

18 October 2006

Dear Participants in the Middlebury-UVM Economic History Workshop:

I am stretching the concept of “workshop” and taking advantage of your willingness to comment on works-in-progress by presenting to you both an early exploratory paper and the proposal for the large project, of which the paper is a part. The paper offers a narrative for many of the analytic issues of the project. However, I still am trying to resolve many of the problems of empiricizing these issues. In the project description (and the attached initial outline of the proposed manuscript) I raise, in *italic font*, some of the empirical issues that I am still resolving. I especially hope to benefit from any ideas on these questions.

Thank you for your indulgence, and I look forward to our session on the 27<sup>th</sup>.

Best

Gail



**Gail D. Triner**  
***Underground Riches: Subsoil Property Rights, the State and Economy in Brazilian History***  
**Project Description**

Project Abstract

The quest for wealth from subsoil resources has motivated much economic and political activity in Brazil, from the first European contact and dreams of gold in 1500 through the current day. The wealth derived from mineral resources has often proved disappointing. Claims to the subsoil and its resources have shaped fundamental Brazilian institutions, and issues of property rights have defined the extent and beneficiaries of economic growth. A history of subsoil property rights offers a unique opportunity to understand the evolving dimensions of public and private spheres of economic activity, processes of institutional development, the persistence of highly personalized political-economic organization, and the role of natural resources in forming the Brazilian State.

The questions framing this study are: How did the property laws and practices governing the extraction of subsoil resources evolve and how did these rights relate to the course of development? I focus on two themes that directly address these questions. First, I analyze the trajectory of laws and practices that constrained access to subsoil resources. Secondly, I explore the intricate inter-relationship between these property rights and political-economic change.

My argument is that the laws and practices applied to subsoil resources have been vitally important to the institutional environment shaping the economic and political systems of Brazil. By successfully defining property to protect its sovereignty over the subsoil, the State used this sector simultaneously to build its own role in the economy and to promote large-scale industry in the twentieth century. Public sector ownership of the subsoil interacted with general property

law, which prohibited the division of physical assets, to structure private economic activity in ways that concentrated access to mineral resources. The interplay between a subsoil-rights regime based on principles from the colonial era and emerging governing structures that relied upon political and economic populism has contributed significantly to constructing the economic role of the modern Brazilian State.

Subsoil minerals were a very early target of colonial property law, laying the groundwork for future economic and political structure. My study of subsoil rights, from the colonial era through the middle of the twentieth century, delineates the difficulty of institutional change, even in the face of fundamental political and economic shifts. Although rights to ownership transferred from the monarch, as an individual, to the public domain of the State early in the nineteenth century, private claims to the subsoil remained severely constrained. The first era of republican government (1889-1930) offered the most important effort to change these arrangements. During these years, precious metals and stones ceded importance to industrial metals. Privatization of subsoil rights and devolution of their regulation from the federal to state level were among the reforms that appeared to point the way to liberalized ideologies and governance, as well as rapid industrialization. These reforms did not survive the end of the First Republic. Economic expediency and traditional organizational principles combined to argue for re-nationalization in 1934. By considering the political and governance implications of relinquishing rights during the First Republic and then re-claiming them after 1934, I examine the implications of this induced change of fundamental institutions and provide new insight on the question of how one of the world's most economically activist States emerged.

*[Good comparative measure of “economic activism” among States?]*

The effort to privatize the subsoil during the First Republic provides the opportunity for

an in-depth examination of an attempt to induce fundamental institutional change. Evaluating the processes of legislating the 1891 privatization and the subsoil's return to the public domain in 1934 permits an understanding of the, ultimately failed, effort to change institutions. Theories of interest groups, public goods and autocracy in public governance (Olson 1971 and 2000) combined with the precise analysis of path-dependent institutional endowments (Pierson 2000; Bian 2005) provide the framework for deciphering the shifting mix of sectoral and regional interest groups behind institutional development. These dynamics became increasingly complex and contested with the shift from gold mining in a slave-based society to the beginnings of large-scale industry. Ultimately, a national industrialization strategy prevailed that relied upon State intervention and the return of the subsoil to the public domain. Debates from the Constitutional Assemblies in 1890-91 and 1934-36, the parliamentary records, and the enactment of the Mining Code (1934 and revised in 1940) document the political dynamics of national legislative change.

*Is a historical narrative sufficient here; how can I test for a causal relationship of interest group effects on legal change? Roll call voting records of legislative actions are not available.*

The effects of legal change and the interaction between national- and state-level legislation and enforcement can be explored by turning to the Brazilian state with the longest and most intensive mining experience, Minas Gerais. If the anecdotal evidence reflects widespread experience, data derived from judicial proceedings will demonstrate that once the regulation of these rights devolved to state governments, resolving contentious issues became slow, expensive and uncertain. State-level governments faced difficulty in legislating and enforcing mining rights. Empiricizing data from judicial proceedings through the last decades of the nineteenth century to resolve conflicts about subsoil rights between individual agents in the mining-intensive districts of Sabará and Ouro Preto, while drawing on insights from institutional

economics (Williamson 1985; Coase 1960), allows me to systematically probe the proposition that privatization of subsoil rights in 1891 did not serve the purpose of increasing mineral production because of the increased transactions costs arising from conflicts over access to mineral veins. The re-nationalization of rights restored order to mining activity, while it also paved the way for federal ownership of large, industrially strategic mining operations.

*Alternatives to court cases for empiricizing the change of transactions costs?  
Problems: (1) Records have been moved; currently researching accessibility? (2) Labor intensity & ambiguities of empiricizing data from manuscript documents of judicial cases.*

The formation of State-owned iron and steel companies in the mid-twentieth century demonstrated that the industrial use of subsoil resources was a crucial determinant of the rights governing their exploitation through the twentieth century. Securing a vastly increased supply of industrial metals gained importance as the modern manufacturing sector consolidated simultaneously with the recognition of Brazilian dominance of global iron ore reserves. In the crucial case of iron, defined as a public good, the State stepped in, with capital and a wide range of policy preferences, to ensure exploration, production and distribution in order to supply both the emerging steel industry and international producers. The policies and politics surrounding the involvement of the State in ensuring iron supplies and developing the Companhia Vale do Rio Doce in the 1930s, were the core of these efforts. These actions fundamentally restructured the Brazilian economy and polity. The formation of State-owned iron and steel behemoths (CVRD and Companhia Brasileira de Siderurgia, Volta Redonda) expanded the scale and nature of the State's role in the economy. State-ownership substituted for foreign investment because the capital, technological and organizational requirements of the industry were beyond the means of private Brazilian economic actors. The Brazilian military and a small handful of prominent industrialists combined interests to negotiate this outcome. These actions set the tone for

subsequent industrial planning and import-substitution policies. Their political origins shed light on the origins of subsequent industrial planning and import-substituting industrialization policies.

*Problem: I can develop the historical narrative that*

1. *2 strategies were available to accumulate the capital and technological expertise in order to realize the benefits of iron and steel development: foreign ownership or state-directed development;*
2. *that, resistance to foreign ownership of strategic resources combined with small interest groups (in the absence of institutions of wide public representation) supported the autocratic governance structures that established 'command economy' institutions to effectively meet their interests [Olson 2000];*
3. *the policies were successful*

*I need ideas on how to empiricize the theory & hypothesis to test its validity.*

The audacious combination of incipient import-substituting industrialization and export-oriented policies overshadowed, without eliminating, private sector production. Relatively small firms in the private sector emerged simultaneously with large, centrally controlled and vertically integrated production. The effects of creating order in mining rights with the Mining Code of 1934 and establishing the governmental commitment to industrialization with its investment in the infrastructure of iron and steel supported the increase of smaller-scale specialty iron and steel firms. The representation of mining companies on the Rio de Janeiro stock exchange (which effectively captures significant capital market activity nationally for this period) and the investment patterns of individual national companies, as determined by industrial censuses and firm-level financial statements from 1889 to the 1950, demonstrate the difficulty of providing for investment in an increasingly capital-intensive sector with an environment of continuing uncertainty, and the positive effects of deep government commitment to the sector. The formation of new corporations and capital investment within companies directly responded to the security of their property rights; federal State involvement made private-sector agents more

secure and supported the expansion of private mining and steel companies.

*'Lumpiness' problems?*

### Project Significance

This perspective moves beyond analyses of political and economic nationalism that are prominent topics in Latin American scholarship on natural resources and industrialization. I emphasize that the State's re-acquisition of subsoil rights constituted a reversion to colonial concepts of ownership that allocated strategic resources to the State. Combined with the political and economic populism that prevailed in the mid-twentieth century, invoking this traditional concept offered a powerful tool to strengthen centralized governance. The legal structure governing rights to the subsoil was a core component of the massive State-directed industrialization that took root in the 1940s.

