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RESEARCH PAPER

Institutional design matters: institutional causes of the Brazilian wine industry's poor performance

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Triple Helix theory prescribes coordinated actions among government, research institutions and industry to achieve growth. However, the Brazilian wine industry case shows that simply having the institutions is not enough – the institutional framework matters. This paper shows three problems in the Brazilian institutional design that hamper wine quality improvements and impede the development of an effective, fully-fledged Triple Helix model in the Brazilian wine industry. They are: overlapping jurisdictions between the federal and state governments; dissociation between the policy-making locus and the industry; and over-institutionalization. The latter cause is not well developed in the Triple Helix literature as yet. These three factors create coordination problems that appear to be almost insoluble in the present state, and underscore the need for designing institutions carefully before this impasse is reached.

1. Introduction

Brazil is one of the most successful emerging countries; it has the world's seventh biggest GDP and is the world's third largest agricultural exporter, behind only the US and the EU. According to the United States International Trade Commission (2012), Brazil accounts for approximately 9% of the world's agricultural exports – it is the world's largest exporter of coffee, sugar, orange juice and poultry; second largest exporter of soybean; third largest exporter of beef and corn. However, Brazil is only the world's twelfth largest producer of wine; according to FAO statistics it ranks only thirty-first in wine and wine derivatives exports in the world. Given Brazil's success as a leading agro-exporting country, why is it lagging behind in wine exports?

Brazil's wine sector is not a nascent industry. The country started producing wine on a commercial scale in the last quarter of the nineteenth century, in the temperate South. It was the pioneer in tropical wines, developing its own technology to make grape-growing and wine-making possible in the semi-arid region. Nevertheless, despite having some tradition in wine-making, and despite its technological breakthroughs, Brazil still produces low-quality wines.

Why does Brazil have low competitiveness in the wine market? Part of the problem lies with geographical conditional factors. Being close to the equator means that most of the country is unsuitable for growing wine grapes. Although technological innovation has made it possible to overcome this natural obstacle, in part at least,

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there is still much to do in terms of research and development of tropical wines. However, part of the problem also lies with *how the Brazilian wine industry is organized*.

This paper will argue that suboptimal results in the Brazilian wine industry stem in part from coordination problems. In the horizontal dimension, coordination problems arise from *over-institutionalization* in the industry, which generates innumerable actors involved in the policy process. In the vertical dimension, coordination problems arise from overlapping jurisdictions between federal and state governments and from the attempt to centralize wine policy nationwide in Brasilia, despite great regional diversity. This attempt at centralization of the wine policy curbs local government's policy-making scope and creates a more difficult policy-making process. Thus, this research adds to the Triple Helix (TH) theory by explaining that the coordination of the three helices of research, industry and policy is neither automatic nor easily managed, reflecting some of the findings of the other articles in this special issue, such as those on the Ontario and Oregon wine industries. In fact, the three helices are part of a vastly more complicated landscape in Brazil that works across levels of governance. What we find is that, even if the TH exists through formal institutions, effective coordination may be stifled when there are different actors with different agendas, both within and across each of the three helices.

To demonstrate these effects, the paper compares the institutional arrangements of Brazil's wine industry at the state and federal levels. This comparison is necessary because Brazil's federal system is characterized by overlapping jurisdictions meaning that the policy-making affecting the wine industry operates in two institutional layers. Rio Grande do Sul (RS) and Pernambuco will be contrasted at state level, chosen because the former is traditionally the most important wine producer in Brazil and the latter is the new Brazilian wine frontier, and because their wine industries have different levels of institutionalization. In order to better understand the cases, interviews with key actors in the wine industry, in the form of online surveys and telephone calls, were made between January and February 2012. The key actors included the main governmental and industry bodies of the industry at the federal level and each of the states. In addition, correspondence with academics with expertise helped to fill out the picture.

Little has been written about the Brazilian wine industry in scientific and academic publications, and most of the articles analyse only local industries. For instance, Vieira *et al.* (2007) carried out a comparative study using as cases the wine industry in the Serra Gaucha and the wine industry in the region of Mendonza, Argentina, in order to assess theories of regional development; Miele *et al.* (2007) identified six groups of wineries, or segments of competition in wine-making, in the state of Rio Grande do Sul; Vital (2009) analysed the development of grape-growing and wine-making in the San Francisco Valley, producers' and government's strategies; Otani *et al.* (2011) studied the institutional difficulties faced by artisan wineries in the state of São Paulo and the state government actions leading to the creation of the state Sectoral Chamber for Grape and Wine (SCGW), and to the creation of associations and cooperatives of artisan wineries. Using the Brazilian wine industry as a whole, Camargo *et al.* (2011) wrote on the technological advance of viticulture in Brazil, especially tropical viticulture; and Sato and Ângelo (2007) used the diamond model to explain how the government, wineries' strategies and the increase in the demand for wines from the New World favoured Brazilian wine exports. This paper

adds to the discussion by using Triple Helix theory to explore organizational and institutional dynamics across two contrasting regions of Brazil.

