

## Chapter 4

### Brazil

#### Public Procurement and Innovation in Brazil: A Changing Course of Public Procurement Policy?

Victor Mourão and Rodrigo Cantu

**Abstract** Despite recent advances, Brazil still faces serious social and economic problems as an emerging economy. Public procurement can be considered an important instrument in overcoming some of these adversities, particularly in promoting domestic innovative capacities. We tackle some of the main aspects of the connection between public procurement and innovation in Brazil, a relatively recent issue in the country's political and economic arenas. We argue that the Brazilian government does not have, so far, a procurement policy that can successfully integrate its innovation policy. Its procurement system focuses primarily on fighting corruption, neglecting the quality and the more broad results of purchases. Against this background, two types of policies stand out: sector-specific procurement policies addressing innovation—still rather fresh and few in numbers—and funding policies directed at specific technological areas, which are in turn not integrated into the purchasing power of government. Since these policies have not yet displayed their full potential, we conclude by pointing out the main obstacles on their way. The development of a more consistent association between public procurement and innovation policy in Brazil thus depends on the coordination between different public policies already in existence, the improvement of procurement departments and the better synergy between public and private actors.

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V. Mourão (✉) · R. Cantu

Instituto de Estudos Sociais e Políticos, Rio de Janeiro State University (IESP-UERJ),  
Rua da Matriz, 82. Botafogo, CEP, Rio de Janeiro (RJ) 22260-100, Brazil  
e-mail: victorlamourao@yahoo.com

R. Cantu

e-mail: rcantuds@gmail.com

## 4.1 Introduction

Brazil is a country of vast dimensions, with a population of about 190 million people in its 8.5 million square kilometers area. This places it as the fifth largest country, both in territorial extension and population. The distribution of population in this territory is uneven, concentrated in urban areas in the southern, southeastern and northeastern regions.

The country is linguistically homogeneous (the vast majority of the population is Lusophone), and ethnic and religious cleavages are weak. Its current political system is defined as a federal presidential republic, with direct elections for the executive and legislative branches at the local, state and federal levels. Its current GDP is 2.52 billion dollars, making Brazil the sixth largest economy in market exchange rates (CEBR 2011).

Positive assessments have pointed out that Brazil was one of the first countries to recover from the crisis that began in late 2008; its agricultural sector thrives, and inequality has decreased mainly because of successful social-assistance programs that became worldwide models. Despite this recent optimism, problems still abound. To start with, high levels of poverty and inequality and poor economic growth are some of the general ills currently plaguing Brazil. More specifically, the risks of regressive specialization and de-industrialization have recently been considered central problems in expert discussion. The current account imbalances—partially generated by the deterioration of the balance of trade in technology-intensive products—is a further element which makes up the picture of what has been considered the main obstacles to sustained economic growth.

The scholarly literature has already identified the importance of public procurement in both achieving social goals and promoting industrial development and innovation (Kattel and Lember 2010; Edler and Georghiou 2007; McCrudden 2004). In Brazil this has also been recognized by actors in the political and economic arena as a key response to the obstacles mentioned above. However, the emergence of this issue is relatively recent, and more systematic investigations are needed on the connection between public procurement and innovation in the Brazilian case. Our objective here is to tackle some of the main aspects of this connection. How is public procurement conducted in a country like Brazil? To what extent can we talk about public procurement for innovation (PPfI)? What are the problems and virtues of the Brazilian PPfI? How does PPfI fit as a solution to the difficulties the country faces? This chapter attempts to answer these questions, arguing that Brazil started acting rather late in the field of PPfIs, although in recent years some initiatives have given greater weight to the developmental role of the public procurement.<sup>1</sup>

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<sup>1</sup> A consolidated version of this text was presented at the workshop entitled, “Public Procurement Policy for Innovation: International Perspectives,” held on 29–30 March 2012 at the Ragnar Nurkse School of Innovation and Governance at Tallinn University of Technology,

The remainder of the chapter is organized in the following manner. After this first section, we present some basic information about the Brazilian economy and politics, with emphasis on recent decades. In the third section, we examine the main characteristics of public procurement in Brazil. The fourth section discusses the policy initiatives which aim to combine procurement and promotion of innovation. The last section concludes with a brief assessment of PPfI in Brazil and considers the main potentials and challenges facing the country in this field.

## 4.2 Country Background Information

Traditionally a country marked by economic cycles linked to primary goods (Brazilwood, sugar cane, gold, diamonds, coffee and cotton), Brazil began to industrialize late, amid the Great Depression of the 1930s. As in many Latin American countries, the difficulty in obtaining foreign currency for the import of manufactured products—caused by the drop in international demand for commodities—resulted in a boost for local manufacturers.<sup>2</sup> Between 1930 and 1945, Getúlio Vargas ruled the country first as a revolutionary leader, then as president elected by the 1934 constituent assembly and finally as a dictator. It was during this period that the public effort for industrializing the country first got under way, marking the initial foundations of what would become a developmental state in the following decades. In the 1950s, several public institutions and companies that are still significant nowadays were created, among them Petrobras, CNPq, ITA, BNDES, which augmented governmental power in directing the economy. During Kubitschek's presidential term (1955–1959) many multinationals came to the country, dynamizing further the industrial base. The period of greatest prosperity for industrial development was set between the 1950s and 1970s, a period described as the heyday of the policy model which came to be known as *import substitution industrialization* (ISI).<sup>3</sup> Largely relying on external financing, this development strategy proved to be unsustainable.<sup>4</sup> With the oil crisis in the 1970s and the crisis of Latin American countries' sovereign debt that followed, the hitherto vigorous economic growth began to decline.

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(Footnote 1 continued)

Estonia. Some minor developments that have since taken place are not discussed, but hopefully they won't change our general argument.

<sup>2</sup> For a classical assessment of the Brazilian economy in the nineteenth and early twentieth centuries, see Furtado (1963).

<sup>3</sup> For an overview on the main issues concerning the ISI model in Brazil and in Latin America, see Hirschman (1968), Baer (1972) and Burlamaqui et al. (2006). For one of the first discussions on the achievements and weaknesses of this model in Brazil, see Tavares (1964).

<sup>4</sup> Cardoso and Fishlow (1990) summarize the main aspects of this crisis.

The country plunged into a deep crisis in the 1980s and early 1990s, a period marked by large macroeconomic imbalances, huge fiscal deficits, erratic growth, high inflation and soaring unemployment. In the 1990s, Brazil adopted a series of liberalizing measures, bringing down trade barriers and privatizing state enterprises. The Real Plan, implemented as from 1994, reduced inflation by means of a partial de-indexation of the economy. The Plan also established fixed exchange-rate parity with the US dollar and high interest rates, both of which stagnated the economy and expanded public debt. Since 1999, the country's macroeconomic policy is characterized by its orthodoxy: relative fiscal austerity is combined with a monetary policy based on an inflation-targeting regime and a floating exchange rate. In the 2000s, a slight recovery of growth was accompanied by the increased importance of primary product exports as a means to redress the balance of payments.

