



# Analysis of some productive development policies in Uruguay

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Agosto de 2009

## **Abstract**

This paper reviews and assesses some of the Productive Development Policies currently being implemented in Uruguay. We have selected three horizontal and three vertical policies and consider them in light of the market and public failures they attempt to address and minimize. Horizontal policies comprise Innovation, Industrial Promotion and Directives for Industrial and Technological Development. Vertical policies include the analysis of Forestry Law, Meat Traceability and the Sustainable Production Project in the agricultural sector.

Keywords: development policy, agricultural production, industrial development, Uruguay

Documento de Investigación, Nro.47, Agosto de 2009. Universidad ORT Uruguay.  
Facultad de Administración y Ciencias Sociales. ISSN 1688-6275.

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<sup>i</sup> The authors thank the research assistance of Gabriela Mendlowicz and many public official and private sector actors for generously agreeing to meet with the authors and sharing their views

## 1. Introduction

The development strategy of the Uruguayan economy evolved from inward looking based on state interventionism and import substitution protectionist policies, towards outward looking, based on the market as a resource allocation mechanism and exports as the growth engine. This change started in the 1970's, when a first phase of trade liberalization took place accompanied by a quick financial liberalization process. During the 1990's, a second phase of trade liberalization took place. This phase combined a deepened gradual unilateral tariff reduction with the creation of Mercosur, an imperfect customs union signed with Argentina, Brazil and Paraguay. In addition, a stabilization program based on an exchange rate anchor was undertaken. This policy considerably reduced inflation -which had climbed to three digits figures at the beginning of the decade-, to an actual annual rate of around 13%, but it was simultaneously accompanied by a significant real appreciation of the peso, specially vis a vis non Mercosur countries.

Uruguay is a small economy where its industrial structure was, in mid 1980s basically composed by a reduced number of traditional-products exporting firms and by sectors developed under the import-substitution process. Most industries showed very high concentration levels. This gave firms considerable market power that allowed them to set prices substantially above marginal costs. This kind of productive structure, highly concentrated and dependent on the protection, had as a byproduct a high grade of formalization in industry employment and also caused union organizations to be in conditions for advantageous wage-negotiations.

Although Uruguay started to open its economy in the 1970s, it was not until the 1990's when the local industry was affected with a maximum tariff not higher than 30%. Since June 1991 Argentina, Brazil, Paraguay and Uruguay started a process of programmed trade reductions that allowed in 1995 a wide range of products to be freely traded among Mercosur countries.

In 2002, Uruguay suffered a profound financial crisis triggered by contagion effects from a depositor run on banks, massive currency devaluation, and gigantic default on sovereign debt that took place in next-door Argentina. In the wake of a run on its own exceedingly dollarized banking system, Uruguay's government was forced by the ensuing loss of international reserves to let the currency depreciate rapidly. Subsequently, it had to provide support to some financial institutions while intervening several failing private-sector banks, for which purpose massive financial backing from the Washington-based multilateral agencies was obtained. Eventually, the government also had to arrange for a market-friendly restructuring of the public debt. Starting in the fourth quarter of 2003, however, the Uruguayan economy staged a vigorous recovery and the government regained access to the domestic and international capital markets.

Overall, the economic performance of Uruguay in the last half-century has been disappointing. Per capita GDP grew at relatively modest rates<sup>1</sup> (1.10% per year), well below the growth rate of more dynamic countries in Latin America (e.g. Brazil with 2.4% on average for the same period), and East Asia (e.g. Korea or Thailand, with annual growth rates above 4%).

The October 2004 presidential election marked an inflection point in Uruguayan history. A coalition of leftist parties that, over the last 20 years (since the recovery of democracy) had

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<sup>1</sup> Average rate for the 1950-2000 period

acted as the main opposition party, won the presidential election and assured herself majority in the legislative branch of government. One of the main ideas stressed during the campaign was the “Uruguay productivo” vis a vis the “Uruguay Financiero”. This idea was presented as a change in the development vision of the country. Although many productive policies in Uruguay were already in place, after election the political momentum of the last years favored the discussion of the efficiency of such policies and the development of new ones.

In this paper, after a brief review of the Productive Development Policies (PDP) system, we focus on three horizontal and three vertical policies and analyze the principal characteristics of these PDPs in terms of the market and coordination failures that it tries to address. Horizontal policies include the Investment Promotion Bill of 1998 and its 2007 modifications, the current state of the Innovation Policy, including the many changes put in place by the Vazquez Administration, and the Directives for Industrial Development announced by the Government in May of this year. We also describe and analyze process by which those productive development policies (PDPs) are established, that is, the institutional structure that includes public and private actors and their interactions. Vertical policies include the modifications to the Forestry Law implemented by the current administration, the policies attempting to assure meat quality and differentiation, and a project of sustainable (responsible) production in the soy industry.

## 2. Overview of the Uruguayan PDP System

The 1980s were characterized in general, by the abandonment of explicit industrial policies in Latin America. This period meant the adoption of structural reforms away from import substitution strategies and an active development role for the state towards a process of allocation of resources by means of free and unregulated markets (IADB, 2001). By mid 1990s, economic and social conditions had shown that the radical shifts of the 1980s had not achieved the desired outcomes of sustainable and equitable growth.

The 1990s witnessed the adoption of a new set of policies throughout Latin America. Most countries adopted medium and long-term explicit industrial policies and strategies under the conviction (on average) that economic growth and development did not rest on an election between the state and the market as responsible for it. Rather, a cooperative process was needed (Melo, IADB, 2001).

The key features of the new industrial policies can be characterized by two elements: a) macroeconomic stability consistent with sustainable investment and long term growth, and b) microeconomic incentives aimed at the correction of market and public failures to improve productivity and the international competitiveness of domestic productions. The latter represented a shift in the international strategy of the countries of the region from an inward oriented orientation towards export development and diversification.

Macroeconomic conditions in Uruguay have traditionally depended on economic and social conditions in Argentina and Brazil. Until recent years, financial and trade integration with those countries have had significant effects on Uruguayan international competitiveness and financial conditions mainly through the impact on the capital account (capital flows) and the level of real exchange rates.<sup>2</sup>

The recent history of Uruguayan industrial policies also needs to be considered within Mercosur. It was tacitly agreed that the Uruguayan role within Mercosur was heavily restricted to the development on land intensive agriculture, financial services and tourism (mainly from Argentina)<sup>3</sup>. As preliminary evidence of this, in 1999, foreign direct investment as a proportion of GDP in Uruguay was 0.7%, compared to almost 3% in Argentina and Brazil.

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<sup>2</sup> Brazilian devaluation of 1999 and the 2002 political and economic crisis in Argentina are the most recent episodes that affected macro and microeconomic conditions in Uruguay.

<sup>3</sup> Causal evidence of this is the recent conflict with Argentina due to foreign direct investment in a pulp and paper factory in Uruguay.

Industrial Policies can be classified as follows<sup>4</sup>:

	Horizontal	Vertical
Public Input	Macroeconomic Instability Volatility of Real Exchange Rate Educated Labor Force Acceptable Business Climate Poor National Innovation System	Very limited due to public financial restrictions
Market oriented	Export credit lines Working Capital credit lines Export Insurance Tax rebates to export industries Exemption of import duties for inputs to export products Temporal Admission Scheme Export Free Zones Credit lines for Investment projects	Tax incentives to Oil, graphics, logistics, forestry, military, airlines, theatres, and film industries.

Recently, Hausmann, Rodriguez-Clare and Rodrik (2005) analyzed the scope for new growth opportunities in Uruguay in the context of “self-discovery”, that is, the development of new products and processes tailored to export growth<sup>5</sup>. Hausmann et al (2005)´s study is a significant improvement over the IADB study of 2001 and constitutes the basis for our present project.

Briefly, Hausmann et al (2005) find an adequate institutional environment for productive development. However, they note that the Industrial Promotion Legislation remains passive to new investment opportunities and creates incentives for activities with few demonstration effects (non-traded), which in their opinion, constitutes a major drawback for self-discovery and growth. Export Promotion Zones do not provide adequate linkages to the rest of the economy, possibly due to coordination failures in industries such as Information and Telecommunications. They also note that exchange rate policy has not contributed to the long-term development of the country, in part due to domestic policies but also due to macroeconomic volatility in Argentina and Brazil. The National Innovation System does not provide adequate horizontal support due to internal inconsistencies among the different components and because of financial constraints. Finally, vertical policies (“picking winners”) seem to be the product of historical circumstances and chance.

The moment when Hausmann et.al. performed their comprehensive analysis leaves to us an “easy picking” (to paraphrase Paul Samuelson’s in his now popular development of the Stolper-Samuelson Theorem): their paper refers to a situation right before a new government was elected in October 2004. The government that took office in 2005 has implemented a series of institutional innovations that modify the scale and scope of support for the productive development of Uruguay.

The following is a set of the main recent modifications to the institutional setting (actors, and activities) in support of productive development. As for new actors:

- a) The government created the Department of Support to the Private Sector under the Secretary of Finance,

<sup>4</sup> Data comes from IADB (2001)

<sup>5</sup> “New products”, meaning the development of products which are not produced in the country.

- b) Additionally, the Government has created the National Agency for Research and Innovation to improve the support for innovation and self-discovery.

As for activities:

- a) With IADB support, The Office of Planning and Budget (OPP) has set up a program of productive cluster development (PACC) (Programa de Apoyo a la Competitividad de Clusters y Cadenas Productivas)
- b) A “one-stop-shop” (“Uruguay fomenta”) for local and foreign investors was created in July 2008,
- c) Congress has also approved a bill that allows for the creation of Export Consorcios to overcome the scale and knowledge problem that many small Uruguayan companies face when trying to integrate to the international market,
- d) The Bill of Industrial Promotion has been modified to include new tax incentives to be granted to qualified investment projects,
- e) Other activities to boost industrial production have included the implementation of the so-called “productive gas-oil” to reduce production costs of farmers and manufacturers.
- f) Tax exemptions have been granted for tourists when consuming in restaurants and other tourist attractions during the season.

The Government also modified the general approach to social problems. For example, the Secretary of Economic and Social Development was established in 2005 to implement an Emergency Plan to help the poorest and indigent. This Secretary has further developed a plan of inclusion of citizens to more productive activities. On the labor side, salary councils (where workers, firms and government officials discuss and accord labor conditions) were re-established after 18 years.

At the regulatory level, the Government has sent to Congress an Education Bill to reform the current educational system, while the National Health system was reformed in 2007. Also, the tax code was reformed in 2007: its main contribution was the implementation of a Personal Income Tax and the suppression and/or modification of existing direct and indirect taxes. The reform has, however, direct productive development implications.

As for the international integration and innovation activities, Uruguay has recently signed a trade and investment agreement with Chile and has consolidated the institutional framework of the Pasteur Institute. On the other hand, Uruguay could not achieve political internal agreement to start negotiations with the United States to sign a free trade agreement<sup>6</sup>.

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<sup>6</sup> Alternatively, both countries signed a Trade and Investment Framework Agreement (TIFA).

### 3. Horizontal Policies

#### 3.1. Innovation

##### a) Introduction

The current administration has assigned the largest budget ever to education and innovation programs in Uruguay. Public spending in education is targeted to attain 4.5% of GDP in 2009. Innovation in Uruguay remains low in comparison with developed countries but in the last years there have been various institutional and policy changes aiming at increasing research efforts and linking it to productive activities.

The first institutional change promoted by the Vazquez administration was the conformation of the “Gabinete Ministerial de la Innovación” (GMI, Secretary’s Innovation Committee) by Decree 136 of February 2005. This committee is integrated by a delegate of the Secretary of Education, the Secretary of Economics, the Secretary of Industry and Energy, the Secretary of Agriculture and the director of the Budget and Planning Office (Oficina de Planeamiento y Presupuesto). The main objective of this committee is to coordinate the actions of all public institutions related to innovation, science and technology.<sup>7</sup> The decree also requests from the committee the elaboration of a National Strategic Plan on Science, Innovation and Technology (PENCTI for its acronym in Spanish, Plan Estratégico Nacional de Ciencia, Tecnología e Innovación).

In September 2007 the body of the PENCTI saw public light.<sup>8</sup> The first paragraph of the PENCTI presents a broad set of actors involved in the plan. In particular it mentions that the process of continuous innovation necessary in the modern world can only be attained with the commitment of public authorities, entrepreneurs, workers, “third sector” organizations and the Uruguayan scientists and Uruguayan innovative entrepreneurs living abroad.