2. Poor performance of the Brazilian wine industry

Despite abundant and suitable agricultural land for wine production in southern Brazil the country still remains a major net importer. Table 1 shows that Brazil's wine imports grew almost exponentially from the early 1990s. The growth came in good part from the opening of Brazilian markets and the effects of the Mercosur (free trade agreement of the Southern Cone of South America) on the Brazilian wine market after 1991. Brazilian wine exports continue to lag other commodity exports, despite these new opportunities. Table 1 shows the growing gap between Brazilian wine imports and exports from 1990 to 2010. Because of this gap, the Brazilian wine industry called for protectionist measures and the federal government has declared its intention to adopt safeguard measures to protect the industry.

In 2000, Brazil was exporting wine to 16 countries only; the figure increased to 41 countries in 2006, including the US (third largest purchaser) and Japan (fourth largest purchaser) (Sato and Ângelo, 2007). Notwithstanding this incentive to exports, in the same period the total exports of Brazilian wine decreased from 6.3 million litres in 2000 to 3.4 million in 2006 while imports increased from 29.3 million litres in 2000 to 46.3 million litres in 2006.

The state of Rio Grande do Sul is historically the most important producer of grapes and wine in Brazil. Temperate climate in the Highlands and expertise brought

Table 1. Brazil – table wine import/export.

Year	Imports amount[a]	Exports amount[a]	Imports–exports amount[a]	Imports value[b]	Exports value[b]	Import–exports value[b]
1990	8	3.4	4.6	15.3	3.6	11.7
1991	8	4.3	3.7	14.1	4.2	9.9
1992	6	7.4	–1.4	10.2	7.5	2.7
1993	12	20.2	–8.2	18.8	14.8	4
1994	21.4	14.8	6.6	35	12.7	22.3
1995	28.1	14.6	13.5	50.7	12.6	38.1
1996	22.6	14.4	8.2	39.1	14.9	24.2
1997	24	15.3	8.7	48.2	15.8	32.4
1998	22.7	7.7	15	54.4	5.5	48.9
1999	26.4	6.7	19.7	62.3	4	58.3
2000	29.3	6.3	23	65.3	3.4	61.9
2001	28	2.6	25.4	63.5	1.3	62.2
2002	24.2	2.2	22	50.2	1.1	49.1
2003	26.8	1.4	25.4	57.3	0.7	56.6
2004	36	2.8	33.2	75.5	1.6	73.9
2005	37.5	3.5	34	85.5	2.5	83
2006	46.3	3.4	42.9	118.4	2.6	115.8
2007	57.6	3.3	54.3	156.9	3.7	153.2
2008	54.4	10.3	44.1	165.7	7.1	158.6
2009	55.9	25.5	30.4	176.4	8.9	167.5
2010	70.7	1.3	69.4	223	2.6	220.4

Notes: [a]Million litres.
[b]In millions. Currency not available.
Source: With data from Embrapa Grape and Wine.

by Italian colonists created the environment that fostered the development of the wine industry in the state, reinforced by the creation of appropriate institutions in the region. However, Rio Grande do Sul's relative participation in the total Brazilian wine and grape output has been declining as new grape-growing and wine-making regions are developing in other Brazilian regions as a result of technological advancements in tropical viticulture, especially in the San Francisco Valley in the state of Pernambuco. This trend can be seen in Table 2, showing Rio Grande do Sul's (RS) and Pernambuco's (PE) grape production in metric tons and their relative participation in the Brazilian total output.

Brazil's wine production, however, has not increased at the same pace as the grape production. It seems paradoxical that new lands were made available to the cultivation of wine grapes but Brazilian wine production has not increased significantly since 1990. Table 3 shows this trend in Brazilian wine production. Unfortunately, information is scant and there are complete data only on RS's and Brazil's wine production for a period of 20 years.

3. Federal level institutions suffocate the Brazilian wine industry

Brazilian wineries enjoyed market protection until the 1990s. The inception of Mercosur in 1991 challenged the wine industry, forcing the industry to modernize and to search for new techniques (Triches *et al.*, 2004). However, adaptation to the new situation of market competition has been unsuccessful. Wine is still in the list of 'sensitive commodities' of Mercosur negotiations because Brazilian wine is not as competitive as fellow Mercosur members Argentina and Chile.

Table 2. RS's and PE's absolute grape production and relative participation in the national production.

Year	RS total (in tons)	% of Brazilian production	PE total (in tons)	% of Brazilian production	Brazil total production
1990	538,705	66.94	14,483	1.80	804,774
1991	396,318	61.16	17,163	2.65	648,026
1992	505,462	63.17	18,510	2.31	800,112
1993	489,464	62.16	26,475	3.36	787,363
1994	479,034	59.32	30,821	3.82	807,520
1995	479,619	57.33	56,672	6.77	836,545
1996	333,638	48.71	47,817	6.98	684,902
1997	456,008	51.20	21,413	2.40	890,708
1998	348,368	44.99	49,973	6.45	774,352
1999	502,950	53.99	85,414	9.17	931,500
2000	532,553	51.98	86,078	8.40	1,024,482
2001	498,219	47.06	102,142	9.65	1,058,579
2002	570,181	49.64	99,978	8.70	1,148,648
2003	489,015	45.81	104,506	9.79	1,067,422
2004	696,599	53.94	152,059	11.77	1,291,382
2005	611,868	49.64	150,827	12.24	1,232,564
2006	623,878	49.63	155,781	12.39	1,257,064
2007	704,176	51.34	170,325	12.42	1,371,555
2008	776,964	54.66	165,075	11.61	1,421,431
2009	737,363	54.00	158,517	11.61	1,365,491
2010	692,901	51.28	195,168	14.44	1,351,160

Note: RS, Rio Grande do Sul; PE, Pernambuco.
Source: IBGE – Produção Agrícola Municipal.