This recent trajectory is translated into numbers in Table 4.1. Considering its GDP, Brazil has left the 16th position in 1970 with a GDP of US\$ 35 billion (current prices) to become the 8th largest economy in 2009 with a GDP of US\$1,593 billion. Per-capita income also increased from US\$5,233 in the 1970s to US\$7,591 after three decades. However, these relatively positive aspects do not overshadow the poor socio-economic indicators of the last third of the twentieth century. Economic growth plunged from an annual average of 8.8 % in the 1970s to 1.6 % in the 1990s. The situation began to reverse in the 2000s, when the average annual growth was 3.3 %. The growth of per capita income fell from an annual average of 6.1 % in the 1970s to practically stagnate in the 1990s. Again, a slight recovery was observed in the following decade, with an average growth of 2 % of per-capita GDP. Another trait of the Brazilian economy is its rather low degree of openness. As shown in Table 4.1, the degree of openness—measured by the sum of exports and imports divided by the GDP—has changed little since 1970. Except for a drop to 15 % in the 1990s, openness remained around 20 %.

An important feature of the Brazilian economy is that the advancements made in the industrialization process between the 1950s and 1970s managed to establish a relatively diverse economic structure in the country (Fishlow 1980). Brazil ranks as one of the most successful cases of import substitution in Latin America. This development went beyond the consolidation of an industry of consumer goods, settling backward linkages with domestic producers of several intermediary goods due to both the large urban domestic market and assistance of development policies promoting industrialization. These linkages—again, largely policy induced—went even further and left rather robust sectors of basic inputs and energy production compounding an important legacy from this period.

In addition to its diversified industrial sector, the Brazilian economy is characterized by a large productivity gap among firms. This heterogeneity emerged already in the 1950s and 1960s, with the coexistence of modern and high-productivity industries along with backward and unproductive ones (Colistete 2009). This characteristic has persisted through time, not only in Brazil but throughout

**Table 4.1** Socioeconomic indicators

	1970	1980	1990	2000	2009
GDP at current prices in US\$—billions <sup>1</sup>	35.21	191.12	402.14	644.73	1593.02
GDP – percent change* <sup>2</sup>	8.79 %	3.02 %	1.64 %	3.32 %	–
Per capita GDP at constant 2009 prices in US\$* <sup>3</sup>	5233.0	6528.8	6683.1	7591.2	–
Per capita GDP – percent change* <sup>3</sup>	6.12 %	0.94 %	0.08 %	2.06 %	–
Gini Index* <sup>3</sup>	0.611	0.600	0.600	0.569	–
Degree of economic openness** <sup>2</sup>	17.2 %	22.3 %	15.2 %	23.2 %	22.1 %

\* Average for each decade

\*\* (Exports + Imports)/GDP

<sup>1</sup> UN statistics division

<sup>2</sup> Brazilian institute of geography and statistics (IBGE)

<sup>3</sup> Institute of applied economic research (IPEA)

Latin America (ECLAC 2010, Chap. 3).<sup>5</sup> Several studies of ECLAC (Economic Commission for Latin America and the Caribbean)—home of the Latin American structuralist school—point to this heterogeneity as the main source of the acute social inequalities in the subcontinent. This is especially true for Brazil, as shown in Table 4.1. Even if the Gini index has declined slightly, the country still remains one of the most unequal in the world.

This structural heterogeneity joins yet another imbalance. During the industrialization process, the Northern and especially the Northeastern regions of the country lag behind, producing significant regional differences.<sup>6</sup> These regions still have a less integrated regional structure. As a consequence, they are economically subordinated in a considerable extent to the dynamics of richer states. Linkages between firms are weaker—resulting in the dependence of intermediate goods from the most dynamic parts of the country—and the regional asymmetries in job creation produced waves of mass migrations to the Southeastern states. Since income is lower in these regions, infrastructure presents more problems and State governments have an abiding dependence on transfers from central government to balance their fiscal power.<sup>7</sup>

Much of the national innovation system was designed at the height of the developmental era of the 1960s and 1970s, when industrialization policies were at the center of government's concerns. The National Development Plans (PNDs) are hallmarks of this fundamental programmatic guidance, especially the second PND, which lasted from 1975 to 1979. Scientific and technological institutions were

<sup>5</sup> For recent and more complete assessments of general and sectoral technological capacities of the Brazilian economy, highlighting the heterogeneity here alluded to, see Negri and Lemos 2011a, b.

<sup>6</sup> For an overview of the history and current state of regional imbalances in Brazil, see Baer (2001: 323–354).

<sup>7</sup> This situation clearly has consequences for the differential development of the national innovation system in Brazil. For a glance at this issue, see Soares and Podcameni (2009).

created in this period, such as CENPES,<sup>8</sup> FINEP,<sup>9</sup> EMBRAPA,<sup>10</sup> COPPE-UFRJ,<sup>11</sup> as well as several undergraduate and graduate courses. This techno-scientific infrastructure lived through hard and inconstant years in the 1980s and 1990s, struck by fiscal crisis and shortage of foreign exchange reserves due to the deteriorating balance of payments.

This picture began to change at the turn of the millennium. Table 4.2 shows the amount spent on research and development as a proportion of GDP in the last decade. Brazil experienced an increase in public resources which allowed R&D infrastructure to expand once again.<sup>12</sup> Since 2006, there has been a mild and steady increase in R&D expenditure, reaching 1.16 % of GDP on 2010, while the average rate for Latin America (including Brazil) is roughly 0.7 % (Red Iberoamericana de Indicadores de Ciencia y Tecnología—RICYT 2012). If we consider the figures for Science and Technology—which some authors (Viotti and Macedo 2003; Luiz Ricardo Cavalcante 2009: 15) argue to be the best indicators to ascertain the expenditure efforts in innovation of a peripheral country—the proportion rises to 1.65 % of GDP in 2010. This scientific infrastructure is one of the central aspects that sets Brazil apart from other Latin American countries, with the possible exception of Mexico. Brazil awarded, in 2009, about 11,300 PhDs, while the rest of Latin America awarded about 4,000 of them (Red Iberoamericana de Indicadores de Ciencia y Tecnología—RICYT 2012).<sup>13</sup>

In technological terms, the Brazilian economy is not predominantly located at the international frontier. Still, it maintains a rate of product and/or process innovation<sup>14</sup> for manufacturing firms which lies at 38.11 %, and firm's spending on internal and external R&D activities in relation to their net sales is 0.73 %, according to data from PINTEC (Survey on Technological Innovation) for the triennium 2006–2008. Most of the spending on R&D industry is concentrated in the areas of medium-high technological intensity, accounting for over half of the

<sup>8</sup> Centro de Pesquisas e Desenvolvimento Leopoldo Américo Miguez de Mello, Petrobras' research center.

<sup>9</sup> Financiadora de Estudos e Projetos (Financing Agency for Studies and Projects), an agency of the Ministry of Science, Technology and Innovation.

<sup>10</sup> Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation), under the Ministry of Agriculture.

<sup>11</sup> Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering, a facility of the Federal University of Rio de Janeiro (UFRJ).

<sup>12</sup> For historical data on releases of funds for the FNDCT projects that confirm a pattern of stagnation of resources in the period of the 1980s until 2000, see Andrade (2009: 8). For more indicators on science and technology in Brazil, see <http://www.mct.gov.br/index.php/content/view/740.html>. Website in Portuguese.