Also the definition of innovation is broad. According to the PENCTI innovation is a social process implying the creation and use of new knowledge, products, process, goods, services, tools or forms of organization. The diagnostic of the current situation presented in the PENCTI can be summarized in three points. First, the public sector<sup>9</sup> concentrates most of the capacities for the generation and development of new scientific and technological knowledge. Second, a large part of this new knowledge is only disseminated among the academic public and besides its academic use has no impact in the productive activities. Third, firms in the private sector have low demand for innovations.

The PENCTI does not discuss the determinants of the current situation. The lack of diagnosis may be due to political economy reasons. The PENCTI points that, in the past, the

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<sup>7</sup> “...cuyo objetivo principal será la coordinación y articulación de las acciones gubernamentales vinculadas a las actividades de Innovación, Ciencia y Tecnología para el desarrollo del País” (Decree 136/05 Article 1).

<sup>8</sup> There are several important annexes that are not yet publicly available. Annex I is supposed to present basic indicators on science, technology and innovation in Uruguay. It is important as the benchmark to compare the evolution of the programs in this area. Annex II argues in detail why the market by itself does not efficiently allocate resources for innovation and therefore it justifies the Government as an active player in the design and execution of science, technology and innovation policies.

<sup>9</sup> Universidad de la República, Instituto Clemente Estable, Instituto Nacional de Investigación Agropecuaria (INIA), Laboratorio Tecnológica del Uruguay (LATU), Instituto Nacional de Carnes (INAC).

political system was able to alter innovation system model proposals and to generate its own designs. These designs ended up being *ad hoc* mostly produced by successive negotiations between actors of the system and lacked a study of the strengths and weaknesses of the proposed models. The PENCTI seeks to improve on this situation and to present a model backed by the executive branch of government.

It is interesting that the plan discusses the enforcement of the priorities defined by the GMI. This enforcement is relevant only for the actors of the public sector (and for the Universidad de la República only up to a certain point). The actors of the private sectors (private universities, firms, etc.) will adhere to the PENCTI priorities voluntarily if they find the incentives proposed of interest. In other words, there will part of the Innovation policy that will be provided as a public input and other part that will work through market mechanisms.

#### b) Commitment for Active Policies

The PENCTI makes a commitment for active promotion policies but warns that this will be done without neglecting the market as a cleansing device of better economic alternatives. Active policies are presented as necessary to solve market failures.

Relevant market failures are: a) limited appropriability of generic technologies, b) information failures between actors of the system, and c) risks associated to the intangibility of assets.

Immediately after arguing the need for state intervention the plan points to the risks involved in that intervention: a) dynamic inconsistency (difficulties to implement policies with short run costs and long run benefits), b) rent capture, and c) principal-agent problems.

The range of policies considered by the PENCTI is wide. First, the plan mentions that a necessary (but not sufficient) condition is the creation of an appropriate environment for the development of innovations and its applications to new technologies. To do so the government has created the National Research and Innovation Agency (ANII) in order to make the government commitment as credible as possible.

Second, the plan mentions the use of horizontal policies to promote the generations of innovations.<sup>10</sup> These horizontal policies include a) larger investments in human capital formation, and b) changes in legislation and regulations that may hamper directly or indirectly the development of innovations. For instance, the Tax Reform Bill (Bill 18.083) passed in December 2006 establishes incentives for activities conducting to innovation. Examples of these activities are favorable tax treatment to personnel education spending and tax exemptions for the acquisition of research equipment.

Third, vertical policies are also deemed necessary. Vertical policies should seek that the knowledge intensive sectors interact with traditional natural resource intensive sectors, such as agriculture, tourism, and energy. Export potential is an objective in these interventions.

In respect to the financial sources, the PENCTI mentions that innovative firms have often financed their activities through retained earnings due to the lack of external sources. Private

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<sup>10</sup> Quoting "...es relevante que existan políticas transversales para fortalecer el apoyo a los procesos innovadores en general independientemente del sector en el cual se pretenda aplicar el incentivo".



finance sources of innovations are considered to be fundamental and therefore it is important to promote the emergence of venture capitalists that could provide seed and angel money.

### c) PENCTI's Objectives

The Program's Objectives and Goals can be summarized as follows:

1. To increase the interaction of researchers with the social environment and the production activities
2. To promote firms' innovations
3. To foster the development of science, technology and innovation human capital
4. To promote innovation and quality in small and medium firms
5. To foster the innovations with social goals
6. To use innovations for public sector governance
7. To develop regional innovations not concentrated only in the capital city
8. To advance scientific and technologic knowledge
9. To facilitate investments in scientific and technologic infrastructure
10. To finance innovations
11. To promote the interaction with international science and technology networks
12. To develop mechanisms for impact evaluation

The plan also provides the actions that should be taken in relation with each objective. A detail analysis of all actions goes beyond the scope of this paper.

### d) Research networks

The team in charge of the PENCTI hired the School of Social Sciences of the Universidad de la República to study the state of research and innovation networks between research centers and firms. Although the resulting paper (Pittaluga et al 2007) is not an official document<sup>11</sup> it provides the rationale for the main policy motivation.

In Pittaluga et al (2007) there is a strong emphasis on the creation of networks as a solution to the limited appropriability of innovation market failure. The networks will transform the public good innovation into a club good in which all of the beneficiaries of the innovation are part of the club. If the network works properly the free riding problem is substantially reduced. Pittaluga et al (2007) present a set of recommendations to foster the development of networks based on 25 case studies of networks and research policies applied in Uruguay between 2002 and 2007.

There are a series of requisites needed for the consolidation of networks. First, the programs should be long run and stable. They should have enough economic resources, be flexible to adapt goals according to partial results and there should be subject to evaluation. Coordination between the different policies is important in order to avoid superposition (something that has happened in the past). Any set of policies to promote innovation networks should use horizontal and vertical policies.

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<sup>11</sup> But it is available from the ANII webpage.

After arguing that the market by itself produces suboptimal results, the authors warn about failures associated with state intervention. One of the findings from their case studies is that very often there is a wide spread of programs with insufficient resources. They suggest that, trying to avoid selection biases, it is important that the promoted programs have the appropriate budget. In other words it is important to have a definition if the priority is given to the impact of the programs or just to cover a wide range of alternatives. A second failure refers to the human capital in charge of managing the programs. Many of these managers have strong background on the network-program area of expertise (e.g. agriculture, biotech, etc.) but are not as strong in modern management techniques, negotiations techniques and business plan follow up. A third problem with state intervention regards the necessity to make of all public policies a coherent group of policies with care on superposition problems. Finally, the networks could transform in club goods the innovations and therefore partnerships between research centers, labs and firms have a lot of potential but care should be taken not to transfer partnerships in a goal in itself. The programs should not reward partnerships per se rather should reward with respect to the innovation in hand.

#### e) National Research and Innovation Agency

The National Research and Innovation Agency - (ANII, Agencia Nacional de Investigación e Innovación) is the most important institutional change in the area of research and innovation. The Budget Bill of December 2005 in its article 256 established the creation of an Innovation Agency to be in charge of the organization and management of policies to promote innovation, science and technology. This should be done favoring coordination among institutions and considering the social and production needs of the country. This Bill gave the President 180 days to present to the Congress a proposal with the judicial nature of the Agency the details of its goals and the internal organization of the Agency.

The Agency was established in December 2006 Bill 18.084. It was constituted as a non governmental state institution (“persona jurídica de derecho público no estatal”) which means that for anything that is not explicitly established in the Bill the Agency will act as a private institution (e.g. accountancy, its personal are not public servant, buying and selling). This may grant the ANII flexibility and speed in decision making.

In line with the PENCTI the main objectives of the ANII are:

1. to generate and manage programs for the promotion and development of science, technology and innovation following the strategic and political guidelines of the executive branch of government
2. to promote the coordination of actions between public and private actors
3. to help (with other Innovation institutions) the development of evaluation mechanisms.

Seven members integrate the board of directors of the ANII. The Government selects five of them, the other two are selected by the National Innovation, Science and Technology Council (CONICYT, Consejo Nacional de Innovación, Ciencia y Tecnología). The CONICYT was created by Lay 17.296 of February 2001 with basically the same objectives as the ANII.<sup>12</sup> The Bill 18.084 that created the ANII did not eliminate the CONICYT it rather re-defined its goals. The main change is that after 2006 the CONICYT started to act more as a consultant institution. The CONICYT is integrated with 21 members: 5 in representation of the executive branch of the government, 1 in representation of other public enterprises, 4 in

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<sup>12</sup> Previously, other public sector agencies were in charge of science and innovation.

representation of the Universidad de la República, 2 in representation of the private universities, 1 member selected by the researchers active in the National System of Researchers (SNI, Sistema Nacional de Investigadores, a program of the ANII), 5 in representation of the productive sector named by the firms Unions, 1 in representation of the Municipalities, 1 in representation of the workers Union, and 1 in representation of the institution in charge of primary and secondary education. The president of the CONICYT is selected by this 21-member directory board.

#### f) National Research and Innovation Agency and the private sector

The ANII has four basic programs targeted to firms in the private sector. The first program, the Young Firms Program (Programa de Empresas Jóvenes), is directed to start ups. The background of this project is Ingenio. Ingenio is a business incubator in the Information and Communication Technology (ICT) field, created as a joint initiative by the Laboratorio Tecnológico del Uruguay (LATU) and Universidad ORT Uruguay with financial support of the Inter-American Development Bank. Ingenio builds on the joint effort of the Government, the universities and the private sector to foster the development of the information and communication technology industry as key to the economic growth of the country. An evaluation of the Ingenio program found that although it was successful in general grounds it could be improved if the entrepreneurs being incubated could assign more time to their projects. The Young Firms Program provides a subsidy of \$20.000 for one year. The basic idea is to provide a basic salary (of up to \$600) per entrepreneur (up to 2 per project) to help them to focus on their project without the need to moonlighting. These projects are approved directly by the ANII committee without external technical evaluations. In the call for projects held in 2002 about 22 projects were presented and 10 were approved.

The second program is targeted to current operating firms. It subsidizes between 40% to 60% of the cost of the project. The percentage of the subsidy depends on the size of the investment (there are small, medium and large projects) and how dramatic is the innovation proposed. This program operates in an “open window” system. Firms can present an outline of their request at any moment. The directory within 2 weeks evaluates the request and invites (or not) the firm to present a full proposal. A technical and a financial expert evaluate the full proposal. About 60 outlines were presented in the last year with an approval rate of about 10%. Although the program is horizontal, according to the Fernando Brun (Director in charge of the firms programs of the ANII), there is a bias in favor of technological sectors. Brun evaluated that although this program has been successful there is the need to complement it with the implementation of industry funds (e.g. energy, biotech) with a more vertical spirit.

The goal of the third program is to improve the efficiency and to obtain quality certifications of small and medium firms. This program operates under an open window system and has very few requirements. It provides a subsidy of up to 50% of the cost of the firm proposal (maximum subsidy \$12.000). Currently the directors are considering profound changes in this program. In the new version there will be more requirements to apply to it (e.g. only project related to external markets will be founded) and the maximum of the subsidy will significantly be increased.

A question always present in this subsidy based policies is whether they really promote new production lines within established firms and facilitate the entrance of new players or if they

just transfer rents to firms that would have acted exactly in the same way in the absence of the subsidy. This is a question of difficult answer. One of the directors of the ANII mentioned that the only thing they have is an intuition. This intuition is that for the most the subsidy goes for projects that would have been carried out anyway but that the subsidy permits a faster and better development of them.

Finally, the forth program is for the conformation of networks. This program has two steps. In the first a group of firms can request from the ANII to hire someone to work with them to develop a proposal to solve a common problem. The ANII subsidizes 100% of the salary of the coordinator for the first 6 months and if needed 50% of the salary for additional 6 months. The second step involves the evaluation of the proposal that could be subsidized by the ANII. Up to now, no project has attained this second stage and there are only three networks working on the first stage. According to Brun, the concept of club good that inspires this program has very strong theoretical basis but is very difficult to implement.

#### g) Summing up this section

Over the last years there has been more emphasis on innovation policies than ever before in Uruguay. Also, there is precise consciousness on the necessity that the innovation process goes back to back with production activities and the private sector. It is too early to conjecture the success of this effort but the programs being implemented seem to be in line with the general objectives of the Government.

