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The self-financing of industrial development in  
developing markets, case studies in: Brazil, South  
Africa, India and China

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# The self-financing of industrial development in developing markets, case studies in: Brazil, South Africa, India and China

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## **Abstract**

This paper provides an overview of alternative sources of financing for industrial development in four emerging countries: Brazil, South Africa, India and China. The paper analyses in particular the mechanisms used to mobilise domestic resources, including savings and foreign exchange reserves as well as channels for their allocation to the real economy. It is argued that these four countries have the capacity to employ fiscal and monetary policies for domestic resource mobilisation; however, due to financialisation, the way that investment is allocated is not always beneficial for industrial development.

**Key words:** Self-financing, domestic resource mobilisation, industrial development, Brazil, India, China, South Africa

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## Table of content

|   |                                     |
|---|-------------------------------------|
| The self-financing of industrial development in developing markets, case studies in: Brazil, South Africa, India and China..... | <b>Error! Bookmark not defined.</b> |
| <b>Abstract</b> .....   | <b>Error! Bookmark not defined.</b> |
| <i>Table of content</i> .....   | 4                                   |
| <i>List of figures</i> .....  | 5                                   |
| <i>List of tables</i> .....   | 6                                   |
| <b>List of acronyms</b> .....   | 7                                   |
| <b>Introduction</b> .....   | 8                                   |
| <b>1. Development of national champions versus foreign direct investment: Industrial strategies in Brazil</b> .....             | 9                                   |
| 1.2 The Brazilian Development Bank- the driver of the industrial development.....   | 11                                  |
| Figure 1 BNDES sources of funding (2001-2015) .....   | 12                                  |
| 1.3 Brazil's aerospace industry .....   | 13                                  |
| 1.4 Brazil's automotive industry .....  | 15                                  |
| <i>Figure 2 Revenues and investment in Brazil's car industry (passenger vehicles only, 1990-2012)</i> .....                     | 16                                  |
| <i>Figure 3 Investment as a share of total revenue in car industry (1990-2012)</i> .....  | 17                                  |
| <i>Figure 4 20 largest auto parts producers in Brazil (2014)</i> .....  | 19                                  |
| 1.5 Financing development- national champions versus foreign direct investment .....  | 20                                  |
| <b>2. Pension funds developmentalism- South Africa and Brazil</b> .....   | 23                                  |
| <i>Table 1 Foreign direct investment by sectors (R million) and their share in total FDI (in %)</i> .....                       | 25                                  |



|   |    |
|---|----|
| 2.1 The South African public pension system .....   | 26 |
| <i>Table 2 GEPF asset allocation 2008-2014</i> .....  | 28 |
| <i>Table 3 Largest equity holdings by GEPF 2009-2014</i> .....  | 29 |
| 2.2 Brazilian closed pension fund system and productive investment.....   | 29 |
| <i>Figure 5 Allocation of assets by pension funds according to sectors (R\$ million)</i> .....                                  | 32 |
| <b>3. India's information and communication technology sector- a result of state interventions or neoliberal reforms?</b> ..... | 35 |
| <i>Figure 6 Sectoral distribution of India's GDP (1960-2014)</i> .....  | 36 |
| 3.1 India's ICT industry- from foreign exchange saver to foreign exchange earner .....  | 38 |
| 3.2 Conclusion .....  | 43 |
| <b>4. Retention of foreign exchange- how China accumulated USD 4 trillion</b> .....   | 45 |
| 4.1 Evolution China's foreign exchange policies.....  | 46 |
| 4.2. China's investment vehicles .....  | 48 |
| <i>Figure 7 Global shares of top 15 wind turbine manufacturers (2014)</i> .....   | 53 |
| 4.4. Conclusion .....   | 54 |
| Conclusion .....  | 57 |
| <b>Bibliography</b> .....   | 60 |
| <b>Appendix</b> .....   | 11 |

### List of figures

|  |    |
|--|----|
| <i>Figure 1 BNDES sources of funding (2001-2015)</i> .....   | 12 |
| <i>Figure 2 Revenues and investment in Brazil's car industry (passenger vehicles only, 1990-2012)</i><br>..... | 16 |



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|  |    |
|--|----|
| <i>Figure 3 Investment as a share of total revenue in car industry (1990-2012)</i> .....       | 17 |
| <i>Figure 4 20 largest auto parts producers in Brazil (2014)</i> .....                         | 19 |
| <i>Figure 5 Allocation of assets by pension funds according to sectors (R\$ million)</i> ..... | 32 |
| <i>Figure 6 Sectoral distribution of India's GDP (1960-2014)</i> .....                         | 36 |
| <i>Figure 7 Global shares of top 15 wind turbine manufacturers (2014)</i> .....                | 53 |

### *List of tables*

|   |    |
|---|----|
| <i>Table 1 Foreign direct investment by sectors (R million) and their share in total FDI (in %)</i> ..... | 25 |
| <i>Table 2 GEPF asset allocation 2008-2014</i> .....  | 28 |
| <i>Table 3 Largest equity holdings by GEPF 2009-2014</i> .....  | 29 |

## List of acronyms

|       |  |
|-------|--|
| CDB   | China Development Bank                   |
| CIC   | China Investment Corporation             |
| DoE   | Department of Electronics                |
| ECIL  | Electronics Corporation of India Limited |
| FAT   | Workers Assistance Fund                  |
| FDI   | Foreign Direct Investment                |
| GEPF  | Government Employee Pension Fund         |
| GFCF  | Gross fixed capital formation            |
| ISR   | Internal Settlement Rate                 |
| MEC   | Mineral Energy Complex                   |
| OFDI  | Outward Foreign Direct Investment        |
| PASEP | Public Employment Savings Programme      |
| PBC   | People's Bank of China                   |
| PIC   | Public Investment Corporation            |
| PIS   | Social Integration Programme             |



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## 1 Introduction

Even after decades of global financial liberalisation, which had been associated with the promise of increased private and overall savings, high investment rates, and better allocation of private investment, the expected improved performance of financial sectors in developing countries has not materialised. Standard theories assume that financial liberalisation leads to better allocation of international finance flowing from capital-rich developed countries to capital-scarce developing ones. However, studies have shown that the amount of capital from developed countries flowing into developing countries remains small. In fact, the countries growing the fastest are the ones that depend *less* on foreign finance (Gourinchas & Jeanne 2007). The liberalisation of capital accounts in developing countries indeed resulted in increasing volatility of financial flows. This was highlighted during the 2008 crisis, when portfolio investment and financial flows immediately contracted. Even though foreign direct investment (FDI) gradually stabilised, it has not reached its pre-crisis levels. The crisis also demonstrated that middle-income countries (including the four emerging countries analysed in this paper) are more vulnerable to volatile international capital flows than low-income countries. Such volatility presents challenges for governments, mostly in relation to unpredictability of revenues and therefore spending. As increasing financialisation in developing countries is associated with a higher volatility of savings, the impact of financialisation on domestic resource mobilisation requires further inquiry. On the other hand, new research argues that developing countries predominantly rely on domestic finance, with 90% of the stock of capital in developing countries between the 1990s and 2000s being self-financed (Aizenman, Pinto & Radziwill, 2004).

The purpose of this paper is therefore to analyse different modalities of self-financing across four emerging countries: Brazil, South Africa, India and China. Mechanisms of





domestic resource mobilisation include development banking, pension funds and retention of foreign exchange. These will be further analysed through a prism of sectoral industrial policies, namely aerospace and automotive industries in the case of Brazil, the ICT industry in India and the wind turbine sector in China.

The main questions connecting the case studies are: (1) what instruments do developing countries adopt in order to mobilise domestic resources; and (2) what institutional channels do they use to allocate these resources to productive investment? These are framed in broader questions of financialisation, inward and outward foreign direct investment, foreign exchange retention and development banking.

## **1. Development of national champions versus foreign direct investment: Industrial strategies in Brazil**

Brazil's industrialisation has evolved through various stages dating back to the 1930s when the shift from an agro-export economy to an urban industrial started. The economic model was consolidated after World War II, when the national-developmental model based on import substitution and protectionist policies was adopted. During this period, Brazil achieved high growth rates, averaging 7 percent per annum, associated with the rise of several successful industrial sectors, such as automobile. The national developmentalist model continued under the authoritarian regime between 1964 and 1985. In this period, industrial production became closely tied to the needs of the military government (Diniz & Galli, 2011). Even though Brazil experienced high rates of accumulation of productive capital and average growth rates of 10 percent in the first half of the authoritarian regime, the system began to lose the support of industrial elites and was contested by the trade union movement; a democratic government was elected in 1988 (Araujo et al., 2012). In the 1990s, under international pressure as well as pressure from domestic business elites, the Brazilian state adopted neoliberal reforms, strengthened "the role of the market" and the participation of the private sector through liberalisation, deregulation and privatisation. In this period, bankruptcies, declining industrial



production and employment as well as denationalisation of industry were the main features of industrial restructuring. Despite its promises, the neoliberal reform agenda failed to revive economic growth (Diniz & Galli, 2011).

The election of Luiz Inácio Lula in 2002 saw the end of the period of stagnation and the emergence of a new developmental model (Diniz & Galli, 2011). During Lula's first administration (2002- 2006), per capita GDP increased by 3.4 percent in 2004 and industry expanded by 6.2 percent (ibid: 70). Increasingly ambitious initiatives in the social and economic spheres replaced the minimalist state of the 1990s. Some define this new economic model as state corporatism, characterised by the state's involvement in the corporate sector through direct and indirect support for businesses, export promotion, and control of strategic publically owned companies, such as Embraer (aerospace), Vale (mining) and Petrobras (petrochemical).

Despite the fact that the Brazilian government has implemented several industrial policies in order to increase the competitiveness of Brazilian industries, the country is currently experiencing a decline in industry's share in value-added creation, which in 2013 accounted for 25 percent of GDP with manufacturing reaching only 13 percent of GDP. In contrast, China's industry share in value-added creation represented 44 percent of GDP in 2013, and the share of manufacturing reached almost 32 percent (The World Bank 2015). Despite the increase in gross fixed capital formation (GFCF) between 2003 and 2008 and its slight recovery in 2010, GFCF remains below 20% of GDP (Gaulard, 2015). While the share of capital equipment in GFCF declined, the share of residential construction rose to 20% of total GFCF in 2010. These trends point to the deindustrialisation of the Brazilian economy.

The following analysis will explore current forms of industrial financing in Brazil, with a particular interest in the role of the Brazilian Development Bank (BNDES) as a key financial instrument in Brazil's industrial development model. Since its creation in 1952 the bank has evolved from a complementary tool to import substitution policies to becoming the crucial source of long-term financial capital and the main instrument of internationalisation of Brazilian companies. The transformation of BNDES will be analysed through its involvement in the aerospace industry in the second section. This analysis is combined with a comparative



appraisal of the differential treatment of FDI in another sector supported by BNDES, counterposing the automotive to the aerospace industry. This discussion draws on Alice Amsden's analysis of the role of the nationality of firm ownership.

The sectoral case studies allow us to compare two diverse industrial policies- one outward oriented and realised through the state-supported financing of expansion and knowledge development and the other one of developing a sector through facilitating foreign direct investment. In addition, Brazil was the first developing country to enter the global aerospace market, taking advantage of wide range of financing and support mechanisms provided by the government.

