this section, we will outline two key policy challenges faced by the governments of these countries. The first concerns the establishment of an appropriate OFDI policy regime in emerging markets that face macroeconomic constraint. The second concerns the possibility of a rise in FDI protectionism in the aftermath of the global economic crisis.

7.1 Establishing an appropriate policy regime for OFDI in emerging markets

Governments of emerging markets seeking to establish an appropriate policy regime for OFDI face a dilemma between micro level competitiveness requirements of firms and macro level development constraints of governments (SAUVANT, 2008). At a micro level, OFDI is beneficial for the competitiveness

6. Other instances Infosys Technologies Ltd. acquired Expert Information Services Pty. Ltd (Australia) in 2003 for \$22.9 million to strengthen its presence in the Australian market and to access clients of the acquired company. Similarly, companies such as Daksh eServices, Datamatics Technologies and Hinduja TMT Ltd have been going abroad to expand the markets for their services and exploit growth opportunities in other regions. Ranbaxy Technologies acquired RPG Aventis (France) in 2003 for \$70 million to strengthen its market position in Europe and to access strategic assets (e.g. brand names). Tata Tea acquired Tetley Tea in 2000 for 271 million pounds for access to the Tetley brand name and market. In 2003, Jindal Polyester Ltd acquired Rexor (France) a polyester producer for 10 million Euros; Sundaram Fasteners Ltd bought Dana Spicer Europe Ltd (United Kingdom), a precision forgings business, for 1.5 million pounds; and Dabur India Ltd. acquired Redrock Ltd (United Kingdom) a cosmetic firm for market reasons.

7. Other instances of technology driven OFDI- I-Flex paid \$11.5 million for Supersolutions Corp. (United States) for access to technologies and knowledge; Wockhardt Ltd bought a pharmaceutical company in the United Kingdom for markets, knowledge and strategic reasons; Reliance Infocomm bought Flag Telecom (United Kingdom) for \$211 million to access to the undersea cable network and connect with key regions such as Asia, Europe and the United States. Access to technologies also means setting up R&D centres in key locations. For instance, Ranbaxy Laboratories has R&D activities in various countries, including in China and the United States.

of firms. It allows them to acquire a portfolio of locational assets, which are increasingly important as a source of international competitiveness for firms as it provides access not only to markets but also to the range of resources that are needed for the production process. This is critical in a world economy that is open and in which competition is everywhere, due to the liberalization of trade, FDI and technology regimes.

However, the other side of this dilemma concerns the macro-level. Most emerging markets perceive themselves as importers of capital, not exporters of capital (with the notable exception of China). By virtue of being an emerging market, they typically face a balance of payment constraint. The priority for them is to build a domestic productive capacity and increase domestic employment. Given these domestic priorities, permitting investment abroad - let alone encouraging it - is therefore, not a natural thing. Therefore, not surprisingly, emerging markets have followed a restrictive policy towards OFDI.

Policymakers attempting to resolve this dilemma, need to address a number of issues. Should the OFDI regime be liberalised gradually, for example, by permitting OFDI up to certain ceiling (which can be raised) or by allowing it in certain sectors that are priority for the host country, or on meeting certain criteria (for instance its impact on employment, balance of payments)? What are the risks when liberalizing OFDI in certain sectors and not others-for the country (has it picked the right sectors?) and companies involved (is the competitiveness of companies in non-liberalized sectors compromised?) Should a country aim for a neutral OFDI regime or like virtually all OECD countries do, go all the way and protect and even facilitate OFDI—China ‘Go Global’.

In the Indian context, as outlined in the preceding section, there has been increasing recognition of OFDI as an effective tool of economic advancement and consequently, the government policy in India relating to OFDI has made a transition from a cautious and restrictive approach to one of facilitation and encouragement. The extent to which OFDI has contributed towards development largely remains an unexplored empirical issue. Two studies in this context indicate that outward FDI has a statistically significant positive effect on the degree of export orientation across an entire sample of firms (4,200) and at the level of a number of key industries [(Kumar and Pradhan 2007, Pradhan 2008)].