The project places current debates and efforts to privatize natural-resource industries into their historical context, while it also examines the mechanisms by which ideas of ownership evolve. The abiding ownership claim of the State combined with the persistent legal protection of the indivisibility of privately owned real assets to determine the trajectory of subsoil property rights and the exploitation of resources. These features have continually concentrated access to valuable resources and constrained the sovereignty of private property, while playing a formidable, if previously unrecognized, role in shaping growth and political-economic institutions.

This research opens a new field of Brazilian and, more broadly, Latin American scholarship at the same time that it provides an opportunity to test theories about the influence of property rights in an important setting. Because of the recurring claim of State sovereignty and its strategic nature, the trajectory of subsoil rights differed markedly from rights to land (Silva

1996; Viotti da Costa 1985; Dean 1971), humans (as slaves; Grinberg 2002) or financial assets (Haber 1998; Triner 2000; Musacchio 2004.) My study introduces another major category of property and innovative theoretical perspectives to property institutions in Brazil, and it has implications for other Latin American societies.

Although scholars recognize the importance of property rights as a determining factor in the course of economic growth and development, the mechanisms that define property and determine the avenues of its importance are not well understood. I use a combination of methodologies, including empirical tests of transactions costs, capital investment, and production, as well as analyses of legislative, legal and business debates, to ensure a nuanced assessment of subsoil rights. Following the rights of one type of property over a prolonged period, this project reveals the trajectory, methods and fragility of institutional change. Understanding the economic concept of property through its legal and political history promises to provide new insights into the role of the State in the Brazilian economy, as well as the institutional structures affecting development and inequality, applicable to a wide range of historical and contemporary settings.

Organized by thematic concept, and secondarily according to chronology, this research will result in a monograph of seven chapters, according to the attached outline.

*Underground Riches:  
Subsoil Property Rights, the State and Economy in Brazilian History*  
**Project Outline**

Part I

Ch 1 Introduction

1. Theoretical context
  - a. Property rights
  - b. Path dependence
  - c. Public-private
    - i. Public goods
  - d. State-building
    - i. Economic activity
    - ii. Level of autocracy
2. Historical context
  - a. Brazil as natural-resource colony

Ch2 History of subsoil rights

1. Pre-industrial
2. Transition
3. Regime change & industrialization

Part II Induced Institutional Change

Ch3 Persistence

Ch4 Privatization

1. Interest groups: Political ideology & competition  
*Roll call vote records do not exist – alternative way of measuring/analyzing political competition?*
2. Results
  - Transactions cost
  - Judicial cases: #, time to duration, types of issues*
  - Alternative approaches??*

Ch5 Re-nationalization: iron & Steel

1. Political competition
2. Interest group: competition & effectiveness
  - i. Economic & political agents
  - ii. ‘nationalism’

*How to empiricize*

*Natural resources [iron] were ‘big bills left on the sidewalk’ of interest-groups: that small interest groups can be more effective than large to invoke State-led industrialization*

*Use differential between domestic & international price levels?*

Part III Effects

Ch6 The State as economic actor

1. Why a State-owned enterprise?
  - a. Incipient industrial planning
  - b. SOE vs other forms of organization
  - c. Proto-ISI
  - d. Criteria for assessing “success”
2. Implications for public governance
3. Size of State-economy  
*Comparative measure for “size of State” & “economic activism”*

Ch7 Economic effects

1. K-goods sector  
*Capital markets*  
*#firms, size, depth of markets [volume trading activity, iron & steel vs other firms] & value [share prices]*  
*capital investment [censuses & annual reports]*
2. Growth, allocation and distribution  
*Industrial censuses*  
*Industrial growth data*

PartIV Conclusion

1. Subsoil rights – allocation non-renewable resources
2. Brazil: broader “property issues”
3. The State
  - a. Form of State economic activity
4. Public domain: 21<sup>st</sup> C application



**State-Owned Enterprise, Industrialization and Subsoil Property Rights:  
Brazil in the 1930s and 1940s**

**Middlebury-University of Vermont  
Economic History Workshop  
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## **State-Owned Enterprise, Industrialization and Subsoil Property Rights: Brazil in the 1930s and 1940s**

### **Abstract**

In the 1930s and 1940s state-directed industrialization took firm root in Brazil. This paper explores one of the strongest and earliest efforts in this activity, the formation of a state-owned enterprise for iron-ore mining, in the context of property rights theories about public goods. Doing so highlights the political economy of allocating to the public domain the property rights to natural resources in order to build State-owned enterprise. It also illustrates the process by which the Brazil established one of the economically interventionist States of the twentieth century.

Focusing on the transformation of the British-owned Itabira Iron Ore Company into Companhia Vale do Rio Doce, a state-owned enterprise, demonstrates the expansion of the concept of the public domain that Brazilians invoked. The Brazilian State reverted to earlier property definitions that protected its sovereignty over the subsoil and mineral resources, and it used the global strategic circumstances of World War II to great advantage. As a result, the Brazilian State built its own role in the economy while promoting large-scale industry in the twentieth century.

## **State-Owned Enterprise, Industrialization and Subsoil Property Rights: Brazil in the 1930s and 1940s**

During the 1940s, the Brazilian economy undertook a massive effort to construct a large and modern capital goods manufacturing sector in order to develop wide-ranging modern industry. This project initiated some of the largest and most enduring industrial concerns in Brazil. The State was a central participant in this program, and one of its outcomes was to establish Brazil as one of the most economically interventionist States of the twentieth century. By the mid-1940s, the national government of Brazil held the majority of equity shares of the two largest companies on the Rio de Janeiro stock exchange, Companhia Vale do Rio Doce (CVRD, iron ore mining and iron manufacturing) and Companhia Siderúrgica Nacional (CSN, steel manufacturing.) These companies became among the largest industrial concerns in the third world. Both companies became fully State owned, though they are prominent, privatized companies today. Their formation required a long period of enormous effort to bring together natural resources, capital, technology, managerial skill, and policies governing trade, foreign exchange and industrialization with circumstances. That the resulting companies would be state-owned was not a foregone conclusion, but rather the confluence of ideology and an entrepreneurial history that spanned almost forty years.

Establishing these state-owned enterprises required extraordinary organizational and political effort; motivating some of the most contentious public policy debates of the period.<sup>1</sup> To establish the companies, the Brazilian State invoked two parallel strategies that redefined the basic property rights attached to natural resources and to private business activity. These strategies were to re-claim sovereignty over mineral resources and to expand the definition of “public goods” that required public sector intervention. The legitimacy of both strategies extended beyond their efficacy, and rested on their origins in colonial and imperial law and practice that prevailed from 1603 to 1891.

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<sup>1</sup> The general histories of both companies are widely published. In English, see Donald Edmund Rady, *Volta Redonda: A Steel Mill Comes to a Brazilian Coffee Plantation Industrial Entrepreneurship in a Developing Economy*. (Albuquerque, N.M.: Rio Grande Pub. Co., 1973) and Robert M. Levine, *The Vargas Regime; the Critical Years, 1934-1938* (New York: Columbia University Press, 1970); on the political debates they engendered, see John D. Wirth, "Brazilian Economic Nationalism: Trade and Steel Under Vargas" (Ph. D. diss., Stanford University, 1966), *DAI-A* 27/04, 181; and John D. Wirth, *The Politics of Brazilian Development 1930-1954* (Stanford, Calif.: Stanford University Press, 1970.)

Securing a vastly increased supply of industrial metals gained importance as the modern manufacturing sector consolidated. In the crucial case of iron ore, the State stepped in, as majority shareholder and offering a wide range of financial and policy advantages, to ensure mining that would allow large scale iron and steel manufacturing. The first Mining Code in 1934, formalized in the Constitution of 1934 (and amended in 1937 and 1940) established the principles that the State used in this endeavor. The Code reclaimed property rights to subsoil mineral resources for the public domain, revoking the privatization in the Constitution of 1891. The Mining Code and the Constitution of 1934 also established the State's right to expropriate mining and strategic mineral industrial enterprises to protect national military and economic defense. Though often mitigated in practice, these principles gained strong momentum.