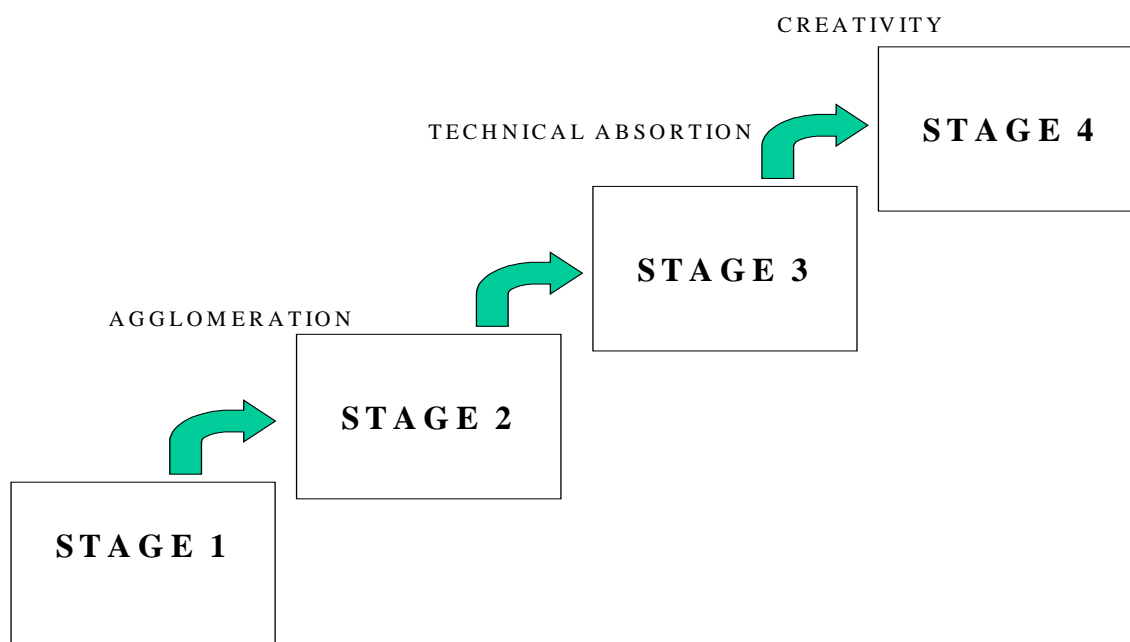
### 3.2. Directives on Industrial Strategy

#### a) Introduction

First, we present some current (2007) facts of the Uruguayan industrial sector :

- Industrial production represents around 25% of GDP (some 5.5 billion US dollars in 2007)
- Total investment in equipment summed US\$ 750 million, less than 13% of GDP.
- Total foreign investment reached US\$ 600 million
- Industrial exports were at their historical maximum: US\$ 2,139 million, and
- Industrial exports also were at their historical maximum: US\$ 5,469 million, of which US\$ 3,661 in raw materials and US\$ 782 million in investment goods
- Although exports have boomed, a limitation to future growth stems from the fact that primary, non-sophisticated products have been the support for that impressive growth

Second, it is the opinion of the Secretary of Industry that Uruguay is located at the lowest stage of industrial development according to the following representation taken from the document “Directivas de Desarrollo Industrial” of Mayo de 2008.



This stage corresponds to the production and exports of agricultural products and less sophisticated manufactures:

Stage 2 corresponds to the existence of poorly developed (technologically) support industries. Firms in Stage 3 are capable of producing acceptable quality products and show knowledge of existing technologies. Finally in Stage 4 firms can innovate and design high quality products at the international level.

In other words, productive structure of the country is not the most appropriate to achieve long-term, sustainable growth. Policies should be targeted to solve two main problems. First,

international experience shows that successful countries incorporate as much as 40% in value added while Uruguay only incorporates 27% of production value. Second, modern production needs technological development. Uruguay is still producing unsophisticated products, most of that are considered commodities.

#### b) Characteristics of Directives of Industrial Policy

Current plans for Uruguayan industrial policy focus on all technologically based, industrial sectors, including the energy sector. Industrial Strategy defines eligible industries as follows:

1. Successful industries: capable of introducing technology and value added: meat, dairy, leather, rice, wood, pulp and paper, mining, fishery.
2. Skilled labor intensive industries: software, automobiles, pharmaceuticals, textile processes, construction, energy, and navy.
3. New industries: Chemical, plastics, agricultural equipment, non-mineral materials, renewable energy, and biotechnology.
4. Support Services: Software, Engineering, Logistics, Transport and Communications

Each of these industries is eligible for protection and promotion, either through public inputs and/or market oriented incentives (see below).

Since the proposal defines “Strategic Industries”, we would be tempted to think in terms of Vertical Productive Development Policies. However, as described in the previous paragraph, the scope of industries included as strategic is so wide that in practice practically includes all relevant industrial sectors. In other words, although some clusters have been and will be selected (see below), no industry is excluded ex-ante. We will therefore consider the Proposal as Horizontal and the unit of reference will be a Productive Cluster or Value Chain.

Government will concentrate on the active promotion of industrial sectors, technology based, and regionally integrated. Promotion includes support for financially weak corporations. Government will not necessarily participate in the production of goods and services, leaving it mainly to the private sector.

Consistently with the analysis developed by the Secretary of Finance, the Secretary of Industry has agreed that the main restriction to Uruguayan economic and social development is the lack of relevant productive investment. Uruguayan restrictions do not stem from the quality of its labor force nor from participation rates, but from the lack of capital investment.

One difference between the strategy supported by the Secretary of Finance and the Secretary of Energy is that the former’s is a pure horizontal strategy while the latter’s consider cluster formation as an important part of it.

This industrial strategy is not just based on the development of new products but also in the development of new production processes taking advantage of globalization (outsourcing) and clusterization. One of the goals is to achieve economies of scale in one of the sections of the value chain.

The Strategy considers the following policy as an optimal regional integration policy. First, there is the need to study recent global trends of each industry and industrial process.

Second, a comparison of costs structures and competitive abilities between international and Uruguayan competitors will define the gap to be eliminated. Third, the gap will be addressed by concrete measures using appropriate incentives

According to the Directives, incentives will necessarily be temporary so as to avoid permanent support to inefficient production. Public support will not discriminate among domestic and foreign investors: the Government considers that long term investment is naturally good regardless of who is the residual claimant. Incentives will not be general but problem-specific, that is, targeted to solving particular and well identified problems, subject to control and evaluation. According to the Directives, incentives need to be transparent, subject to counter duties and socially negotiated (by relevant, interested parties).

Directives for Industrial policy define several goals to be achieved: a) economic growth, b) incorporation of value added, c) technological development, and d) promotion of environmentally friendly projects. More specifically, the following objectives are formulated:

1. Annual Growth of Industrial Product of 10% for 2008-2015
2. Multiply by three the production of technologically accepted products at the international level by 2015
3. Increase renewable-based (other than hydraulic) production of energy to at least 15% of total domestic consumption by 2015.

#### c) Market and Public Failures

According to Government officials, Uruguayan Industrial development faces several restrictions of diverse nature and significance. Among the most relevant restrictions are:

Uruguay lacks enough supply of skilled workers. This failure is pervasive in today's Uruguay. The Directives create an institutional body (the Productive Cabinet) that will create and coordinate specific programs of human capital formation with other relevant public institutions<sup>13</sup>. The ultimate goal is to check market conditions periodically and to adapt current programs to changes in those market conditions.

Uruguay faces a restriction in the availability of natural resources. Industrial development requires low-cost and efficient energy resources. New sources of energy such as solar, wind, and other still face information problems and credit restrictions, which requires the participation of the public sector.

There is shortage of physical and administrative infrastructure. This coordination failure requires large investments, some of which need to be financed and probably executed by the public sector.

Quality and amount of Information needs to be improved. Rules on project selection, monitoring, credit conditions, etc, must be available to investors. Progress has been made through the implementation of the Industrial Promotion Bill, the soon to be approved Bankruptcy Bill, the Bill of Defense of Consumers, etc.

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<sup>13</sup> Such as the ANII analyzed in last subsection.

Long term investment requires specialized inputs in terms of human capital. Long term investment requires an educated analysis of current and future market conditions, that is research beyond which is firm-specific. The Directives intend to create an institutional framework to improve the interaction between the Productive Cabinet and the Agency for Development with the ANII. Long term research is a public good that needs to be publicly supplied in order to avoid innovation restrictions.

New strategies of industrial development include as an important component the participation and cooperation between the public and private sectors. Representatives of the Government are discussing what institutional structure fits best for industrial development. Main concerns are with the potential capture of public officials by private interests leading to inefficient results

Long term investments also require protection. Innovation in new technologies is risky because of the uncertainty of future profits (see analysis of Innovation Policy).

Finally, economies of scale are an impediment for regional and international integration. Uruguayan firms should have the opportunity to integrate to global value chains through the formation of productive clusters and avoid this coordination failure,

According to representatives of the Secretary of Finance, the strategy is tailored to attack two market failures: problems of information and coordination failures that prevent an increase of productive investment. In this sense, the program does not try to identify each particular market failure associated with a particular market but to attack the key factor associated with low investment. It is argued that a boost in productive investment is a necessary condition for long-term development.

d) Instruments of Industrial Policy

The Government has defined several instruments to achieve the objectives described in previous sections. The following table outlines the main development policies.

	<b>Horizontal/Vertical PDPs</b>
<b>Public Inputs</b>	<ul style="list-style-type: none"> <li>▪ Institute for Commercial Promotion including an Export Promotion Fund (Agency for Industrial Development)</li> <li>▪ Cluster formation (PACCPYMES AND PACC)</li> <li>▪ Productive Cabinet and other Public Institutions</li> <li>▪ Support (unspecified) to industries where risks are high and/or no FDI exists</li> <li>▪ Possible promotion of a participatory institutional framework to achieve consensus on policy</li> </ul>
<b>Market Oriented</b>	<ul style="list-style-type: none"> <li>▪ Tariff exemptions for selected industrial inputs</li> <li>▪ Promotion of domestic production of selected inputs through selective protection</li> <li>▪ Production Subsidies for selected sectors</li> <li>▪ Tax exemptions for selected sectors</li> </ul>



### e) Evaluation

Many of the PDPs outlined in the previous section are included as part of the Industrial Promotion Bill passed in 2007, and are analyzed in a separate section of this document. We concentrate on some aspects of the Bill relative to industrial promotion and on two issues: the institutional context and cluster formation.

Relative to horizontal market incentives, the “Directivas” point to the Promotion Bill of 2007. Market measures such as tax benefits, production subsidies are included within the scope of instruments to be used to achieve industrial development. Since the granting and maintenance of benefits depend on pre-established and agreed indicators (instead of the presentation of a business plan), it is interesting to summarize a preliminary assessment of the consistency of the relation between failures, instruments and potential biases.

The main objective is to promote investment in physical and human capital, which is considered as the main economic restriction to economic development. A secondary and implicit objective is to minimize specific market and public failures of specific markets. This is not to say the efficiency issues are ignored since officials admit the existence of pervasive failures such as corruption, rent seeking and market information and coordination problems.

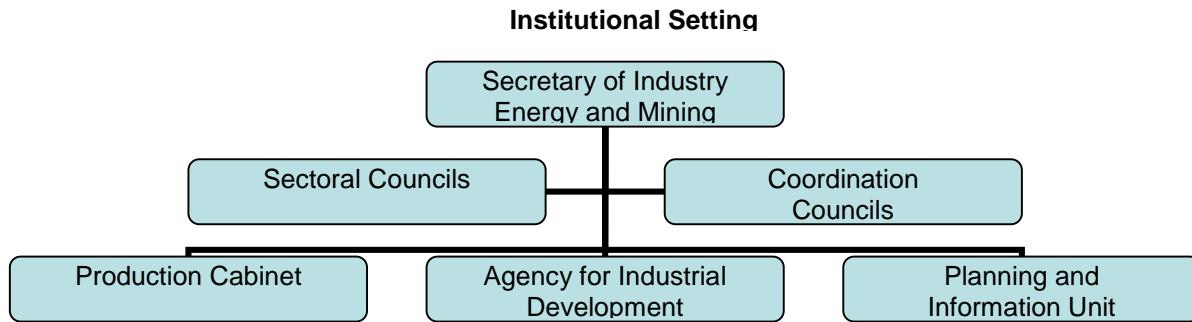
Our main concern is related to dynamic efficiency issues, that is, the biases that the incentives systems potentially can create. Since the system works on the basis of a flexible set of indicators, the process of selection and change of those indicators becomes relevant. The system is flexible in that indicators can be changed according to policy decisions. For example, if decentralization becomes important, an indicator that promotes investments in certain regions of the country could be incorporated. The weight (which measures the relative importance assigned to the indicator) can also be changed according to policy.