Table 3. Annual Rio Grande do Sul's wine production (millions of litres).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total wine production	200	209	224	255	274	200	228	198	260	319	329	263	291	232	357	271	217	318	335	245	220
% of Brazilian total wine production	54.12	82.65	74.52	83.42	78.41	56.55	87.70	60.16	96.70	84.70	90.49	88.61	90.66	88.55	90.90	84.84	91.53	90.89	90.88	n.a.	n.a.
Brazilian total wine production	370	253	301	306	349	354	260	329	269	376	364	297	321	262	393	320	237	350	368	n.a.	n.a.

Source: Elaborated with data from Embrapa Grape and Wine and the International Organisation of Vine and Wine.

The presence of the federal government pervades the Brazilian wine industry. The federal government performs not only its traditional functions of rule-maker but also provides some coordination for the sector, capital and R&D. In short, it occupies two-thirds of the TH spheres. It uses tools of direct government (regulations), mostly through the Ministry of Agriculture, and tools of indirect government such as research corporations, development corporations, universities, technical institutes, independent government agencies (for trade promotion, entrepreneurship support) and public–private partnerships for exports.

Although it is important for only a few states, most of the R&D in the sector is done by federal institutions. The state of São Paulo's Agronomic Institute of Campinas developed grape varieties adapted to tropical climates. Embrapa is the sector's leading research institution, particularly its specialized branch Embrapa Grape and Wine. The federal government also provides workforce training. Hence, the federal government regulates and funds the wine industry, and provides a skilled workforce and R&D for the industry. Therefore, in spite of its arguably asphyxiating omnipresence, the Brazilian wine industry would not survive without the state.

In Brazil's corporatist system, an industry concerned with public policies can have a sectoral chamber in the government's organs to represent the industry's interests. These chambers have an auxiliary function to the ministry and they are also a forum where the industry can articulate its interests within the government. The key actor in the Brazilian wine industry is the Ministry of Agriculture because it is the locus where the most important decisions affecting the industry are made. The establishment of the CPCVWD (Chamber of the Production Chain of Viticulture, Wines and Derivatives)[1] in 2004 represents the absorption of the industry within the corporatist state. The CPCVWD is the 'head' of the Brazilian wine industry because it is the forum where 26 permanent members, including industry associations, government (federal and states), agencies of the indirect government, para-government institutions, research institutions and guests meet to discuss the industry's problems and action strategies.

A very important outcome of the CPCVWD is the strategic agenda for the period of 2010–15, which 'allow[s] the coordination of work, organizing, systematizing and rationalizing actions and objectives set by the Sector Chamber'[2] (Ministry of Agriculture, 2011, p.3). Amongst many goals in the agenda, some should be mentioned: to support ongoing research and development started by Embrapa and to create new regional partnerships with research institutions and universities; to build capacity; to harmonize institutions; to review legislation concerning the sector; to support cooperativism; to promote Brazilian wine internationally, to stimulate domestic consumption of wine, to develop oenotourism; to boost the quality of Brazilian wine; to make the Ibravin the industry's national representative institution; to create a national version of Fundovitis; to revamp tax, labour and regulatory legislations concerning the sector; to stimulate the modernization of the industry (Ministry of Agriculture, 2011). Although it is still too early to assess how successful this agenda might be, it already represents a turning point for the Brazilian wine industry, for it is the result of coordinated action at the national level between the industry, and the federal government and its agencies.

The federal government also initiated Wines of Brazil, an export platform for Brazilian wine. This programme started in 2002 as a joint venture between the Ibravin and the federal Brazilian Trade and Investment Promotion Agency (Apex). The strategic goal of this programme is to export 20% of national wine production by

2025 (Vieira *et al.*, 2007, p.49). Wines of Brazil does not promote individual brands; rather, it has a generic brand strategy because the goal is to build a reputation for Brazilian wine, emphasizing the country of origin instead of individual brands (Sato and Ângelo, 2007, p.22; Sebrae, 2011).

Among the non-government actors, the Ibravin is the most important industry representative institution at the national level. It is in charge of the industry's strategic coordination and harmonic development. One of the interviewees hopes that the Ibravin fills the industry's lack of cohesion and that it begins to coordinate action. Although Ibravin's purpose is to represent private interests, it is funded with *public* money and it manages the state of RS's Fundovitis. This conflation of public and private is reflected in the entity's councils, which include members of the RS government and of the private sector. Meanwhile, another national organization, the Uvibra, represents the interests of wineries that use *Vitis vinifera* to make wine.