<sup>13</sup> For a general review of Latin America's science, technology and innovation policies, as well as considerations about the current crisis impact on this matter, see Cimoli et al. (2009).

<sup>14</sup> The rate of product and/or process innovation refers to the proportion of firms claiming to have created a new product and/or process. This rate is very comprehensive, though, encompassing products or processes ranging from new to the international market to new to the firm itself.

**Table 4.2** Research and development expenditure as % of GDP (MCT 2012)

	2000 (%)	2002 (%)	2004 (%)	2006 (%)	2008 (%)	2010 (%)
Public	0.55	0.53	0.48	0.50	0.58	0.61
Private	0.47	0.46	0.42	0.51	0.53	0.55
Total	1.02	0.98	0.90	1.01	1.11	1.16

amount, followed by the medium-low technology sector, with about a quarter of total expenditure (Cavalcante and De Negri 2010; IBGE 2010).

Brazil has been a federation throughout its republican history. Although the degree of central government's power over the states has changed over history, the Constitution, promulgated in 1988, returned some autonomy to states and municipalities, when compared to the previous military-authoritarian period. Still, this is not a strong decentralization, such as the one prevailing in the USA. The 1988 Constitution established a political system characterized by presidentialism, multipartism and proportional representation for legislative elections. Despite showing some problems of governance in its early years,<sup>15</sup> this system eventually stabilized, allowing a relatively stable decision-making flow in a model that political scientists have termed "*presidencialismo de coalizão*" or "coalition presidentialism".<sup>16</sup> In this model the president builds coalitions through cabinet power-sharing arrangements between allied parties and political groups, similar to what happens in parliamentary democracies.

State bureaucracy in Brazil has heterogeneity as its central feature: pockets of efficiency coexist with sectors structured in ways which render them incapable of efficient and coherent actions (Schneider 1991). There is a notably high proportion of positions filled by elected officials' appointment, hampering the professionalization of the bureaucratic staff. Fernando Abrucio (2007) evaluates the reforms in public administration in the second half of the 1990s and concludes that, despite advances in recruitment, professionalization and payment amid the higher strata of bureaucracy, the large proportion of positions filled by non-meritocratic appointment remains an obstacle to the State's efficiency. Among other reasons, this is why Peter Evans (1995) describes the Brazilian case as a halfway between a developmental state and a state invested with predatory characteristics.

The relationship between the Brazilian state and the market has been deeply affected by the liberal reforms of the 1990s. First, the state retreated from the economic field, privatizing companies in various sectors such as transport, communications and energy. In addition, the state became somewhat more autonomous from the business community. Previously, employers had direct contact with the government, composing different types of councils within the executive branch. In

<sup>15</sup> The first directly elected president was impeached in 1992, just over two years after assuming office.

<sup>16</sup> For a classic account of coalition presidentialism as we described above, see Figueiredo e Limongi (2000). A summary of the discussion on governance in the Brazilian political system can be found in Amorim Neto (2002).

the wake of reforms, most of these councils were reduced and left up to technical government staff. The business community has since changed the focus of its political action from the executive to the legislative branch, from the circulation in direct decision spheres to lobbying (Boschi and Diniz 2004).

In its relationship with civil society, the Brazilian state seems to go through major changes as a result of the maturing of democracy. There are several pieces of evidence suggesting that the State is overcoming a historical lack of connection and coordination with society. First, during the last decade, several programs directed to the vast poor and vulnerable population (in areas such as welfare, housing, education and urban infrastructure) have been created or substantially expanded. Moreover, conferences sponsored by the federal government have emerged, especially in the last ten years, as an important occasion for enlarged civil participation. These conferences address varied themes such as Human Rights, Youth, Culture, LGBT, Social Assistance, Racial Equality, Health, Environment, etc. Besides, as shown by Thamy Pogrebinski and Fabiano Santos (2010), they have not remained simple spheres of public discussion, but have been informing the legislative output.

### 4.3 Public Procurement Overview

The aforementioned federative structure of the Brazilian state projects a character of its own on the Brazilian public-procurement policy. In spite of a unified legislation, the administrative process of procurement is highly decentralized, and each federative element (municipalities, states, central government and autarchies) conducts its own procurement processes. This feature makes it difficult, within the scope of this chapter, to precisely delineate this subject. For this reason, we will focus here on the rules, standards and practices concerning the federal level of government procurement policy, as well as on a general assessment of the possibilities of a Public Procurement for Innovation in Brazil.

A first general characteristic of Brazilian public procurement is the low constraints placed by international agreements. Brazil does not participate in the Agreement on Government Procurement (GPA) of the WTO. The country is neither considering becoming a member nor an observer of the agreement (WTO 2009: 85–86). Regarding Brazil's position in relation to international agreements, the priority that has been announced by authorities is the advancement of the procurement protocol of Mercosur, which has not yet been ratified by its members.

Calculations of the size of the government procurement market in Brazil vary between 7 and 9 % of GDP in 2009—depending on the data source—on an upward trajectory over the past years. In Table 4.3, we present two estimates of the public procurement market size. Estimate 1 was calculated with data from the Brazilian treasury department. Because it relies on more disaggregated data, this estimate is perhaps a little more precise and allows a decomposition of the respective proportions of federal and sub-federal governments. Estimate 2 has the



**Table 4.3** Public procurement as % of GDP

	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)	2009 (%)
<i>Estimate 1</i>						
General government procurement (GGP)*	5.86	5.84	6.24	6.45	6.82	7.12
General government + Petrobras procurement	–	6.03	7.27	7.69	8.40	8.21
Participation of central government in GGP	20.71	23.24	20.65	23.48	20.54	22.99
Participation of state and local government in GGP	79.29	76.76	79.35	76.52	79.46	77.01
<i>Estimate 2</i>						
General government procurement **	–	8.82	8.91	9.19	9.31	9.65
General government + Petrobras procurement	–	9.00	9.94	10.44	10.89	10.73

\*Sum of the following accounts from the detailed government accounts prepared by the Brazilian treasury department: supplies, outsourced services, works and installations, equipment

\*\*Defined as intermediate consumption + gross fixed capital formation (Audet 2002: 159–161), using data from the Brazilian National Accounts (Brazilian institute of geography and statistics, IBGE)

advantage of being more adequate for comparisons, since it uses the methodology similar to the one proposed by the OECD. Considering estimate 1, if we add the procurement of Petrobras—the state-controlled company with the highest procurement figures—public procurement rises about one percentage point of GDP. Still according to estimate 1, the central government is responsible for about 1/5 of the general government procurement, the rest being distributed among states and local governments. Considering estimate 2, Brazilian government procurement reached 9.31 % of GDP in 2008. This magnitude is slightly smaller than the average for OECD countries, 12 % in 2008 (OECD 2011: 148).<sup>17</sup>

It is important to highlight two general features of the structure of public procurement concerning technology. First, there is relatively little amount of high technology purchases. Soares (2005) conducted a research on the profile of firms supplying the government during the beginning of the 2000s and found that government procurement was of little use to stimulate innovative firms, since most acquisitions consisted of low-technology products and standardized goods—involving no innovative expertise in their manufacturing processes. Part of this

<sup>17</sup> Figures from estimate 2 should be taken with a grain of salt for the sake of comparison with OECD estimates. OECD (2011) adds social transfers in kind via market producers in the calculation. This was not done in estimate 2, because the Brazilian national accounts do not disaggregate social transfers in kind via market producers from social transfers in general. On one hand, this means that the results in estimate 2 are perhaps slightly underestimated. On the other hand, the inclusion of social transfers in general in the calculation would excessively overestimate the result.