## ***1.2 The Brazilian Development Bank- the driver of the industrial development***

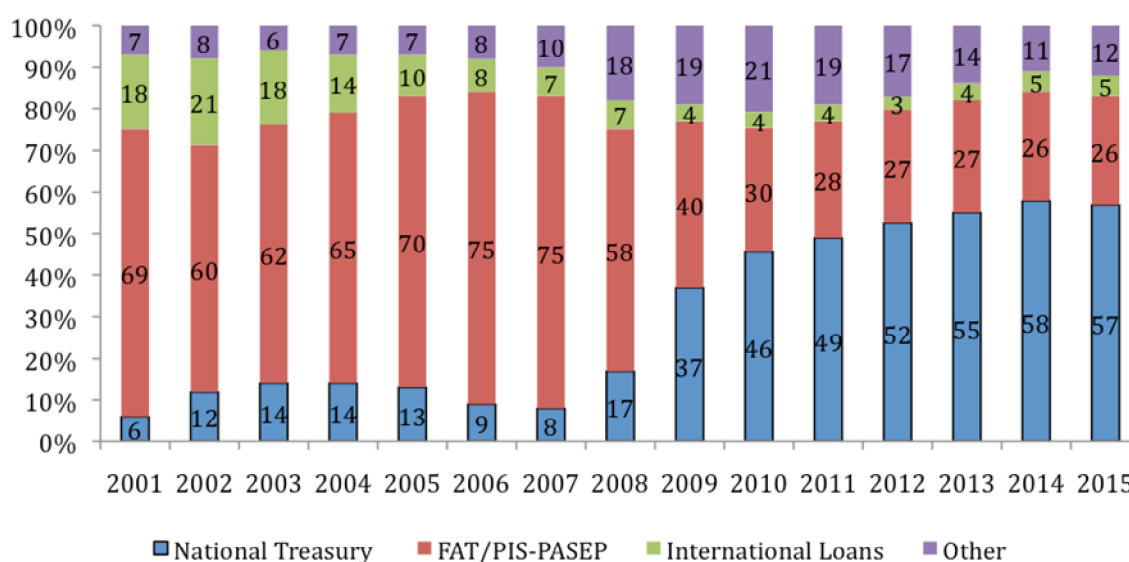
The Brazilian Development Bank (BNDES) was established in 1952 as a complementary tool to import substitution policies. In its early stages, BNDES responsibilities included financing and managing support for two main sectors- transport and energy. The important vehicles for mobilising resources for BNDES have been two state pension funds, , the Social Integration Programme (PIS) and Public Employment Savings Programme (PASEP). The increased funding allowed BNDES to expand its operations into steel and nonferrous metals, paper and pulp, oil and petrochemicals (Araujo 2013). After the 1988 restructuring process, which merged PIS-PASEP into the Workers Assistance Fund (FAT), changed the nature of resource mobilisation. The Fund was required to provide at least 40 percent of its funds to BNDES. These resources must be further invested in employment and income generating activities,

The Bank expanded its operations to provide assistance with the 1990s privatization and support for internationalisation of Brazilian companies. During Lula's presidency BNDES accentuated its role in export promotion and between 2002-2010 export finances increased from USD2.6 billion to USD 11.3 billion (ibid: 6). BNDES support for internationalisation includes support for establishing subsidiaries abroad, creating and managing global supply chains and creating strategic partnerships. Currently, the Bank is present in all sectors of the economy and its

operations include the support for mergers and acquisition, R&D, urban development and environmental protection.

BNDES funding was affected by 2008 financial crisis, which shifted the main sources of funding from FAT to loans from the National Treasury (see Figure 1 ). Between 2007 and 2012 the funding from the National Treasury increased from 8 to 52 percent.

Figure 1 BNDES sources of funding (2001-2015)



Source: author's calculation based on BNDES data

Due to the crisis and rising disbursement of social funds, it is difficult to assess if the current shift in the funding model will persist. Before the crisis, the Bank witnessed expansion of its retained earnings, mostly from investment administered by BNDESPAR, its equity arm. Apart from the compulsory minimum 40 percent of FAT funding, government deposits and transfers between 1980s and 2008 represented an irrelevant share in the BNDES funding (Musacchio & Lazzarini, 2014).

BNDES provides the majority of long-term loans in Brazil. In 2012 the Bank accounted for 70 percent of all long-term credit in the country (Rezende, 2015). Some argue that the dominance



of BNDES crowds out private lending. On the contrary, Rezende concludes that the problem is not the lack of commercial banks' funding mechanisms, but 'unattractiveness of long-term lending relative to other short term products, such as payroll deductible loans, auto loans and loans to firms, such as working capital loans and SME loans' (Rezende, 2015:12).

### ***1.3 Brazil's aerospace industry***

Brazil was the first developing economy to enter the global aerospace competition. Its biggest aerospace manufacturer, Embraer, is Brazil's largest domestic exporter and the biggest manufacturer of commercial jets up to 120 passengers in the world (Broad, Choi, Drum, & Lagues, 2005). The European Union (27) is the second biggest import and export partner of Brazil, with most of the trade concentrated in aerospace parts. The successful expansion of its regional jets to the European market led Embraer to acquire production and maintenance facilities in Portugal and France.

Embraer was founded in 1969 as a state-owned enterprise to supply aircrafts to the Brazilian Air Force. After the decline of the global aerospace industry related to the end of the Cold War, the company reoriented itself to manufacturing commercial aircraft and became regional leader in the production of commercial jets. Collapse in financing, led to privatization of Embraer in 1994 (Porter et al. 2010). A 45 percent stake of Embraer was purchased by Brazil's two largest pension funds- Brazilian conglomerate Companhia Bozano Simonsen and US investment bank Wasserstein Perella. In 1999 a consortium of French aerospace companies acquired 20 percent of Embraer. However, the Brazilian government kept a so called "golden share" allowing it to veto any decision related to defence and security, transfers of military technology as well as changes to social objectives of the company (Hira & de Oliveira, 2007).

The government's involvement in the company's development has took different forms over the years. On one hand, the state provided direct support in the form of cooperation with foreign designers, universities and foreign suppliers, which allowed Embraer to acquire knowledge in the field (Fernandes, Moscoso, Price, Yoshino, & Zhang, 2011). In addition, the government demand for military aircraft, also manufactured by Embraer, allowed the company to invest



in its commercial manufacturing. On the other hand, the company also benefited from the state's protectionist policies, which included 50 percent tariff on commuter-type aircraft. Furthermore, the 'law of similar' and exemption from production and trade taxes (ibid).

Current support takes form of a preferential custom regime-RECOF (Industrial Bonded Warehouse Regime), which suspends federal taxes on imported goods as long as they contribute to the production of later exported goods.. This policy also applies to importers in the automotive industry. (Hira & de Oliveira, 2007).

Furthermore, the company receives finances from FINEP- Finance Fund for Studies and Projects administered by the Ministry of Science and Technology, which together with BNDES contributed 22 percent to development of ERJ 135/145 and 100 percent to development of AL-X light-attack jet fighter (A. Goldstein, 2002). Embraer is also the largest beneficiary of the Industrial Development Technology Programme also under the administration of the Ministry of Science and Technology. Similarly, as 90 percent of the production is exported, the company benefits from Proex- Export Promotion Programme managed by the Banco de Brasil (ibid). The scheme provides a rebate of up to 3.5 percent on loans to purchasers of the exported aircraft (Fernandes et al., 2011).

In fact, it is government support that enabled the company's emergence as a new important player in global and regional aerospace markets. Apart from Embraer's outward success, the industry attracted a a large number of foreign companies into Brazil. These suppliers of subsystems to Embraer established production and distribution facilities in the country, including R&D centre by Boeing, maintenance, repair and operations units (TAP, Goodrich, Pratt&Whitney Canada, Rolls Royce UK...) as well as assembly plants (Latécoere France, Aemnova Spain, Sonaca Belgium and Helibras France) (Sturgeon et al. 2013).

Embraer itself focuses more on final assembly and design rather than manufacturing of components. While Embraer's internationalisation strategy succeeded in establishing a well-defined global supply chain, the local content of the final aircraft dropped to 10 percent (Fernandes et al. 2011). According to Hira and de Oliveira (2007) up to 98 percent of Embraer's suppliers of systems, parts and services are foreign,



The small amount of local suppliers left, are concentrated mostly in the lowest third tier of the production pyramid. As the majority of these companies are small and medium sized enterprises, they often lack required certifications and scale to meet Embraer's demand. In addition, as these suppliers tend to process raw materials provided directly by Embraer, the dependence of their revenues on Embraer in some cases reaches 90 percent (Cafaggi et al. 2012, ; Embraer, 2012).

#### ***1.4 Brazil's automotive industry***

With 3.8 million cars sold in the country in 2012, Brazil represents the fourth largest car market in the world, behind China, the United States and Japan. Automotive industry represents 18.7 percent of industrial GDP in 2011 and directly employs 150,000 people (Hirai & Ibusuki, 2014). When taking into consideration indirect employment, the industry generates 1.5 million jobs (Anfavea, 2015). 87 percent of the cars produced in 2012 were sold on the domestic market (Pagano, 2013).

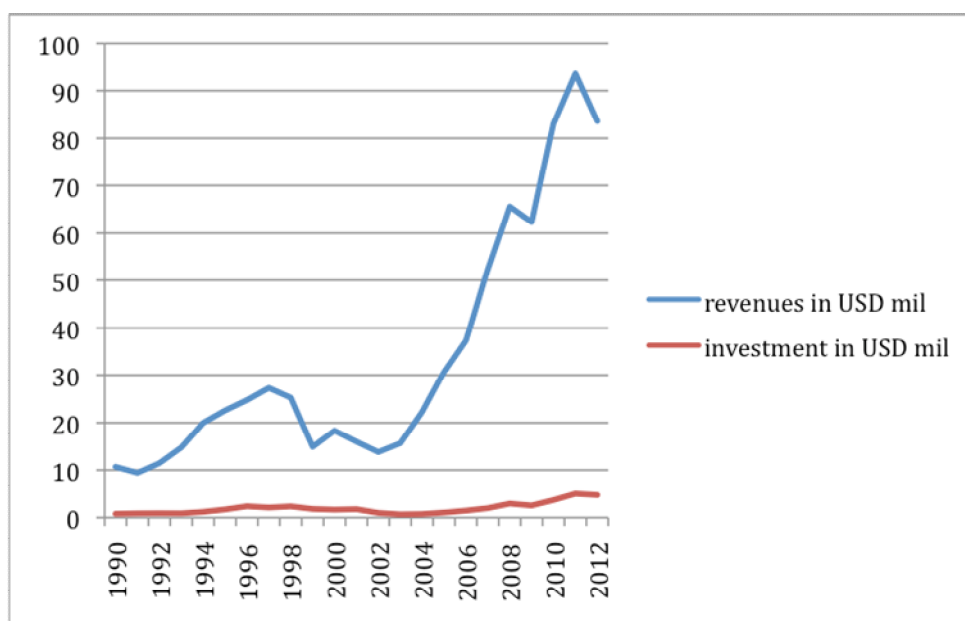
Until 1990s, Brazilian car industry was oriented on domestic market and was highly protected through import substitution policies. After trade liberalisation in 1990s, car import rose dramatically, challenging established position of existing car assemblers- Fiat, General Motors, Ford and Volkswagen. In order to increase productivity, update car models and meet the standards, the four companies increased investment either through modernisation and expansion of local plants, upgrading model portfolio or building new green field units.

Between 1990 and 2012 more than USD71.7 billion were invested by the foreign car companies operating in Brazil. 61 percent of the total was invested in car assembly plants and the rest was invested in manufacturing of auto parts (Wojtowicz & Rachwal, 2014). Apart from the four key existing players, a part of the investment originated from new companies entering the sector- such as Toyota, Honda, Renault, Peugeot- Citroen etc. In 1999 alone foreign companies accounted for 72 percent of total investment in automobile and auto parts sectors ( Santos & Pinhao, 2000).



However, the average share of investment in relation to revenues of automobile companies remains low. Between 2000 and 2012 the share averaged 5 percent, dropping from 8 percent between 1990 and 2000 (see Figure 2 and 3).