Officials admit that this is a potential problem in terms of efficiency but they argue that the system is somewhat more isolated from rent-seeking activities and corruption. In terms of dynamic inefficiency, officials argue that the indicators are permanently monitored to correct for possible biases in policy.

### f) Institutional Context

The relevance of the institutional context within which development policies are executed has gained momentum in recent years, especially after successful development experience of small open economies such as Taiwan, South Korea, New Zealand and Ireland.

According to officials of the Secretary of Finance who instrumented the modifications to the Industrial Promotion Bill, three cases were considered potential benchmarks to be applied to the Uruguay: China, Germany and Ireland. Permanent participatory Institutions were discarded as valid instruments to promote industrial development in Uruguay because of fears of capture by special interests. The view held by Officials at the Secretary of Industry is somewhat different. These officials have proposed the following institutional structure:



The Production Cabinet will include representatives of different public offices such as the Office of Coordination and Planning, the Secretary of Labor, the Secretary of Agriculture, Cattle and Fishery and the Secretary of Industry, Energy and Mining. The Cabinet will exercise leadership over selected sectors to be promoted. The Agency for Industrial Development will plan, execute and control the industrial strategy. Not specified in diagram above: the National Advisory Council for Industrial Development which is integrated by the “most relevant social actors for industrial development” (not specified). The Sectoral Councils will include representatives of the public and private (firms and labor) sectors. Its main purpose is to exchange information and advice. The Coordination Councils will work with other public agencies on issues such as Commercial Policy, Research and Development and Human Resources.

According to public officials at the Secretary of Industry, Energy and Mining, this institutional setting is under evaluation and it is being negotiated with other Secretaries and the President. However, it is believed that the setting described above will be modified. This official specified that the benchmark for this was Brazil and South East Asia.

At this point we reasonably can conclude that the Sectoral and Coordination Councils will not be a part of the framework. Policy will be defined by the Production Cabinet and implemented by the Agency for Industrial Development. Participation of the private sector will be required whenever necessary but will not be institutionalized as a permanent body. This runs consistently with the view held at the Secretary of Finance where the fear of capture by special interests is predominant.

#### g) Cluster Formation

There are two main programs on Cluster: PACCPYMES<sup>14</sup>, a Program developed by the Secretary of Industry and PACC<sup>15</sup>, developed by the Office of Planning and Budget

PACCPYMES consists of three main subprograms: a) Clusters (PC), b) Firms (PF), and c) Networks (PN). We are interested in the first of these Programs.

The PC Program intends to capture interested private companies in order to cooperate with each other and with public officials to improve the competitiveness of each firm through a joint venture, or cluster. The process of cluster formation includes several stages: a)

<sup>14</sup> Programa de Apoyo a la Competitividad y Promoción de Exportaciones de la Pequeña y Mediana Empresa”, Secretary of Industry, Energy and Mining.

<sup>15</sup> Programa de Competitividad y Conglomerados de Cadenas Productivas, Office of Budget and Planning.

selection and sensitization of interested parties, b) collection and evaluation of relevant information, c) diagnosis and strategic planning, and d) execution.

Selected firms will obtain the following benefits: a) a coordinator/facilitator, b) support in logistics and dissemination of experience, c) expert support for strategic planning, and d) a subsidy of up to 100,000 Euros which will co-finance all the process.

Clusters are evaluated and selected according to their potential for the development of non-primary products. An important pre-requisite is the existence of a critical mass of firms capable of working in association with other firms. Firms must be willing to risk their own resources and to be able to prepare a feasible action plan, or strategy.

After a critical mass of firms is detected, representatives of would-be clusters are asked to present their projects. Several factors are evaluated at this stage: firm's compromise with objectives, contribution to the goals of the PC Program, and internal consistency. This stage ends with the selection of 10 proposals

An Evaluation Committee then evaluates the institutional capacity, the level of social cohesion between the partners and the long-term profitability of the project. This stage ends with the selection of the best 5 proposals

Finally, the potentiality for replication is evaluated for the selected proposals.. There are several Cluster and Value Chains currently in formation. The Secretary of Energy is working on seven Clusters<sup>16</sup>. The Office of Budget and Planning is also working on several projects<sup>17</sup>.

#### h) Related Market Failures to Clusters

This program attempts to minimize important restrictions for the development of a sustainable network of small firms. First, scale economies limit the development of these firms. But scale economies can be obtained if firms associate in joint-production. Second, coordination failures between small and larger firms can be minimized through the formation of clusters. Asymmetries of information can also be minimized in, e.g. credit negotiations with financial institutions. Last but not least, small firms are labor intensive and can contribute to relax the restriction of high unemployment and social costs.

#### i) Summing up this section

Industrial Directives is a new initiative of the Vazquez administration. It attempts to develop targeted industrial sectors and solve market and public failures using market incentives, supply of public good and the creation of an institutional environment where policy is formulated on a consensual basis. It is too early to formulate any evaluation on the institutional context proposed since it is really being discussed by officials.

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<sup>16</sup> Wine, Tourism (2), Life Sciences, Cheese, Logistics and Transportation, Naval Industry, and a Agricultural project on the west of Uruguay (Litoral)

<sup>17</sup> Beekeeping, Blueberries, Shoes, Software, Tourism, Clothing.

### 3.3. Investment Promotion

#### a) Introduction

Based on the concept of “Open Regionalism”, State intervention to promote industrial development was justified and a Bill on Industrial Promotion was passed to take advantage of the potential attractiveness of MERCOSUR in 1998. The Bill had fundamentally two broad objectives. First, it aimed at improving investment conditions through market oriented policies such as tax incentives. Second, the regulatory framework was modified to assure there would be no discrimination against foreign investors, private property guarantee and the permanence of the tax treatment. There was also an attempt to increase transparency and reduce bureaucratic costs.

The current Administration concluded that some unintended consequences of the Bill needed to be evaluated. These include bureaucratic delays, lack of transparency in the selection of investment projects, discrimination against small investment projects<sup>18</sup>, biases towards selecting investments in physical assets, too short tax-exemption periods, and limitations of tax-benefits to those projects financed by retained earnings or capital investment (Canalización del Ahorro).

#### b) New Framework

In 2007, the Vazquez Administration passed Presidential Decree 455/07<sup>19</sup> that introduced modifications aimed at correcting the deficiencies mentioned above. It also passed new criteria for investment evaluation and selection to be used by the Application Commission (Comisión de Aplicación, COMAP). These criteria essentially represented a change in the attitude towards investment and a new “shock” strategy to attract investment. The main objectives of the new framework are the same that were stated in 1998 Law:

1. To improve competitiveness through technical progress
2. To facilitate development of more and new exports, specially those that incorporate local value added
3. To generate productive employment
4. To facilitate the formation of productive chains, or value chains
5. To facilitate the creation of new small and medium size companies
6. To facilitate economic (industrial, agricultural, services) and social decentralization, as a means to achieve sustainable development.

The investment promotion system is structured with an executive committee (“Comisión de Aplicación”, COMAP) that is integrated with delegates of Ministry of Economics and Finance (coordinator), Ministry of Agriculture, Ministry of Industry, Ministry of Labor, Ministry of Tourism and Budget and Planning Office. This commission recommends the

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<sup>18</sup> Free Zones attracted foreign, significantly large scale, investments while the Bill was used by large and mid-size investors, leaving small projects out of the reach of the benefits. The costs associated with the presentation of the promotion, and the discrimination against social constitutions that were not S.A. (corporations) were prohibited for small firms.

<sup>19</sup> The Administration essentially maintained the goals of the original Investment Bill but changed norms that relate to its implementation.

promotion of projects to the executive power in a rather automatic way after checking all requirements. A government resolution gives tax benefits to the project.

There is also a new office at the Secretary of Finance: Private Sector Development and Investment Support Unit (“Unidad de Apoyo al Desarrollo y la Inversión en el Sector Privado”). It works as a front desk in projects presentation and facilitates the relationship with the public sector.

### c) Main Characteristics

Projects would be evaluated according to investors’ commitment to objectives to be achieved and not based only on a proposed investment project and the history of the investor(s). Papers are kept to a minimum, and only need to be presented at one-stop window. There is a 60-day period to explicitly decide on the project, but a tacit approval follows if no explicit declaration is made after 60 days.

Investment projects are classified according to amount to be invested and to their contribution to Gross Domestic Product<sup>20</sup>. The following table shows the criteria:

	Amount of Investment <sup>21</sup>	Investment as % of 2008 GDP(%) <sup>22</sup>
Small	Less than 0.3	Less than 0.001
Mid-size 1	0.3 to 1.2	0.001 to 0.004
Mid-size 2	1.2 to 6.0	0.004 to 0.020
Large 1	6.0 to 12.0	0.020 to 0.040
Large 2	12.0 to 42.0	0.040 to 0.145
Large 3	42.0 to 600.0	0.145 to 2.00%
Of Great Economic Significance	More than 600.0	More than 2.00%

A specific link between incentives<sup>23</sup> and achievement of objectives is established through a Matrix of Indicators<sup>24</sup>. Selected indicators are:

<b>Indicator</b>	<b>Criteria</b>
Employment	Jobs (Full time equivalent) created
Geographic Decentralization towards poorer regions	Local Human Development Index
New Exports	Relative to no-project situation
Domestic Value Added	Change in the participation of local salaries and inputs in sales
Clean Technologies	% of “Clean Investment” on total investment

<sup>20</sup> One of the objectives is to facilitate presentation of projects by small companies

<sup>21</sup> Millions of 9/08 dollars

<sup>22</sup> 2008 GDP is estimated at USD 30B

<sup>23</sup> Benefits include the amount of the exemption and the period of exemption.

<sup>24</sup> Small projects are allowed to choose only one and unique indicator which will determine the extent of the benefit received.

R&D and Innovation	% of R&D on total investment or number of R&D jobs created
Impact on GDP	For each 0.003% of GDP of investment
Labor Agreement	Collective Agreement approved by Govt.

The period over which tax-benefits (rent) are granted is extended to a minimum of three and a maximum of twenty years. Benefits can be used at a decreasing rate: exemption can be used in a maximum of 90% of the income tax (IRAE) during the first half of the period, this percentage reduces gradually on the second half.

The term “Industry” means not only manufacture but also Services and Commerce. In other words, benefits apply not only to investments in traditional industrial sectors but also to new ones such as software, logistics, transportation, etc.

In a way consistent with the previous paragraph, benefits apply not just to equipment but also to investments in fixed assets and “invisibles”.

Benefits are strongly concentrated in giving a robust signal to investors by increasing their rents. The average fiscal incentive was established three times the monetary amount of the old regime. Benefits are also strongly associated with the successful achievement of agreed objectives (measured by the indicators shown above). Moreover, benefits are protected against domestic inflation, as they are expressed in terms of Indexed Units

Benefits can be easily modified if new investments are made or if objectives are outperformed. The intention is to provide flexibility to adapt cost structures to an uncertain environment giving a reward to “self-discovery” updating automatically de incentive to the more productive reality.

#### d) Market and Public Failures

Although the Government focused on the broad goal of increasing investment without a direct reference to specific market failures, the following Table attempts to link proposed indicators to relevant failures, as discussed informally with official representatives:

<b>Objectives of Fiscal Incentive</b>	<b>Restrictions to be minimized</b>
Increase of Employment	Lack of spillover of tax exemptions Lack of skilled labor
Exports increase (US\$)	Scale economies Market size
Geographical decentralization to poorer regions	Income distribution Agglomeration Externalities
Increase of Value Added	Lack of skilled labor Availability of Natural Resources Appropriability of Self-discovery
Environment-friendly investments	Negative externalities
R&D	Underdeveloped Academic Research Asymmetric information
Modern Labor Relations	Asymmetric Information PA problem

The new investment framework is tailored to minimize two relevant public failures: corruption and rent seeking. It does so by setting a framework that applies across the board, and includes clear and quantitative measures of evaluation. To receive benefits, investors need to meet different pre-determined objectives during the life of the project. These pre-determined objectives are set by policy and each objective is weighted also by policy. This framework may lead to granting excessive benefits relative to efficiency and/or to distortions in the allocation of resources (bad selection of indicators). Officials admit this potential problem but argue that the system is flexible enough to be changed whenever distortions and /or errors are detected. Since the priority is set at increasing investment, officials believe this is the best mechanism.

e) Summing up this section

Investment promotion provides the PDP scheme with a powerful horizontal tool. Its main feature is that it is general, transparent and has broad coverage. The new framework substantially increased tax benefits, leaving the problems arising from the relation cost-efficacy as a second priority of the policy. The intention was, at this stage, to shock expectations and to attract investment and put the country in the international list of the best places to invest.