This paper explores the formation of a state-owned enterprise for iron-ore mining in the context of property rights theories about public goods. Doing so highlights the political economy of allocating to the public domain the property rights to natural resources in order to build State-owned enterprise. In the middle of the twentieth century, new political and business interest groups invoked long-entrenched traditional practices in order to pursue this trajectory of development. Focusing on the transformation of the British-owned Itabira Iron Ore Company into Companhia Vale do Rio Doce, a state-owned enterprise, demonstrates the expansion of the concept of the public domain that Brazilians invoked.<sup>2</sup> The Brazilian State reverted to earlier property definitions that protected its sovereignty over the subsoil and mineral resources, and it used the global strategic circumstances of World War II to great advantage. As a result, the Brazilian State built its own role in the economy while promoting large-scale industry in the twentieth century.

#### **PUBLIC GOODS AND STATE-OWNED ENTERPRISE**

Development economists have studied the economic role of the State in detail. In addition to the nature and scope of regulation, state-owned enterprise (SOE) has been an important, if controversial, tool in attempting to manage growth and development. However, business and economic historians of the developing world have neglected these firms and their origins. In this paper, I document the history of the Brazilian State coming to define the domestic provision of iron ore mining and steel manufacture as a strategic public good that would enhance both national military security and rapid industrialization. Absent a domestic private sector means to

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<sup>2</sup> The focus on CVRD also provides much explanation of and insight into the origins of CSN (Volta Redonda.)

institute mining and manufacture as efficiently as projects pursued by outsiders, the State ultimately took advantage of a particular set of circumstances that allowed it to substitute for private providers. The public goods argument prevailed with respect both to sovereignty over subsoil resources and to iron and steel manufacturing during the 1930s. The State resolved financing and organizational problems in both mining and production by constituting state-owned enterprises.

Theory about the provision of public goods provides a prism for understanding state-owned enterprise. Public goods theory considers the interaction between collective and individual interests.<sup>3</sup> Olson focuses on the special difficulty for a private entrepreneur to provide collective goods.<sup>4</sup> When economic activity generates externalities (benefits that extend beyond those accruing to the provider) the incentive of any individual economic actor (person or enterprise) to engage in that activity diminishes, because of the benefit that actor cannot capture. If the externality, or collective good, is sufficient, then the State, as the public authority, may step in to provide it. State action may not necessarily imply widespread consensus among its citizens in defining public goods. Conflict over identifying a public good is often fraught with political competition. Strong interest groups identify externalities that they have no incentive to provide, or cannot capture, and they attempt to influence the State to provide for their collective creation. Once decided upon, the State can provide public goods through a variety of arrangements: as part of the public bureaucracy (e.g., child-welfare services), through a public operating “authority” (e.g., operating commission for toll roads), by subsidy to private enterprise in exchange for regulatory control (often, railway construction.) State-owned corporate enterprise, operating in the economic marketplace, is only one of many possible arrangements.

The idea of the state owning business enterprises that operate in conjunction with the private sector is not natural, inevitable, or even, obvious. Galambos and Baumol suggest that the motivations to establish SOEs have typically been the failure of markets or market-oriented capitalism to provide a public good.<sup>5</sup> The choice of establishing an SOE to satisfy a demand for a good or service that private markets do not otherwise provide also requires an ideological

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<sup>3</sup> Mancur Olson, *The Logic of Collective Action: Public Goods and the Theory of Groups* (Cambridge, Mass.: Harvard University Press, 1971).

<sup>4</sup> Olson, *The Logic of Collective Action*, p. 178.

<sup>5</sup> Louis Galambos and William Baumol, "Conclusion: Schumpeter Revisited," in *The Rise and Fall of State-Owned Enterprise in the Western World*, ed. Pier Angelo Toninelli (Cambridge, U.K. New York: Cambridge University Press, 2000), 303-10.

propensity for the State to assume a large role in production. Economic justifications for this form of enterprise have included the desire for economic growth and modernization as well as remedies for market failure (information asymmetries, externalities, capture systemic synergies).<sup>6</sup>

In a seminal piece presenting ideas about the distinction between “public” and “private,” Hirschman suggests that the boundaries between the two realms of activity shift with time and circumstance.<sup>7</sup> In the middle of the twentieth century, the widespread introduction of SOEs responded to a prevailing hope that “enlarging public properties and activities would open the way to a fundamental change in the distribution of power within society; thus engendering a new socioeconomic equilibrium”.<sup>8</sup> Creating employment, improving industrial relations and addressing other social goals (such as income distribution) were among the public goods, which would not accrue directly to entrepreneurs and investors in given projects, that often provided motives for establishing SOEs.

From a very pragmatic perspective, state-owned enterprises enjoy intrinsic advantages over those of private entrepreneurs.<sup>9</sup> They spread the business and investment risks across the wider population who benefit from the externalities, rather than limiting risk to private investors. The State’s creditworthiness can contribute to lowering the cost of capital. For large risky capital-intensive projects these advantages can be considerable. When information asymmetries render regulation unreliable, the State’s role as major investor implies that relevant regulatory information is available. Finally, profit maximization may receive lower priority in public enterprise than in private sector efforts. All of these considerations are relevant to projects in the mining and metals sectors.

By forming a business enterprise, the State enters into an activity in which it interacts in business transactions with other economic agents. Its partners, customers and competitors do not

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<sup>6</sup> Pier Angelo Toninelli, "The Rise and Fall of Public Enterprise: The Framework," in *The Rise and Fall of State-Owned Enterprise in the Western World*, pp. 7-8 and Erik S. Reinert, "The Role of the State in Economic Growth," both papers in *The Rise and Fall of State-Owned Enterprise in the Western World*, ed. Pier Angelo Toninelli (Cambridge, U.K. New York: Cambridge University Press, 2000), p. 75. The determination of economic justification is an empirical question that requires examination on a case-by-case basis.

<sup>7</sup> Albert O. Hirschman, *Shifting Involvements Private Interest and Public Action* (Princeton, N.J.: Princeton University Press, 1982).

<sup>8</sup> Toninelli, "The Framework," pp. 5-6.

<sup>9</sup> Mary M. Shirley, "Bureaucrats in Business: The Roles of Privatization Versus Corporatization in State-Owned Enterprise Reform," *World Development* 27, no. 1 (January 1999): p. 116.

have the same the powers as the state-owned enterprise to command resources, benefit from explicit or implicit subsidies, regulate practices, set prices or allocate output.<sup>10</sup> Embedded ideas about one of the fundamental concerns of property rights – the distinction between the public domain and private property – underpin the organization of SOEs. The case study that is the subject of this paper, the formation of CVRD as a state-owned iron-ore mining company, relied on a statist solution to two long controversies: industrialization and the domain of mineral resources.<sup>11</sup>

### **SUBSOIL AS PROPERTY IN BRAZILIAN HISTORY**

As an agricultural and precious-minerals colony, regulating and monitoring access to natural resources was always at the center of ideas about property. Portuguese authorities introduced law to regulate mining in their American colonies even before discovering large mineral deposits.<sup>12</sup> Pre-colonial practices firmly established the Crown/State's claim to non-renewable subsoil resources; this was the source of the (in)famous *quinto* (one-fifth) that the Spanish and Portuguese Crowns claimed of precious mineral production, through the collection of rents or concession grants.<sup>13</sup> The first mining laws, dating to 1603, regulated surface mining. The earliest royal *alvará* to govern mining emphasized the physical integrity of fixed assets by establishing that no party to a mine lode had independent access to the lode, and that veins of unmined gold were indivisible. Through the seventeenth and eighteenth centuries, regulation

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<sup>10</sup> These are the preferences that many believe to allow state-owned enterprises to overcome the market failures that motivate their formation.

<sup>11</sup> Harry N. Scheiber, "Property Law, Expropriation and Resource Allocation by Government: The United States, 1789-1910," (*Journal of Economic History* 33, no. 1 [March 1973]: 232-51) offers an seminal analysis of the evolution of property law and resource allocation in the United States. See also Gary D. Libecap, "Government Support of Private Claims to Public Minerals: Western Mineral Rights," *Business History Review* 50, no. 3 (Autumn 1979): 364-85. This is a topic with a thin body of research literature outside of the US.

<sup>12</sup> The major gold mines of Minas Gerais were discovered, and widely publicized, at the end of the seventeenth century. By 1750, the first cycle of gold mining had largely run its course. However, exploration remained active (Roberto Cochrane Simonsen, *Historia econômica do Brasil, 1500-1820*, 4. Ed. [São Paulo: Editora Nacional, 1962.]