At the federal level, Brazil's incoherence in governance stems mostly from the large number of actors that are part in the public policy process. Approximately 30 institutions are members of the CPCVWD. These are public and private institutions operating either at the national level or at the state level or at both levels. At least five states are represented in the CPCVWD. The institutions from the public sector are both from direct government and from indirect government organizations, and from both federal and state tiers of government, like state-owned corporations (e.g. Embrapa) and independent agencies. From the private sector, there are many industry associations, not only concerning grape and wine but also federation of industries associations, cooperative federations, workers' associations, etc. Having so many actors in the CPCVWD may confer more legitimacy to it; however, the need to reconcile the different interests of a large number of actors would be enough to slow down the decision-making process.

Hence, the Brazilian wine industry coordination problems in the horizontal dimension are aggravated by the sector's over-institutionalization. For instance, Ibravin is the institution that represents the industry at the national level; however, the CPCVWD also represents the sector at the national level. In the vertical dimension (federalism), coordination problems are worsened because representation in the federal level is replicated at the state level, thus creating overlapping institutions performing the same function. For instance, there is the CPCVWD at the federal level and the SCGW in RS. These blurred institutional boundaries can create bizarre situations, such as overlapping membership. At least six organizations have representation both in the CPCVWD and in the SCGW. This awkward institutional design also makes it possible for the same organization to be directly and indirectly represented in a third institution. For instance, at least seven organizations have representation in the CPCVWD and in the Ibravin, which is also part of the CPCVWD.

Despite seemingly adequate funding, and abundant efforts at the formal functions of the TH, progress in the Brazilian wine industry is so slow and the industry still has to come to grips with international competition. This intricate institutional design makes it difficult to coordinate the large number of actors involved in policy-making and to assign particular responsibilities to a specific institution, given the fact that jurisdictions overlap and that there are too many institutions. Hopefully, the attempt at centralizing policy-making at the federal level will yield good results, although a centralized policy-making process will have to reconcile the interests of many, and very different, wine-producing areas in the country.

4. State level case 1: Rio Grande do Sul

Brazil's most important wine region is the Serra Gaúcha (Gaucho Highlands), situated in the northeastern part of the state of RS. The region has a mild temperate climate ideal for growing wine grapes, which was noticed promptly by Italian colonists who settled in the region in the last quarter of the nineteenth century. The wine industry in RS has approximately 650 wineries and 15,000 grape growers. Farms average only 2.5 ha. Approximately 540 wineries make only table wine, while 80 wineries also produce fine wines (Wilk, 2006, pp.66 and 76), generating approximately 3300 direct jobs. Some 13,288 families depend on the wine industry (Souza, 2005, p.54). Wine is also part of the local Italian heritage (Frigeri, 2009) and it is also a factor in the development of social capital in the region (Vieira *et al.*, 2007). Proof of this higher level of social capital is the existence of many winery cooperatives, some of them established in the 1930s.

RS, specializing in bulk table wine, is finding it difficult to switch to the production of fine wines. It is worth noting that sparkling wine made in RS is regarded to be amongst the best sparkling wines in the world (Wilk, 2006, pp.74–75). The wine industry in RS has to deal with many deficiencies in the production chain, such as the need to import vine saplings, and basic inputs like corks, bottles and oak barrels, because local supply is unsatisfactory; the low rate of mechanization; lack of consensus on what are the best varieties of grape for the region; expensive inputs (23% of final price); tax burden (41% of the final price); 'unstable' quality of grapes; and low innovation (Souza, 2001; Wilk, 2006).

The market in RS can be divided into six clusters, according to Miele *et al.* (2007). They grouped 381 wineries in six clusters according to strategic segments in wine-making. Table 4 shows the market share of each cluster. The first cluster has 30 large- or medium-scale wineries and its characteristics are quality and specialization. This cluster accounts for most of the quality wine and sparkling wine produced in the state. The second cluster has only four wineries, which are among the five largest wineries in RS, and its characteristics are large production scale and diversification. The third cluster has 46 large wineries and its characteristic is low added value. This cluster has a diverse range of products and, alongside the second group, it leads in the sales volume of table wine and cooler. The fourth cluster has 43 micro wineries, or 'family businesses'. It has local scope and its products are of low aggregated value. The fifth cluster has 149 wineries of diverse scales, corresponding to 9.6% of wine sales. Their product is of low added value and is distributed in bulk.

Table 4. Clusters' market share.

Cluster	Number of wineries	Commercialization share (%)		
		Total[a]	Quality wine	Sparkling wine
1	30	7	47	52
2	4	25	40	35
3	46	43	12	13
4	43	2	0.3	0
5	149	10	0.1	0
6	109	13	1	0

Note: [a]Wine and derivatives from wine and grape.
Source: Miele *et al.* (2007).

The sixth cluster has 109 wineries answering for 13.2% of volume of commercialized wine. It is similar to the fifth cluster but it has a more geographically diversified market.