In interpreting these findings, it is important to take into account that firms with overseas operations are largely concentrated in capital and skill-intensive industries. This will be important in further analysis because the competitive advantage underpinning the observed export success of these industries may not necessarily reflect the intrinsic comparative advantage of the country (Lall 1986). Given the market conditions of the labor-abundant Indian economy, export

growth per se is unlikely to contribute to achieving the employment and equity objectives of national development policy.

The central issue in any assessment of developmental implications of OFDI is the possible trade-off between overseas investment and domestic investment. Much faster growth of overseas FDI relative to domestic investment in the reform era could possibly reflect the fact that domestic investment remains less attractive to Indian firms compared to overseas investment. To the extent that a relatively less attractive domestic environment acts as a push factor in outward investment, some of the investment could take the form of pure capital flight. Of course, this does not make a case for a restrictive policy stance toward outward FDI. Rather, it makes a case for further reforms to improve the domestic investment climate (ATHOKORALA, 2009).

7.2 Rise of protectionism in future?⁸

The current financial and economic crisis has had no major impact on FDI policies so far, since FDI is not the cause of this crisis. However, some national policy measures of a more general scope (national bailout programmes, economic stimulus packages) introduced in response to the crisis are likely to have an impact on FDI flows and TNC operations in an indirect manner. There are two possibilities in this regard. On the one hand, they may have a positive effect on inward FDI, as they could help stabilize, if not improve, the key economic determinants of FDI. On the other hand, there are concerns that country policy measures could result in investment protectionism by favouring domestic over foreign investors, or by introducing obstacles to outward investment in order to keep capital at home.

There are also signs that some countries have begun to discriminate against foreign investors and/or their products in a “hidden” way using gaps in international regulations. Examples of “covert” protectionism include favouring products with high “domestic” content in government procurement (particularly huge public infrastructure projects), de facto preventing banks from lending for foreign operations, invoking “national security” exceptions that stretch the definition of national security, or moving protectionist barriers to subnational levels that are outside the scope of the application of international obligations (e.g. in matters of procurement).

Looking to the future, a crucial question is which FDI policies host countries will apply once the global economy begins to recover. The expected exit of public funds from flagship industries is likely to provide a boost to private investment, including FDI. This could possibly trigger a new wave of economic nationalism

8. See Sauvant (2006).

to protect “national champions” from foreign takeovers. International Investment Agencies (IIAs) have a role to play in ensuring predictability, stability and transparency of national investment regimes. Policymakers should also consider strengthening the investment promotion dimension of IIAs through effective and operational provisions. Investment insurance and other home-country measures that encourage outward investment are cases in point where continued international cooperation can be useful. As there are looming fears of emergence of nationalist policies and state controls, efforts should be made by the countries across the globe to provide the appropriate stimulus to investment and to revive the faith in the belief of an open global economy.

8 CONCLUSIONS

The financial crisis changed the investment landscape of global FDI, with the BRIC economies taking the lead in attracting investments as well as investing globally. The BRICs weathered the crisis better than developed countries as their economic growth remained robust. Importantly, it is predicted that it is these four economies along with the US that will lead the future FDI recovery. However, there are important policy challenges for the BRICs as the global FDI landscape changes. An important policy issue that merits attention is the fear of a possible rise in protectionism in FDI as the world emerges from the global financial crisis. The BRICs with their tremendous clout in the global investment landscape have a key role in ensuring that there isn't a backlash against FDI following decades of liberalization and openness. Also, there is a need to establish an appropriate OFDI regime that can resolve the dilemma between micro level competitiveness requirements of firms and macro level development constraints of governments. OFDI must not be encouraged at the expense of building domestic productive capacity. Given the relation between FDI and economic growth and the benefits FDI brings in the form of greater capital accumulation and technology spillovers, the maxim for these countries should no longer just be “the more FDI, the better” ; rather emphasis should be on targeting FDI that is important for their economic development.