<sup>13</sup> In the area around Vila Rica (the most famous gold mining territory in Brazil, now known as Ouro Preto) the Portuguese Crown retained its claims to land ownership, and leased rights to mine ore. In Sabará (the other main gold mining area of colonial Brazil) the Crown allowed private ownership of land. Access to mining lodes could be a source of dispute between owners and prospectors, but miners needed only the concession to mine gold from the Crown. I thank Victor Rodrigues of AngloGold for this information, which deserves further study and documentation.

evolved to distribute and supervise concessions.<sup>14</sup> The legal structures and the practices governing property remained remarkably constant over time. Portuguese colonial administration established the principles that would continue to govern property through the nineteenth century.

Independence in 1822 did not bring substantive changes to the law or to its practical applications. With the post-Independence Constitution of 1824, ownership of subsoil resources passed from the person of the Portuguese monarch to the institution of the Brazilian State.<sup>15</sup> This transfer did not result in changes to business opportunity or practices for miners. Although the share of output claimed by the State in exchange for conceding access changed through the nineteenth century,<sup>16</sup> mining and the development of mineral-based industries was not a priority for the Brazilian Empire, and mining policy commanded little attention.<sup>17</sup> The principle of the State's sovereignty over subsoil resources survived until the 1891 Constitution of the first Brazilian republican government.

As interest shifted from precious to industrial minerals, at the end of the nineteenth century, policy attention returned to mining law. The advent of the Republic in 1889 and the Constitution of 1891<sup>18</sup> introduced the first fundamental changes to subsoil rights in Brazilian history. While the first constitution of republican Brazil was in effect (1891-1934) subsoil rights belonged to the surface owner, and regulation of mining devolved from the national to the state level.<sup>19</sup> Although this change in the legal regime has not been fully explored, it clearly related to

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<sup>14</sup> For details on colonial mining rights and law, see Gail D. Triner, "Kinship Groups, Firm Structure and Property Rights in Nineteenth and Twentieth Century Brazil," *Enterprise and Society* (forthcoming) and Simonsen, *Historia econômica*, pp. 276-79.

<sup>15</sup> Alfredo Ruy Barbosa, "Breve panorama da legislação minerária," *Revista de Direito Administrativo* 197 (Jul./Sept. 1994): 64-73 and Messias Junqueira, *Inconstitucionalidade do Código de Minas: Impugnação da Fazenda do Estado de São Paulo á applicabilidade do decreto federal no. 24642* (São Paulo: Procuradoria de Terras do Estado de São Paulo, 1936), pp. 24-26.

<sup>16</sup> For example, at various times the St. John d'el Rey Company paid taxes at rates between zero and 10% (The St. John d'el Rey Company Ltd. Archives at Morro Velho, Nova Lima, Brazil; Anon. [J.H. Wharrier?]. "Historical Notes," MV Imobiliário, 13.10.66. 1960 [?]. Hereafter, cited as "MV Historical Notes": p. 3 and Official letters from St. John d'el Rey Board of Directors to Superintendent. Casa de Memória. Cited as MV Board Letters [with date], 2 August 1878.)

<sup>17</sup> Attilio Vivacqua, *A Nova política do sub-solo e o regime legal das minas* (Rio de Janeiro: Editora Panamericana, 1942), 517-18.

<sup>18</sup> Brasil, *Constituição dos Estados Unidos do Brasil* (Rio de Janeiro: Imprensa nacional) 1891, art. 72 §12.

<sup>19</sup> Brazil was not unique among Latin American countries in making substantial changes to subsoil rights at this time. For example, the Mexican government asserted its ownership of subsoil resources in the Constitution of 1917; and went further by nationalizing the petroleum industry in 1938 (Linda B. Hall, *Oil, Banks, and Politics the United States and Postrevolutionary Mexico, 1917-1924* [Austin: University of Texas Press, 1995.]) Despite efforts to institute specific mining laws during the Republic (most notably with the Lei Calógeras in 1915) the only significant change was in 1926 when a Constitutional amendment prohibited the transfer to foreigners of mines or

a widely held perception that mining development had always fallen short of its potential, and was impeding industrialization.<sup>20</sup> The change in mining rights in 1891 reflected a combination of shifting economic interests to industrial, rather than precious, minerals and hastily considered ideological commitments to economic liberalism.

Allocating subsoil rights to private agents was not a smooth or widely accepted transition. The hoped-for increased development of mines apparently did not occur.<sup>21</sup> In 1901, a federal survey on the problems of expanding mining found the most serious problem to be “the inertia or caprices of owners and the innumerable complications arising from questions of possession, domain and definition of territorial area.”<sup>22</sup> The change in rights, combined with the practice of common land holdings among small-scale cultivators and grazers, resulted in most small-scale miners having to renegotiate, and often lose, their access to subsoil mineral lodes and water.<sup>23</sup> With land owners in control of contracting for access to the subsoil, many miners with existing claims suffered great difficulties. Anecdotal evidence and legal treatises suggest that litigation over mining claims increased significantly.<sup>24</sup> Many concluded that private subsoil rights accorded to the owner of the surface area impeded, rather than promoted, mineral development as a result of decreased investment and technological innovation as well as increased litigation.<sup>25</sup>

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mineral veins deemed necessary for national security. (Brasil, *Coleção das Leis e Decretos* [hereafter cited as *Leis e Decretos*]: Decreto 2933, 6 January 1915, enabled by Decreto 4265, 15 January 1921; Constitution amended 7 September 1926, §17. See also Barbosa, "Breve panorama," p 69.

<sup>20</sup> Américo Werneck, *Relatório apresentado ao Dr. Presidente do Estado de Minas pelo Secretário de Estado dos negócios da agricultura, comércio e obras públicas* (Cidade de Minas: Imprensa Oficial de Minas Gerais, 1899), p. 33 and João Pandiá Calógeras, *As minas do Brasil e sua legislação: Geológica econômica do Brasil; 3 Vols., 2. Ed. refundida, atualizada e dirigida por Djalma Guimarães, Com auxílio de vários colaboradores., Biblioteca Pedagógica Brasileira.* (São Paulo: Companhia Editora Nacional, 1938 [1905]), Vol. 2, p. 601 and Vol. 3, p. 60. Vivacqua, *Nova política*, p. 464. opined that the change was one of many that simply reacted against pre-existing imperial law.

<sup>21</sup> Developing a historical time series of mining output is one of the on-going efforts of this project.

<sup>22</sup> Cited in Vivacqua, *Nova política*, p. 528.

<sup>23</sup> The St. John d’el Rey Company Ltd. Archives at Morro Velho, Nova Lima, Brazil; *Registro de Documentos*, Morro Velho Imobiliário. (Hereafter, cited as *MV Registro*, with holdings and document numbers.), Document 10/1; *MV Historical notes*, p. 4; Triner, "Kinship Groups, Firm Structure and Property Rights."

<sup>24</sup> Calógeras found that “Until then [Constitution of 1891] litigation could arise between two badly defined concessions, between miners and land owners linked by their works, causes in the end, simple and promptly resolved. Now there are interminable questions over the regularity of titles, over partnerships [condomínio] and the complaints that they initiate.” (Calógeras, *As minas do Brasil* vol. 2 pp. 602; see also Werneck, *Relatório*, p. 33.) Calógeras further complained that land in mining regions was over-valued as a result of the joining of surface and subsoil rights (vol. 1, p. 233.) Other research suggests that the pre-1891 conflicts could also be complicated and drawn-out. (Triner, "Kinship Groups, Firm Structure and Property Rights.")

<sup>25</sup> Companhia Vale do Rio Doce, *A mineração no Brasil e a Companhia Vale do Rio Doce* (Rio de Janeiro: CVRD, 1992), p. 150-51 and Vivacqua, *Nova política*, 411. Junqueira (*Inconstitucionalidade*, pp. 45-49) finds that the

Therefore, miners and large mining companies did not stand in the way of the changes wrought by the subsequent governmental regimes.

A coup in October 1930 ended the First Republic and brought Getúlio Vargas to the Brazilian Presidency. One lasting legacy of the Vargas regime was to engineer a fundamental expansion of the role of the Brazilian State in the economy.<sup>26</sup> The State, under Vargas, was committed to acquiring control of strategic resources to promote its programs of industrialization, “economic nationalism,”<sup>27</sup> and centralization of governance. The changes in Brazilian mining rights and laws occurred in conjunction with a distinct political-economic regime that focused intently on the nature of the Brazilian economy and the possibilities for its industrialization.