Wineries in the first and second clusters have a profile close to that of international competition; wineries in the fourth group are associated with subsistence activities; wineries in the fifth and sixth clusters are subordinated to supply strategies of other wineries and bottling companies, mostly located in the main consumer centres (Miele *et al*., 2007).

4.1 Research and training in RS

Research institutions have been supporting the wine industry in RS for over 100 years, since 1900. Innovation in the sector has been driven by the state. Most of the R&D is done in federal institutions. Research funding comes from the federal government and, to a lesser extent, from the state government. The most important R&D institution in the sector is the Embrapa National Research Centre for Grape and Wine (Embrapa Grape and Wine). Another federal institution, the UFRGS Institute of Food Science and Technology has a laboratory for wine and beverage analysis. It is also up to the federal government to provide workforce training: the Cefet-BG offers a technical programme in Superior Viticulture and Oenology. A relatively important private actor in the sector of R&D and education is the University of Caxias do Sul.

4.2. Industry organization

The wine industry in RS has many producer associations. The most important associations at the state level are the Wine Industry Trade Union (Sindivinho) and the Agavi. A third association, Fecovinho, represents the winery cooperatives. Sindivinho is the official corporatist representation of the wine industry, with compulsory membership and fees. Agavi has 71 wineries associated, accounting for 40% of all wine made in RS. There are many local producer associations.

Winery cooperatives are important actors in the RS wine industry. Five out of the 10 largest wineries in RS are cooperatives (Souza, 2001). They are a successful strategy for small producers to survive in the market. Forqueta is the oldest cooperative, and a pioneer in Latin America, established in 1929; Aurora is the largest, counting over 1000 associated families. The Fecovinho was established in 1952 to represent the winery cooperatives. With 11 members (cooperatives), the Fecovinho represents approximately 5000 families, and corresponds to 25% of RS wine and grape production. The cooperative experience in RS is at odds with Brazil's traditional large agricultural enterprises. Given their longevity, their number of associated families, their capacity of action coordination and their market share, winery cooperatives in RS have been an economically and socially thriving experience. Cooperatives not only make possible the survival of thousands of small producers in the market but also help to build social capital in the region by bringing people together around a common enterprise.

4.3. Domination of the federal government (again)

In the Brazilian corporatist policy-making model, the government is an important actor in the industry. Wine has always been a priority for the state government of RS

because of its economic, social and cultural importance. Public policies aimed at the wine industry were adopted first in RS and then copied at the federal level. In the aftermath of the Mercosur agreement, RS created a corporatist representation to the wine industry by establishing the Sectoral Chamber for Grape and Wine (SCGW), whose objective is

> to define, orient and discuss policies, strategies and guidelines concerning viticulture and oenology in order to improve competitiveness, so that harmonic lines be traced for the development needs of the whole productive chain as well as setting beneficial relationships among farmers, workers, producers, suppliers, consumers, businesspeople and the State Government.[3]

Yet, even at the state level, the federal government controls action across the TH. A distinguishing feature of Brazil's federal system is the overlapping jurisdictions among the three levels of government.[4] Competences are vaguely defined, thus leading to a polycentric policy process (Schmitter, 1971). Furthermore, in Brazilian federalism, subnational governments lack primary economic authority within their jurisdictions (Ames, 2001, p.22). These factors help to create eventual vertical coordination problems between the state and the federal tiers of government. To illustrate this fact, the state of RS has its own wine policy which has to be coordinated with the federal policy because of the overlapping jurisdictions (e.g. creating regulations for the industry) and because of federal areas of exclusivity (e.g. taxation). Hence, despite the importance of the wine industry in RS and despite the fact that RS is by far the largest wine producer, the government of RS does not have much autonomy in wine policy; it also depends on the federal government. As in PE, the ultimate policy-making locus for the RS wine industry is Brasilia. As a symptom of this fact, membership in the federal CPCVWD and in the SCGW (state level) overlaps largely, but the SCGW has not met, at least, since 2011,[5] whereas the CPCVWD has been meeting regularly.

Later, the federal government would establish the federal version of the SCGW. The chamber should be an important venue to discuss policies because it is where representatives of the industry, of the government and of workers' associations meet to discuss problems concerning the whole industry, design strategies and coordinate action; however, it has not had regular meetings. This may be due to the fact that the creation of the federal chamber shifted the policy-making locus to the Ministry of Agriculture. The state government is also an important funding source for the wine industry. It created the Fund for the Development of Viticulture and Wine-making (Fundovitis) in 1997 to finance actions aimed at improving the viticulture and wine-making in the state. It is curious to notice that the Fundovitis is a *state* fund but it funds the Brazilian Institute of Wine (Ibravin), and thus the federal programme, Wines of Brazil.