REFERENCES

- ATHUKORALA, Prema-chandra. **Outward Direct Investment from India**. Australian National University, Economics RSPAS, 2009 (Departmental Working Papers 2009-14).
- AYKUT, Dilek. **Emerging Trends in FDI flows to Asia**. World Bank, 2007.
- BENGOA, Marta; SANCHEZ-ROBLES, Blanca. Foreign direct investment, economic freedom and growth: new evidence from Latin America. **European Journal of Political Economy**, 19, p. 529-545, 2003.

BERGSMAN, Joel. **Improving Russia's Policy on Foreign Direct Investment**. World Bank, Policy Research, 2000 (Working Paper, n. 2329).

BORENSZTEIN, Eduardo; DE GREGORIO, Jose; LEE, Jong-Wha. How does foreign direct investment affect economic growth. **Journal of International Economics**, 45, p. 115-135, 1998.

CHENG, Leonard K.; KWAN, Yum K. What are the determinants of the location of foreign direct investment: the chinese experience. **Journal of International Economics**, 51, p. 379-400, 2000.

DAVIES, Ken. **While Global FDI falls, China's Outward FDI doubles**. Columbia: FDI Perspectives, 2009.

FUNG, Kwok-Chiu. Foreign Direct Investment in China: Policy, Trend and Impact. *In*: INTERNATIONAL CONFERENCE ON CHINA'S ECONOMY in the 21st Century, Jun. 24-25 2002. Hong Kong, 2003.

GRAHAM, Edward M.; WADA, Erika. **Foreign Direct Investment in China: Effects on Growth and Economic Performance**, 2001.

HUNYA, Gabor; STÖLLINGER, Roman. Foreign Direct Investment Flows between the EU and the BRICs. **Research Reports 358**, Weiner Institute fur Internationale Wirtschaftsvergleiche, 2009.

JAEGER, Markus. **BRIC Outward FDI-the dragon will outpace the jaguar, tiger and the bear**. Talking Point, Deutsche Bank Research, 2009.

JAVORCIK, Beata. Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. **American Economic Review**, 94, p. 605-627, 2004.

JOHNSON, Andreas. **Host country effects of foreign direct investment: The case of developing and transition economies**. Jönköping International Business School/Jönköping University, 2005.

KUMAR, Nagesh; PRADHAN, Jaya. Knowledge-based Exports from India: A Firm-Level Analysis of Determinants. *In*: KUMAR, Nagesh; JOSEPH, K. J. (Ed.). **International Competitiveness and Knowledge-based Industries in India**. New Delhi: Oxford University Press, 2007, p. 53-96.

LALL, Sanjaya. Technological development and export performance in LDCs: Leading engineering and chemical firms in India. **Weltwirtschaftliches Archiv**, 122, p. 80-91, 1986.

NAGARAJ, Rayaproulu. Foreign Direct Investment in India in the 1990's: Trends and Issues. **Economic and Political Weekly**, v. 38, n. 17, p. 1701-1712, Apr. 26/May 2 2003. Special Articles.

ÖGÜTÇÜ, Mehmet. **Attracting Foreign Direct Investment for Russia's Modernisation: Battling Against The Odds.** Saint Petersburg, Russia: OECD-Russia Investment Roundtable 19 June 2002.

OLOFSDOTTER, Maria. **Allelopathy in rice.** Makati City, Philippines: International Rice Research Institute, 1998.

PRADHAN, Jaya Prakash. Outward Foreign Direct Investment from India: Recent Trends and Patterns. **International Journal of Technology and Globalisation**, v. 4, p. 70-86, 2008.

SATYANAND, Premila N.; RAGHAVENDRAN, Pramila. **Inward FDI in India and its policy context.** Columbia: FDI Profile, 2010.