Vargas’s first presidential speech in Minas Gerais, Brazil’s most intensive mining region, in February 1931 emphasized the centrality of the state’s mineral resources for growth and independence, and it articulated a long-term intent to nationalize mining.<sup>28</sup> The speech also hinted at the ideas about “economic nationalism” and the relationship between military and economic security. One of the regime’s guiding principles became that “without iron and steel it is not possible to assure the sovereignty and progress of a nation”.<sup>29</sup> These concepts became hallmarks of Vargas’s fifteen-year regime. The government quickly backed this rhetoric by moving aggressively to command mineral resources. Two parallel strategies were invoked: executive control through constitutional and codification procedures and direct intervention into existing contractual commitments. In December 1931, the Federal government first stepped in to regulate mining concessions differently from the republican procedures. A new law required federal authorization of all mineral explorations.<sup>30</sup> Most importantly during the interval from the end of the Republic until the Constitution of July 1934, mining works were explicitly defined to

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incompatible concepts of devolving mining regulation to the states while also joining subsoil rights to the surface had not been resolved in the Constitution of 1891.

<sup>26</sup> CVRD, *Companhia Vale do Rio Doce*, p. 171 and Wirth, *The Politics of Brazilian Development 1930-1954*, Introduction.

<sup>27</sup> The experiences in forming domestic iron and steel industries seem to be the origins of the phrase “economic nationalism,” which attained substantial prominence. The concepts of economic nationalism and the defense of the national economy as a basic national defense goal enlarged substantially during the early industrialization process. See Wirth, “Brazilian Economic Nationalism” (pp. 26-66) for a fuller discussion of the concept of “economic nationalism” as invoked by Brazilians of this era.

<sup>28</sup> CVRD, *Companhia Vale do Rio Doce*, p. 171.

<sup>29</sup> Vivacqua, *Nova política*, p. 329.

<sup>30</sup> *Leis e Decretos*, Decreto 20799, 16 December 1931.

be “public goods” in November 1932.<sup>31</sup> This designation established the groundwork for re-defining subsoil rights.

The Mining Code and Constitution, both of 1934, re-instituted State claims to subsoil rights.<sup>32</sup> The principles of these changes remained in place for much of the remainder of the century. Ironically, the tools for this radical program relied on definitions of property that derived directly from traditional colonial legal concepts. By the late 1950s, the St. John d’el Rey Company, an important English gold-mining company that had been operating in Brazil since 1830, opined that “[c]omparatively speaking, present Mining Legislation differs little from that which prevailed when the Company first functioned.”<sup>33</sup>

The most important change resulting from the reversion of subsoil claims was the re-separation of subsoil from surface rights. Further the term “subsoil” took on a somewhat ambiguous, circular interpretation:

The subsoil considered in the face of the mining law, in our accepted use of the vocabulary, is conceived in the sense of mineralized geological beds, *on the surface or underground*, containing minerals subject, by virtue of their industrial utility, to the mining law ... The domain of the mining law covers, in reality, all minerals of the national territory<sup>34</sup> [italics added]

By this definition, all “industrial minerals” whether found below or on the surface, were considered subsoil minerals.<sup>35</sup> Separating surface from subsoil rights (or land from mineral rights) was, in practice, problematic. As late as the middle of the twentieth century, when

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<sup>31</sup> *Leis e Decretos*, Decreto 20096, 16 November 1932 and Vivacqua, *Nova política*, p. 571.

<sup>32</sup> *Leis e Decretos*, Decreto # 24642, 10 July 1934Código de Minas. See also MV Historical Notes, p. 4 and Marshall C Eakin, *British Enterprise in Brazil: The St. John d’el Rey Mining Company and the Morro Velho Gold Mine, 1830-1960* (Durham: Duke University Press, 1989), p. 98. The Mining Code was one prong of a strategy for the State to reclaim control of natural resources. A Water Code was implemented the day after the Mining Code, with the prospect of developing hydroelectric facilities in mind. See *Leis e Decretos*, Decreto 24672, 11 July 1934, Código de Aguas and Pedro Paulo Zahluth Bastos, "Sobre o Nacionalismo do Segundo Governo Vargas: O Caso de Empresas Estatais e Filiais Estrangeiras no Ramo de Energia Elétrica," paper presented at the XI Encontro Nacional de Economia Política (N.d.).

<sup>33</sup> MV Historical Notes, p. 6. See also Vivacqua, *Nova política*, pp. 603-05.

<sup>34</sup> Vivacqua, *Nova política*, pp. 552-53, p. 556. [“O sub-solo considerado em face do direito das minas, na acepção em que usamos o vocábulo, é concebido no sentido de camadas geológicas mineralizadas, superficiais ou subyacentes, contendo minerais submetidos, por sua utilidade industrial, à lei mineira. ... O domínio da lei mineira abrange, na realidade, todos minerais do território nacional.”] Vivacqua also pointed out that “the Constitution of 1934 adopted as a fundamental principle the separation of the two properties – the territory and the mineral” (p. 545) and “the Constitution of 1934 as well as the current Constitution [1937] follows Napoleonic Code (Law of 1810) and separated the property of the soil from the mineral for purposes of mining or industrial uses” (p. 575).

<sup>35</sup> The language of debate, discussion and legislation uses the term “subsoil” in this extended manner, despite the seeming contradiction. I have not found, to date, any reference to interpretation of the term “subsoil” prior to the

[m]ining Concerns had mining rights over ‘datas,’ as also water rights and possibly timber rights for the purposes of mining, and the legal situation was quite ambiguous. ... It should be noted that the system of concession does not absolutely take away the rights of ownership to the land, but only limits the use that the owner can make of it...<sup>36</sup>

The re-separation of subsoil from surface rights allowed the federal government to establish its right to concede access to mineral resources on lands in the public domain. Further, all newly discovered mineral deposits would belong in the federal domain. The Mining Code required federal authorization of all “industrial” mining concessions (whether in the federal domain or not).<sup>37</sup> The Constitution explicitly referred to the “progressive nationalization of mines, mineral veins and waterfalls or other sources of hydroelectric energy judged basic or essential to national economic or military defense” and it restricted new concessions (but not authorizations) to Brazilian individuals or companies.<sup>38</sup> Foreigners could participate in mining through share ownership or partnership in domestic enterprises<sup>39</sup> Challenges to the Mining Code’s constitutionality began immediately, based on procedural issues, confusion about the distinction between “authorizations” and “concessions,”<sup>40</sup> the specification of “industrial mining” that was intrinsic to the identifying the minerals regulated, and inconsistencies between the Constitution and the Mining Code.<sup>41</sup>

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1934 changes that would indicate inclusion of minerals found on the surface (such as iron ore.) While research on this issue remains on-going, this seeming expansion of the term is significant for the case of iron ore.

<sup>36</sup> MV Historical Notes (1954): p. 6.

<sup>37</sup> The work of categorizing these authorizations is on-going. Of the 6766 individual authorizations from the time of the 1934 Mining Code until individual authorizations were discontinued, a rough estimate of approximately 5000, might represent new authorizations to mine “industrial metals.” Companhia Vale do Rio Doce, *Coletânea da legislação sobre mineração no Brasil, 1889-1943* (Rio de Janeiro: CVRD, 1993). These estimates need to be taken very roughly at this point.

<sup>38</sup> Brasil, *Constituição dos Estados Unidos do Brasil*, 16 July 1934 (Rio de Janeiro: Imprensa nacional, 1934), article 119, §4. See also Vivacqua, *Nova política*, pp. 545-46 and 575; CVRD, *Companhia Vale do Rio Doce*, pp. 172-76 and Junqueira, *Inconstitucionalidade*, pp. 76-77. The reformation of the Mining Code in 1937 strengthened this provision.

<sup>39</sup> The 1934 Mining Code specifically revoked the first attempts (in 1926) to limit foreign participation in mining. (Barbosa, "Breve panorama," p. 69.)

<sup>40</sup> The confusion about “authorizations” and “concessions” resulted from both wording imprecision and incomplete delineation of state and National domain (Junqueira, *Inconstitucionalidade* and Percival Farquhar Papers [Yale University, Beinecke Rare Books and Manuscripts Library; Manuscript Group 205. Hereafter, cited as PF, with Box and Folder number.]), Box, 6 Folder 83 “Notas sobre o Código de Minas.”) Vivacqua (*Nova política*, p. 570) distinguishes an authorization, as a license to explore, from a concession, which attributed a property right to extracted minerals.

<sup>41</sup> Procedurally, the Mining Code had been passed (but not announced) prior to the Constitution, rendering it questionable whether the Constitution governed the Code. The major inconsistency between the two documents was that the Constitution did not specifically identify minerals as items of public property.