**Table 4.4** Number of firms from high and medium-high technology sectors acting as central government suppliers (2008–2010)

Central Government Department	2008	2009	2010
Defense	117	131	156
Health	34	66	92
Mining and energy	42	42	43
Social security	25	27	36
Finance	–	22	30
Agriculture	–	18	28
Development, industry and foreign trade	3	–	19
Science and technology	39	–	17
Total	206	306	421

Source: Schmidt and Assis (2011: 18)

behavior is due to the strength of the isonomy and competition principles permeating the procurement procedures (as will be discussed below), which discourage public tendering of goods that cannot be produced by a large number of firms. Flavio Schmidt and Lucas de Assis (2011) conducted a similar research for the end of the decade and came to an identical conclusion: between 2008 and 2010, almost half of the companies supplying government were from low-technology sectors. Second, within the government, one can distinguish different groups of agencies according to their demand for technology. Table 4.4 shows the number of firms in high and medium-high technology sectors which supply different central government ministries. Areas that traditionally rely on more sophisticated materials, such as Defense,<sup>18</sup> Health, and Energy and Mining, accumulate most of the contracts made with these firms. For other ministries, the low demand for high and medium-high technology products is the rule. These results show that, if a procurement policy aimed at innovation should emerge, it must take into account the technological asymmetries within government procurement.

For the central government, the procurement policy is under the responsibility of the Ministry of Planning, Budget and Management (MPOG), and takes as its structural point of reference the *System of General Services* (SISG). The *Secretariat of Logistics and Information Technology* (SLTI) is the central body of this system and is responsible for the establishment and dispatching of rules and standards for materials used by the federal public service. The *Department of Logistics and General Services* (DLSG), subject to SLTI, implements, manages and operates the policies and guidelines relating to the management of materials, constructions and services of the federal administration. This department monitors the acquisitions made by the *Administrative Units of General Services* (UASGs). In addition to these central agencies, there are specific divisions, such as the

<sup>18</sup> For an overview of the industrial base that supplies the Defense Ministry, see Schmidt et al. (2012).

*Undersecretaries of Planning and Budget* (SPOs), present, for example, in the structures of the Ministry of Health and Ministry of Education (Motta 2010: 100–102). The *Court of Audit* (TCU) and the *Office of the Comptroller General* (CGU) are administrative bodies responsible for controlling and monitoring the system of federal procurement.

The main directive norms of public procurement in Brazil are found in Act 8666/1993, which lays down general rules for purchases of products and services for direct and indirect public administration at all levels (municipalities, states, central government and state enterprises). The text of the law contains some basic principles to be applied in government procurement at all levels, such as isonomy, publicity, transparency and guarantee of competition. In its Sect. 1, article 3, the original Act of 1993 reads as follows:

The tendering process is intended to ensure compliance with the constitutional principle of isonomy and select the most advantageous proposal for the public administration and will be held and judged strictly in accordance with the basic principles of legality, impersonality, morality, equality, publicity, administrative probity, compliance with the public call, objective judgment and those related to them.

The isonomy principle is emphasized not only in the parlance of this article, but in the very construction of the law's sections, as indicated by Motta (2010: 115–117). The supremacy of the isonomy principle in legislation and its interpretation further expresses a great concern with fighting corruption (Motta 2010: 114–116). There is no distinction between domestic and foreign companies, though the law gives preference for services and products bearing technology developed in Brazil. The law's text was reformulated a few times, and a detailed assessment of its contents and reformulations goes beyond the scope of this chapter. However, we can identify two key changes: the first carried out in 2005, with Act 11196, also known as *Lei do Bem*, and the second in 2010, with Act 12349, both enacted in the Lula administration.<sup>19</sup>

The *Lei do Bem* first established, as a tie-breaker in choosing the winner of the bidding competition, the fact that the good or service in question comes from a firm investing in research and technology development in Brazil (paragraph 2, article 3, of Act 8666, as amended by *Lei do Bem*).

Act 12349 of 2010 went a little further, reforming article 3 of Act 8666, mentioned above; there was a change in text, so that the selection of the proposal would not only be “most advantageous to the public administration”, but “most advantageous to the public administration and the promotion of sustained national development”, which expands the possibilities of selection criteria. This expansion

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<sup>19</sup> There have been several other reforms that changed the bidding process in Brazil, such as Act 12462 of 2011, which implemented the Differentiated Regime for Government Procurement (Regime Diferenciado de Contratações Públicas, RDC), and also Act 10520 of 2002, which implemented the Reverse Auction (Pregão) regime. Although these are central reforms for the Public Procurement System, we focus here on the normative guidelines closest to the PPfI discussion. For a discussion regarding the RDC Act, see Fiuza (2012).

appears in, for instance, an overpricing rate of at most 25 % for national products and services, an initiative hitherto unheard of after the 1988 Constitution.

The 2010 Act also expanded the legal basis for the use of Act 10973 of 2004, known as Innovation Act. In addition to establishing incentives for innovation, and scientific and technological research, the Act defines in its article 20, the possibility of at least one specific type of PPfI: one Leif Hommen and Max Rolfstam (2009) refer to as *direct* PPfI. In this kind of PPfI, the innovative product possesses intrinsic governmental interest. According to article 20 of the referred Act, the government can hire firms—which will engage in research and development involving technological risk—for the purpose of solving a specific technical problem or acquiring an innovative product or process. Although in force for some time, we have no notice of the use of this article in public procurement.

According to Alexandre Motta (2010), the main features of the Brazilian public procurement policy are: procurement positions are seen as bureaucratic and non-strategic; the hierarchical position of the administrative staff responsible for it is usually intermediary, below the decision-making level; procurement activities are highly standardized, with little room for interpretation of the agents responsible for applying it, and therefore these agents give priority to the observance of regulations, at the expense of concerns about the results and effects of purchases. This framework is the result of a strict regulatory control of the agencies responsible for administrative control—TCU and CGU—which have better trained and paid staff compared to the bodies directly responsible for procurement. Thus, Motta summarizes this framework claiming that the government procurement system in Brazil is essentially *corruptocentric*; that is, it strives primarily for the extinguishment of corruption, neglecting results and focusing solely on compliance with strict procedures.

#### 4.4 Public Procurement Policy and Innovation

In this section, we will address the association between public-procurement and innovation policies in Brazil. Before examining this association in detail, it would be opportune to outline some brief preliminary considerations based on the characteristics of the institutional set-up, the legislation, and the bureaucracy of governmental procurement, as discussed above. First, until recently, legislation barely focused on what Kattel and Lember (2010) point out as the basic feature of public procurement for innovation, that is, on the purchase of products and services not yet available on the market. Second, the role of procurement officials is not sufficiently underscored, while the corruptocentric bent of the system reinforces institutionally the persistence of a very low risk-taking level on the part of these same officials, who are only encouraged to follow procedures and avoid being prosecuted by control agencies. Third, the new public procurement legislation—which effectively approaches orders of products not yet available—has not been, for now, employed as PPfI. Government purchases of products not readily

available on the market are rare. Consequently, there has been, so far, a somewhat sharp division between public-procurement policy and innovation policies put forward by the Brazilian central government.