SAUVANT, Karl. **World investment prospects to 2010: Boom or backlash?** New York, London and Hong Kong: Economist Intelligence Unit, Columbia Program on International Investment, 2006.

_____. **Outward FDI from Emerging Markets: Some Policy Issues'**, Foreign Direct Investment, Location and Competitiveness, 2008.

SINGH, Sumanjeet. **Foreign Capital Flows into India: Compositions, Regulations, Issues and Policy Options.** Asia Research Center, 2009 (Working Paper, n. 155).

SRIDHARAN, Perumal; VIJAYAKUMAR, Narayanamurthy; SEKHARA, Rao Kode. Determinants of FDI in BRICS Countries: A panel analysis. **Int. Journal of Business Science and Applied Management**, v. 5, Issue 3, 2010.

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (UNCTAD). **World Investment Report 2009.** New York; Geneva, 2009. Printed in Switzerland.

VEIGA, Pedro M. **Foreign Direct Investment in Brazil: regulation, flows and contribution to development.** Manitoba; Canada: International Institute for Sustainable Development, 2004.

VIJAYAKUMAR, Narayanamurthy. Determinants of FDI in BRICS Countries: A panel analysis. **International Journal of Business Science and Applied Management**, v. 5, Issue 3, 2010.

WAN, Xueli. FDI in BRICs. **International Journal of Business and Management**, v. 5, n. 2, Feb. 2010.

WILSON, Dominic; PURUSHOTHAMAN, Roopa. Dreaming with BRICs: Path to 2050. **Global Economics Paper**, Goldman Sachs, n. 99, 2003.

YALLAPRAGADA, Ram Mohan; PARUCHURI, Madhu R. Foreign Direct Investment in India: A Lost Opportunity. **Southwestern Economic Proceedings**, St. Louis, Missouri, v. 30, n. 1, 2001.

ZHANG, Kevin H. Does Foreign Direct Investment Promote Economic Growth? Evidence from East Asia and Latin America. **Contemporary Economic Policy**, v. 19, n. 2, p. 175-185, 2001.

_____. **Foreign Direct Investment and Economic Growth in China: Panel Data Study for 1992-2004**. Illinois: State University, 2006.

Ipea – Institute for Applied Economic Research

Publishing Department

Coordination

Cláudio Passos de Oliveira

Supervision

Everson da Silva Moura

Translation

Bié Tradução

Typesetting

Bernar José Vieira

Cláudia Mattosinhos Cordeiro

Jeovah Herculano Szervinsk Junior

Aline Rodrigues Lima (intern)

Cover design

Fábio Oki

Bookstore

SBS – Quadra 1 – Bloco J – Ed. BNDES, Térreo

70076-900 – Brasília – DF

Tel.: (61) 3315 5336

Correio eletrônico: livraria@ipea.gov.br

PRESENTATION

The Perspective of the World Review is an international periodical sponsored by Ipea (Institute of Applied Economic Research), a body belonging to the Presidency of the Federative Republic of Brazil through the Secretariat for Strategic Affairs (SAE).

The magazine features versions in Portuguese and English and was designed to present and promote contemporary debates, emphasizing the theme of development from a South – South perspective. Its field of action is that of political economy, with plural approaches on the essential dimensions of development such as economic, social and sustainability-related issues.

The goal is to enhance the debate in order to formulate proposals for the development of public policies and, accordingly, to encourage international comparisons and interdisciplinarity – always highlighting the role of planning. The Perspective of the World Review takes the ambition to formulate the questions faced by contemporary civilization, which wants to enjoy comfortable living standards and dignified living conditions, but must simultaneously respect the limits of what the planet can support in terms of environmental exploitation.

It is important to point out the tribute given to Fernand Braudel through the enhancement of his formulation on the *time of the world*, which, together with the *structures of everyday life* and the *games of exchange*, shapes his originality. Braudel always sought to address issues involving the dimensions of development in a historical and long-term perspective. He emphasized that a world dominated by a mode of production based on the accumulation of capital had always had to balance society, market and state. As the master taught us, in places where this task was most successful, there was prosperity, and where difficulties were persistent, results were not as successful. This initiative is not new in Brazil – its great precursor was Celso Furtado, in *The Economic Growth of Brazil*. This seminal work was welcomed by Braudel as innovative under a methodological perspective.