5. State level case 2: Pernambuco

In our second case study, we see again how the federal government has come to dominate the industry, displacing competitive dynamics with organizational and political processes. The San Francisco Valley (SFV), situated between the states of Pernambuco and Bahia, is the most important grape and wine region in the Northeast of Brazil. Although the region has a tropical semi-arid climate, it produces seven

million litres of wine/year. Because of the climate pattern, with plenty of sunshine hours, this is the only region in the world that produces grapes throughout the year, with between two and three harvests/year. Hence, production of wine in the region can be staggered throughout the year (Vinhovasf, n.d.). Cultivation of grapes in the SFV started in the 1950s through governmental action. The precondition for the emergence of a wine industry in the region was created in 1968 with a federal programme to irrigate the lands alongside the San Francisco river banks (Vital *et al*., n.d.). In addition to this, new technology developed by the state-owned Brazilian Corporation for Agricultural Research (Embrapa) improved the quality of fruits from the region. Today the SFV accounts for almost 100% of all table grapes produced in Brazil (Vinhovasf, n.d.).

Wine-making in the SFV started almost randomly. 'Having grapes in a region – said an oenologist – at some time wine will be produced'[6] (quoted in Vital, 2009, p.500). Wine grape cultivation started in 1982, and the first winery was established in 1984. In this same year, fine wines started being produced in the region, which became the first tropical region to produce wine (Ferreira, 2008). A qualified workforce came from RS. The first option was to produce young wine with technology from California and vines from Europe and USA. In the 1990s, European vines brought from Southern Brazil were introduced into the SFV (Vinhovasf, n.d.). Due to this unique experience of producing table wine, fine wine and sparkling wine in a semi-arid region, Brazil is developing its own expertise in wine-making (Ferreira, 2008).

Today there are eight wineries in the region, of national and foreign capital (Ferreira, 2008; Vital, 2009; Vinhovasf, n.d.; Vital *et al*., n.d.). The market is differentiated by producers with brands known by the public. Brand, quality and price are important but also important is that a winery have access to large distribution networks. The largest wineries in the SFV have well-known brands, and domestic and international distribution networks. Some of them are exporting wine whereas other wineries are struggling for a market share (Vital, 2009; Vital *et al*., n.d.). The challenges the SFV wine industry faces are: (1) the fact that the Northeast's wine is largely unknown in the most important Brazilian markets; (2) deficient marketing; (3) consumers' preference for imported wine; and (4) lack of an 'identity' for the wine (Vital, 2009, p.519). In the production chain, the problems are: (1) each winery acquires inputs individually; (2) a large part of the inputs (boxes, corks, bottles) is imported from Southern Brazil or from overseas; and (3) private industrial refrigerator installations, with a capacity of 68.200 m^3 (Carneiro and Coelho, 2007).

The wine industry in the SFV is facing the difficulties of an incipient industry that is still paving its way to consolidate market share. Availability of a cheap workforce and land, and high productivity of the land are factors which will stimulate the regional wine industry's expansion. Nevertheless, there is much to be done, especially concerning the quality of the wine. As one of the interviewees remarked, because the SFV is a new wine-producing region, investment in R&D and in human capital are needed. When the quality of the grapes used in the region are improved, this pioneer region in the production of tropical wines, endowed by nature with two or three grape harvests/year, has the potential to become a major wine producer.

5.1. Research

The wine industry in the SFV did not start endogenously. It has to be understood in the context of the expansion of Brazilian agricultural frontiers. Infrastructure was provided by the federal government, private capital and expertise in grape-growing came from RS. The federal government is the key actor in this process. It created the conditions for the existence of the wine industry in the SFV through development programmes for the Brazilian semi-arid land, and its agricultural research enterprise Embrapa is the key research institution, having a seminal role in the development of tropical fruit growing through its Center for Agricultural Research in the Semi Arid Tropics (Embrapa Semi-Árido).

Concerning grape and wine, Embrapa Semi-Árido works in partnership with Embrapa Grape and Wine. Embrapa Semi-Árido has been working with the local producers' association, funded with public money, to improve the quality of the wine produced in the region. Thanks to federal funding, and support from Embrapa Grape and Wine and the San Francisco Valley Wine Institute (Vinhovasf), Embrapa Semi-Árido was able to launch an oenology laboratory in 2006 (Vital, 2009; Vital *et al*., n.d.).

5.2. Industry

Compared to RS, the wine industry in Pernambuco does not have the same level of institutionalization and corporatist representation. The industry has only one association of regional producers, the Vinhovasf. Nevertheless, since there are only a few wineries in the region, it is possible to coordinate action without the need for a formal institution. Concerning corporatist representation, the wine industry in the VSF does not have a sector chamber in the secretary of agriculture, nor does it have its own trade union like its counterpart in RS.

5.3. Policy

In the case of the SFV wine industry, the federal government provides not only infrastructure and research but also workforce training. Workforce training is provided by two federal institutions. The Federal Centre for Technological Education (Cefet) in Petrolina provides technical training and the Federal University of the San Francisco Valley (Univasf) offers programmes in agricultural engineering.

Furthermore, the federal government uses tools of indirect government to support the wine industry. State-owned (BNDES and Bank of Northeast) and state-controlled (Bank of Brazil) banks provide subsidized loans to finance plantation and building of facilities (Vital *et al*., n.d.). The state government of PE plays a minor role, by investing in infrastructure, giving fiscal incentives to the wine industry and marketing the oenotourism in the region (Vital, 2009).