Potential problems with this framework lie on: a) selection of appropriate indicators, b) their calibration, c) potential unintended biases. Indicators and parameters need to be constantly revised in order to adequately represent changing circumstances.

## 4. Vertical Policies

### 4.1. Sustainable Production Project<sup>25</sup> (agricultural sector)

#### a) Motivation: the case of soybean explosive growth

Probably the most important structural change of the last decade in the Uruguayan agriculture is the development of the soybean sector. The Sustainable Production Project is not the official response to the challenges implied by the soy sector but understanding the issues raised by the explosive soy development is useful to understand the working of the Sustainable Production Project.

At the beginning of the century the soy was almost abandoned in the Uruguayan agriculture but since 2000 it started a period of intensive growth both in absolute value (tons and monetary value) and as a share of total agricultural production. By 2006, soy production accounted for 17% of total agricultural production and by 2007 soy exports reaching more than 200 million dollars represented one third of agricultural exports. The increase in production and exports is the result of increases in quantities produced and increases in prices. Soy prices evolved from \$164 per ton to \$288 per ton (a price increase of 75% in seven years). The area plowed with soy also increased in absolute and relative terms. By 2007 the area devoted to soy production was the largest of all agricultural products, even above rice.

Almost all of the soy produced in Uruguay is transgenic. Using genetic engineering techniques it is possible to alter the genetic material of living organisms. These are called genetically modified organisms (GMO). These techniques allow the combination of DNA molecules from different sources into one molecule to create a new set of genes. This DNA is then transferred into an organism that acquires enhanced or novel traits. In 1995, Monsanto, an international corporation, introduced Roundup Ready (RR) soybeans. These RR soybeans have had a copy of a gene from the bacterium *Agrobacterium* sp strain CP4 inserted into its genome. This allows the transgenic plant to survive being sprayed by the non-selective herbicide Roundup (Glyphosate being its active ingredient) therefore farmers may reduce tillage or even to sow the seed directly into an unplowed field.

#### b) Market failures

In the reading of the literature, the public press and as a result of informal talks with relevant parties several market failures have been signaled with respect to soy development that also may apply to other agricultural products. It is important to note that there is no agreement on how severe these market failures are. The range of opinions is quite wide. For instance, a consulting firm (SERAGRO) argued in the press that a temporal ban imposed by the government on the introduction of new GMO (January 2007) was a terrible policy mistake in contradiction with the innovation policies fostered by the government. The ban would delay the development of the agricultural sector and since bean production impacts positively in animal (cattle) production, it would also affect negatively this sector. On the other extreme in a recently published book by RAPAL<sup>26</sup> (Blum et al 2008) it is mentioned that most of transgenic soy producers in Uruguay are foreigners renting land at low prices with no care

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<sup>25</sup> In Spanish: "Proyecto de Producción Responsable".

<sup>26</sup> RAPAL Uruguay is a member of PAN International (Pesticide Action Network).



for the soil and the environment. According to the author these firms make profits in the short run but the country has a long run impact of soil erosion, water pollution and health effects for the industry workers.<sup>27</sup>

As the opinions of SERAGRO and RAPAL make it clear there is no consensus among interested parties about the pros and cons of the current development of the soy sector. Therefore discussion of possible market failures and policies to solve them should be considered with care. There are actors of the industry that consider that the market failures (if they exist) are minimal and have no real impact and other argue that they are so strong and that the government has been so negligent in controlling it that the soy growth attempts against Uruguayan development. In this paper we discuss the economic rationale of the most important potential market failures and how the Sustainable Production Project is supposed to deal with them but we do not estimate how severe they actually are nor if the policies implemented had the desired impact.

The most important market failure mentioned by several actors and members of the government refer to the negative externality of transgenic soy on the environment. In particular there have been cited negative impacts over soil erosion, water pollution and animal and vegetal bio-diversity.

Some people have argued also that transgenic soy has negative externalities to other sectors. Gudyans (2007) points that cattle producers are concerned about the proliferation of transgenic because of the risk they represent to exports under an “organic” label. Organic meat is supposed to proceed from cows that did not grow in transgenic fields and were not feed with transgenic food. Palomeque (2008) mentions that many honey producers have complained about the decrease in the number of bees in the surroundings of transgenic soy fields. To the best of our knowledge no public institution has taken action to establish the validity of these complaints.

A third market problem has to do with innovation. Although RR soybeans have been patented by Monsanto there is the need of research on how to adapt them to the weather and soil characteristics of Uruguay. The market failure here is a result of the not completely appropriability of this research.<sup>28</sup>

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<sup>27</sup> In their words (in Spanish): “*Gran parte de los cultivadores de soja transgénica en nuestro país son “empresarios extranjeros” que arriendan las tierras a un bajo precio y el cuidado de la tierra es lo que menos les importa. El beneficio económico que obtienen estas empresas es logrado en un período muy corto (seis meses), pero al país le cuesta muy caro, ya que una vez hecha la cosecha el suelo queda degradado y sin cobertura vegetal.*

*Es decir, que a Uruguay solo le queda el destrozo y la erosión de la tierra, contaminación del agua y efectos en la salud de los trabajadores y pobladores locales. Este tipo de monocultivos destructivos se consolida y profundiza año a año y la pérdida de nuestras tierras agrícolas se intensifica, lo que implica una agudización de la pérdida de soberanía nacional y alimentaria del país”.*

<sup>28</sup> This is not a goal of the Sustainable Production Project. The National Seed Institute (INASE, Instituto Nacional de Semillas) is devoted to promote and contribute to the development of seed related activities by furthering use and production of superior quality seed. The National Institute of Agricultural Research (INIA, Instituto Nacional de Investigación Agropecuaria) goal is to contribute to the development of the agricultural sector by generating, incorporating and adapting knowledge and technology. The Mesa Tecnológica de Oleaginosos was created in December 2005 following the initiative of several public actors and eleven private firms. The goal of the consortium is to create a framework to analyze the competitiveness of the sector. One of its specific objectives is to co-finance projects of mutual interest. In this sense a public good can be transformed into a club good (as analyzed in the innovation section of this paper) and the free riding effect vanishes or at least is significantly reduced.

Finally, the growth of the soy sector and the strong export orientation demands infrastructure to carry the produce, to store it in appropriate conditions and finally to ship it to its destiny. Lack of this infrastructure could have created coordination problems that could have jeopardized the development of the soy sector.<sup>29</sup>

### c) Sustainable Production Project

The Sustainable Production Project is being carried out under the Secretary of Agriculture. The main goal of the project is to foster the adoption of efficient systems of production based on natural resources (including bio-diversity) that need to be economically and environmentally sustainable.<sup>30</sup> This is a very broad objective so it is important to understand the diagnostic of the agricultural sector that this project is trying to address.

According to the Operation Manual of the Project, the main problems detected are:

1. Problems of soil erosion, difficulties in the implementation of conservative practices and problems with the change from traditional tillage to no-till farming.<sup>31</sup>
2. Inefficiencies in the use of watering due to lack of equipment.
3. Deprivation in the genetic resources especially in natural pasture due to inadequate cattle feeding.
4. Lack of a modern system of information and monitoring of natural resources that could help to manage climatic risk, e.g. drought.
5. Lack of identification of elements of bio-diversity with productive potential.
6. Lack of a comprehensive national understanding that could perpetuate the genetic natural bio-diversity.
7. Problems in water provision not only in quantitative terms but also in qualitative terms due to pollution.
8. Excessive and inadequate use of herbicides.
9. Problems due to inadequate post harvest activities including agricultural waste.
10. Some plagues.

### d) Projects

Up to June 2008 the Sustainable Production Project has approved 2838 projects subsidizing an average of 70% of total investment. The subsidies were approved in four categories of projects according to the following table.

	2006	2007	2008	Total
Natural resources management	328	657	1261	2246
Bio diversity	3	26	76	705
Drought prevention		208	271	479
Fishery		6	2	8
Total	331	897	1610	2838

<sup>29</sup> This is also not a specific concern of the Sustainable Production Project. The Plan Nacional de Silos and the Secretary of Infrastructure and Public Works are more related to this issue.

<sup>30</sup> In Spanish “promover la adopción de sistemas de manejo integrado y eficiente de los recursos naturales de uso agropecuario, incluyendo a la diversidad biológica, que sean económica y ambientalmente viables”.

<sup>31</sup> No-till farming is a production mechanism where the producer sows the seed directly into an unplowed field. It is traditionally associated with less soil erosion and lower impact in wildlife habitat.

e) The economic rationale for the project goals

The Sustainable Production Project worked as a direct subsidy to producers to implement process that could improve some of the mentioned problems. The subsidies range from 80% of total investment for small producers to 20% for large producers. The emphasis on small and medium producers has been very strong in the implementation of the program. Even to the extent that in an interview with the head of the program, Alfredo Bruno, he remarked that the main point of the program is to help (subsidize) small agricultural producers while production improvements were of second magnitude. Somewhat at odds with the official statement of purpose, the project seems to have acted more as a tool for social policy than as a PDP.

We understand how water pollution and vegetal bio-diversity can be subject to externalities. In the Coase Theorem spirit there is an impact on them because property rights are not well defined. But from an economist point of view it is more difficult to understand the impact on soil erosion and why this impact in soil erosion (if there is any) is above the social optimum level. Land is privately owned and the owner of the land should care about the net present value of the income from this land. If he decides to produce soy without alternating with other products or even without alternating soy and cattle production (as is more traditional in Uruguay) it must be that he believes this is his best course of action. It has been argued that “foreign” entrepreneurs rent lands and they do not care about soil erosion, they just care about short run profits. But this also does not make sense. If the owner of the land decides to rent the field he should know what he is doing. We do not have regulations to control the renting of apartments on the summer in the sea side resorts. It is natural that house renters care about the building less than owners, but if the owner choose to rent it to an Argentinean tourist it is because that is what is best for him. With property rights well defined the market provides the social optimum level of soil erosion.

The fact that the soil is a non-renewable production factor does not affect the argument that under well-defined property rights the market produces the social optimal outcome. But, if this social optimal outcome is attained by a process of try and mistake, the impact of mistakes in soil is much worse than in the case of renewable factors of production.

Therefore in order to argue that there is a need for government intervention to control soil erosion we need to argue that i) land is not really private property, ii) land owners are myopic, or iii) there are information asymmetries. We have not officially found any of these arguments but in the interview with the head of the Sustainable Production Project he mentioned that the current administration views soil as a “social good”, clearly implying some limits to land private property. Yet, soil regulation is not a new concern, rather is one of the first environment concerns Uruguayan governments ever had. By decree-Bill of 1981 (during the military dictatorship) it is stated that the government has the duty to prevent and control soil erosion. The details of implementation of this Bill were only put into practice by a Decree in 2004. Concerns about explosive soy growth motivated a new Decree in August 2008 with more details on the type of actions that were considered inadequate in agricultural production. This last decree in its justifications explicitly mentioned the growth of agricultural products that do not protect the soil much as the “explosive expansion of soy”. Currently there is a new Bill being discussed about soil protection.

f) Summing up this section

The Sustainable Production Project goals refer fundamentally refers to natural resource management (especially soil and water) and bio-diversity. It is clear that water pollution and bio-diversity are subject to market failures but it is much less clear how reasonable are the regulations on soil use. Besides this, the Sustainable Production Project has been very active on the last years. Finally, its focus on small establishments has more to do with social policies rather than productive development policies.