Editorial Board

RULES FOR ARTICLE SUBMISSION

1. *The Perspective of the World Review* considers for publication original articles in Portuguese, English, French and Spanish. Manuscripts will first be reviewed by the editors, accordingly to the editorial policy, without external evaluation. Articles not in accordance with the criteria and technical characteristics required for publication will be rejected.
2. After the editors' preliminary evaluation, the manuscript will be submitted to two peer reviewers. The journal applies the *blind review* system, which means that the authors are not identified during the evaluation process. Therefore, before submitting the article, the authors must make sure that their names have been removed from the manuscript. The reviewers written evaluations will be sent to the authors. All submissions must be original manuscripts. They should be a maximum of 25 pages (or 50 thousand characters with spaces, including charts, figures, footnotes, bibliography, etc).
3. The format of the file must be the following: A-4 Paper (29,7 x 21 cm); margins: superior=3 cm, inferior=2 cm, left=3 cm and right=2 cm; the characters must be in font Times New Roman size 12 and 1.5 spacing, justified. BOLD must be used to emphasize terms, phrases and symbols. ITALIC must be used only to refer to foreign words. DOUBLE QUOTATION MARKS must be used on quotations. SIMPLE QUOTATION MARKS must be used inside a quotation to isolate phrases that were quoted on the original material.
4. The file with text and charts, figures, etc (complete version) must be submitted in *.PDF format, throughout the Submission Document. The complete version must also be submitted in *.DOC, *.DOCX or other format compatible with Microsoft Word throughout the Supplementary Documents.
5. Charts and/or graphics must be submitted also in *.XLS, *.XLSX or other format compatible with Microsoft Excel throughout the Supplementary Documents. The figures, maps and graphic files must also be submitted on the original formats, separated from the text, presented with their names, footnotes and other information throughout the Supplementary Documents. The illustrations must be numbered and have captions. All figures, charts, illustrations, maps and other graphic elements must be in black and white (not color). The original source of graphic elements must always be on the captions. In case of the elaboration of graphic element by the author, present that in the caption.
6. The first page must have: a) the title of the work in its original language and in English (Capital letters, bold); b) up to 5 keywords; c) an abstract of approximately 150 words; d) JEL Classification and e) information about the author(s): full name, academic title, present work and/or academic experience, research field areas, institution, address, email and phone. If the work has more than one author, refer to all in the first page.
7. Observe the Chicago Style for bibliographical reference as in the following examples:
 - For articles:
CERVO, Amado L. Política exterior e relações internacionais do Brasil: enfoque paradigmático. *Revista Brasileira de Política Internacional*, v. 46, n. 1, p. 5-25, 2003.
 - For books:
SARAIVA, José F. S. (Ed.). *Foreign Policy and Political Regime*. Brasília: Ibrri, 2003. 364 p.
 - For electronic documents:
PROCÓPIO, Argemiro. *A hidropolítica e a internacionalização amazônica*, 2007. Disponível em: <<http://mundorama.net/2007/09/13/a-hidropolitica-e-a-internacionalizacao-amazonica/>>. Acesso em: 18 set. 2007.
8. The complete references must appear at the end of the article, in alphabetical order.
9. Each author will receive four (4) copies of the journal in which his/her article is published, in his/her chosen language (Portuguese or English).
10. The submissions must be performed online. Manuscripts shall be sent to tempodomundo@ipea.gov.br.