Because the Mining Code grandfathered previously existing concessions, the new Code and Constitution affected only a minority of mining activity.<sup>42</sup> Future development was at stake with these changes. Nevertheless, mining companies immediately perceived opportunities for the State to take control of the subsoil and its minerals. Two provisions within the Mining Code opened this possibility. First, the continuity of existing concessions applied only to veins already under exploration; veins not in productive use would pass to the national public domain.<sup>43</sup> Ambiguities about the distinction between “explored” and “unexplored” veins did not take long to surface.<sup>44</sup> The second avenue for increasing State involvement that the Mining Code offered was the provision that allowed for expropriation of resources deemed to be crucial in the defense of national economic and military security.<sup>45</sup> This phrase acquired ever-wider interpretation.

One of the early acts of the Vargas government’s establishment of the extra-constitutional regime, the Estado Nôvo (1937-1945) was to legitimate itself with a new Constitution, which required revisions to the Mining Code<sup>46</sup> The revised Code even more deeply implicated the federal state in mining, resolved irregularities of the 1934 version<sup>47</sup> and further limited opportunities in the sector for foreigners.<sup>48</sup> Concessions (whether from federal or state authorities) applied to specific minerals within veins, unless the concessionaire received a charter that specifically covered all minerals. Tight regulation on registration and productive-use requirements eased the ability of the federal State to re-claim concessions for the public domain. Finally, foreigners could not acquire new concessions or authorizations to mine, and foreign

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<sup>42</sup> PF, Box 7, Folder 94, Carl Kincaid, “Outline of Brazilian Mining Legislation,” 30 November 1934. This memo says that “the nation is not the proprietor of the mines (except those under land belonging to the Nation, which is negligible), although it makes their industrial use dependent on an authorization of the Federal Government.” Existing concessions were subject to the constraint that they had been appropriately registered and had been in “productive use” or in “temporary suspension” at the time the Mining Code was put into effect.

<sup>43</sup> Brasil, *Código de Minas 1934*, art. 5 §1 and art.10.

<sup>44</sup> Junqueira, *Inconstitucionalidade*, p. 81.

<sup>45</sup> Brasil, *Constituição 1934*, art. 119 §4.

<sup>46</sup> Brasil, *Constituição dos Estados Unidos do Brasil*, 10 November 1937 (Rio de Janeiro: Imprensa nacional, 1937), with enabling legislation: *Leis e Decretos*, Decreto-Lei 66, 14 December 1937.

<sup>47</sup> See Junqueira, (*Inconstitucionalidade*, p. 104) and PF, Box 6, folder 83 for arguments against the constitutionality of the 1934 Mining Code.

<sup>48</sup> Barbosa, “Breve panorama,” p. 69; CVRD, *Companhia Vale do Rio Doce*, p. 176; Pedro Rache, *A grande siderurgia e a exportação de minério de ferro brasileiro em larga escala*, Estudos e conclusões apresentados ao Presidente da República em 27 de Julho de 1938 pelo Conselho Técnico de Economia e Finanças do Ministério da Fazenda (Rio de Janeiro: Imprensa Oficial, 1939), pp. 32-35 and PF, Box 7, Folder 88 “Preliminary Memo Regarding the Legal Aspects of Proposed Acquisition of Itabira Mines ...” 1939.

share ownership of Brazilian-chartered firms was limited to minority status.<sup>49</sup> The 1937 Constitution broadened the State's expropriation rights of mines deemed "necessary for the public interest."<sup>50</sup> The Mining Code of 1940 clarified some of the legal ambiguities of the 1937 Code, but did not change the essential elements established during the 1930s.<sup>51</sup> This version of the Mining Code spelled out administrative details of mining concessions, tightened restrictions that constrained foreign participation, and incorporated natural gas and petroleum into its purview<sup>52</sup>

Throughout these changes, the debates about subsoil property rights encompassed, and often conflated, many different legal, economic and ideological principles. Among the confusions that remained were: Did the subsoil differ from the surface? Was the subsoil, in fact, a "thing" that could be "owned," or did the principle of *res nullius* rooted in Roman legal tradition (and expressed in the French Code, upon which the Brazilians had modeled theirs) apply?<sup>53</sup> What were the appropriate realms of public and private sector activities? Did "nationalization" mean public sector ownership, or ownership by Brazilian citizens?<sup>54</sup> These questions determined who had the right to benefit from and allocate access to subsoil resources. The only commonly agreed concept was that, however resolved, the ownership of resources taken from the subsoil and the soil resided with the entity extracting them. In practice, claims to minerals became increasingly concentrated in the State's domain.

#### **EXPANDING THE DEFINITION OF "PUBLIC GOOD" – IRON AND STEEL IN BRAZIL**

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<sup>49</sup> To accommodate this regulation, many foreign companies transferred their assets to Brazilian-domiciled subsidiaries. Equity shares in Brazilian mining companies could be issued in "bearer" form, obscuring the nationality of equity owners. (Rache, *A Grande Siderurgia*, p.35.) One option, adopted by the St. John d'el Rey Mining Co., was to form a Brazilian subsidiary that was the holder of record of their mining concession. (Triner, "Kinship Groups, Firm Structure and Property Rights.")

<sup>50</sup> Rache, *A grande siderurgia*, pp. 94-95; Brasil, *Constituição 1937*, arts. 122 and 144. Though Rache (pp. 151-166) also makes clear that strong opposition arose in the Câmara dos Deputados (the lower legislative chamber) against state-ownership of mining and metal manufacturing industries.

<sup>51</sup> Vivacqua, *Nova política*, 547.

<sup>52</sup> Vivacqua, *Nova política*, pp 552-70; Wirth, "Brazilian Economic Nationalism," p. 122.

<sup>53</sup> By this principle, the concept of ownership of the subsoil lost its meaning. The State claimed the right to administer and concede access to the subsoil, and the concessionaire could claim ownership of the resources extracted from it. Vivacqua is careful to ground these concepts in legal traditions developed within the Napoleonic Code. (Vivacqua, *Nova política*, pp. 410, 464-66.)

<sup>54</sup> Vivacqua (*Nova política*, p.595) suggests that 'nacionalização' referred to the reserving ownership rights to Brazilian nationals; though, he also concedes that the Constitution (of both 1934 and 1940) conflated the concepts. See also Wirth, "Brazilian Economic Nationalism," p. 121.

Iron ore is not glamorous or precious; it is only an industrial necessity. As such, from the 1890s when economic and political interests began to coalesce to promote industrialization, access to iron ore and processing it into manufactured iron and steel products rapidly gained increasing attention. The property rights issues embodied in the Mining Code and Constitution that affected iron ore were those determining separation of mineral rights from the soil,<sup>55</sup> authorization of mining projects, enforcing the productive use provisions on existing concessions, nationality concerns, and the evolving definition of national military and economic interests. Further, iron ore mining and attendant iron and steel manufacturing emerged as the central application for developing a very broad definition of “public good.” The public-goods argument extended well beyond subsidies and preferential treatment accorded to infant industry, and it justified State appropriation of natural resources in order to mandate the construction of the largest capital goods industries in the developing world as State property.

Iron ore had been discovered in Brazil by the middle of the sixteenth century, and the first forge was constructed as early as 1552.<sup>56</sup> Colonial authorities tried to promote iron ore mining and refining in order to support large-scale plantation-agriculture and the mining and refining of precious minerals and stones.<sup>57</sup> In the early nineteenth century, the Portuguese/Brazilian monarch, Dom João, sponsored European engineers in Brazil to research the formation of an iron industry. A debate resulted that compared the merits of centrally located large-scale mining and forges in contrast to the possibility of small, geographically disbursed plants that could minimize transport difficulties by proximity to their locales of usage.<sup>58</sup> Several small factories were established, and they were concentrated in the traditional mining region of Minas Gerais, where iron ore deposits were particularly large and rich. Nevertheless, total output remained low and localized. Virtually no change in production technology occurred between

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<sup>55</sup> The distinction between mineral rights and a narrower definition of the term “subsoil” is crucial here, since iron ore is typically found on the surface.

<sup>56</sup> Calógeras, *As minas do Brasil*, vol. 2, pp. 8-10.

<sup>57</sup> This was one of the most significant exemptions to the constraints on colonial manufacturing.

<sup>58</sup> (Baron) Wilhelm Ludwig von Eschwege arrived in Brazil 1811; his interest in developing iron mining and manufacture was to support the need for equipment in gold mining. Eschwege introduced production technologies to standardize the quality of forge output, and he favored small, dispersed foundries. Francisco Adolfo de Varnhagen, a German mining engineer arriving in Brazil in 1818, tried to introduce large scale production techniques, and opened the first pig iron factory. A century later, Calógeras continued to argue for a geographically dispersed industry to spur regional development. (Vivacqua, *Nova política*, p. 303; Calógeras, *As minas do Brasil*, vol. 2, pp. 90-102, 190-91; CVRD, *Companhia Vale do Rio Doce*, p. 95; Werner Baer, *The Development of the Brazilian Steel Industry* [Nashville, Tenn.: Vanderbilt University Press, 1969], pp. 53-55.)