The conditions for a Triple Helix model are there; however, it has not developed fully-fledged. Despite the small size of the industry, several actors – public and private, in the state and federal level – are involved to carry out local actions. This low level of organization seems to lead to a low level of institutional coordination and specialization. Furthermore, an important fact that hinders the development of a Triple Helix model is that the policy-making locus is not in the region but in Brasilia and in the South, where the bulk of the wine industry and its most important

institutions are located. In the end, institutions were not the causal variable for the emergence of the wine industry in the SFV. However, they were the permissible variable instead. Tropical wine-making may not have been a deliberate policy but it would not be possible if it was not for the action of development and R&D institutions.

6. Conclusion

'[T]he role of institutions, be they regulatory, research and development or suppliers of inputs and equipment, among others, can be either a thrust link or a strangulation point to the development of the production chain of grape and wine'[7] (Triches *et al.*, 2004, p.23). The Brazil case shows that the presence of Triple Helix institutions is not sufficient to ensure that a Triple Helix model will develop fully-fledged. This case evinces that *institutional design matters*. Three institutional features hampering the development of a Triple Helix model can be identified in the Brazilian case: over-institutionalization, overlapping jurisdictions, and dissociation between the policy-making locus and the industry. These factors account for part of Brazil's lack of competitiveness in the international market.

The excessive number of institutions present in the Brazilian wine industry makes it difficult to coordinate the action of the diverse actors in wine policy-making. As a consequence of this coordination problem, the policy-making process can be very slow. Over-institutionalization also creates difficulties in assigning specific responsibilities to a single institutional actor because other actors can have the same scope of action. Hence, the result of over-institutionalization is a suboptimal process of deciding what to do, and clearly defining who will do it.

The Brazilian system is characterized by overlapping jurisdictions among the federal government, state governments and also municipal governments. As a natural consequence, there can be conflicts of jurisdiction. This fact creates an additional problem in the policy-making process: to coordinate and reconcile states' wine policies with the federal policies. This blurred boundary between state and federal scopes of action can give rise to the additional problem of clarifying who can do what concerning wine policy.

An attempt at centralizing the policy-making at the national tier of government might offer a solution to the problem of overlapping jurisdictions. However, it creates the problem of dissociating the policy-making locus and the industry. Due to geographical factors, the Brazilian wine industry is too diverse; each regional industry has different needs and interests. Centralizing the policy-making in Brasilia means that the interests of very different wine-making regions have to be reconciled, thus making it more difficult to address particular problems from a specific region. The federal solution for this problem would be devolution of power to states, so that they could take care of their industries' specific problems, instead of concentrating power in the federal tier of government.

Brazil's complicated institutional design is a hindrance to the full development of a Triple Helix model in the wine industry. The institutions necessary for the model are present but it does not mean successful development of a Triple Helix model. The case of Brazil shows the importance of having adequate representation of the productive sphere in the overall coordination decisions, and of having clear and simple decision-making hierarchies so that a coherent vision for the industry can be created and carried out.

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Notes

1. Ministerial Ordinance No. 139 of 2004.
2. In the original, 'proporcionando o ordenamento dos trabalhos, organizando, sistematizando e racionalizando ações e objetivos estabelcidos pela Câmara Setorial'.
3. State Decree 36.203 of 29 September 1995, free translation. In the original: 'definir, orientar e discutir políticas, estratégias e diretrizes relativas à viticultura e à enologia, visando aumentar a sua competitividade, de modo que venham a ser traçadas linhas harmônicas para as necessidades de desenvolvimento de toda a cadeia produtiva, bem como estabelecidas relações benéficas entre agricultores, trabalhadores, produtores, fornecedores, consumidores, empresários e Governo do Estado'.
4. The Brazilian Constitution acknowledges municipalities as federated units like states.
5. As of 16 May 2012, see http://www.saa.rs.gov.br/uploads/1298559247Lista_de_Camaras_Setoriais.pdf.
6. In the original: 'tendo uva numa região em algum momento vai se produzir vino'.
7. Free translation. In the Portuguese original: 'o papel das instituições, sejam elas reguladoras, de pesquisa e desenvolvimento sejam como fornecedoras de insumos e de equipamentos, entre outros, pode constituir-se em elos de impulsão ou de estrangulamento para o desempenho da cadeia produtiva da uva e do vino'.

References

Ames, B. (2001) *The Deadlock of Democracy in Brazil*, University of Michigan Press, Ann Arbor MI.

Camargo, U., Tonietto, J. and Hoffmann, A. (2011) 'Progressos na Viticultura Brasileira', *Revista Brasileira de Fruticultura*, 33, pp.144–9.

Carneiro, W. and Coelho, M. (2007) 'A Vitivinicultura no Nordeste Brasileiro: Características e perspectivas da atividade para a região', *XLV Congresso da Sociedade Brasileira de Economia, Administração e Sociologia Rural*, oral presentation, available from http://www.sober.org.br/palestra/6/189.pdf [accessed January 2014].

Ferreira, P. (2008) 'Brasil Inova na Produção de Vinhos Tropicais', *Inovação em Pauta*, 2, pp.16–9.