Items Verified on Submission

1. The article is original.
2. The article is in accordance with the editorial rules of the Magazine.

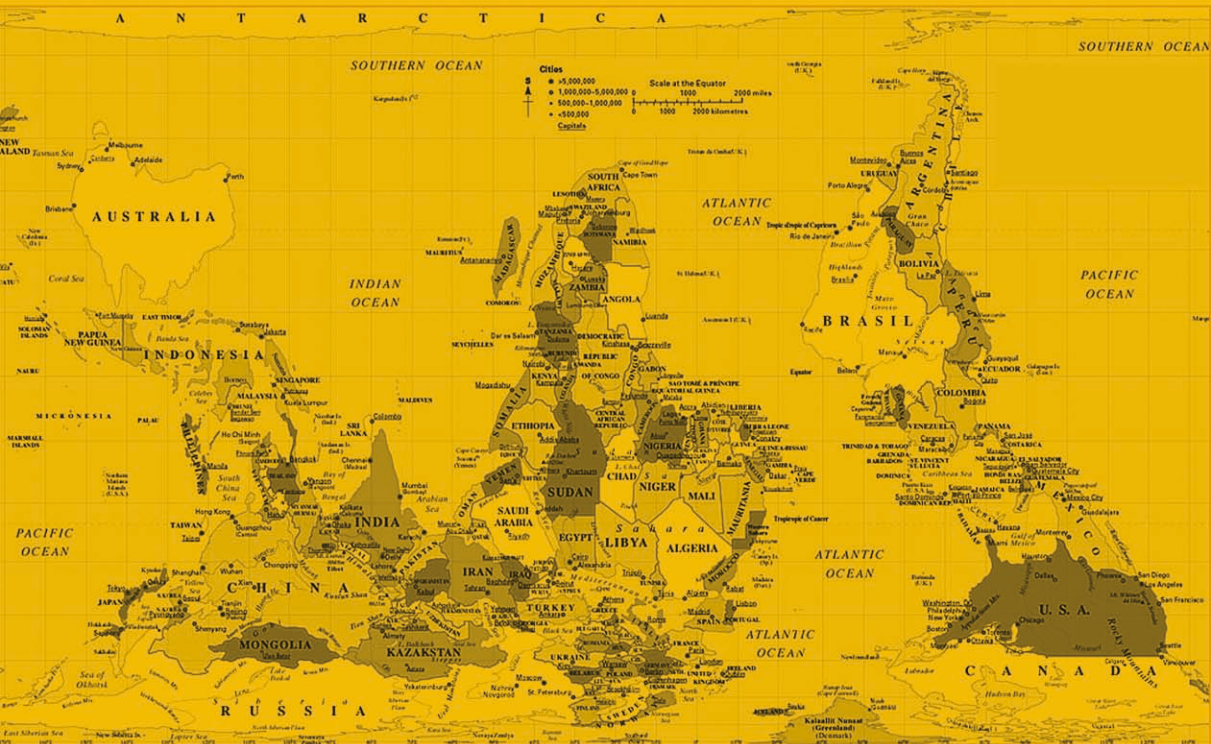
Copyrights Declaration

The submission of the article authorizes its publication by IPEA and implies that the article must not be submitted for publication elsewhere. The original is considered definitive, so the articles pass throughout a grammatical and orthographical review. The owner of the copyrights is the Instituto de Pesquisa Econômica Aplicada (IPEA), with headquarters in Brasília, Brazil. Authors must sign a copyright agreement, which will be sent via email.

Privacy Policy

The names and emails submitted will be only used for editorial purposes by *The Perspective of the World Review*, and will not be published or given to any other institution.

The *Perspective of the World Review* is an international publication by the Institute for Applied Economic Research (Ipea), a body belonging to the Presidency of the Federative Republic of Brazil. It was created to promote contemporary debates emphasizing the theme of development from a South to South perspective and seeks to formulate proposals for the development of public policies, as well as to encourage international comparison with a focus on the scope of political economy.



Ipea – Instituto de Pesquisa
Econômica Aplicada

SE
SECRETARIA DE ASSUNTOS ESTRATÉGICOS
PRESIDÊNCIA DA REPÚBLICA