1830 and the end of the nineteenth century.<sup>59</sup> By 1905, there were no more than one hundred factories with a capacity greater than 2000 tons per year.<sup>60</sup> With Brazilian interests in developing industrial capacity more pressing at the end of the nineteenth century, the importance of iron, and other industrial minerals, increased and superseded the earlier focus on precious metals and stones.

As early as 1905, João Pandiá Calógeras published the first argument on the role of iron mining and steel production as public goods that required State control and participation.<sup>61</sup> Calógeras's interest was developmental, rather than ideological. He based his argument about the national public interest in iron ore mining on the externalities and linkages of iron and steel manufacturing. Large-scale integrated steel plants would support wider industrial capacity.<sup>62</sup> Enhanced manufacturing would promote economic development by allowing domestic producers to provide a wider range of consumer and intermediate goods. The construction of physical infrastructure in ports and railways would have uses beyond the iron and steel sectors. Finally, Calógeras saw the State as the most advantageous and equitable source of capital for the enormous undertaking of developing iron mining and iron and steel manufacturing of sufficient scale. In advocating "nationalization" of these endeavors,<sup>63</sup> Calógeras left room for doubt about whether he referred to ownership by Brazilian nationals or by the State. However, his concern about sources of capital suggests that he always saw a role for the State as a participating actor in the industry. Calógeras's education as a mining engineer, combined with his high-level political career (including as a national Deputy and as Finance Minister) gave his opinions on these issues considerable weight.<sup>64</sup> His attention to mining law heightened its visibility as a public interest.

The increasing, if somnambulant, profile for iron mining and manufacture experienced a sudden change in 1910 with the International Geological Congress in Stockholm. Steel producers from industrialized nations had come together to address the troubling prospect of their dwindling reserves of ore. Engineering and surveyors' reports for this conference estimated that

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<sup>59</sup> Calógeras, *As minas do Brasil*, vol. 2, p. 103, citing a report by Paul Ferrand of the Escola de Minas, 1893.

<sup>60</sup> Calógeras, *As minas do Brasil*, vol. 2, p.103-13.

<sup>61</sup> Calógeras, *As minas do Brasil*, vol. 2, pp 204 – 215. As early as 1899, Calógeras tried to amend the mining law that emerged from the Constitution. (Vivacqua, *Nova política*, 527.)

<sup>62</sup> Integrated-steel plants are those that refine iron ore in several steps to produce high quality steel with controlled chemical compositions in order to meet multiple product quality requirements. These are highly capital-intensive production facilities.

<sup>63</sup> Calógeras, *As minas do Brasil*, vol. 2, p. 233.

<sup>64</sup> *Pandiá Calógeras na opinião de seus contemporaneos*, Commemorative volume after his death (1934).

Brazil was the site of the world's largest known ore reserves.<sup>65</sup> By 1922, industry officials estimated that Brazilian deposits accounted for 23% of known global iron ore reserves.<sup>66</sup> Further, much of the Brazilian ore was of exceptionally high quality (high iron content in the ore's chemical composition.<sup>67</sup>) The implications for Brazil of these findings followed two paths. First, iron supplied an important resource for pursuing domestic industrialization; second, the metal offered an extremely valuable commodity for international trade. Linking these trajectories to each other provided the context for the entry of the Brazilian State into the businesses of iron ore mining and iron and steel manufacture.

In 1908, shortly before the Stockholm Congress a group of British mining engineers acquired options on land in the Rio Doce Valley of the Itabira region in Minas Gerais (see map, below.) The resulting British Hematite Syndicate organized in 1912 for the purpose of mining iron ore for export to Britain.<sup>68</sup> British Hematite, later renamed the Itabira Iron Ore Company, acquired 12,000 hectares, with an estimated 700 million tons of high-grade ore.<sup>69</sup> With an average purity of 68.8%, these ore deposits turned out to be the richest known reserves in Brazil at the time. Because the mineral rights resided with the owner of the land at this time, the company's rights to the iron ore deposits were secure with its land purchases.

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<sup>65</sup> CVRD, *Companhia Vale do Rio Doce*, pp. 151-54.

<sup>66</sup> PF; Box 7 Folder 86; cited in "A Nossa Siderurgia e a Grande Siderurgia" Report attributed to Getúlio Vargas, November 1932 and Ministério da Agricultura, Serviço de Fomento da Produção Mineral, memo of 26 May 1936. (Also cited in Vivacqua, *Nova política*, p. 306.) The volume of reserves estimated in Minas Gerais was 13 billion tons (Wirth, "Brazilian Economic Nationalism," p.105.) The arithmetic discrepancy is not resolved. According to these findings the United States possessed 20% of world reserves (though of lower quality), and other countries followed with much smaller shares

<sup>67</sup> Russia and Sweden had ore reserves of comparable quality to Brazil's, but the high concentration reserves were of smaller quantity. (PF, Box 5, Folder 62, "Official Note" [1940, re-affirmation of 1936 manifest of mining holdings] and Box 7, Folder 86,)

<sup>68</sup> CVRD, *Companhia Vale do Rio Doce*, pp. 151-61 and PF, Box 8, Folder 104 "Itabira memoir" by Percival Farquhar, 30 July 1942. This group was a syndicate associated with steel producers who jointly sought to secure iron ore supplies. In 1942, the Itabira mines were estimated to have 700 million tons of iron ore, about 54% of Brazilian reserves (Dermeval José Pimenta, *Companhia Vale do Rio Doce*, Relatório apresentado ao Ministro da Fazenda; Programa de Obras - Realizações [Rio de Janeiro: Imprensa Oficial, 1947], p. 24.) Hematite is a variety of iron ore.

<sup>69</sup> Minimizing the public awareness of British ownership was the purpose of the name change. (CVRD, *Companhia Vale do Rio Doce*, pp. 154-61.) Pimenta (*Companhia Vale do Rio Doce*, p. 24) estimates the size of the Itabira holdings and iron ore reserves.



Rio Doce: Itabira to coast

In order to realize its ambitions of exporting large quantities of iron, the company required major infrastructure development. The improvements required more capital than the British consortium could raise. In 1921, they sold options to the company to Percival Farquhar,<sup>70</sup> an engineer from Pennsylvania with experience in building railroads in Central America and Brazil; he also participated in building urban tramways in Rio de Janeiro and São Paulo. His plans for Itabira included construction of port facilities in the adjacent coastal state of Espírito Santo, acquisition of majority ownership and major upgrading of the connecting railroad line (the Estrada de Ferro Vitória a Minas) and establishment of an overseas shipping line of Bessamer freighters to export the ore. To accomplish these plans, Farquhar assembled a consortium of investors (the PF Group.)<sup>71</sup>

The full range of its activities required that Itabira Iron Ore enter into contractual arrangements with both the state government of Minas Gerais and the federal government of

<sup>70</sup> CVRD, *Companhia Vale do Rio Doce*, p. 155.

<sup>71</sup> See Charles A. Gauld *The Last Titan: Percival Farquhar: American Entrepreneur in Latin America* (Stanford: Institute of Hispanic American and Luso-Brazilian Studies, Stanford University, 1964) for a hagiographic personal biography of Farquhar. He developed deep experience in a wide array of business ventures in Brazil, and has become such an icon of Brazilian history that he was the subject of a popular “telenovela” (soap opera) on national Brazilian television in 2005. For more on Farquhar’s involvement in iron mining, see Calógeras, *As minas do Brasil*, vol. 2, pp. 178, 212 and Baer, *The Development of the Brazilian Steel Industry*, pp. 64-68.