Figure 2 Revenues and investment in Brazil's car industry (passenger vehicles only, 1990-2012)

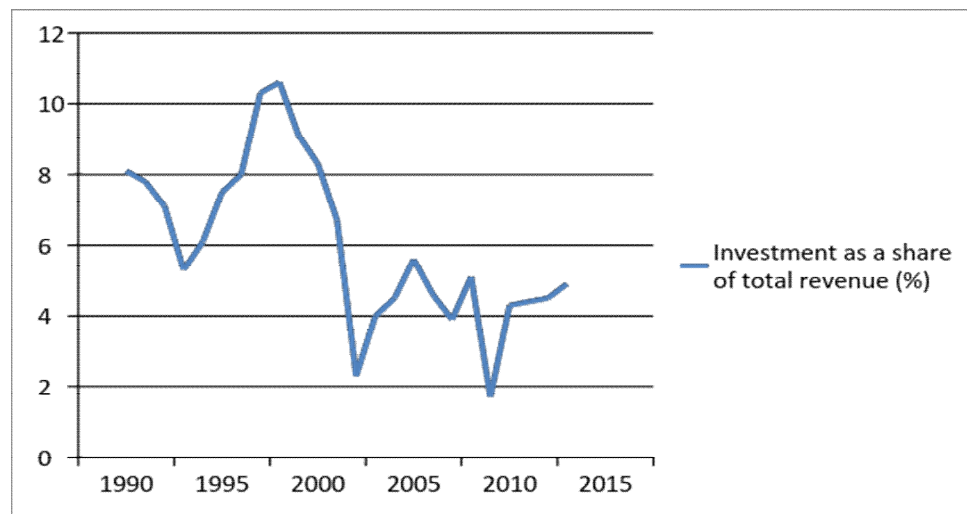


Source: (author's calculation based on Anfavea 2015)





Figure 3 Investment as a share of total revenue in car industry (1990-2012)



Source: [author's calculation based on Anfavea 2015]

Similarly to the aerospace industry, the evolution of the automotive industry has been shaped by different government policies. In early years of the 1990s policies aimed to curb imports and protect employment in existing car industries by the local content requirement set at 60 percent. (Consoni & Quadros, 2004). BNDES has played an important role in financing the industry. BNDES disbursement in the automotive sector increased dramatically in the 1990s, rising from USD 50 million in 1990 to almost USD 700 million in 1999 (Rodrigues n.d.:8). Between 1997 and 1999 BNDES invested USD5.88 billion to auto parts industry and auto assemblers in total. 60 percent of the investment aimed at acquisition of the equipment manufactured in Brazil and a part of it was invested in engine manufacturing, which later facilitated increase of the local content to 70 percent (A. M. Santos & Pinhao, 2000). Furthermore, between 2008 and 2014 the bank approved USD14.7 billion to fund the industry, of which more than 10 percent targeted R&D and engineering projects. On the other hand, the carmakers themselves invested approximately USD19 billion between 2010 and 2013 (C. Santos, 2015).

In order to stimulate investment in research and development, engineering and localisation companies can obtain reduction of the industrial product tax from 55 percent, introduced under



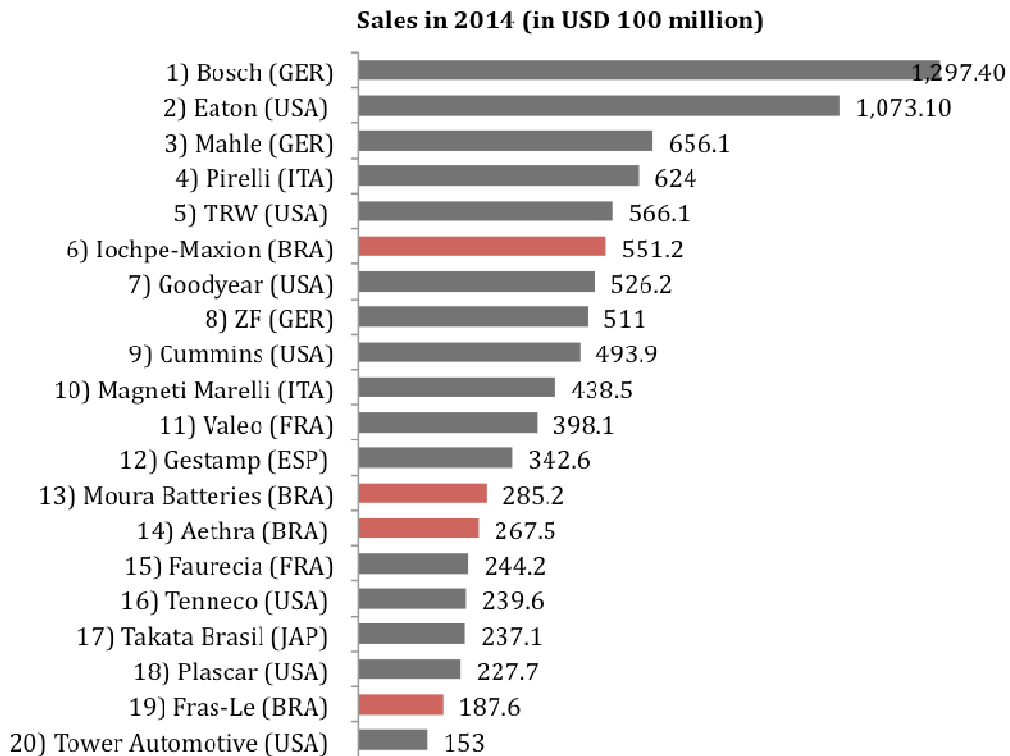
three new regime - INOVAR-AUTO (Ernst&Young, 2012). The initiative is a reaction to increasing imports in auto parts industry. Despite the fact that Brazil's supply chain is fairly developed, the imports grew from USD0.8 billion in 1990 to USD4.1 billion in 2002 and to USD16.3 billion in 2012 (Hirai & Ibusuki, 2014).

As argued by BNDES report, R&D incentives in automobile are successful. In comparison with the rest of the manufacturing, which as a whole invested only 0.7 percent of net revenues in R&D and 2.5 percent in innovative activities, automakers invested 1.4 percent and 2.8 percent respectively (C. Santos, 2015).

Despite of wide range of government policies promoting country's automotive sector, incentives remain misplaced. On one hand, the above-mentioned government initiative to promote local auto parts sector does not account for the lack of existing capacity of local manufacturers. In order to meet the rising demand for locally manufactured parts and components, domestic auto-parts producers need to expand their existing production, which would additional financial support from BNDES. (Hirai & Ibusuki, 2014).

On the other hand, under the INNOVAR –AUTO regime a new foreign auto assemblers (such as Chinese and Japanese) can either bring their own supply chain manufacturers and thus avoid imports of auto parts, or to encourage their suppliers to create joint ventures with the domestic auto parts companies (ibid). This would have further negative consequences for deindustrialisation of Brazilian auto parts industry. In fact, there are currently only four domestic auto parts companies within the top 20 auto parts manufacturers in Brazil. The top five include Bosch (Germany), Eaton (USA), Mahle (Germany), Pirelli (ITA) and TRW (USA) (see Figure 4). This was accompanied by the decline in the share of national capital in total sales from 52.4 percent 1994 to 28.2 percent in 2012 (Hirai & Ibusuki, 2014, p. 6) The decline was caused by two related reasons. Firstly, some of the companies decided to create joint ventures with bigger foreign companies, which, on the one hand, made domestic companies more competitive, while on the other hand allowed foreign manufacturers locate production in Brazil. Secondly, some local auto parts producers were pushed out of the market due to the lack of capital necessary for modernisation and expansion of the production (Hirai & Ibusuki, 2014).

Figure 4 20 largest auto parts producers in Brazil (2014)



Source: based on data obtained from Exame 2015

Therefore, foreign car assemblers and car-parts producers which entered the country since the 1990s as a part of the government's strategy to attract FDI, had great impacts on the existing structure of the industry in terms of increasing competition vis-à-vis local producers, pressure for modernization and expansion, as well as their production strategies (see Consoni & Quadros, 2004; Salerno & Dias, 2002 for more on global production strategies of automobile sector)

To conclude the policy shift towards greater localisation administered by BNDES led to greater internationalisation of the suppliers and subsequent crowding out of existing local producers. The majority of firms in the supply chain remain foreign, with Brazilian auto parts suppliers concentrated in second and third tiers (A. M. Santos & Pinhao, 2000). Despite the provision of large number of jobs, such structure has negative impacts on innovation and engineering



capabilities of Brazilian companies. Research realized by BNDES showed that domestic firms fall behind the TNCs, with 42 percent of Brazilian companies not developing any new design (Zilbovicius et. al., 2002).

### ***1.5 Financing development- national champions versus foreign direct investment***

Two sectoral case studies presented above highlight a tension in industrial strategies emerging economies face. In the case of the aerospace industry, Brazil chose promotion of a national champion as a driver of industrial development and exports., On the other hand, the development of automotive sector was achieved through attracting foreign direct investors. At the same time both sectors required active financial strategies administered by BNDES.

In light of Alice Amsden, we can observe that despite of the rise of transnational corporation, the nationalities of capital matters. Embraer, similarly to other state-owned (or state-controlled) enterprises has served as a technological incubator and a centre for accumulation of knowledge-based assets. Secondly, as a state-controlled company, Embraer faces higher public scrutiny than foreign companies, which expected rate of returns by the hosting country is much lower (Amsden 2001).

On the contrary, the case of the automotive industry demonstrates that due to less diverse operation structure, foreign companies repatriate high proportion of their profits to either headquarter or to use it as investment elsewhere. In addition, historical research confirms that foreign-owned enterprises are not industrial pioneers in developing countries (Amsden 2009). Subsequently, foreign-owned enterprises do not have any incentives to locate its most prized value-added activities, such as R&D, into developing countries. In addition, the nature of exported R&D activities is often restricted to application of existing research undertaken by headquarters. Subsidiaries in developing countries rarely participate in product design and therefore their ability to develop top managerial and engineering capabilities is limited (Amsden, 2009; Chang, 2010). Only Fiat, General Motors and partly Volkswagen rearranged their product strategies to incorporate greater integration of local engineering teams into product



development and created local autonomous engineering centres in Brazil (Consoni & Quadros 2004).

The government strategy in maintaining golden share in Embraer, as well as other crucial companies, allows it to control beneficiation strategies not through policy initiatives but directly through control of the companies.

With regards to automotive sector, the government policies aimed at trade liberalisation and attracting FDI, misplaced incentives to foreign car assemblers, which were encouraged to bring their suppliers into newly established industrial clusters (Lopes 2007). The strategy resulted in crowding out of domestic private investment leading to denationalisation of Brazilian auto part industry. The success of the government's recent attempt to increase the local content, however, will depend on access to finance for small and medium domestic enterprises.

To conclude, government strategy to finance industrial development in Brazil brought contradictory results. In instance of aerospace industry, the country successfully promoted R&D activities and product development despite failed localisation of the supply chain. In addition, Embraer's expansion abroad and acquisition of foreign technology and expertise, would not be possible without financial assistance from BNDES. While benefits of inward FDI are contestable, outward foreign direct investment (OFDI) plays a crucial role in industrial catching up (Amsden 2012).

On the other hand, government's support for automotive industry has not brought technological spillovers predicted by FDI promoters. Not only is significant migration of R&D activities restricted to Fiat, GM and VW, but internationalisation of the supply chain also led to crowding out of domestic companies. Therefore, it is more appropriate to think of foreign-owned enterprises as accompanying economic growth in developing countries, rather than driving it (Amsden 2009).

Overall, the existence of the BNDES has been crucial for industrial development in Brazil. The bank is a main provider of long-term finance in the situation when commercial banking lags behind. In addition, the role of BNDES has changed over time from supporting heavy industry in



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1950s to subsidizing imports to current promotion of internationalisation. Privatization of state-owned enterprises made BNDES into an important equity holder, Through its equity arm, BNDESPAR, the development bank controls minority stakes in several national champions. Due to long-term investment, the involvement of BNDES alleviates capital constraints and thus positively affects companies' performance (Lazzarini & Musacchio 2010).

## 2. Pension funds developmentalism- South Africa and Brazil

South African industrialisation has been shaped by the existence of the mineral-energy complex (MEC), which has skewed both foreign and domestic investment towards mining and quarrying and more recently towards financial services. Underinvestment in manufacturing and manufacturing-related sectors have made the South African economy weak and vulnerable, on the one hand, to the export of primary resources and, on the other hand, to the mobility of financial capital and the growth of the financial sector. The South African economy has as a result experienced a process of deindustrialisation for the past three decades (Ashman, Fine, & Newman, 2013)

South Africa is often presented as an example of domestic resource mobilisation for other Sub-Saharan African countries. South Africa is the largest tax collector on the continent. In 2013, 70% of all tax collected in Africa originated from six countries: South Africa (USD 86.5 billion) and Nigeria (USD 77.8 billion), followed by Algeria, Angola, Libya and Egypt. South Africa is also the largest recipient of portfolio flows (African Economic Outlook 2015).

However, due to financial liberalization, low economic growth and the poor access to banking services of many South Africans, private saving in the country remains low. In 2014 gross domestic saving as a share of GDP declined to just above 14 percent. The largest share of savings was the slowly recovering corporate savings. On the other hand, household saving remained extremely low, inching around 0.1 to 0.2 percent of GDP (SARB 2014).