## 4.2. Meat Traceability

### a) Motivation: Human Health and Product Differentiation

Mainly since the appearance of the Bovine Spongiform Encephalopathy (BSE), commonly known as Mad-Cow Disease (MCD) in England in the mid 1980s, international institutions such as FAO and others have been concerned with the sanitary conditions of food products and their effect on human health. Safety conditions are enhanced by setting up efficient traceability systems

The increase in fresh food choice is affecting consumer demand for more and more product information. The identification of the origin of feed and food ingredients and food sources is of prime importance for the protection of consumers, particularly when products are found to be faulty. Many producers and public officials believe that an efficient traceability system would enhance safety conditions while allowing them to differentiate their products and obtain economic rents. Traceability should facilitate the withdrawal of foods (if needed) and should enable consumers to be provided with accurate information concerning safety characteristics and management technologies of implicated products. In addition to the increase in consumer demand, market opportunities and regulators<sup>32</sup> are demanding that traceability of meat & fresh produce be addressed as quickly as possible.

Traceability of cattle provides numerous benefits including access to restricted markets (such as the European Union), improved pre-slaughter management, quick and accurate tracking of disease, and improved firm management and production decisions through more detailed information (e.g. inventory management and logistics)

In food processing, traceability refers to the recording of all movements of the product and of the steps within a given production process. In situations where an efficient traceability system is in place, it is possible to precisely identify the product's origin and how and when it was produced. In the case of meat products, traceback systems allow to link the final beef a consumer is eating, say, at a French restaurant, to the animal from which that beef was produced, probably bred at a Uruguayan farm and slaughtered at US processors. Traceability implies the use of data such as barcodes and Radio Frequency Identification (RFID) that can be traced through the entire production flow from the farm to the processors and beyond, connecting all the stages of a given business.

Traceability systems vary because different sectors (industries) face different costs and benefits from such systems (AER 830). Hobbs (2004), states that some countries set up mandatory systems while other countries rely on voluntary systems. Moreover, some systems include tracing from the farm to the processors while others also include tracing of meat cuts up to the retail sector. Besides food processing, traceability systems have been adopted in different economic industries such as logistics, materials, blood analysis and software.

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<sup>32</sup> For example, Harmonized EU control measures were introduced in 2001 to combat the spread of BSE. New elements are contained in the EU Regulation (1292/2005) which amended Annex IV of the Regulation (999/2001) from 1 September 2005. The EU is also requiring exporters to the EU to meet sanitary requirements regarding these diseases (see below)

## b) Market Failures and Traceability

Insufficient traceability in food markets can arise due to information problems (asymmetries or absence of information) among suppliers (e.g. cattle ranchers and processors) and between consumers and suppliers.

Briefly, traceability efforts to supply information on credence attributes to differentiate products will not be maximized if firms regard those efforts as not having value to consumers. On the other hand, if potential problems are not firm-specific but involve the whole industry, firms will not have incentives to supply information on their products. In other words, if safety problems are common to the whole industry and out of the control of individual firms, they may not be willing to supply information that would expose them to liabilities. Additionally, even if problems are not common to the industry, firms may value anonymity if supplying information on products and processes exposes them to legal sanctions. Finally, traceability will be undersupplied when disclosure requirements are partial or incomplete and when innuendo is pervasive. In all these cases, government policies can be thought as necessary.

Alternatively, private supply of traceability information would be less than optimal due to the presence of externalities or the public good features of traceability. With respect to food safety, supply of traceability services will not be at its social optimum if the public health benefits of traceability are larger than the firm's private benefits. This will happen if firms regard some level of anonymity as convenient, and if they cannot transfer the private cost of setting up traceability systems to the product price.

## c) Meat Traceability in Uruguay

Uruguayan Meat Traceability system can be divided in two subsystems: a) Traceability proper (TP), and b) Black Boxes (BB). The former implies the tracking of data from the farm up to the processors while the latter consists in tracing information on meat cuts at the industrial (processors) stage to the retail stage. The link between the two systems should allow for the tracing of beef cuts at the retail level up to the farm of origin.

The Secretary of Agriculture (MGAP) has defined the objectives of the TP:

1. Food Safety
2. Create a Data Base about data on cattle characteristics and management practices
3. Certification of Production Processes
4. Certification of Origin
5. Creation of Trade Marks such as "Uruguay Natural"
6. Genetic Improvement
7. Tracking of diseases
8. Smuggling Control

#### d) Traceability (TP)

Animal traceability is a part of a more general system of Animal Identification<sup>33</sup> but goes beyond the simple identification. The Program allows the tracking of a specific animal during all its life (Tracking of Products), and the tracking of how the animal was raised (Tracking of Process). Data collected include, date and place of birth, owner, sex, breed, etc. The Program also gives information on the route followed by the products (food) extracted from the animal, on the characteristics of those products, on the middlemen involved in their trading up to delivery of the animal to the processors.

Uruguay implemented the first group traceability program in 1973. Information problems arising at the industrial stage relative to the real weights of each animal and the corresponding prices paid to cattle ranchers and taxes paid to the Government showed the need for a more efficient information system. After the 1986 BSE disease in England, Uruguay began implementing individual TP as a mandatory requisite to meet international standards.

After a process of consultation with interested parties (cattle ranchers, middlemen, processors, and retail operators), the Government launched the TP system that aims at the identification of each animal and of its movements within the country. The current version of the program was operative in September 1st, 2006<sup>34</sup> and aims at tracing every animal in the country by 2010. As of June 2008, the Government has reached half of that goal, that is, it has traced 5,821,585 animals, or 264,716 traced animals per month. Each registered interested party can access to the available information supplied by the Government through the SNIG.

As an indication of the interest of the different parties, the SNIG publishes the number of monthly visits to its web page: it has increased from an average of 5,000 in 2006 to an average of more than 17,000 in 2008.

##### d.1) TP and Market Failures

The 1973 system was created to obtain more reliable information on the births, deaths and movements of cattle and on the tons of meat processed and sold by processors. The main objective of the system was fiscal, that is, to control the flow of taxes paid by cattle ranchers and meat processors<sup>35</sup>.

The subsystem TP has been created to assure food safety according to international standards. For a country like Uruguay, a net exporter of meat products, food safety represents not only a formal procedure to comply with international standards, but also a requirement to preserve current export markets and obtain new ones. Thus, food safety can be seen as a public good with environmental consequences. Public officials and representatives of Cattle ranchers Organizations coincide on the public good nature of TP. One representative of a supplier of software services on traceability declared that “collecting

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<sup>33</sup> National System of Livestock Information (Sistema Nacional de Identificación Ganadera, SNIG)

<sup>34</sup> Initially, the system only allow for group-identification. A second stage included individual identification.

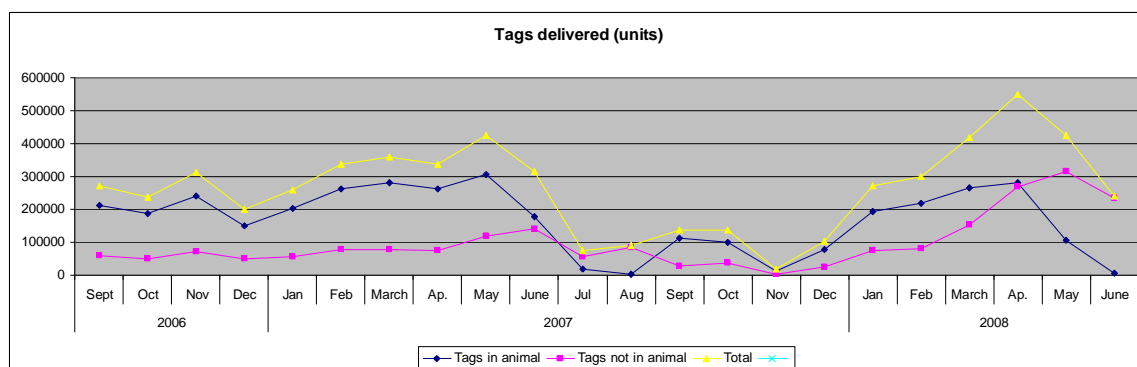
<sup>35</sup> Since cattle ranchers are paid by processors according to the weight of the animals delivered using scales own by those same processors, there are conflicts between ranchers and processors on the fair value of cattle (see the Black Box system)

money from producers to fund the TP program would be like supplying vaccines without syringes”.<sup>36</sup>

Accordingly, the TP system has been funded through public funds. Producers have not directly paid either for the hardware or the software needed to implement the system. They have neither paid for its maintenance, which is carried out by the MGAP.

Should cattle ranchers and meat processors pay for the system? Would traceability be socially undersupplied in this case? We need to gauge at the private costs and benefits and the social costs and benefits of such a system. This case seems to fit perfectly under the “private benefits-social benefits” dilemma. It seems clear that safety issues are a public good and that there are good reasons to believe that government should fund the costs of the TP program. Apparently, cattle ranchers don’t see TP as a program that justifies the private burden of its costs, especially if they depend on other producers to tag their animals, although they admit that it is a desirable program. This gives support to the theoretical argument outlined above that traceability (TP) would probably be undersupplied in Uruguay.

That said, data collected from SNIG and other sources as well as statements by public officials, show some yellow lights. The following graph show the evolution of the total number of tags delivered to cattle ranchers from September 2006 until August 2007. The graph also shows the number of tags attached to the animal as well as those not attached<sup>37</sup>:



Up to August 2007, the (monthly) average number of tags delivered to consumers was 268.750 since the system was launched. However, the number of tags delivered shows a sharp decline in June and July of 2007, reaching less than 83,000 delivered tags per month. The number of tags delivered to cattle ranchers begins to rise by the end of 2007. However, although the total number of delivered tags rises significantly, so does the number of tags that *are not being attached* to the animal. Moreover again, the total number of tags delivered declines significantly after April, 2008. Assuming total livestock in 11.5 M, to meet EU requirements by 2010, more than 315,000 tags should be delivered to cattle ranchers each month and more than 434,000 tags should be attached to animals each month from June 2008 till December 2009<sup>38</sup>. It seems quite a challenging task, one that seems difficult to achieve given what has been done so far.

<sup>36</sup> J. Barreto, Director of Proyecto Farming Services, 2006.

<sup>37</sup> Each producer has 60 days to attach the tag to the ear of the animal. -

<sup>38</sup> An animal is not traced until the tag is registered in MGAP. The number of traced animals by this criteria total 3,745.861 which makes the situation even worse.



This situation begs the question: if all relevant actors agree on the need for TP and the way it is being funded: why is then traceability not fully implemented? Are there any other market or public failures that need to be addressed in order to get closer to the 2010 target? What are the potential consequences, say, in terms of food safety and export markets? Clearly, no meat will be allowed in the EU if there are animals left to be traced.

One explanation for this problem is that cattle ranchers estimate the number of births and request tags based on that estimation. Through the press and personal contacts, we have been told that the number of births has been less than the forecasted number and that makes for some of the difference, but still wanting.

Others, point to the fact that the modifications to the old system or cattle registration and monitoring have not yet proved satisfactory: the transit from a system based on physical support (paper) to an electronic system has proven to be more difficult than expected. (El País, Sunday, May 6, 2005, Editorial). Additionally, the new system implies the emergence of a new agent: the operator. Operators are individuals or firms registered at the Sistema de Información y Registro Animal (SIRA in Spanish)<sup>39</sup>. Operators must have the appropriate training and infrastructure to supply electronic information on livestock movements and changes of property. The operator is responsible for the appropriate collection and recording of the needed data. This new agent needs to have basic knowledge of software and other computing technologies, which is a scarce factor of production in most Uruguayan rural areas.

One important limitation would be the lack of internet connections in some Uruguayan rural areas. This has significantly reduced the number of registered animals, according to statements of Juan Magallanes, director of SIRA. The extent of the coordination failure and its potential impact over the whole system needs to be further evaluated.

#### d.2) Institutional Context

As mentioned above, the TP in its current version was proposed by the Vazquez Administration and discussed with relevant parties such as cattle ranchers and associations of cattle ranchers, slaughter firms and their corresponding associations, transportation companies and retail operators.

The SNIG includes the creation of the Committee for the Evaluation of the Cattle Information System (“Comisión de Evaluación del Sistema de Información Ganadera”), where representatives of the Government and the private sector discuss the evolution of the TP program.

#### d.3) Conclusion

Regarding public safety issues, the TP policy seems to point in the right direction, despite all the implementation problems noted above. Public funding of TP, either through direct subsidies or tax rebates seems to be necessary to achieve the 2010 goals. Potential coordination problems arise due to lack of appropriate internet connections in rural areas,

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<sup>39</sup> System of Animal Information and Registration

especially those related to the delivery of tags, the registration of animals by cattle ranchers and the efficiency of the operators.