The potentials inscribed in the Innovation Act and the changes established by the Act of 2010 represent a breakthrough nonetheless. Although the preferential price margin does not imply PPfI per se and although the potentials from the new legislation have not yet materialized, these changes certainly announce significant transformations in the character of public procurement in Brazil. In what follows, we will present further elements from the field of public procurement in order to attempt a more comprehensive assessment of the strength of this coming inflexion. A first attempt to implement PPfI in Brazil was extinguished in 1990 (we will discuss it in [Sect. 4.4.3.1](#)). Currently, two types of initiative stand out. First, funds focused on the development of specific technologies—but with no guarantee of subsequent purchase by the government—carried on by FINEP. We will address this initiative in [Sect. 4.4.3.2](#). Second, punctuated programs and technological orders fostered by specific government and regulatory bodies and state-controlled companies ([Sect. 4.4.4](#)).

#### ***4.4.1 Main Characteristics, Policy Types and Institutional Set-up***

Brazil is a semi-peripheral country that managed to establish, over the past 50 years, a relatively well-built scientific and technological infrastructure, distant from the ones available in more advanced nations, but ahead of most developing countries. This infrastructure has placed Brazil at the technological frontier in some sectors such as energy, aviation and agriculture, supporting the diversification of industry and the economy in general. The innovation and technology-promotion policy is primarily carried out by the Ministry of Science, Technology and Innovation, though with important contributions from other ministries such as Education (which sponsors the federal universities), Defense, Health and Communications, among others. Among the main innovation policies, we can highlight three important initiatives.

The first one concerns tax exemptions. The *Lei do Bem* (Act 11196), together with Acts 8248 of 1991 and 10176 of 2001 (Information Technology Act), instituted various tax exemptions granted to companies that invest in R&D, including: deductions of expenditure in research and development from the taxable corporate net profit; tax reductions (of IPI, an consumption tax on industrial products) on equipment for R&D purposes; full depreciation of equipment and accelerated depreciation of intangible assets for the calculation of corporate income tax, among others (CGEE and ANPEI 2009: 31–32). According to an estimate of the Brazilian Internal Revenue Service, the central government waived

around 6.5 billion reais (3.9 billion dollars) in tax revenues in 2011 for technological, scientific and innovative purposes (MCT 2011).

Second, subsidized credit-contemplating innovative projects are part of programs carried out by FINEP (such as *Inova Brasil* and *Programa Juro Zero*) and BNDES (*Inovação Tecnológica* and *Capital Inovador*) (BNDES 2011). These are the main instruments for promoting innovation in the business sector. There are also non-reimbursable funds, operated by FINEP (which will be discussed in Sect. 4.4.3.2) and BNDES (Funtec). Funtec does not finance firms directly, only technological institutions—working in partnership with companies in areas of strategic interest, such as: energy, environment, health, electronics, new materials, chemicals, transport, and oil and gas (BNDES 2011). In 2007, 54 million dollars were released to this funding program, and in 2008, 62.5 million (CGEE and ANPEI 2009: 57–58).

Third, there is also the Program of Human Resources in Strategic Areas (RHA—Pesquisador na empresa), maintained by CNPq,<sup>20</sup> with the objective of increasing the absorption of graduated personnel in R&D activities of micro, small and medium enterprises. The 2007 public call stipulated 20 million reais for allocation in the 2008–2009 biennium, and the November 2008 call stipulated the allocation of 26 million (about 12 and 15 million dollars, respectively). The areas covered were those identified as priorities in the Productive Development Policy (PDP) (CGEE and ANPEI 2009: 59–60).

#### 4.4.2 Drivers and Hindrances of Policy Developments

These policies for promoting innovation face a series of drivers and hindrances in the contexts of the national system of innovation, the macroeconomic background, the state bureaucracy and the business community. A key driver of innovation policies in Brazil is the existence of a comparably consolidated national innovation system. Quality universities (such as USP, Unicamp, UFRJ, UFMG, among others) provide human resources and research capabilities that place Brazil in a privileged situation in comparison to countries outside the center of the world technological system. State agencies such as FINEP, CNPq and Capes maintain several programs supporting training of human resources (grants, support for educational infrastructure), scientific and technological projects, and interaction between companies and universities.

Despite this infrastructure, a major obstacle to PPfI in Brazil consists in the lack of human resources with the necessary skills for such a policy. FINEP has recently conducted several public exams (in 2006, 2009 and 2011) in order to build the necessary bureaucratic staff for the analysis of technological and scientific projects.

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<sup>20</sup> National Council for Scientific and Technological Development, an agency of the Ministry of Science, Technology and Innovation.

This is perhaps a good start for the creation of a skilled staff capable of carrying out government procurement focused on innovation, but this is still far from realization. For if the state should become a consumer for innovative products and services (Moreira 2009; Moreira and Vargas 2009) and if it seems that this is increasingly turning out to be realistic in Brazil, it still depends on an increase in the quantity and quality of personnel within the State.

Two other important hindrances come from the macroeconomic arena. First, the monetary policy based on an inflation targeting regime has resulted in the maintenance of a high rate of interest that, though successful in controlling inflation, has severe recessionary effects. Despite a slow decrease during the last decade, Brazil's benchmark interest rate was still at an annual average of 11.7 % in 2011 (which roughly corresponds to a real interest rate of 5.2 %). Second, the increasing overvaluation of the exchange rate during the second half of the last decade has been an obstacle to the competitiveness of Brazilian manufactured products abroad.<sup>21</sup> By restraining international demand and making credit more expensive, this macroeconomic framework not only depresses the economy as a whole, but also shortens the investment horizon of projects of uncertain return and/or time-consuming ones, such as is the case with innovative enterprises.<sup>22</sup> Hence the centrality of current policies for promoting innovation through financing with subsidized credit.

The state's coordination capacity is also an important point to be remembered. The ability to produce convergence around various issues in a democratic environment and in a highly unequal society is one of the main challenges facing the country. Despite the advances described in Sect. 4.2, there is an enormous difficulty for the state to exercise effective coordination and to build a common agenda among different domestic actors. This was a point raised by Souza (1997) in his search for the possible causes of the relative failure of the NAIs (Forums for the Articulation of Industry) experience in the 1970s, as we shall see later (Sect. 4.4.3.1). There is a coordination deficit among agencies and even among different programs within the same government agency (CGEE and ANPEI 2009: 72).

Another major obstacle is the aforementioned corruptocentric character of the Brazilian government procurement system. The attention to the tendering

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<sup>21</sup> For an entry into the recent discussion about the exchange rate, industrialization and development policies in Brazil, see Bresser-Pereira (2008, 2011).

<sup>22</sup> It is worth mentioning that recent developments are challenging this framework. In the beginning of 2012, President Rousseff's administration enacted measures to prevent further exchange-rate valuations. Most importantly, the government started an offensive against high interest rates. As the central bank reduced the benchmark interest rate to unprecedented levels, public banks are being used to force down market interest rates and exorbitant spreads. As these developments are largely new and recent, it is still difficult to assess—in the face of protests from the Brazilian bankers association and the critique of economists skeptic of the effectiveness of such a maneuver—to what extent they will be permanent. Nonetheless, it should be emphasized that we are indeed confronting a critical juncture, in which the macroeconomic framework can be entirely redesigned.

procedures, at the expense of concerns about its effects and results, prevents the creation of a comprehensive government procurement policy aimed at innovation.