Literature on financialisation in South Africa points out that private sector investment is not capital constrained, but rather driven by global financialisation trends. In her



analysis of the largest non-financial corporations in South Africa, Karwowski demonstrates that the majority hold their excess capital as bank deposits. Such over-capitalisation of the corporate sector means that companies prefer to hold substantial volumes of their revenues in liquid assets, rather than invest them in illiquid productive capital. As the author points out, there might be different reasons for such preference: precaution, transaction costs or speculations. Consequently, excess bank deposits then serve as a credit to households in the form of mortgage loans (Karwowski, 2012).

In the period of rapid increase in domestic credit available to the private sector, starting in the mid-1990s and lasting until 2008, gross private fixed investment did not increase significantly, demonstrating that credit was not channelled into productive activities (Mohamed, 2012). Credit extension between 2002 and 2009 was thus not driven by long-term productive investment, but rather by rising debt-driven consumption and speculation in financial markets (Mohamed 2010). After 2002 the economy experienced increases in investment, partly driven by large megaprojects related to the World Cup. However, this increase was unevenly distributed across industrial sectors (Newman, 2014).

The majority of manufacturing in South Africa developed in connection to the mineral-energy complex, with automobile and components sectors being the only exception (Mohamed, 2010). As manufacturing is largely undiversified, manufacturing sectors unrelated to the MEC without support from the state remain relatively underdeveloped. As shown in Table 1 below, both financial services and mining attract higher volume of foreign investment than manufacturing. The relative increase in foreign direct investment in manufacturing in the early 2000s was caused by returning automobile companies.



*Table 1 Foreign direct investment by sectors (R million) and their share in total FDI (in %)*

|      | Total foreign direct investment | Mining and quarrying | Share of total FDI | Financial intermediation, insurance, real estate and business services | Manufacturing              |
|------|---------------------------------|----------------------|--------------------|--|----------------------------|
| 1999 | <b>318 630</b>                  | 114 095              | 35.8               | 104 992  | <b>79 486</b> <b>24.9</b>  |
| 2000 | <b>328 859</b>                  | 91 540               | 27.8               | 129 162  | <b>86 783</b> <b>26.4</b>  |
| 2008 | <b>632 619</b>                  | 195 365              | 30.9               | 182 420  | <b>204 754</b> <b>32.4</b> |
| 2009 | <b>866 664</b>                  | 289 836              | 33.4               | 234 955  | <b>242 217</b> <b>27.9</b> |
| 2010 | <b>1 015 517</b>                | 388 772              | 38.3               | 241 792  | <b>262 920</b> <b>25.9</b> |
| 2012 | <b>1 390 022</b>                | 429 276              | 30.9               | 500 725  | <b>249 334</b> <b>17.9</b> |
| 2013 | <b>1 595 760</b>                | 448 406              | 28.1               | 643 348  | <b>269 115</b> <b>16.9</b> |

Source: author's calculation based on South African Reserve Bank Quarterly Bulletins

The liberalisation of the economy and reforms in corporate structures contributed to further disinvestment from productive sectors, shifting investment away from domestic market towards foreign ones. The corporate sector went through several transformations: unbundling and restructuring, internationalisation and black economic empowerment. Even though the internationalisation of the large South African conglomerates (including the transfer of their primary listing from Johannesburg to London) was successful, they have not reinvested the newly obtained capital domestically. In fact, outward FDI has exceeded inward FDI (Mohamed, 2010).

On the other hand, the rapid growth of the finance and insurance sector between 2003 and 2008 was not associated with higher levels of investment, but rather with rapid increases in mortgage advancement and overall household consumption and construction (ibid). Despite the credit expansion in the 1990s up until 2008, during which credit to the private sector increased by about 22 percent, Mohamed points out that private business investment increased by only 5 percent (Mohamed 2010).



In addition, financialisation of South African corporations is also demonstrated by the fact that net acquisition of financial assets is much higher than companies' reinvestment into productive activities (that is, net capital formation). The majority of companies in South Africa rely heavily on external funds as opposed to retained earnings. In particular, equity finance constitutes half or more of the external funds (Melherbe & Segal, 2003). Conversely, Brazilian companies rely more on internal funds (63.9 percent) and bonds. The stock market provides only 6.5 percent of firms' finances in Brazil (Coutinho & Rabelo, 2003).

South Africa also is the world's second most dynamic pension fund system. Pension funds, together with sovereign wealth funds, came to be seen as a new source of global finance, which can provide liquidity for a wide range of assets. They are instruments for channeling pension fund contributions into security markets to provide savings for financing capital investment (Toporowski, 2000). The growth of the pension fund industry has great implications for emerging markets not only due to increasing demand for their assets and their penetration into developed markets, but also due to their ability to become a key source of long-term finance (Studart, 2000). This section thus seeks to examine the role of pension funds for the mobilisation of domestic resources for investment in the specific context of South Africa. It highlights that the allocation of public funds continues to reproduce the biases associated with the mineral-energy complex. A comparison with Brazil's closed pension fund system further shows that an alternative approach is possible, called in the Brazilian context 'pension fund developmentalism'.

## ***2.1 The South African public pension system***

South Africa is the third fastest growing pension fund market in the world (Brazil is the second) (Datz, 2013). Its largest pension fund is the Government Employee Pension Fund (GEPF) administered by the Public Investment Corporation (PIC). The PIC is a



financial service provider wholly owned by the South African government. Apart from the GEPF, the PIC manages assets of 34 other public sector pension funds.

Allocation of the GEPF funds is governed by the government regulations, according to which the Fund can allocate 45-55 percent of its assets in domestic equities. Out of these domestic equities, 2-8 percent can be allocated into property, 0-8 percent can be invested in money markets, 1-5 percent in foreign equities and additional 0-5 percent can be allocated into foreign equities in African countries.

GEPF invests around a third of its assets into bills, bonds and securities, compare to 10% in the case of private pension funds. In addition, GEPF invests just above a half of its assets into equities listed on the Johannesburg Stock Exchange, compare to a quarter of assets by its private counterparts (Habbard 2010).

In 2012, the PIC allocated 46 percent of its assets into equities, 36 percent in capital market, 8 percent in cash and money markets, 5 percent in offshore assets, 4 percent in property and 1 percent in Isibaya (Development) Fund (PIC 2013:44).

While R11 billion of the GEPF assets were invested in private equities, out of which 51 percent went to industrial sector, R29 billion was allocated to property! In fact, investment in real estate increased from 0.4 percent of total assets in 2008 to 4.5 percent in 2014. Investment in bonds has been stable, accounting for average 31.8 percent in the past seven years. Investment in equities was dominated by the asset allocation in firms listed on the Johannesburg Exchange Market (both primary and secondary listings). Since 2010 there has been an increase in investment in foreign companies, including those from African emerging economies (see Appendix for detailed view of the Table 2)

Table 2 GEFP asset allocation 2008-2014

|      | EQUITY |                 |          |         | BONDS       |       |          |         | CASH/MONEY | REAL ESTATE |          |          | PRIVATE DEVELOPMENTAL |
|------|--------|-----------------|----------|---------|-------------|-------|----------|---------|------------|-------------|----------|----------|-----------------------|
|      | total  | listed/unlisted | domestic | foreign | unspecified | total | domestic | foreign |            | listed      | unlisted | domestic |                       |
| 2008 | 52.7   | 92%             |          |         |             | 33.8  |          |         | 7.9        | 0.4         |          |          | 4.4                   |
| 2009 | 43.9   | 94%             |          |         |             | 43.9  |          |         | 5.8        | 0.9         |          |          | 2.5                   |
| 2010 | 56     | 99%             | 54.95    | 1.05    |             | 36.3  |          |         | 3.9        | 1.4         | 2.1      |          | 0.4                   |
| 2011 | 57.4   | 97%             | 53.2     | 4.2     |             |       | 36.1     |         | 4.6        |             |          | 1.9      | NA                    |
| 2012 | 53.81  | 95%             | 50.7     | 3.11    |             | 36.18 | 33.6     | 2.58    | 4.1        |             |          | 4.7      | 1.15                  |
| 2013 | 56.4   | 95%             | 53       | 3.4     |             | 35.4  | 33       | 2.4     | 5          |             |          | 3        | NA                    |
| 2014 | 58.4   | 95%             | 54.3     | 4.1     |             | 31.6  | 29.7     | 1.9     | 4.8        |             |          | 4.5      | NA                    |

Source: GEFP annual reports

However, when we have a closer look into actual allocation of the resources, we see that equities purchased by the GEFP are located in telecommunication, finance, real estate and retail. In particular, the GEFP largest equity holdings are located in MTN, Sasol and the Standard Bank. Regarding the corporate bonds, its ownership is concentrated in state-owned enterprises- Eskom, Transnet, Trans-Caledon Tunnel, DBSA and Telkom. The biggest direct loans were provided to Afrisan (building material company), financial providers- Batho Bonke Capital and Investec Bank, First Rand; and Consol. Table 3 summarises 10 largest equity holdings by the GEFP in the past 5 years.

Table 3 Largest equity holdings by GEPF 2009-2014

| Top 10 companies            | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Sector                |
|-----------------------------|------|------|------|------|------|------|-----------------------|
| Sasol limited               | x    | x    | x    | x    | x    | x    | chemical              |
| MTN group limited           | x    | x    | x    | x    | x    | x    | ICT                   |
| Billiton Plc                | x    | x    | x    | x    | x    | x    | mining                |
| Standard Bank Group Limited | x    | x    | x    | x    | x    | x    | finance               |
| Anglo American Plc          | x    | x    | x    | x    | x    | x    | mining                |
| Telkom SA Limited           | x    |      |      |      |      |      | ICT                   |
| Impala Platinum             | x    | x    | x    |      |      |      | mining                |
| South African Breweries     | x    | x    | x    | x    | x    | x    | food and beverages    |
| British Tobacco Plc         | x    |      | x    | x    | x    | x    | agriculture           |
| Naspers Ltd                 |      | x    | x    | x    | x    | x    | media                 |
| FirstRand                   |      | x    | x    | x    | x    |      | finance               |
| Anglo American Platinum     |      | x    |      |      |      |      | mining                |
| Richmont Securities AG      |      |      |      | x    | x    | x    | finance, property     |
| Sanlam                      |      |      |      |      |      | x    | construction material |

Source: GEPF annual reports

To sum up, even though South African pension fund industry is among the world's most dynamic ones, the structural allocation of its assets does not correct for chronic underinvestment in South African productive sectors. The GEPF investment in domestic equities is skewed towards finance, mining and property sector. . Such allocation of resources underlines the structural bias towards the mineral-energy complex.

In contrast, Brazilian largest closed pension funds invest considerable amount of their resources into secondary sector. The political economy of Brazilian "pension funds developmentalism" therefore deserves a further scrutiny.

## ***2.2 Brazilian closed pension fund system and productive investment***

As elaborated in the previous section, Brazilian manufacturing benefits from financial assistance provided by BNDES in form of long-term loans, export promotion, import tax reductions and other forms of government support. In addition to government finance, a large part of BNDES resources comes from corporate taxation through FAT/PASEP contributions. FAT, which replaced PIS/PASEP system, is financed by 0.65 percent tax



on revenues of private firms, a one percent tax on revenues of public firms and a one percent levy on the cost of non-profit firms (The World Bank, 2004). In exchange, BNDES makes annual cash payments back to FAT at 6 percent interest on out-standing FAT funding (ibid.).

Datz (2013) refers to Brazilian economic system as 'pension fund developmentalism' or 'pension fund capitalism' highlighting the process of increasing role of state-controlled pension funds in providing long-term finance for domestic companies, mostly national champions. The major players or 'social agents' (as President Lula called them in 2002) in this form of financing are private closed pension entities operating out of publicly owned enterprises. PREVI, PETROS and FUNCEF are the largest three of them, controlling 40 percent of total assets in all pension funds in Brazil (Datz 2013). The pension funds were established in 1977 to promote accumulation of domestic savings and since then underwent a series of reform. In the 1990s they assisted with privatization securing shares in major state-owned enterprises, including Embraer. In addition to investment in equities of large state-controlled companies, the three pension funds established INVEPAR, which invests solely in large infrastructural projects, such as highways and energy projects.