Public funding of TP as an instrument for product differentiation is more debatable. This issue is treated in more detail when we discuss the second traceability subsystem, Black Boxes, but a word in advance is worth here: consumers do not seem to value traceability per se as much as safety and quality guarantees.

Accordingly, the policy of public funding of TP plus the strategies to assure healthy international standards as carried out by current administration seem to be an adequate productive development policy.

#### e) Black Boxes (BB)

The initial goal of the BB project was to obtain reliable information related to taxes paid by meat processors<sup>40</sup>. The project developed into a more comprehensive electronic information system aimed at two main objectives: to complement the TP project at the industrial stage, and to increase business transparency.

The BB project complements the TP system because it allows traceability to reach the final meat cut to be delivered to final consumers. BB begins by recording the data contained in each of the tags attached to the ear of the cattle (weight, age, origin, sex, etc.) and links this identification to each subsequent industrial process. The system thus allows the traceback of every meat cut up to the individual animal. The link of the two policies constitutes an asset to assure that Uruguayan meat meets quality and sanitary international standards so as to increase consumer confidence. In particular, this nexus guarantees the “natural” characteristic of Uruguayan meat, that is, there is no use of antibiotics, hormones or proteins in animals feed. Also, the system allows checking if cattle have been confined to yards or feedlots and if cattle are grass fed.

The Black Box system also improves business transparency. The data contained in the tag is kept in every subsequent phase of the BB process, which is mainly a system of electronic scales located in each subsequent (seven) production stage<sup>41</sup>. The scales are connected to a local server where the weights in each stage are stored. The system also includes a set of printers and bar codes.

All registered processors and ranchers have access to the information contained in each production stage. Ranchers can then link the weights of each stage to their cattle<sup>42</sup>. Since ranchers are paid according to the weight of each animal, the BB project has made a significant contribution by incorporating an independent weighting system. Ranchers and

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<sup>40</sup> The first bid to incorporate electronic scales at processors plants took place in 1998. The Vazquez administration encouraged the National Institute of Meat (INAC) to further develop the project into a more comprehensive system to allow for a more fluid interaction between processors and ranchers. See Institutional Analysis below.

<sup>41</sup> The seven stages are: 1) Reception of cattle, 2) Bleeding, 3) Dressing, 4) Classification, 5) Boneless, 6) Packing, and 7) Delivery. The project is being implemented in two phases: Phase 1 includes Stages 1 through 4 and it is completed. Phase 2 includes stages 5 through 7 and is 70% completed. See next footnote.

<sup>42</sup> For technical information on the BB project, see: [http://www.inac.gub.uy/innovanet/macros/Home\\_2\\_4P.jsp?contentid=1092&version=1&channelid=1](http://www.inac.gub.uy/innovanet/macros/Home_2_4P.jsp?contentid=1092&version=1&channelid=1)

processors are at this point discussing which of the scales is the most appropriate to determine the weight that will be considered as the basis for payment.<sup>43</sup>

According to INAC's President Fratti:

“Each processor will have a local area network including a circuit of electronic scales, computers, printers, scanners and other hardware which cannot be hacked, that are connected through their own servers to an extended area network whose main server is in INAC. The data obtained from the different scales throughout the slaughterhouse network during the production process can be read as many times as necessary but cannot be modified by anyone”.

#### e.1) BB and Market Failures

The cost of the BB project was estimated in US\$ 7 million. Ranchers, processors and the government have agreed that US\$ 1 dollar for every animal processed will be used to fund the project. However, this dollar will be compensated through a tax rebate on current taxes. In other words, the money is coming out of fiscal revenues. Although the project is funded through public funds, ranchers have questioned the method since they argue that it may affect the prices they receive from processors<sup>44</sup>.

Ranchers regard BB as a significant improvement with respect to the information received on the weights paid by processors. Processors, in turn, although they support BB in general, some consider BB as an “unnecessary sophistication”.

First, the problem of asymmetric information between ranchers and processors is minimized with the implementation of the new system. This is consistent with the explicit support by ranchers and the not so enthusiastic adherence by processors.

On the other hand, the system is enthusiastically supported by the Government. BB represents an effective control on the industry and on the revenues collected through taxes. Since all information is stored and managed at INAC, the government actually has control on inputs and outputs processed by slaughterhouses<sup>45</sup>. According to some officials, BB actually acts as a “big brother”! This is also consistent with the positive but less than warm support by processors. The government also supports both TP and BB projects as complements to the Certification Programs on meat quality and safety conditions.

Third, some officials argue that BB represents an opportunity to develop a competitive advantage over other countries in the international meat market. The argument that “small is beautiful” applies to this case. The BB project actually comprises almost 100% of all ranchers and processors. This means that the entire country's rodeo can be traced. This has proven to be an impossible task for larger countries such as Brazil and Argentina, traditional

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<sup>43</sup> Before the new system was implemented, the weights were determined by the processors using their own scales at the reception of the cattle. The new system incorporates a series of scales that are managed and controlled by INAC (see below)

<sup>44</sup> Note that processors are “retention agents”: they collect revenues from exports and domestic sales, from which they pay ranchers for their cattle and taxes to the government.

<sup>45</sup> At INAC, we were shown how the system warns (a beep is heard) controllers every time a carcass passes through the different electronic scales. Information on weight, cut, origin, etc. is displayed in the monitor. Beeps sound every 5 or 6 seconds!

competitors. Product differentiation is thus a powerful argument for officials. Ranchers and processors, however, seem to disagree.

Finally, there is consensus on the benefits with respect to quality assurance and safety issues. The benefits arise in two ways: first, BB and TP systems allow for an almost immediate identification of the origin of a disease<sup>46</sup>. When BB is full in operation, a consumer will be in a position to identify the origin of the T-bone steak he/she is eating at a New York restaurant. If consumer's health is harmed by potentially traceable meat, rancher and processors would be liable and subject to payments in accordance to the damage. This brings us to the second benefit: both ranchers and processors receive positive incentives to assure appropriate meat quality. Despite these positive incentives, as we have shown, the intensity of support for the system varies among interested parties.

The above analysis shows that, although BB is supported in general, some actors say it is basically an "unnecessary sophistication". Why this different evaluation? Is traceability an appropriate policy to minimize information failures between ranchers and processors, and between these and consumers?

First, there is no doubt that BB has contributed to increase transparency between ranchers and processors. In this respect, traceability improves efficiency and transparency and should be supported as such. Since BB would have been undersupplied if left to processors, the government has funded the system because it considers BB a public good.

Second, does BB increase the consumer's confidence? This is more debatable. Would traceability per se reduce consumer costs ex-ante, that is, before purchase? Hobbs (2003) finds that Canadian consumers value traceability less than other factors such as safety conditions and animal treatment. In other words, when choosing among different meat cuts, consumers are willing to pay more for those cuts that supply objective assurance<sup>47</sup> of meeting international quality and safety standards with respect to those cuts that only assure that, in case of problems, the original rancher can be traced back and be subject to liability. So BB, considered just as a system that allows tracing the meat cut up to the rancher, does not seem to "add value" per se and does not seem to be an efficient policy aimed at product differentiation in international markets.

The Uruguayan BB system is partially mandatory. This means that processors must proceed to install the necessary infrastructure in order to be able to operate the system. However, the actual functioning of the system is voluntary, that is, processors are not required to offer BB in the market place if not required by consumers. This is consistent with the view of BB as an "unnecessary sophistication" and it is also consistent with the findings of the Hobbs (2003) paper: consumers do not seem to be willing to pay more for just traceability. In this sense, BB per se is not justified as a public good and should not be funded through public moneys.

There is however, one very important reason to consider BB a public good. It creates a positive externality on the supply of adequate safety conditions on the part of ranchers and processors. This is because BB, together with TP, makes both ranchers and processors subject to liabilities if they are caught violating international standards. That is, the

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<sup>46</sup> A few months ago, a warning of potential Foot and Mouth disease (FMD) disease triggered the traceability control system and it took less than 10 minutes to identify the affected ranch and the cattle. It turned out to be a false warning.

<sup>47</sup> By International Certified and Independent Programs

information contained in BB and TP allows checking if cattle is fed and managed according to international standards at the ranch level and if processors comply with sanitary industrial conditions. In this respect, both BB and TP seem to be right conceived. Moreover, one of INAC's main activities consists on implementing certification programs to assure consumers the appropriate quality standards.

#### e.2) Institutional Context: INAC

Its mission is to develop collective actions tailored to incorporate value added and promote the economic development of the "meat value chain" (cadena cárnica).

More specifically, INAC has a special interest in regulating and monitoring industrialization and international trade of meat products. INAC is a public-private joint venture that includes the participation of private farmers (2), private packers (2) and public officials (Secretary of Agriculture and Secretary of Industry, Energy and Mining) (2).

Attributions of INAC include:

1. Provide adequate information on market research and coordinate policies with other public dependencies
2. Authorization and registration and administration of meat exports. INAC can also set reference prices
3. Formulation of product quality norms according to international standards
4. Management of Meat Transportation Means
5. Control of the retail business
6. Imposition of Sanctions
7. Control and management of slaughters and industrialization
8. Advice on technological issues
9. Supervision of private farmers and packers

Decisions in general, are taken on a consensual basis, although the President has the final vote if no majority is achieved. The composition of INAC includes representatives of all interested parties, except retail operators.

#### f) Summing up this section

TP and BB seem to represent different things for different actors. The Government considers both projects as correcting for some information asymmetries between ranchers and processors, while at the same time act as mechanisms of revenue control. Besides, both projects are complement efforts to assure adequate safety and quality conditions in international markets. INAC also considers BB a powerful instrument of product differentiation and regards the program as a public good. INAC considers BB as providing competitive advantages over direct competitors such as Argentina and Brazil, that is, acting as a self-discovery instrument of new products and markets.

Ranchers are mainly concerned about their relationship with processors and the information problem stemming from the weighting and payment system. In this sense, they are strong supporters of BB. However, they don't really support BB as product differentiation strategy

and considers it as “processors’ problem”. They support TP and the fact that it is publicly funded. They see the government as having leadership in establishing a system of information for disease prevention.

Some processors consider BB as an “unnecessary sophistication”. First, they consider that information asymmetries with ranchers are not so important. Second, they think processors should be allowed to offer BB voluntarily to international customers, since they are not sure the market pays for the costs. They support TP as an instrument for protection against spreading of diseases such as FMC and BSE.

All actors are consistently satisfied with the institutional framework represented by INAC. They find INAC to be providing useful services to the industry, although some think INAC is over staffed.

In our opinion, TP is justified as mechanisms that prevent spread of diseases and as a guarantee of product healthy conditions. In this sense, it is a public good. BB complements TP in allowing the trace of unhealthy meat if needed. The public good characteristics of BB are more debatable. Both projects would allow for some product differentiation of Uruguayan meat at the international markets. However, some studies show that consumers are more willing to pay for safety and quality than for the fact that for the possibility of identifying who produces what product. It seems BB, at some point, would be more conveniently left in private hands.

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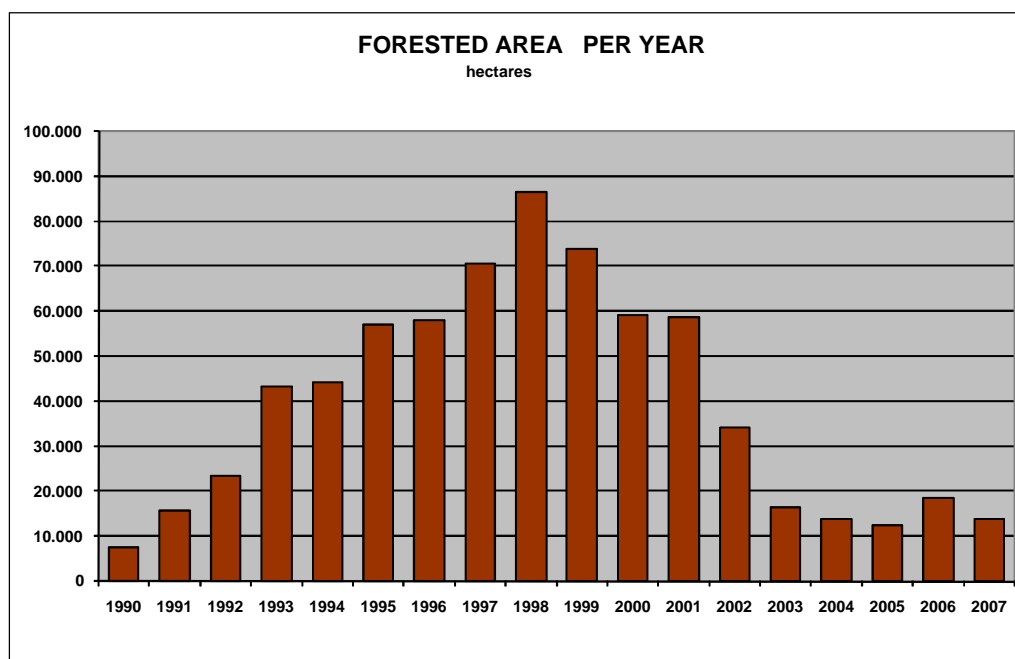
### 4.3. Forestry

#### a) Introduction

One of the vertical productive development policies in Uruguay relates to forestry and wood industrialization. Promotion has been justified in terms of comparative advantages given by abundant natural resources located in favorable latitude for planted forest<sup>48</sup>. Land and climate characteristics allow trees growing in less time than in other regions. The legal framework, passed in 1987, aimed at granting long term guarantees to would-be investors, subsidized costs of plantations (not purchase of land), and tax exemptions using as benchmark the Chilean model.