Another hindrance is the so-called ‘innovation culture’ that seems to be absent from the national business community, according to another diagnosis of the Brazilian technological backwardness. There is also a considerable information gap regarding innovation policies put forward by the Brazilian government: a large part of firms simply does not know about these policies at all (CGEE and ANPEI 2009: 72–74). Thus, the lack of a disposition toward research and development investments, and the widespread bias toward acquisition of already existent technology developed abroad, leads to an environment where—despite relatively strong innovation policies—the situation changes only slowly.

Despite this generally negative picture, a growing awareness is already noticeable among experts and authorities—especially at the core of the federal administration (including statements of president Roussef herself)—about the importance of government procurement in promoting innovation. Thus, a main driver for innovative policies is related to a general diagnosis among public authorities that in the present global economic context, the market cannot be left alone in charge of the economic development. A loose network of federal officials, intellectuals and scientists—much akin to an epistemic community (Haas 1992)—brought together around development and innovation issues has gained visibility in the last 10 years. Recently, members of this group, mostly from universities such as Unicamp and UFRJ, gathered in the discussion forum called “Developmental Network” (*Rede Desenvolvementista*) (Lamucci 2011).

This new apprehension around the development issue occurs symptomatically along with a re-primarization of exports as a result of the recent increase in the price of commodities. It is increasingly common to see diagnoses of a variant of the Dutch disease, in which the superior productivity in primary goods hinders industrial development mainly through currency overvaluation—rendering Brazilian industrial products uncompetitive abroad and flooding the domestic market with foreign products.<sup>23</sup> The discovery of huge oil reserves in the pre-salt layer of the Brazilian coast should also be mentioned as a danger (as well as an opportunity) in this context.

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<sup>23</sup> Palma (2005) argues that the Brazilian case is characterized by a de-industrialization induced by orthodox economic policies. In a country where there is greater productivity of natural resources, the lack of development policies for the industrial sector leads to a Ricardian return to the position of exporter of primary products.



### ***4.4.3 Development of National Innovation System vis-à-vis Developments in Public Procurement***

As we have seen, the development of a modern economy in Brazil has its roots in a process that started in the first half of the 20th century, although its peak was reached in the 1970s. It was during this decade that the State was most shaped in a developmentalist way. Public Procurement used as a means of increasing domestic productive capacity has a rather long history in Brazil, which permeates the developmental state strategy.<sup>24</sup> We also have seen that the shortcomings of this mode of development were its large dependence on foreign finance and the macroeconomics imbalances it produced—such as high inflation. The 1980s and 1990s witnessed unprecedented inflation levels, exceeding 2,000 % in 1993. The stabilization plan elaborated to curb high inflation was based on high interest rates as a way of diminishing the level of economic activity and attracting capital to counter balance payment problems. The economic picture which ensued was of a depressive character: it seemed that the boom of the 1950s–1970s period left only macroeconomic imbalances and low growth as its legacy. Innovation policies have been implemented and exercised in this rather unfavorable environment where many obstacles are combined with recent displays of political willingness to balance them out. Governmental purchasing power certainly has a valuable role in this enterprise. We will start the discussion about the relationship between procurement policy and innovation in Brazil with two of its major landmarks. First, the Centers for the Articulation of Industry, a program that constitutes a first attempt to join the purchasing power of government and the promotion of technological capacities in domestic industry. Second, the Financing Agency for Studies and Projects (FINEP), an agency designed to finance projects in science and technology, which has been gaining great importance in the last decade, as it manages technology sector funds and implements programs of economic support for innovation.

#### **4.4.3.1 Centers for the Articulation of Industry (1975–1990)**

In the period from 1975 to 1990, the Forums for the Articulation of Industry (NAIs, from the Portuguese *Núcleos de Articulação da Indústria*) sought to use the purchasing power of state enterprises for the promotion of technological capacity building in the sector of capital goods and in engineering consulting firms. According to its guidelines, public enterprises and their subsidiaries should “organize forums, on a permanent basis, to promote the preferential purchase of

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<sup>24</sup> Two examples from the 1970s are notably suggestive of this: the attempt to build a Brazilian mini-computer industry (Westman 1985) and the consolidation of the power-equipment industry (Faucher 1991).

equipment developed and manufactured domestically”<sup>25</sup> (Souza 1997: 26). It was not, however, a market-reserve policy, because the definition of what a national company was could be established by each public enterprise, which made room for more pragmatic interpretations as to the domestic industrial sector’s capacity to produce the goods in question (Souza 1997: 27). The NAIs served primarily as a space for articulation between public and private companies, and between research centers and government, coordinating different actors around the development of domestic firms and their technological capabilities.

An illustration of the successful working of the NAIs in its earlier years can be found in the power-equipment industry. Philippe Faucher (1991) identified a major transformation in this industry during the 1970s through the mid-1980s. The production of domestic firms, as well as the technology transfer from foreign sources, was effectively fostered by government, despite the existence of an oligopoly exercised by foreign capital. The monopsonic structure of the market—in which Eletrobras assumed a major role—favored the enterprise. The NAIs then gave further support to this transformation articulating the relevant actors and establishing market rules. In this manner, the government was able to internalize production capacity in the country.

The forums eventually failed and were disbanded at the beginning of the 1990s. In 1979, the CCNAI (Comissão Coordenadora dos Núcleos de Articulação com a Indústria), the body responsible for coordinating actors, was closed. FINEP took over this responsibility from that time on and assumed a nationalistic approach to the NAIs, directing resources only to national enterprises and convening other NAIs’ actors to support and strengthen those companies. In the 1980s, the NAI System focused on the development and standardization of parts and components, inducting its actors to exchange information with its small suppliers and finally establishing a supplier list that rationalized the procurement process. But soon coordination turned out to be a serious problem (the private sector, for example, was out of the NAIs’ decision-making council), and the unfavorable macroeconomic conditions hindered any attempt of restoring the forums’ strength. Furthermore, by the 1990s neoliberalism was already in the winds in Latin America. In 1990, Fernando Collor assumed the presidency and began a series of economic reforms that liberalized the national market and killed several instances of the Brazilian bureaucracy, including the NAI system.

#### 4.4.3.2 FINEP

FINEP is a government agency allocated under the Ministry of Science, Technology and Innovation (MCTI), responsible for promoting and funding scientific

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<sup>25</sup> These permanent forums consisted of plenary meetings, circulation of bulletins, courses for the dissemination of the forum’s functioning and supervision—by agents of state enterprises—of the development of scheduled products.

and technological research in enterprises, universities, research centers and government itself. Founded in 1967, during the military-authoritarian regime, it has run the National Fund for Scientific and Technological Development (FNDCT) since 1971. FINEP has participated in several successful technology projects in Brazil, such as the Embraer Tucano aircraft, a number of agricultural projects carried out by Embrapa, and employee training for Petrobras (FINEP 2012).