Apart from large contribution of BNDES into industry and infrastructure in Brazil, retained earnings accounted for noticeable 39 percent of investment in 2011. In addition, more than 20 percent of the investment came from equities and corporate bonds largely acquired by Brazilian closed pension funds. The rest was obtained through foreign financing (Coutinho, 2013).

Brazilian pension system is similarly to its South African counterpart multi-pillar consisting of public, mandatory pay-as-you go system, second- complementary pillar and third, voluntary private plan (ABRAPP, 2014). Two different types of pension funds exist within the second, complementary pillar. First, open pension funds operate as



private commercial products offered by insurance companies. These are equivalent to personal pension funds in other countries. On the other hand, closed pension funds were originally established by one or a group of employers directed solely to their employees. Recently some closed pension funds were established by trade unions and professional associations (Reis & Paixao, 2004). They operate as non-profit organisation with the purpose of financing retirement pensions, benefits related to disability and death and some offer additional health insurance. In 2003 there were 360 funds covering 1.7 million workers, representing 2.2 percent of workforce, and accumulating USD 82.9 billion (15.9 percent of GDP) (Reis & Paixao, 2004). Three biggest pension funds, PREVI, FUNCEF AND PETROS account for more than 40 percent of total assets in pension funds. All three are sponsored by federal, state-controlled companies. Previ is a pension fund covering employees of Banco de Brasil, Petros serves employees of Petrobras and Funcef covers civil servants.

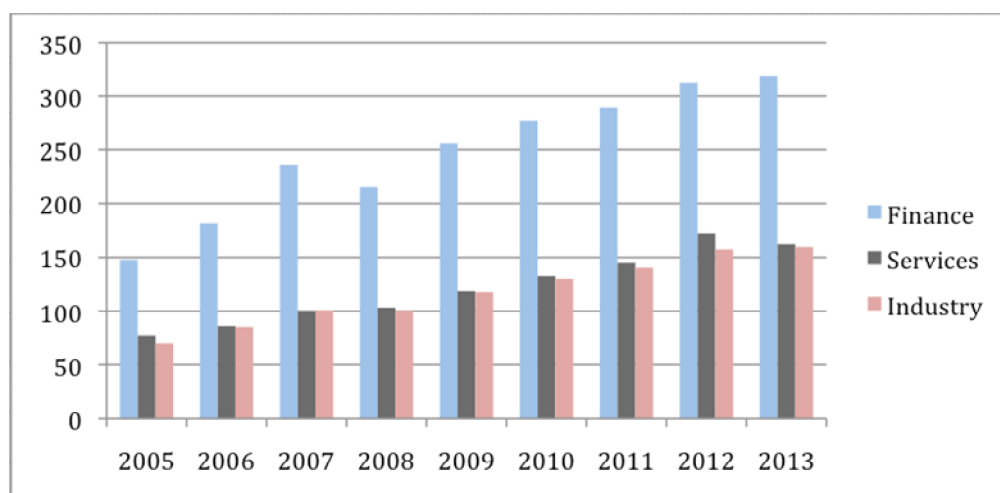
Regarding their asset allocation, closed pension funds invest primarily in bonds (around 60 percent of total assets) and equities (30 percent). The funds shifted their strategy towards disinvestment in properties, which used to amount for 5-7 percent in early 2000s. Current investment in properties ranges from 2-3 percents of closed pension funds' total assets (Pugh, 2009).

Historically, Brazilian regulatory bodies imposed strict limits on asset allocation of existing pension funds. When they were established, in the 1970s, 20-40 percent of their asset had to be invested in securities issued by private companies. Up to 50 percent could have been invested in government bonds. Overall, 75 percent of pension funds' portfolio had to be invested in domestic enterprises (Studart, 2000). Liberalisation in the 1990s led to greater diversification of portfolio, making real estate an additional asset class (ibid).

Asset allocation limits for Brazilian pension funds regulate investment strategies of the fund. Between 0 to 70 percent of total assets can be allocated in equities, up to 10 percent can be invested overseas and up to 8 percent can be invested in real estate (Nunes & Lima, 2014). When compared with actual allocation of assets, both private and public funds tend to invest mostly into public bonds and stocks. Even though closed pension funds can invest up to 10 percent of their assets abroad, the actual allocation of foreign investment is approximately 0.1 percent in total. At the end of 2011, a mere 0.016 percent of total investment in equities was invested abroad and 0.12 percent was invested in foreign fixed income products (Campollo Consulting LLC, 2013). The aggregate picture of asset allocation is distorted by allocation strategies of the largest 20 funds addressed below. The concentration of the investment in fixed income assets continues to be influenced by high interest rates. (ibid)

Regarding sectoral distribution of the pension funds investment, investment in industrial sectors more than doubled from R\$70 million to R\$160 million between 2005 and 2015. However, the allocation is still dominated by financial and service sectors, which together account for more than 2/3 of the total investment.

Figure 5 Allocation of assets by pension funds according to sectors (R\$ million)



Source: author's calculations based on ABRAPP 2013



With regards to three largest pension funds- PREVI, PETROS and FUNCEF, the companies tend to acquire equities solely in Brazilian companies. This tendency is determined by the regulatory environment, which restricts their investment to private equities issued by domestic companies. All three funds invest various sectors, including:

- petrochemical (Petrobras, Braskem)
- metallurgical (Forjas Taurus, Paranapanema- largest Brazilian refined copper producer)
- steel and cast iron (Usiminas, Tupy)
- automotive (Fras-Le, Weg, Kepler Weber, Marcopolo)
- aerospace (Embraer)
- mining (Vale)
- paper and cellulose
- ICT and so on

(source: annual reports of Previ, Funcef and Petros)

In addition to direct acquisition of companies' shares listed above, the funds invest in equities of Brazilian companies through investment or structured funds, such as Sondas specialising in investment in oil and gas sector, Neo Capital Mezanino investing in Brazilian companies with minimum sales value of USD 37.55 million (PREVI, 2012). However, due to the lack of data, it is not clear what proportion of assets is invested abroad through such structured funds.

To sum up, due to the nature of their liabilities and their demand for long maturity assets Brazilian pension funds are important long-term drivers of the economy. The funds hold 17 percent of total equities in the market and are largest buyer of long-term private debt (Weiss, 2013). Interests of the pension funds are complementary to those of BNDES. While the former focus on long-term profitability of their assets and prefer to



invest in domestic enterprises, the latter supports both industry and infrastructural development in the country (Inhudes, Albuquerque, Torres Filho, & Borca Junior, 2009). Regulatory and macroeconomic environment shapes investment strategies of pension funds and by extension investment in productive activities.

In contrast, the largest South African pension fund, GEPF, does not act as a social agent of broader economic growth. Even though a part of its assets is channelled toward social development via Isibaya fund, its relative size remains small and its nature is closer to corporate social responsibility rather than long-term developmentalist approach.

Brazil and South Africa have two of the world's fastest growing pension funds sectors. Both countries utilise saving mobilised through pension funds as a source of finance for development of domestic markets. However, while Brazil pension scheme provides companies with sources of long-term finance, the same does not apply in the case of South Africa. As demonstrated in South Africa, both mobilisation of domestic and external resources reproduce structural bias towards the mineral-energy complex. The largest public pension fund, Government Employees' Pension Fund allocates its resources towards finance, mining and real estate,

On the other hand, its Brazilian counterparts, in form of closed pension funds which are associated with public sector- FUNCEF and PREVI and large government-controlled companies- such as PETROS operate as 'social agents'. Their investment is concentrated in domestic equities of large companies in key sectors of the economy- such as metallurgy, petrochemical industry, steel etc.

Overall, the process of allocation is as crucial as an ability to mobilise domestic resources. Pension funds can be used both to raise additional investment and investment in productive activities in the economy.



### 3. India's information and communication technology sector- a result of state interventions or neoliberal reforms?

Despite the widespread belief that the spectacular success of India's information and communication technology (ICT) industry was driven by 1990s liberalisation reforms, the roots of India's ICT industry date back to the period of interventionist and protectionist government policies starting in 1960s.

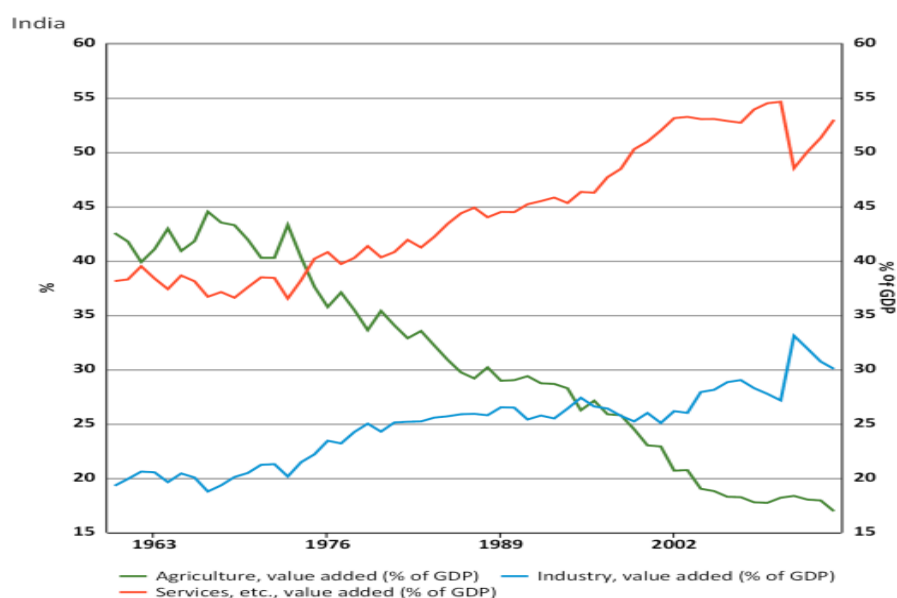
The case study of India's ICT sector demonstrates the limited success of self-financing in establishing a domestic ICT industry. The study analyses government policies in the ICT sector, financing mechanisms and their consequences. It argues that it was the state's need for foreign exchange that led India on the path to software export. With the increasing liberalisation of India's economy since the 1990s, the role of the ICT sector shifted from that of foreign exchange saver to foreign exchange earner. As a result, the government bias towards software sector and its export has hampered a long-term development of ICT industry in general and the hardware sector in particular. The main initial objective of government policy was to acquire foreign exchange to finance technological autonomy of the hardware industry. The policy, however, became a victim of a power struggle between various ministries, hardware producers, software providers, multinational corporations and local business houses.

This section offers an overview of history of industrial policy in India, with the focus on impacts of neoliberal shift on the ICT sector. Emphasis is given to the role of foreign exchange and promotion of software industry as a main driver of foreign exchange earner. The case study will then move towards the consequences of software export intensity for the overall India's ICT industry.

Earlier this year the International Monetary Fund predicted that India would overtake China and become the fastest growing large economy in the world in 2015. The predictions of GDP growth for 2015 and 2016 reached 7.2 percent and 7.5 percent respectively. The IMF continues with forecasting that India could become the world's largest economy, overtaking China, Germany and Japan, by the end of the decade. The growth would continue to be driven primarily by consumption, followed by investment (IMF, 2015).

Regarding the structure of Indian GDP, Indian economy has undergone a shift from agriculture towards services, which account for more than 50 percent of GDP. The contribution of industry increased from 20 percent in the 1960s to post-crisis 30 percent (The World Bank 2015).

Figure 6 Sectoral distribution of India's GDP (1960-2014)



Source: (The World Bank, 2015)

After independence India went through series of economic reforms, starting in the late 1940s by adopting national industrial policy aimed at creating industrial autonomy. The



country inspired by Soviet model, adopted central planning formulated through five year plans. Critics of India's developmental path focus on slow rates of growth, which averaged around 3-3.5 percent between 1950 and 1980 (Singh, 2008).

In the early stages of industrial policy, the emphasis was on development of heavy industries under protectionism via industrial licensing, import substitution and export promotion. However, the government failed in one of the main preconditions in successful industrial policy- market expansion. In the case of regulated access to external markets, production depends on increasing domestic demand, which never materialised. Subsequently, the growth that occurred in this period was constrained by the limited size of the market (Patnaik & Chandrasekhar, 1998). In fact, growth of manufacturing fell from 7.8 percent between 1951 and 1965 to 3.3 percent from 1965 to 1970. In addition, external pressure on Indian economy and currency appreciation led to government deficit and subsequent fiscal crisis in the 1970s (ibid). With decreasing public investment and social spending, big business houses, which were previously stripped of political power, begun to demand change of the regime (Saraswati, 2013). Therefore, the centralised industrial framework ceased to be viable due to both its internal contradictions and inconsistency of the policies (Patnaik & Chandrasekhar, 1998).