Soil not appropriate for agriculture and livestock was chosen and production subsidies and tax exemptions were put in place so as to achieve competitive scales of production in forestry and promote a diversification in agricultural productive units. Promotion was targeted to two species, Eucalyptus and Pine, so as to achieve scale economies in a relatively short period of time. Once production of raw material in the country had achieved the scale needed for industrialization, it was expected that related industries such as pulp and paper, construction materials, furniture, etc., considered localization in Uruguay.

Next, we show the number of hectares forested per year.



Source: DGF, Secretary of Agriculture (MGAP)

Once the production of raw material in the country achieved the scale needed for industrialization, related industries such as pulp-mills and sawmills located in Uruguay or announced their interest. Investments by large companies are characterized by having control of the supply of enough raw materials to operate. They also locate within a certain range of forestry (approximately 300 km) to avoid transport costs..

<sup>48</sup> Other important factors mentioned in the interviews are: stable macroeconomic environment, stable democratic regime, and education of the labor force

In 2002 the country entered a deep financial crisis and the government performed a fiscal adjustment, postponing the payment of subsidies and determining the gradual reduction for new forestry projects. Local investors, highly indebted with the state owned Banco República, appealed to the sale of plantations to big international enterprises to cancel their debts and obtaining financial liquidity for the core business, livestock.

In the following years pulpwood plantations started to mature and the harvest brought new problems of transport infrastructure like inadequate roads, lack of development of rail and insufficient port capacity. The installation of the first pulpmill (Botnia) on the coast of the Uruguay River created a conflict with neighbor country Argentina. In turn, as the forested area increases, the risk of fire and diseases health surges as a policy topic on the agenda. The Vazquez Administration kept the main strategic lines of the 1987 Bill but introduced some modifications related to its implementation. First, production subsidies elimination was anticipated two years Second, new goals were formulated. Policy should aim at the following goals:

1. To avoid overproduction and specialization of pulpwood species..
2. To diversify production of new species and to encourage the development of downstream industries
3. Diversify geographical location of plantations allowing new ones in the north-east of the country, and reducing the use of areas near the agriculture and livestock zone and the litoral west of the country.
4. To develop a productive structure based in the externalities of forestry with livestock production (agroforest or silvopastoral system).
5. To encourage the participation of small producers as wood suppliers.

## b) Main stakeholders

### b.1) Public Sector

At the policy level, the Secretary of Agriculture (MGAP) is responsible for the National Forestry Policy that is conducted by the Forestry General Agency (Dirección General Forestal, DGF). Also within the Secretary of Agriculture, the Renewable Natural Resources Agency (Dirección General de Recursos Naturales Renovables, DGRNR) determines which soil is to be classified as subject to forestry. This division has played an important role in the discussion about the extension of would be forestry areas to the East of Uruguay. Additionally, if a forestry project involves more than 100 hectares, approval is needed by the Secretary of Housing and Environment.

On research, the public Universidad de la República and the Laboratorio Tecnológico del Uruguay (LATU) are key players<sup>49</sup>. INIA has defined six strategic areas related to forestry issues for the 2007-2011 period.

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<sup>49</sup> The School of Agronomy and the National Agriculture Research Institute (Instituto Nacional de Investigaciones Agropecuarias INIA), are the divisions within public university that conduct research on forestry.



Research is conducted in close partnership with the private sector. The so-called “Grupo de Trabajo Forestal” includes representatives of private firms, farmers and other private institutions, and dates back to 1992. In 1995, the Government created the “Mesa Tecnológica de la Madera” with participation of representatives of private and public institutions. In general, private firms have developed their own research departments.

#### b.2) Private Sector

The private sector is represented by the Union of Forestry Producers (Sociedad de Productores Forestales SPF) which includes independent producers, forestry companies, investment funds, nursery companies, service providers, and the industrial sector and the Union of Wood Manufacturing Industries (Cámara de Industrias Procesadoras de la Madera).

Finally, the industry is characterized by the presence of many NGOs and lobby groups, mainly concerned with environmental issues and with some influence over policy.

#### c) Diversification policy for the forestry sector

As mentioned above, the Vazquez Administration kept the main strategic lines of the 1987 Bill but introduced some modifications related to its implementation with the objective of increasing diversification.

For the fiscal year 2008, the following are the targeted objectives:

1. At least 25% of projects should be small, involving mainly family business.
2. At least 5 projects should involve the joint participation of cattle ranchers and or dairy producers.
3. At least 100 hectares of new species should be planted, as defined by INIA

The policy objective and the statements by relevant private and public actors allow us to characterize current forestry policy as one that aims at diversification. This diversification has several dimensions:

1. Avoid excess supply and dependency on Eucalyptus and increase production of species more productive in the wood pulp industry that incorporates more value added
2. Development of downstream sectors (such as furniture), more technologically updated and labor-intensive
3. Geographical diversification, allowing plantations in the east of the country, and preventing the west region concentration.
4. More productive units, increasing the participation of small producers as wood suppliers, developing a productive structure consistent with other traditional agricultural production as livestock.
5. Avoid conflicts with traditional agriculture (cattle and dairy)
6. Avoid conflicts with environmental NGOs

#### d) Policy Instruments

The main policy instruments that have characterized forestry promotion in Uruguay have been:

1. Taxative soil selection
2. Production subsidies of up to 50% of planting costs
3. Tax exemptions on accrued Rent, Capital, and on imports of equipment
4. Favorable credit conditions
5. Tax rebates on exports
6. Public goods on research (INIA, LATU, and UDELAR)

The Vazquez Administration has manipulated the policy instruments in accordance with the policy objectives described above:

Soils located in the Southern and Western regions of the country have been eliminated as eligible for forestry projects. Soils located in the Eastern part of the country have been updated as eligible for forestry projects. However, final decision on which soil is accepted relies on the Secretary of Agriculture. This raises issues of discretionality and rent seeking activities and may have effects on land prices.

Forestry projects of more than 100 hectares now need to obtain environmental approval from the Secretary of Housing and Environment. These projects were exempt of such authorization.

Tax exemptions discriminate in favor of “high quality” wood<sup>50</sup>, and against pulpwood production with short rotation technique

Subsidies have been eliminated, anticipating the 2002 schedule from 2007 to 2005. The private sector has accepted this measure as a natural consequence of the evolution of the industry.

Production subsidies to small producers attempt to diversification of sources of wood supply to industrial firms. Up to date, only 14 projects have been approved. The Administration intends to generalize this instrument in order to boost supply diversification

Research and Development continues to be a policy priority, as mentioned above, especially that related to development of new species oriented to the high quality wood production.

The Government sets the policy with respect to sanitary conditions and fire prevention. These are public goods with strong externalities. The Government has implemented a best practices booklet (“Código de Buenas Prácticas Forestales”) that establishes quality standards.

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<sup>50</sup> Wood of more than 15 years, coming from plantings with density between 100 and 450 trees per hectare. Additionally, more than 20% of the harvest must be used as raw materials by sawmills.

e) Market and public failures that justify diversification policy

e.1) Promotion of new soils in Eastern Regions

This policy is justified in terms preventing the spread of forestry to regions that are more apt to dairy production and cattle management, and to avoid concentration. The western region is not saturated but two pulpmills projects (BOTNIA and ENCE) were thought in it and an international conflict arose with Argentina.

Some issues arise with respect to the bureaucratic management of this policy: the authorizations in the east is granted on a case by case basis, which has the potential problem of rent seeking and corruption and distort the commercial negotiation with landowners.

e.2) Previous Environmental Authorization

It is justified in terms of an adequate use of water. No clear objective criteria is disclosed as the basis for giving or refusing this authorization. Some entrepreneurs have warned us on the potential delays, especially because this authorization is granted after the project has been approved by the DGF, generating inconsistencies between bureaucratic times and productive times

e.3) Tax incentives to production of high quality wood

One of the objectives here is to avoid negative externalities of the current mode of production, highly specialized in Eucalyptus and pulpwood. High quality wood is especially appropriate in downstream industrial sectors which are labor intensive and present scale economies.

The negative incentive for pulpwood production has been criticized by some investors, who see this policy as “too much intervention” in a very dynamic market, characterized by the uncertainty on future demand conditions.

e.4) Elimination of Productive Subsidies.

This measure has been justified by public officials because the objective of financing long term risks and obtain appropriate scales economies had been achieved.

e.5) Subsidies to projects including both forestry and cattle production

Joint production has positive externalities because trees supply adequate shelter to cattle and cattle cleans the soil reducing fire risk. On the other hand, joint production prevents rural migration. This externality is recognized by private sector and there is an interesting development of contracts and projects of joint production without public sector intervention.

The downside of this policy is that no clear criteria for the granting of subsidies have been established, leading to discretion and potential rent seeking. The implementation is time consuming and has a high administrative cost.

#### e.6) Research and Development

The goal here is to supply a public good for the development of new species and increase of productivity. The National Institute of Agricultural Research (INIA) has taken the initiative in developing research programs.

It seems to be a lack of appropriate interaction with the private sector, especially with respect to the market opportunities of new species.

#### f) Summing up this section

Overall, the set of legal modifications established since 2005 seem to be consistent with the objectives of greater diversification in production, environmental protection, decentralization, and minimization of social conflicts.

Weaknesses seem to arise in the lack of public resources to manage the process to achieve those objectives. In general, public decisions are taken on a case by case basis, which is subject to rent seeking activities, since there are no clear rules. Both private and public actors seem to think of this stage as experimental, since both parties are learning how to deal with each other.

Interaction among private and public actors comes through the Academia and Research. Private investors and the Government have overcome their initial differences and fears and declare to have an acceptable relationship. Some investors worry about potential negative discrimination in an extrapolation of the pulpwood experience.

Summing up:

1. There are elements that lead us to think of a consistency between incentives and objectives of public and private actors.
2. Participation of the private sector in the design, selection, and implementation of productive policies is not homogeneous.
3. Some public actions are seen as too much intervention, subject to public failures.
4. There is no institutionalized learning mechanism through which errors are corrected and policies changed based on consensus.
5. There are coordination problems with other industrial sectors and different horizontal policies, such as infrastructure policy.
6. Self-discovery is promoted through Research at INIA and LATU, although some uncertainty remains about changes in rules.

## 5. Final words

In this paper we have reviewed and assessed some of the Productive Development Policies currently being implemented in Uruguay. We have selected three horizontal and three vertical policies and consider them in light of the market and public failures they attempt to address. We also describe and analyze process by which those productive development policies are established, that is, the institutional structure that includes public and private actors and their interactions. Horizontal policies comprise: Innovation, Industrial Promotion and Directives for Industrial and Technological Development. Vertical policies include the analysis of Forestry Law, Meat Traceability and the Sustainable Production Project in the agricultural sector.

Although we found that in principle the policies studied could be understood as attacking market or coordination failures and we did not find any obvious contradiction between them, we also found problems in their implementation and sometimes even differences in the approaches of the authorities and the letter of the law or regulation.

An important generalized change is the commitment to more active policies than in past years. This change in policy implies significant fiscal costs that during the booming years could be afforded. The fiscal sustainability over the business cycle of this policies is uncertain.

Finally, for the most part it is too early to evaluate the success of the policies in terms of welfare improvements that was anyway beyond the scope of this paper.

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