In 1999, the Sectoral Funds for Science and Technology started to be created, and FINEP assumed its management. These funds amounted to 2.8 billion dollars in 2010, although they were only partially used (FINEP 2011b). They are structured around specific areas (such as Oil, Biotechnology and Health) though projects' areas sometimes overlap. These funds are currently a fundamental pillar of the science, technology and innovation policy in Brazil, providing funding and support for universities, companies and research centers. In addition to these funds, there are other exceptional resources, such as the 3.8 billion reais added in 2011 through the Plan for Investment Sustenance (PSI), launched by the federal government to counteract the recent signs of economic slowing-down in world markets. In December 2011, FINEP had about 9.1 billion reais in credit applications for innovation, an amount five times larger than at the beginning of the same year (Olmos 2011). After studies conducted by consulting firm Ernst and Young, expectations are that FINEP will evolve into a development bank. This change, it is hoped, would allow an increase in FINEP's resources available for the funding of science, technology and innovation activities.

FINEP provides several forms of financial support—both refundable and non-refundable—for technological and scientific projects. The 'economic subsidy' (*subvenção econômica* in Portuguese) instrument is of special relevance to our purposes here, because it consists of non-refundable resources, in order to share with firms the costs and risks inherent in technological development activities. For this reason, this program bears resemblance to a PPFI policy. The program works as follows. First, FINEP chooses strategic areas for technological development—currently, six areas are covered: information technology and communication, energy, biotechnology, health, defense, and social development. Firms then submit projects for each specific area in a public tender. Applicant firms should hold a stake in the project, contributing with a proportion of FINEP's grant (ranging from 10 % for micro enterprises to 200 % for large companies). Between 2006 and 2009, about 2 billion reais (about 1.3 billion US dollars) were allocated to this program (Andrade 2009: 8–9). In 2011, the total amount available for the 'economic subsidy' for innovation was 500 million reais (approximately 300 million US dollars) (FINEP 2010). In any case, it is worth noting that, although the agency directs resources to areas of overt (and in some cases almost exclusive) governmental interest—such as health, defense and social development—there is no guarantee of a subsequent purchase of the developed products by the

government.<sup>26</sup> Therefore, the PPfI character of the program remains fragile and uninstitutionalized.

Two aspects stand out in the program evaluations, conducted by FINEP (FINEP 2011a) itself. In an assessment from 40 participating companies in 2006 and 2007, a first positive result is the relative success of the program—58 % of companies had already put the product developed in the project in the marketplace. Also noteworthy is the incentive it represented in terms of R&D—for micro and small enterprises, for example, financing from FINEP represented more than 80 % of the firm's R&D spending. Another important result concerns the type of innovation developed. Only 32 % of companies had developed products that were new for the international market. The other 68 % of companies had developed products new for the domestic market only, that is, they acquired an expertise already in existence elsewhere. Therefore, the most substantial contribution of the program seems to be the technological capability building of domestic firms to produce goods already manufactured abroad.

#### ***4.4.4 Sector-Specific Developments***

As mentioned in Sect. 4.2, the Brazilian economy is very heterogeneous, with innovative and technological capabilities asymmetrically distributed among and within economic sectors. We also contended in Sect. 4.3 that public procurement in Brazil is predominantly concentrated on the low technology side of this heterogeneity spectrum, as most products acquired are standardized and based on extant technological knowledge. In this section, we discuss four sector-specific developments—in the Oil, Health, Defense and Education sectors—which seem to be exceptions to this picture. In spite of their different degrees of consolidation—ranging from rather established (Oil) to very recent initiatives or re-emerging ones (Defense and Education)—these developments show how serious PPfI is entering the political agenda in Brazil. The constitution of a more structured model of PPfI may be on the way.

The first case comes from the oil sector. Petrobras is a semi-public Brazilian oil company with high technological competence. It was established in 1953 within the framework of state monopoly on activities related to the oil and natural gas industry. The company had to face many challenges in order to maintain its activities in the country, such as overcoming the lack of human resources and of machines for prospecting, producing, refining and transporting oil and derivatives. Despite these adversities, it played a major role in the building of the capital-goods

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<sup>26</sup> The authors contacted FINEP and were informed that because the 'economic subsidy' is still relatively new, no systematic survey about public procurement of products developed in the program were carried out—though such a survey is already in the agency's plans. However, there are records within the agency—even if still somewhat informal and not yet disclosed to the public—of a few cases in which the products were later purchased by the government.

industry in Brazil (Alveal 1993). In 1997, the legal monopoly was abolished, though the company still holds a near-monopoly share of the exploration and production market. With the discovery of the pre-salt layer reserves in 2006 on the Brazilian coast, Petrobras has intensified its investments.<sup>27</sup> The current chain of its direct and indirect suppliers reaches 20,000 companies from various industrial and service areas (Durão 2011). Given this scenario, the expansion of investment may well be concatenated with public policies to promote innovation, boosting many of these suppliers, most of them domestically located.

CENPES, Petrobras' research center, is the largest research facility in Brazil, and one of the world's largest in the energy sector. It has about 1,600 employees in the Research, Development and Engineering (RD&E) area (Fraga 2010) and invested 872 million dollars between 2008 and 2010 in RD&E (Fraga 2011).

ANP (National Petroleum Agency), the sectoral independent regulatory agency, is responsible for the regulation, oversight and tendering of oil fields. In concession contracts, ANP establishes a minimum margin of R&D spending. Moreover, it also establishes a minimum percentage of domestic content in products and services used in the field's exploration. The aforementioned sectoral fund for the oil sector (managed by FINEP) also provides funds [in 2010, the amount reached 120 million reais (FINEP 2011b)] to be used in companies' technological and innovative projects.

Petrobras also has technical cooperation agreements with equipment suppliers (Dantas 1999; Silva 2009) presenting PPfI-like features. Through these agreements, Petrobras hires companies to develop prototypes of equipment and machines that may in the future become part of its regular supplies. CENPES' technicians and researchers follow the prototype's development in order to allow knowledge exchange between the actors involved. Cassio da Silva (2009) suggests that this may be an effective way of spreading technological capabilities already present within the Petrobras, but absent in the Brazilian industry—that is, in Petrobras' suppliers. The spread of such agreements between public companies and private firms could broaden the dissemination of technological and innovative expertise in Brazil.

The health sector pursues a PPfI policy through a program called *Profarma Inovação* (BNDES 2012), focused on the development of pharmaceutical products. Started in 2008, the program works on the basis of an agreement between two federal agencies: the Ministry of Health and the National Bank for Economic and Social Development (BNDES). The former discloses lists of products of strategic interest, while the latter provides venture capital—up to 90 % of the project's budget—to its development. If the project fails, the company does not need to return the funds. If successful, BNDES has a participation in sales revenues from the product developed under the program. The company has market guarantee

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<sup>27</sup> The current company's Business Plan envisages investments of 224.7 dollars between 2011 and 2015. Output is forecast to jump from the current 2.7 million barrels to 4 million in 2015. For a brief review of the opportunities presented after the discovery of the pre-salt layers for the Petrobras suppliers, see De Oliveira and Rubiano (2011).

since the Ministry of Health commits to purchasing the new product to introduce it in the Brazilian public-health system. An important feature of the list of products disclosed by the Ministry of Health is that it is composed, in large part, by pharmaceutical products and medical equipment already in existence but not manufactured domestically.