The victory of Rajiv Gandhi in the 1985 election marked the short period of broad liberalisation. Neoliberal reforms, including reduction of corporate and income taxes, liberalisation of import tariffs and exports; were adopted (Mccartney, 2004). In 1991 after a brief return to protectionist and social policies, India succumbed to global neoliberal forces. The currency was devaluated, the exports liberalised, quantitative restrictions removed and foreign investment allowed (ibid). Even though 1990s liberalisation led to economic growth, Chandrasekhar argues that such growth is driven



by consumption, leading to increase in capital goods imports, rather than investment boom (C. P. Chandrasekhar, 1996).

Yet, India is often seen as a major beneficiary of globalisation; this is mostly because of outsourcing related to the ICT industry analysed below.

### ***3.1 India's ICT industry- from foreign exchange saver to foreign exchange earner***

Contrary to the popular belief, the history of the Indian ICT sector did not begin with 1990s liberalisation reforms, but with interventionist policies of the Indian government in the 1970s (Saraswati, 2008). Security issues, such as Sino-Indian war and the US embargo led Indian government to its first efforts to formulate a policy towards self-sufficiency in technology, including computers. Until then the industry was dominated by foreign corporations, such as IBM, which provided computers on lease, making high profits without establishing local manufacturing capacities (Saraswati, 2008). In 1966 Bhabha report outlined reforms in the industry, including creation of the Department of Electronics (DoE).

Self-sufficiency in computer production was to be achieved through creation of wholly-owned Indian companies and partial nationalisation of foreign enterprises. A new Indian company- Electronics Corporation of India Limited (ECIL) was established. It was granted monopoly in manufacturing of computers at the higher end of the market with the objective of providing the company with sufficient time to develop technology as well as to grant it with a dominant position on the local market (Saraswati, 2013). However, as ECIL lacked knowledge of production process, the development of domestic hardware stagnated. In addition, political rivalry between DoE and the Ministry of Defence prevented two public sector enterprises ECIL and Bel from sharing innovation, knowledge and technology (Saraswati, 2008). Therefore, while developing indigenous



hardware, ECIL continued to rely on importing components using foreign exchange obtained from export of software.

The Software Export Scheme adopted in 1972 was designed to promote software exports in order to finance development of hardware industry by obtaining foreign exchange. The Scheme allowed small software companies to import computers for lower duties with the objective to use them for developing software for foreign markets. Additional promotion of export included loans provided by the DoE, which could only be repaid in foreign currency earned through export. However, the Scheme failed to account for additional expenses related to on-site installation and maintenance of software, such as travelling and living expenses of engineers abroad. As the profit margins remained low, the companies lacked investment for upgrading and innovation (Saraswati, 2013).

The objective to acquire foreign exchange as fast as possible thus began to impede development of value-added software industry built on trials and errors in a conducive environment of the domestic market. At the end of 1970s the government revised the strategy and in 1978 introduced the Minicomputer Policy. The purpose of the policy shifted towards greater access to computers rather than creation of strong IT industry. It hastily expanded licensing for manufacturing of computer components. Subsequently, increased competition hampered desired economies of scale and infringed on ECIL's market and further threatened reinvestment of profits. Apparent discrepancies between rhetoric of the Policy, which maintained the support for dominance of ECIL in higher-end computers and its poor implementation, satisfied interests of big business houses, which lobbied for easier access to cheaper and better-quality computers. (Saraswati, 2013).

An additional unintended consequence of the Minicomputer Policy was increased import of Simple Knocked Down kits from Taiwan and Japan and their assembly by newly



licensed small Indian hardware companies. Even though recorded as computers manufactured in India, such screwdriver assembly represented only little value added and failed to contribute to the development of local production capabilities (ibid). However, as the assembled computers were imported without software, the Indian software companies were given opportunities to create new one. Since the first time after the introduction of the Software Export Scheme, revenues from domestic service provision in the software industry outpaced revenues from their export (ibid). The industrial shift from the hardware development to the provision of software services ignited by the Minicomputer Policy was explicitly embraced by the government led by Rajiv Ghandi.

The software industry, represented by NASSCOM- the National Association for Software and Service Companies took a lead in influencing the government policies. The state embraced NASSCOM's request for liberalisation of ICT industry, including exports and provision of high quality infrastructure, which would facilitate the export of software. During 1986 and 1989 the DoE adopted several new policies in support of software export, including reduction of import duties on hardware and software. Furthermore, the Exim bank began to offer financial support for software exporting companies in a form of loans, port-shipment credit and export credit guarantees. (Saraswati, 2008).

In addition to financial incentives for export, the state's main contribution to the industry has been its support for infrastructure development. Firstly, the state financed implementation of the International Packet Switched Service, which allowed Indian companies to connect to international network and transmit data to its foreign clients. Secondly, the DoE formulated and implemented creation of Software Technology Parks (STP), in which companies are directly connected to clients via satellites. Apart from advanced telecommunication technology, the parks offer subsidies in water and electricity. Finally, companies located in STP are given tax holidays and can import



computers duty-free. Moreover, the company, which is entirely export-oriented, enjoys tax free status for five years. Currently there are approximately 6550 STP in India. (STPI, 2011).

India's shift to liberalisation and free trade in 1990s transformed the role of government in the IT industry. Current structure of Indian IT sector has been shaped by government policies adopted since 1970s as well as by globalisation of IT markets. On one hand, the latest phase of reforms in the industry, which aimed to facilitate relationship between Indian software companies and their foreign clients, delivered it promises. However, when considering the entire IT industry, three structural features become apparent. First, none of the recent policies addressed structural problems of hardware industry. Second, Indian software industry is driven by export, making it dependent on international markets and trends. Third, liberalisation of both hardware and software industries led to reestablishment of transnational corporations in both markets. The three features will be elaborated below.

India's ICT sector has been growing at unprecedented rate since 1990s. Between 1990 and 2000 the annual compound rate of growth of output was 37 percent. However, the growth is being led by rapid expansion of exports, which have been growing at 54 percent a year in the same period. The shares of exports in total output in Indian ICT industry rose from 19 percent in 1991 to 81% in 2014 (Heeks, 2015)!

Zooming in one observes that export is dominated in the ICT services, which contributed almost 57.9percent to total export revenues, followed by business process management (23.5%) and software products and engineering services (18.6%) (IBEF, 2015).<sup>1</sup>

However, regarding the value-added of the ICT services exported Indian software producers concentrate on provision of outsourced services with low level of innovation. .



While business process management services grew by 59 percent between 1990 and 2002, ICT service, product and technology services grew only by 18.3 percent in the same period (ibid). In fact, it is technology development, networking services and ICT consulting, which constitute higher value-added in ICT service sector. ICT consulting, which is on a top of value-added pyramid, accounts for only 3 percent of export revenues, while customer service segment contributes to more than half of the total export revenues (CII, 2010).

On the other hand, hardware contributed to only 1 percent of Indian ICT export revenues in 2010, while accounting for 49 percent of domestic revenues (CII, 2010). The reason is the state bias towards the software industry exports, limited amount of indigenous producers and lack of competitiveness on the global market. The government never enforced compulsory spending in R&D hampering development of local hardware industry. In addition, as mentioned earlier, reduction of import duties and tariffs and market liberalisation gave rise to re-emergence of multinational corporations in Indian ICT sector. Currently, a half of 15 computer brands in India are well known international brands, and the only two Indian companies in the group are active in retail (C. P. Chandrasekhar, 2003).

In addition to monopolising the domestic market, multinational corporations contribute to growing import intensity in the industry. Instead of localising manufacturing of components, the corporations' suppliers continue to import knocked down kits for mere assembly. Such strategy limits employment and innovation opportunities in Indian hardware sector (ibid). The result is domestically low value added industry dependent on import of foreign produced components, with profits accruing in the hands of multinational corporations operating in India.

Nevertheless, the government promotes the country as the most popular offshoring destination for ICT services. However, the biggest beneficiaries of offshoring are the



companies, which engage in offshoring, capturing 78 percent of offshoring value. On the other hand, India captures only 33 cents out of every dollar offshored. 4 cents accrued by the state might not cover the subsidies that state provides to foreign and domestic companies operating in India (C P Chandrasekhar & Ghosh, 2006). In addition to repatriation of profits, Indian companies spend extra 5 cents (on every dollar offshored) on purchase of computers, telecommunication equipment, other hardware equipment and sometimes software, financial and marketing services from the United States, in order to be able to provide services to its American clients (ibid).

### ***3.2 Conclusion***

The objective of the section was to account the government role in creation and development of the India's ICT industry. Unprecedented growth of the industry has given rise to many optimistic projections of industry's developmental potential. However, numerous questions arise with respect to the state's ability to capture benefits of the industry's success. First of all, the government's primary objective to acquire foreign exchange to promote further development of ICT industry and the economy has failed. Most of the profits are either repatriated to companies abroad or are kept by private enterprises. The inability of the state to retain profits hindered development of hardware industry, making the whole industry highly dependent on exports. Secondly, the state has not succeeded in promoting broader linkages between the ICT industry and the rest of the economy. As the state restricts its support to provision of infrastructure, its ability to determine the terms of the industry's structure remains limited. The domination of the private enterprises in investment in the sector can threaten diffusion of connectivity and networks unless their expansion is profitable for businesses. This might have negative impact on broadening internet and telecommunication use to government, lower classes as well as education providers. Lastly, current domination of software exports has been an outcome of government



policies, sometimes intended and at times unintended. Despite of popular optimistic projections of ICT-led growth, the industry's impacts remain geographically, socially and economically limited.

However, many Indian economists argue that in fact, recent success of Indian sectors is a result of continuity between the state's interventionist policies of the past and current indirect support of the state in terms of technical and scientific infrastructure (Saraswati, 2008; Singh, 2008).

Two observations are crucial with regards to the development and state of Indian ICT industry. First of all, Indian ICT policy emerged, transformed and reformed as a result of negotiations and battles among different actors, including the DoE, the Ministry of Defence, business houses, transnational corporations, Secondly, the state-led development of ICT industry has been an outcome of trials and errors, intended and unintended consequences of the state interventions. Starting with nationalisation of foreign enterprises and extreme delinking between foreign capital (including technology and knowledge) and wholly-owned Indian enterprises, through dependence on foreign exchange and with it connected support for software export to undermining indigenous production of hardware by lack of implementation of the Minicomputer Policy, the structural features of Indian ICT sector is a result of planned steps, historical forces and inadvertent conclusions.

Analysing export structure of the ICT industry one must be very careful with regards to optimistic projections of many policy-makers and analysts. Dependence on exports of low value-added services and inability to move beyond assembling hardware prevents Indian ICT industry from having widespread economic and social benefits. In addition to the low value-added structure of exports, the dominance of multinational corporations prevents government from acquiring necessary revenues for further improvement of the both software and hardware industries.



## 4. Retention of foreign exchange- how China accumulated USD 4 trillion

In contrast with India, Chinese developmental experience offers an example of a successful foreign exchange retention scheme. China, similarly to India, adopted export-led industrial strategy with the objective of generating foreign exchange. However, on the contrary to India, China has benefited from retention of export profits, and in their use in cross-subsidizing development of other industries. China's recent shift towards investment in high value industries represents a continuum in her development policies.

China's foreign reserves are currently estimated at USD3.9 trillion (The World Bank 2015). Despite increase in consumption rates, which grew at 8-12 percent a year in the past two decades, Chinese growth continued to be led predominantly by investment (Rosen & Bao 2015).