Frigeri, A. (2009) *Os Italianos, Vinho e Turismo: O Vale dos Vinhedos na Serra Gaúcha*, Masters conclusion paper, Fundação Getúlio Vargas, Rio de Janeiro.

Miele, M., Coldebella, A., Waquil, P. and Miele, A. (2007) 'Segments of competition in South Brazilian wineries', *Scientia Agricola*, 64, 3, pp.227–34.

Ministry of Agriculture, Brazil (2004) Portaria (Ordinance) No. 139 of 21 June 2004.

Ministry of Agriculture, Brazil (2011) *Agenda Estratégica 2010–2015: Vinicultura, Vinhos e Derivados*, Ministry of Agriculture, Brasilia.

Otani, M., Verdi, A., Maia, M. and Fredo, C. (2011) "Ambiente Institucional da Vinicultura Artesanal em Jundiaí', *Estado de São Paulo', Informações Econômicas, SP*, 41, 3, pp.25–36.

Sato, G. and Ângelo, J. (2007) 'Exportações de Vinhos e Derivados e o Processo de Internacionalização das Vinícolas Brasileiras', *Informações Econômicas, SP*, 37, 11, pp.15–25.

Schmitter, P. (1971) *Interest Conflict and Political Change in Brazil*, Stanford University Press, Stanford CA.

Sebrae – Brazilian Service of Support for Micro and Small Enterprises (2011) *Wines from Brazil – 'Uma andorinha só não faz verão'*, available from http://201.2.114.147/bds/bds.nsf/0BA7644EA8ED628483257855001695D9/$File/NT000454C6.pdf [accessed January 2014].

Souza, F. (2005) *Mudanças Promovidas no Setor Vitivinícola do Rio Grande do Sul pela Inserção de Profissionais Especializados nas Áreas de Viticultura e Enologia*, Masters dissertation, Universidade Federal Rural do Rio de Janeiro, Rio de Janeiro.
Souza, S. (2001) *Desenho e Análise da Cadeia Produtiva dos Vinhos Finos da Serra Gaúcha*, Masters conclusion paper, Universidade Federal do Rio Grande do Sul, Porto Alegre.
Triches, D., Siman, R. and Caldart, W. (2004) *Identificação e análise da cadeia produtiva da uva e do vinho na região da Serra Gaúcha*, IPES-UCS Discussion Paper, available from http://hermes.ucs.br/ccea/ipes/Td005.html [accessed January 2014].
US International Trade Commission (2012) *Brazil: Competitive Factors in Brazil affecting US and Brazilian Agricultural Sales in Selected Third Country Markets*, USITC, Washington DC.
Vieira, C., Albert, C. and Bagolin, I.P. (2007) 'A Produção Vitivinícola da Serra Gaúcha – Brasil e de Mendonza – Argentina: Uma análise comparativa à luz das teorias de desenvolvimento regional', *Estudos do CEPE, 26*, available from http://online.unisc.br/seer/index.php/cepe/article/view/405 [accessed January 2014].
Vinhovasf – Instituto do Vinho do Vale do São Francisco (n.d.) *Notas Técnicas*, available from http://www.vinhovasf.com.br/site/arquivos/NotasTecnicas.pdf [accessed January 2014].
Vital, T. (2009) 'Vitivinicultura no Nordeste do Brasil: Situação recente e perspectivas', *Revista Econômica do Nordeste*, 40, 3, pp.499–524.
Vital, T., Filho, R. and Filho, Z. (n.d.) *Vitivinicultura no Nordeste do Brasil: Um arranjo produtivo em expansão*, available from http://www.sober.org.br/palestra/2/812.pdf [accessed January 2014].
Wilk, E. (2006) *A Relação entre Estratégias, Recursos e Performance: Uma Investigação em Empresas de Vinhos Finos do Cluster da Serra Gaúcha*, Ph.D. thesis, Universidade Federal do Rio Grande do Sul, Porto Alegre.

Websites

Associação Brasileira de Enologia: http://www.enologia.org.br/.
Associação de Produtores dos Vinhos dos Altos Montes: http://www.apromontes.com.br.
Associação dos Produtores de Vinhos Finos do Vale dos Vinhedos: http://www.valedosvinhedos.com.br.
Associação Gaúcha de Vinicultores: http://www.agavi.com.br.
Embrapa Uva e Vinho: http://www.cnpuv.embrapa.br.
Food and Agriculture Organization – FAOSTAT: http://faostat.fao.org/.
Instituto Brasileiro de Geografia e Estatistica – IBGE: http://www.ibge.gov.br.
Instituto Brasileiro do Vinho: http://www.ibravin.org.br.
International Organisation of Vine and Wine: http://www.oiv.int/.
Ministério da Agricultura: http://www.agricultura.gov.br.
Secretaria da Agricultura, Pecuária e Agronegócio do Rio Grande do Sul: http://www.saa.rs.gov.br.
Sindicato da Indústria do Vinho do Rio Grande do Sul: http://www.sindivinhors.com.br.
União Brasileira de Vitivinicultura: http://www.uvibra.com.br.
Wines of Brazil: http://www.winesofbrasil.com.