There is little information on the results achieved so far by this policy. One of the few results reported was the development, in early 2012, of a more efficient process for the isolation of an input for pharmaceutical antiretroviral products (Calandrini 2012). Despite the vagueness around the general results of the program, the company which developed this process stated that the returns to scale induced by the higher preferential demand from the government are already responsible for higher efficiency and lower prices in the pharmaceutical sector.

In the case of the defense sector, there are great expectations around recent innovation policies. Government procurement of innovative products is far from unusual in this sector, as shown by cases such as the Embraer Tucano aircraft, the development of a nuclear submarine and the KC-390 military transport aircraft<sup>28</sup> (Andrade 2009: 103–104; Poggio 2011). In September 2011, a Provisional Measure<sup>29</sup> (MP 544/2011) was issued, establishing special rules for government procurement in the defense area and providing a variety of tax incentives for the national defense industry. It creates the category of Strategic Defense Company and establishes tendering restricted to the domestic industry (Bresser-Pereira 2011). It has been issued as Act 12598 in March 2012.

Regarding education, there are also indications that the Ministry of Education will use its purchasing power to stimulate innovation, through the intention of purchasing tablets for public-school teachers and students. A range of fiscal incentives were established in 2011 to promote the implementation of a modern electronics industry for that purpose, and one of the key organizers to attract investments from companies in this direction was a former Minister of Science, Technology and Innovation, Aluizio Mercadante. He was recently appointed Minister of Education, which indicates that the government purchases of tablets may become a reality (Costa 2011).

## 4.5 Conclusions

The Brazilian government does not have, so far, a procurement policy that can successfully integrate its innovation policy (Andrade 2009: 26; CGEE 2007). Apart from the regular processes of public procurement—judiciously done in

<sup>28</sup> The development and production of both the nuclear submarine and the KC-390 aircraft are still in progress. The former is being developed by the Navy Technology Center and the latter by Embraer.

<sup>29</sup> A Provisional Measure is a decree enacted by the Brazilian president established by the 1988 Constitution—having the force of law.

terms of transparency and legality, but poorly executed in terms of actual quality of acquisitions and their technological content—there are two types of initiatives. On the one hand, there are a few specific policies, linked to sectors such as health, defense and procurement of state enterprises (Petrobras). On the other hand, there are funding policies directed at specific technological areas—such as the economic subsidy from FINEP—which are in turn not integrated into the purchasing power of government. Along these lines, we can conclude that the results of PPfI—and of policies akin to PPfI—have not yet had a comprehensive impact in innovation in Brazil and have not yet displayed their full potential. It is manifest that these poor results accrue from problems regarding these policies, which are still many.

A first main problem is the merely reactive nature of some policies. In the health sector the primary goal is to introduce in the country the production of goods which currently have to be imported. The results of the economic subsidy program from FINEP have also shown that it essentially builds capacities of domestic firms for the production of goods already in existence and manufactured abroad. Both seem to be unadorned reactions to current account deficits in products of high and medium technological content. This can be described as a new application of the import-substitution recipe—again induced by imbalances in trade related to technological backwardness.<sup>30</sup> These considerations point, in short, to the fact that there is still a long way for the Brazilian industry: structural heterogeneity needs to be reduced, and whole industrial sectors need to come closer to the international frontier before reactions to trade imbalances can become active innovation policies. Policy-oriented public procurement for innovation certainly has a role in overcoming these difficulties, because it can effectively assist in promoting sustained innovative activities which go way beyond mere reactive import substitution.

Despite this rather disappointing picture for PPfI, there are potentials that, if realized, may put Brazil on a new trajectory with respect to its procurement practices. Evidence can be found, firstly, in the recent legislation on the subject, especially in the recent Act 12598 of 2012 concerning government procurement in defense, and in Act 12349/2010 establishing a margin of overpricing for domestic products and services. Together with Article 20 of the Innovation Act, this legislation lays the legal basis for PPfI. Everything depends now on the law thriving as a tool for the promotion of domestic industry and its innovative capabilities. In addition, existing policies in the areas of defense and health are still relatively recent, preventing a more accurate account of their problems: whether they are transitory and correctable faults or truly structural imperfections. Finally, the lack of integration between funding for specific technological areas and governmental purchasing power is a critical point that is already the subject of public discussion (Andrade 2009: 26; CGEE 2007). If the institutional framework outlined in Sect.

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<sup>30</sup> This problematic feature of the ISI model—which would come about, were the economy not to reach a level of sustained economic development—had already been identified in the 1960s by Tavares (1964).



4.2—of increased decision-making capacity from the executive power and its permeability to the democratic debate—is correct, the trend is that criticism regarding this lack of integration is going to be absorbed in future policies.

It is therefore possible that Brazil, in the coming years, is going to constitute—while policies in specific sectors such as defense, health and energy become consolidated and gain strength—a model of *PPfI as technology (platform) development policy*. A new system could emerge, in which procurement is integrated into the development of both sectors where the country already has technological advantages and sectors stimulated to respond to economic and social demands.

This outcome depends, however, on the overcoming of several obstacles. First, it is through the synergy between innovation policies put forth by FINEP and government procurement that the consolidation of PPfI can be contemplated in Brazil. The pursuit of synergy between different policies already in existence can be instrumental in promoting innovation. Programs managed by FINEP should be taken into account as a potential focal point around which PPfI policies could be articulated within state bureaucracy.

Second, the staff responsible for public-procurement policymaking, as well as the staff responsible for the fulfillment of procurement activities, must acquire further necessary skills, developing a comprehensive view of society's strategic needs. The strategic importance of procurement positions needs to be emphasized, and the building of capabilities specific to sectors of high technological intensity must count on constant and strong support from the state bureaucracy. Only by surpassing the mere mastery of legally established procedures will the bureaucracy be qualified for the tendering of innovative products and services at the technological frontier. Only then can the promises of the new legal foundations—such as Article 20 of the Innovation Act—materialize.<sup>31</sup>

Third, spaces of articulation between the staff responsible for government procurement activities and other relevant actors—such as FINEP, users of products/services acquired and companies that produce them—must be created. In this sense, there is a correlation to be sought between public and private technological capabilities: innovation policies should be developed conceiving the national innovation system as systemic interrelationships between public and private sectors (Cassiolato and Lastres 2011). Government procurement policy should not neglect this aspect, contributing to dimensions that cannot be properly addressed by the private system of science, technology and innovation alone.

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<sup>31</sup> Mota's dissertation (2010), which makes the case for the corruptocentric character of Brazilian government procurement policy, suggests a starting point for such a transformation. As a substitute to the infatuation with normative procedures, he advocates a results-driven procurement policy, which would highlight the principle of 'best value' as opposed to the current predominance of the principle of 'less value'. In our view, the best-value principle would have to encompass considerations about the level of technological learning that particular purchases would stimulate, and not only product's quality as, it seems, is Mota's argument.



With these concluding remarks, we can conceive of a public procurement system to promote synergies with innovation policies carried forward by the Brazilian government, consolidating political and economic progresses made in recent decades and paving the way for Brazil to continue advancing in its project of offering its people a high level of welfare.

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