The following country study will explore the mechanisms of export profits retention adopted by the Chinese government and their subsequent allocation through China Investment Corporation and Development Bank. The first section analysing the introduction and evolution of China's foreign exchange policies will be followed by an overview of financing vehicles, which transform foreign exchange reserves into domestic investment. China is in the process of a gradual foreign exchange reform since opening up. While the latest phase focuses on exchange rate convertibility, its initial phases aimed at strengthening of real sector and export capacity, slowly moving towards liberalisation of domestic financial sector, including liberalisation of current account and liberalisation of inward foreign direct investment (Lin & Schramm, 2003). Foreign exchange system reform lies in the core of the reform process. The last section will then investigate how China uses the retained foreign exchange for the development of one of the most dynamic sectors, wind turbine industry. Separate

attention will be given to access to capital through state banks and institutions as well as indirect support by the government in form of subsidies, tax and export incentives.

#### ***4.1 Evolution China's foreign exchange policies***

Before opening up, China's foreign trade was conducted through limited amount of state-owned foreign trade corporations. All the foreign exchange as well as the domestic currency profits had to be surrender to the central government, which then allocated the forex according to state planning. With the opening up in the late 1970s, a steady increase in export meant that allocation of foreign exchange became an excessive burden for the central government and was therefore gradually decentralised. The number of the foreign trade corporations rose from 400 in 1981 to over 10,000 in 1990s. Coastal provinces were granted greater autonomy in establishing and operating their own foreign trade. In 1979 SAFE- State Administration of Foreign Exchange was established as an institution supervising foreign exchange control (Lin & Schramm 2003).

In order to provide incentives for exports under the new retention system, exporters were allowed to retain a certain portion of their foreign exchange earnings through quotas. These quotas (or earnings) could be subsequently used for financing imports approved by the state. From 1980 different cities introduced trading system for the quotas through which licensed companies could trade among themselves.

In practice, domestic enterprises were allowed to retain around 25 percent of their foreign exchange earnings up to a target amount, which was negotiated with the government. The rest of the earning was remitted to the central government. In addition, a firm had to share 12.5 percent of the retained earning with the local company. Any foreign exchange earnings above the target amount remained in control of the firm and served as an incentive for further export (Kelley & Shenkar, 1993).



However, as exchange rate for trading was overvalued, the export sector suffered from unprofitability, while the import sector remained profitable. To stop cross-subsidizing, the government introduced the internal settlement rate (ISR) system, which applied only to tradable goods. The introduction of ISR was accompanied by the establishment of dual exchange rate system, in which tradables were exchanged at undervalued rate, while official exchange rate used for non-tradable and remittances remained overvalued. This dual exchange rate was officially abandoned in 1985 and replaced by swap market (ibid).

With the rising number of joint ventures in special economic zones, the provision of direct export subsidies became unfeasible. Therefore, swap markets grew into a favourable incentive mechanism for export promotion.. After the first swap market opened in Shenzhen special economic zone, the number of markets rose substantially. The exporters were encouraged to exchange foreign currency for Yuan in the swap market for more preferable rate than the official one. Subsequently, obtained domestic currency was then used for purchase of local inputs at lower costs (Lardy, 1992).

Through such design of foreign exchange retention, domestic exporters, local governments and foreign enterprises also received part of the benefits generated by the system as the more depreciated swap market rate was applied. However, importer who didn't have access to cheap foreign exchange did not benefit from underappreciated exchange rate.

Swap markets were replaced by government-designated forex controlling banks in 1988, which continued to operate under dual exchange rate system until its abolishment in 1994 (Ni, 2009). During this period direct export subsidies were abolished and individual were allowed to participate in swap markets (Lin & Schramm 2003). When domestic enterprises were allowed to purchase foreign exchange in 1994, the People's Bank of China (PBC) became the dominant institution of the foreign trade policy.



Further liberalisation of current account relaxed controls on transactions and access to foreign exchange for both domestic and foreign companies (Ni, 2009).

Monetary policies controlled by the central bank, PBC, regulate supply of foreign exchange accumulated in banks. Currently, banks have to sell the foreign exchange balance to the central bank. Another instrument adopted by the PBC is altering working balance requirement for banks, according to which all the foreign reserve above the balance must be surrendered to the central bank. Despite the fact, that such monetary policy hinders development of interbank market and stimulates inflation, it allows the economy to absorb the excess of foreign exchange and prevents the currency depreciation (ibid).

#### ***4.2. China's investment vehicles***

Similarly to other countries with excess foreign exchange reserves, China divides its reserves between those held for the purpose of liquidity and those intended for long-term investment. For that purpose, the government established an allocation mechanism consisting of the central bank, the Ministry of Finance and the China Investment Corporation.

In 1992 China's foreign exchange reserves accounted for 4 percent of GDP, USD 19.4 billion. This amount crossed USD 100 billion in 1996, USD 200 billion in 2001 and USD 500 billion in 2004 (Truman, 2008). The increasing amount of foreign exchange reserves required a creation of institutional structures, which would facilitate their management. At the beginning of the 2000s the government created the Central Huijin Investment Corporation with a capital of USD 67.5 billion of foreign exchange reserves. In 2007 the corporation was absorbed into the China Investment Corporation (CIC). The objective was to use USD 200 billion from foreign exchange reserves to recapitalise the



Agricultural Bank of China and the China Development Bank (ibid). This was thus the first role of newly skyrocketed foreign exchange reserves.

In addition to providing support for domestic investment, the reserves are used for providing loans to foreign companies and investment abroad. In order to invest in the domestic market, the foreign currency needs to be converted into Yuan. Some criticize such operations as the conversion creates a risk for the bank as well as opens space for corruption. On the other hand, when the CIC provides loans to foreign government, it can do so either in foreign currency directly or by obtaining a loan from the PBC denominated in foreign currency.

Since its establishment, the CIC invested the majority of its assets in corporate bonds and about one third of its assets is estimated to be invested in foreign equities (Setser, 2008). In addition to the CIC handling the pool of foreign exchange, additional resources are managed by smaller players. These include Chinese financial institutions managing their foreign assets as well as foreign direct investment by Chinese companies.

The purpose of the CIC is to maximise long-term investment returns. The CIC serves as the main vehicle in handing the excess reserves mobilized through the PBC and commercial banks.

Additional instrument for financing domestic investment is the China Development Bank (CDB). In April 2015 the PBC recapitalised the CDB and the Exim Bank by providing them with capital of USD 32 billion and USD 30 billion respectively. This was in support of infrastructural project "Belt and Road" (Zhang, 2015). After its formation in 1994 the bank focused on large infrastructural projects in China. The bank is semi-commercial serving the developmental objectives of the state. It is the second biggest bond issuer in China, after the Ministry of Finance. The funding sources for foreign currencies is raised through a combination of domestic bond market and domestic



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borrowing Apart from bonds, the bank acquires funds from the National Post Savings and other savings and insurance companies (CDB, 2015).

The CDB gradually expanded its portfolio to include its overseas lending. The bank provides commercial loans to Chinese companies expanding abroad, resource-backed loans and provides credit for mergers and acquisitions. In addition, the bank expands its presence overseas through private equity funds. One of these funds is the China- Africa Development Fund was created in 2006 with the initial capital of USD 5 billion entirely financed by the CDB.

The CDB continues to focus on infrastructural projects, which account for approximately 37 percent of its loans, followed by energy projects (11 percent) and railway (8 percent). In 2013 more than 15 percent of the CDB's loan went overseas (Grimsditch & Yu, 2015).

The last vehicle for financing development projects is the Exim Bank, which is a export credit agency supporting Chinese companies investing abroad. In addition to its concessional lending, which accounts for the largest part of its disbursement, the bank provides export seller's credits, export buyer's credits, commercial loans and guarantees, import credits and resource-backed loans The bank also operates via investment funds, such as China- ASEAN Investment Corporation Fund (Grimsditch & Yu 2015).

Both the CDB and Exim Bank are the main vehicle of providing so called green lending, which includes projects such as water management, recycling, industrial upgrading and renewable energy. In 2013 the CDB's loans for environmental protection and energy conservation amounted to USD 144 billion (ibid.).

The following section will analyse how the abovementioned drivers of domestic investment contributed to the development and growth of one of the biggest beneficiary of industrial financing, the wind energy sector.

#### 4.3. Stimulation of the economy through the wind turbine industry

China and India represent two major emerging wind turbine markets. In addition to the increasing capacity of renewable energy, both countries are homes to some of the world's largest wind turbine producers (Lewis, 2007). China is currently the world's second largest wind power after the United States. In installed capacity, China overtook Germany and the United States in 2009, accounting for 31 percent of the global capacity in 2014 (GWEC, 2014).

However, the success of the Chinese wind turbine sector would have not been possible without industrial policy instruments specifically designed for the sector, which will be elaborated below.

In China, the evolution of the modern wind energy sector went through four phases. In the first phase, foreign companies, which started to operate in China, such as Goldwind established demonstration wind farms, using grants from foreign donors (IRENA, 2012). In the 1990s the wind energy sector gradually expanded through government subsidies. Starting from 1993 the government embraced strategic development of the industry by facilitating connection of wind farms to electricity distribution grids. The second phase was characterised by the government facilitation of the market through creating concession policy programme, which encouraged domestic companies to participate in projects. In addition, the local content requirement was increased from previous 50 to current 70 percent. The purpose of the competitive bidding was to lower power generation cost, decrease cost of electricity and to increase local production of wind turbines. By the end of the second phase in 2004-2005, the market share of locally



produced wind turbines increased to 18 percent. Third, the period between 2005 and 2007 marked a phase of accelerated growth of renewable energy in China through targets formulated by the central government. The official commitment of the government to renewable energy sent a positive signal to both foreign and domestic investors. In order to encourage international producers to localise manufacturing in China, the 70 percent local content requirement remained. With regards to the funding, the extra cost of integrating the renewable energy into distribution networks was to be covered by the Renewable Energy Fund. Current, fourth developmental phase focuses on creation of seven new bases with doubled capacity. The central and provincial governments started to coordinate infrastructure development required for storage and transmission of renewable energy related to the rapid increase in its generation. In addition, China is moving towards offshore wind energy generation and already started building the first offshore demonstration plants. In 2010 the 70 percent local content requirement was removed as it became obsolete. The requirement achieved its objective of localising foreign manufacturers as well as generating domestic production.

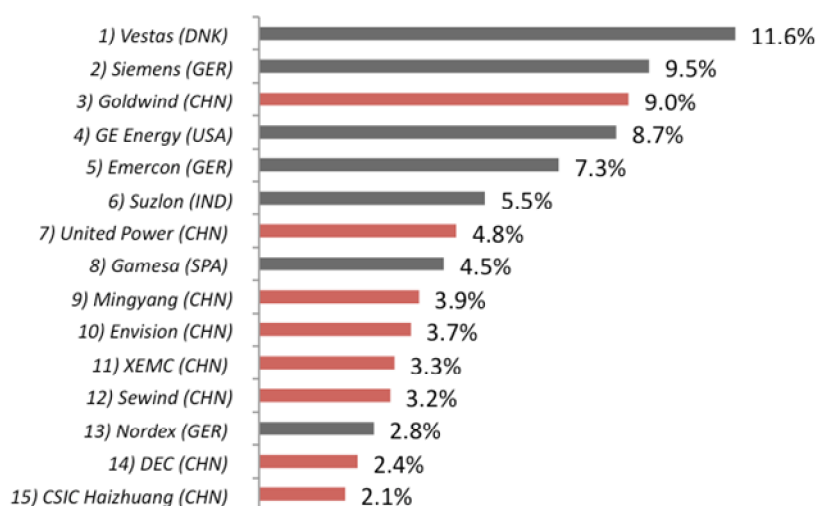
While at the beginning, China did not possess technological knowledge of wind turbines production and all turbines had to be imported, domestic producers currently control a half of the China's market (Zhou & Wang, 2009; IRENA, 2012). The development of the national wind turbine manufacturing required investment in R&D, the support for technology transfer and indigenous innovation.

The government facilitated acquisition of foreign technology through funding for R&D and promotion of joint ventures with foreign companies. Goldwin, currently the second largest Chinese producer, obtained advanced technology through technology licensing from American company Jacobs and German Repower (Ru et al., 2012).

The next step towards the final indigenous production was to encourage joint innovation and design and to establish collaborative initiatives. The strategy was, however, only partially successful. As in 2003 84.7 percent of turbine systems in the market were produced by foreign companies, the government adopted a 50 and later a 70 percent local content requirement. The regulation was effective and five years later 75.6 percent of turbines were produced domestically.

In 2008 large Chinese wind turbine producers launched their internationalisation strategies. The reason was to escape saturated domestic market as well as to acquire access to core technologies and markets. Goldwind acquired Vensys and established R&D centre in Germany. Huiteng gained access to the prestigious blade design through acquisition of Dutch CT Holding. At the same time, the government abolished localisation requirement and suspended preferential value-added tax regime. Currently four Chinese producers rank among the world's ten largest wind turbine manufacturers (see Figure 7).

Figure 7 Global shares of top 15 wind turbine manufacturers (2014)



Source: statista.com



In addition to the Chinese turbine producers, Chinese suppliers to the wind energy sector are becoming better integrated in global supply chain. For example, in casting for wind turbines sub-sector, Chinese firms control 30 percent of global market (RBSC, 2011).

The main facilitators of the expansion of Chinese wind turbine manufacturers both home and overseas are the CBD and Exim Bank. In order to meet the government goal to produce 20% of the energy from renewable sources by 2020, the CBD provided solar and wind energy sector with investment totalling USD 47.3 billion in credit lines between 2010 and 2013 (Sanderson & Forsythe, 2013). In addition, the CBD in 2010 alone provided approximately USD 6.5 billion and USD 6 billion to Sinovel and Goldwind respectively (Tan, Zhao, & Bai, 2013). The CBD provides credit lines for projects with the objective to acquire and develop foreign plants, balance sheet financing as well as credit to foreign partners. In addition, the Bank together with the Exim Bank provides finances in support of export (ibid). In 2012 the CBD provided line of credit to Goldwing in order to develop its African market. In March 2015 Tanzania entered negotiations with Exim Bank for a loan over USD 132 million to build its first wind farm in cooperation with the Chinese (Construction Review Online, 2015). In addition to loans, the government subsidizes use of renewable energy. In 2010 the government provided subsidies amounted 26 percent of the total power sector investment (Hu, et al., 2013)

#### ***4.4. Conclusion***

Despite the fact that China's development has been facilitated by the unprecedented amount of its foreign exchange reserves, the mechanisms behind their accumulation seldom explored. This section analysed particular instruments of foreign profit retention adopted at the beginning of China's reform era and reformulated since. The country's foreign exchange policy became instrumental in not only controlling the



exchange rate, but also in encouraging foreign enterprises to localise their production facilities in China. Firstly, the earliest quota system succeeded in encouraging domestic companies to export. As the rise of foreign enterprises in China made quotas unsustainable, the system was replaced by swap markets, which on one hand strengthened the retention of foreign exchange, while on the other, created demand for local inputs. These were offered to foreign and local producers for more convenient exchange rate. To sum up, the exchange retention system enabled China to control inflow of foreign exchange in more effective way than any other developing country. As demonstrated in the case of India, unsuccessful retention of foreign exchange changed the direction of the ICT industry, making it more dependent on export altering its structural characteristics.

Subsequently, the section moved towards answering the question of how China uses its accumulated foreign exchange for further economic growth. The analysis of different financing vehicles demonstrates that China implemented indirect use of foreign exchange reserves in order to support its domestic investment. The foreign exchange reserves were on one hand used to recapitalise Chinese investment banks with large share of non-performing loans, such as the Agriculture Bank of China and the CBD. On the other hand, the reserves are now being used for the promotion of internationalisation strategies of Chinese corporations. This is done through the China Development Bank and the Exim Bank. Interestingly, these two institutions are used to promote the government's commitment to environmental protection and domestic sectoral restructuring. As manifested in the case of the wind turbine sector, the financing mechanism in combination with industrial policy contributed to development of indigenous industrial production. At the beginning, the government sponsored R&D activities undertaken by local producers and foreign companies in order to obtain technological knowledge and capabilities necessary for development of domestic



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production. Currently, the CDB and Exim Bank provide loans and export credit to largest manufacturers in order to expand their production overseas.

The Chinese wind industry has largely benefited from formalised and stable government support. Favourable policies and the government pledge to renewable energy made China the most dynamic wind energy market in the world. China is endowed with both a large domestic market and increasing competitiveness on the global markets. To conclude, even though the effort of the Chinese government to move up the global value chain is in its early stages, the country has been able to position itself in several high tech sectors, including wind energy sector. The success of the industry demonstrates China's commitment to its industrial policy, which includes clear formulation of industrial plans and subordination of financial instruments towards the goal. The state interventionist policies would not be, however, possible without great amount of financial resources that China has accumulated since its first reforms in the 1970s.





## Conclusion

The four studies of emerging economies shed light on the ways in which developing countries mobilise domestic resources for their industrial development and on the tensions arising from different industrial strategies. As liberalisation of capital accounts and increasing dependence on external finance increase the vulnerability of developing countries, they try to find alternative sources of financing on their domestic markets. This paper analysed some of the mechanisms of mobilizing domestic resources and their subsequent allocation.

Firstly, the case of Brazil showed that despite the existence of a large and relatively effective disbursement institution, such as BNDES, the country faces challenges in the form of misaligned policy instruments. The issue arising from the comparison between the aerospace and automotive sectors is who benefits from BNDES financing. While Embraer successfully made use of BNDES funding for the acquisition of new technology, investment in R&D and design, the finance that supported attracting FDI in the automotive industry failed to prevent the further deindustrialisation of Brazil's auto-part sector. BNDES financing and the new INNOVAR\_AUTO regime benefit large foreign companies, which dominate the local market. Therefore, it is not only the volume of available funding but also its incorporation into wider industrial strategies that can create successful self-financing mechanisms.

The second vehicle for accumulating domestic resources examined in this paper were pension funds. In South Africa and Brazil, private savings administered by public pension funds represent two of the world's most dynamic pension fund industries. Due to the financialisation of the global pension fund market, the aim of funds has shifted



towards maximising profits of their assets, away from supporting domestic socio-economic objectives. Pension funds are increasingly seen as sources of liquidity able to channel resources towards a great variety of assets. However, while Brazilian pension funds still serve as instruments for enhancing broader economic objectives, their South African counterparts are governed by profits only. The purpose of Brazil's PREVI, PETROS and FUNCEF's participation in the privatisation process of the 1990s was to maximise the benefits of privatisation by dividing the profits among their members. On the contrary, South Africa's GEPP invests in the most profitable sectors in the country, without any specific concern for public goods. Its investment is skewed towards finance, mining and property, reproducing historical patterns of underinvestment in South African productive sectors. The challenge arising from the comparison between the South African and Brazilian pension systems is therefore how to combine effective management of resources with their allocation for the purpose of increasing productive growth.

The third self-financing mechanism relates to export strategies pursued by many emerging and developing countries. As demonstrated in the case of India, it is not just industrial strategy which drives successful development, but also the ability of a country to retain foreign exchange acquired through export. India's development strategy envisaged using exports of ICT software to attain resources for financing the development of higher value-added hardware industry. However, because of power struggles between government agents and foreign and domestic producers, the retention of foreign exchange from exports never materialised. On the contrary, the export of software made the industry more dependent on the export of low value-added software services, which in addition require subsequent import of foreign hardware and software, worsening India's trade balance. The government's inability to harvest export revenue reproduces its bias towards software, contributing to locking in India's hardware industry in low value-added assembly of foreign computers.



Lastly, in comparison with India's inadequate foreign retention mechanism, the case study of China demonstrated how the evolution of Chinese capital controls contributed to the retention of a large proportion of China's export earnings and their subsequent use for financing industrial development. The section analysed changes in China's policy from a dual exchange rate mechanism to the current monetary policy administered by the People's Bank of China. The analysis further explored the institutional vehicles used for allocating foreign exchange reserves. For the purpose of investment in domestic markets, the reserves are used in two ways. Firstly, since the early 2000s the reserves have been used for recapitalising large development banks in order to improve their performance. This took place in the case of the Agricultural Bank of China and the China Development Bank. Secondly, the reserves are currently used to improve economic performance through financing industrial upgrading. The China Development Bank and the Exim Bank are two main channels for financing Chinese companies' industrial expansion. The institutions are instruments supporting the government's commitment to environmental protection and the promotion of renewable energy. This was demonstrated in the case of the wind turbine manufacturing sector discussed in the section. The unprecedented growth of the wind energy sector in China and its subsequent globalisation would not have been possible without financial assistance provided by both the CDB and Exim Bank.

Different forms of self-financing of industrial development were therefore explored. The main lesson arising from this study is that successful industrial strategy does not depend only on the ability of the state to mobilise finance but also on its allocation towards productive sectors of the economy.

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<sup>i</sup> Business process management accounts for broad based service providers, who offer IT enabled services to overseas customers, including customer interaction services, processing of credit card accounts, insurance claims and business payrolls, help desks, medical transcription etc. (C. P. Chandrasekhar, 2003).

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## Appendix

Table 2 GEPF asset allocation 2008-2014

|      | EQUITY |                 |          |         | BONDS       |       |          |         | CASH/MONEY | REAL ESTATE |          |          | PRIVATE DEVELOPMENTAL |
|------|--------|-----------------|----------|---------|-------------|-------|----------|---------|------------|-------------|----------|----------|-----------------------|
|      | total  | listed/unlisted | domestic | foreign | unspecified | total | domestic | foreign |            | listed      | unlisted | domestic |                       |
| 2008 | 52.7   | 92%             |          |         | 33.8        |       |          |         | 7.9        | 0.4         |          |          | 4.4                   |
| 2009 | 43.9   | 94%             |          |         | 43.9        |       |          |         | 5.8        | 0.9         |          |          | 2.5                   |
| 2010 | 56     | 99%             | 54.95    | 1.05    | 36.3        |       |          |         | 3.9        | 1.4         | 2.1      |          | 0.4                   |
| 2011 | 57.4   | 97%             | 53.2     | 4.2     |             |       | 36.1     |         | 4.6        |             |          | 1.9      | NA                    |
| 2012 | 53.81  | 95%             | 50.7     | 3.11    |             | 36.18 | 33.6     | 2.58    | 4.1        |             |          | 4.7      | 1.15                  |
| 2013 | 56.4   | 95%             | 53       | 3.4     |             | 35.4  | 33       | 2.4     | 5          |             |          | 3        | NA                    |
| 2014 | 58.4   | 95%             | 54.3     | 4.1     |             | 31.6  | 29.7     | 1.9     | 4.8        |             |          | 4.5      | NA                    |

Source: GEPF annual reports

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## **THE ABSTRACT OF THE PROJECT IS:**

The research programme will integrate diverse levels, methods and disciplinary traditions with the aim of developing a comprehensive policy agenda for changing the role of the financial system to help achieve a future which is sustainable in environmental, social and economic terms. The programme involves an integrated and balanced consortium involving partners from 14 countries that has unsurpassed experience of deploying diverse perspectives both within economics and across disciplines inclusive of economics. The programme is distinctively pluralistic, and aims to forge alliances across the social sciences, so as to understand how finance can better serve economic, social and environmental needs. The central issues addressed are the ways in which the growth and performance of economies in the last 30 years have been dependent on the characteristics of the processes of financialisation; how has financialisation impacted on the achievement of specific economic, social, and environmental objectives?; the nature of the relationship between financialisation and the sustainability of the financial system, economic development and the environment?; the lessons to be drawn from the crisis about the nature and impacts of financialisation? ; what are the requisites of a financial system able to support a process of sustainable development, broadly conceived?'

## THE PARTNERS IN THE CONSORTIUM ARE:

| Participant     | Participant organisation name                    | Country      |
|-----------------|--|--------------|
| 1 (Coordinator) | University of Leeds                              | UK           |
| 2               | University of Siena                              | Italy        |
| 3               | School of Oriental and African Studies           | UK           |
| 4               | Fondation Nationale des Sciences Politiques      | France       |
| 5               | Pour la Solidarite, Brussels                     | Belgium      |
| 6               | Poznan University of Economics                   | Poland       |
| 7               | Tallin University of Technology                  | Estonia      |
| 8               | Berlin School of Economics and Law               | Germany      |
| 9               | Centre for Social Studies, University of Coimbra | Portugal     |
| 10              | University of Pannonia, Veszprem                 | Hungary      |
| 11              | National and Kapodistrian University of Athens   | Greece       |
| 12              | Middle East Technical University, Ankara         | Turkey       |
| 13              | Lund University                                  | Sweden       |
| 14              | University of Witwatersrand                      | South Africa |
| 15              | University of the Basque Country, Bilbao         | Spain        |

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