Brazil. In addition to a mining concession from the state of Minas Gerais,<sup>72</sup> business charters, and export licenses, the preferences that British Hematite, Itabira Iron Ore and/or the PF Group sought from public authorities included: an amendment to the 1890 Commercial Code to allow the company to issue preferred equity shares,<sup>73</sup> railroad and port monopolies and subsidies for the facilities that they developed, import tariff exemptions for capital goods, relief from exchange controls, corporate tax preferences and state export tax exclusions.<sup>74</sup>

Farquhar's endeavors with the Itabira mines became the centralizing flashpoint for the emerging concerns about foreign control of key economic sectors.<sup>75</sup> Political leaders in Minas Gerais and Rio de Janeiro, divided over the desirability of developing ore deposits for export.<sup>76</sup> Many saw the Itabira project as a foreign monopoly on a valuable resource that would not benefit Brazilians.<sup>77</sup> Some were reluctant to export Brazil's non-renewable natural resources if they could be used to promote rapid local industrialization.<sup>78</sup> Still others objected to foreign presence in a core industry that was strategically important to the economic standing and military defense of Brazil.<sup>79</sup> Among the opponents, some simply anticipated that the revenue potential of the mineral could be maximized by delaying development, and waiting for the depletion of alternative sources.<sup>80</sup> Only a small group defined their opposition in terms of non-renewable resource depletion.<sup>81</sup> Proponents of the plan saw the opportunity to use the strong source of export earnings from iron ore to finance imported capital and technology in pursuit of large-scale

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<sup>72</sup> Prior to the 1934 Code, state government granted concessions to mine; after 1931, in addition to state regulation, required authorization from the federal government. (PF, Box 7, Folder 94 Carl Kincaid "Outline for Brazilian Mining Legislation.")

<sup>73</sup> PF, Box 3, Folder 30, letters of 1 June 1920 (from Henry Leigh Hunt to Farquhar) and 15 September 1920 (from Sir Alexander Mackenzie [a Farquhar Syndicate investor] to Carlos de Campos.)

<sup>74</sup> PF, Box 6, Folder 74, transcript of Comissão Nacional de Siderurgia, "Resposta aos quesitos de revisão do contracto da Itabira Iron Ore Co., Limited" from the Ministério da Viação, December 1931 and Clodomiro de Oliveira, *A Concessão Itabira* (Belo Horizonte: Na, 1934), p. 56.

<sup>75</sup> Vivacqua, *Nova política*, p. 440 and Wirth, "Brazilian Economic Nationalism," p. 12.

<sup>76</sup> PF, Box3, Folder 33, Letter from Sir Alexander Mackenzie to John Tilley (British Ambassador to Brazil), 27 October 1921.

<sup>77</sup> Oliveira, *A Concessão Itabira*, p. 378; CVRD, *Companhia Vale do Rio Doce*, pp. 154-61.

<sup>78</sup> PF, Box 3, folder 33, Letter from Sir Alexander Mackenzie to John Tilley (British Ambassador to Brazil, 27 October 1921.)

<sup>79</sup> Wirth, *The Politics of Brazilian Development 1930-1954*, Chapter 5.

<sup>80</sup> This strategy appears to have been Percival Farquhar's understanding of the original objections to his venture by Arturo Bernardes, both during Bernardes's governorship (presidency) of Minas Gerais (1918-1922) and his term as president of Brasil (1922-1926. PF, Box 8, Folder 104, Oliveira, *A Concessão Itabira*, p. 45.)

<sup>81</sup> PF, Box 6, Folder 77, 1936 Report by Epitácio Pessoa, on the efforts of his government (1919-1922) to make iron ore exports viable. Pessoa identified opposition to the arrangement on grounds of mineral depletion.

steel production for rapid industrialization.<sup>82</sup> This strategy amounted to an audacious attempt to pursue export-oriented and import-substituting growth simultaneously.

Reflecting these controversies, the Tribunal de Contas refused to register the original federal contract with Itabira Iron Ore in May 1920, on the grounds that the government had exceeded its authority in granting monopoly railway and port concessions.<sup>83</sup> The legal status of this dispute, and the Tribunal's ability to negate the agreement, remained unresolved. In 1927-28, a more accommodating political environment resulted in contracts with both the federal government and Minas Gerais. The concession from the state of Minas Gerais included a steel plant with a capacity of 150 thousand tons per year (about seven-and-a-half times the national output in 1930; see Table 1, page 23.) The federal contract granted the transport monopolies to Itabira Iron Ore. The contract specified a maximum start-up period of two years. After the contract's approval, the PF Group was unable to issue the necessary capital in the New York stock market prior to the crash of 1929. The subsequent Brazilian government of Getúlio Vargas refused to recognize the crash as a *force majeure* that would suspend the contract. The ambiguities of the contract status from 1920 and 1927 were never resolved.<sup>84</sup>

The Vargas regime adopted the dual strategy of ore export with import substitution of steel. Vargas's ambition to develop ore exports was intended to generate the capital necessary for steel production. To this end, in May 1931 President Vargas's personal intervention resulted in a suspension of the federal contract with Itabira Iron Ore.<sup>85</sup> Review commissions and renegotiations prolonged uncertainty surrounding the contract. The National Steel Commission review (1931-1932) searched for alternative organizational arrangements to provide for both iron ore exports and large-scale integrated-steel production. Unable to resolve the problems of financing, coal supply for steel, plant location or transportation more economically with local ownership than the Itabira project proposed, this commission recommended renegotiating the

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<sup>82</sup> Oliveira, *A Concessão Itabira*, p. 21.

<sup>83</sup> C. Bevilaqua opinion (9 December 1924) on Itabira contract. (PF, Box 3, Folder 31.) The Federal government gave Itabira the right to export ore, and recognized Farquhar's role. The original, September 1920, agreement for a concession from the state of Minas Gerais, committed Itabira Iron Ore to build a steel plant, in exchange for the right to export ore from the state. The contract granted Farquhar concessions for an exclusive port, railway extensions, and a monopoly on export freighters. (Vivacqua, *Nova política*, pp. 308-11 and CVRD, *Companhia Vale do Rio Doce*, pp. 154-60.)

<sup>84</sup> PF, Box 7, Folder 90, English version of protest filed with the Brazilian government in response to annulling the Itabira Iron Ore contract, August 1939.

<sup>85</sup> *Leis e Decretos*, Decreto 20046, 27 May 1931.

original Itabira contract. The changes they proposed included eliminating the railroad and port monopolies, requiring that the company make available its (specifically designed) iron-ore freighters to import heavy capital equipment on return trips, reducing tax preferences and imposing an export tax.<sup>86</sup>

The National Steel Commission also assessed the military security implications of the Itabira contract. Increasingly, the Vargas regime equated economic and military security.<sup>87</sup> The connection between military and economic security first arose in the aftermath of the Paraguayan War (1864-1870) when the backwardness of Brazilian military technology and equipment became apparent. Later, with the cessation of international trade during World War I,<sup>88</sup> protection against war-related supply disruptions became defined as a security issue. The Brazilian army endorsed the export of iron ore simultaneously with accommodation of its needs to modernize military technology. By allowing for the possibility of meeting these goals through either an Itabira-owned steel plant or another, the military seemed neutral on the question of the nationality of ownership. However, reflecting its broadening role in public policy, the Army Ministry also characterized the contract as “monstrous” in its allocation of benefits and control of the “public wealth” [riqueza pública] to Itabira Iron Ore.<sup>89</sup>

By 1934, Farquhar and his syndicate took seriously the provision in the Mining Code and the Constitution that reserved the right to claim as public property the natural resources needed for the “economic and military security of the Nation.” The project expanded its plans for an integrated steel plant, with a specific commitment to give priority to military contracts.<sup>90</sup> Farquhar also responded to the intensifying attention to the issue of national ownership by reorganizing the company. Originally, the syndicate planned to organize a multinational firm, with a New York company issuing bonds and preferred stock and operations in Brazil (with the

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<sup>86</sup> National Steel Commission Report, 1932.

<sup>87</sup> The Commission’s review of the contract (beginning in 1932) came in response to a request from the military CVRD, *Companhia Vale do Rio Doce*, p. 181. PF; Box 6, Folder 74, Ministério da Guerra “Resposta aos quesitos ...” and Calógeras, *As minas do Brasil*, vol. 2, pp. 105, 114. Werneck (*Relatório*, p. 36) is the first explicit reference that I have found that linked national defense and the protection of a domestic iron industry. The politics of the Vargas regime also required constant, and increasing, compliance with a growing role for the military. Vargas’s presidency required the complicity of the Army. As one of the strongest national institutions, the Army laid the framework for their future dictatorship (1964-1985) during the Vargas years.

<sup>88</sup> See Wilson Suzigan, *Indústria brasileira: Origem e desenvolvimento* (São Paulo: Brasiliense, 1986) on the economic impact for Brazilian industrialization efforts of the disruptions to international trade during World War I.

<sup>89</sup> PF, Box 6, Folder 74, Ministério da Guerra, “Resposta aos quesitos ...” December 1931.

<sup>90</sup> PF, Box 5, Folder 75; Percival Farquhar’s comments to the National Steel Commission, October 1931 and Box 3, Folder 36.

equity shares of this company held in New York.) Because of the failure to issue equity before October 1929, this arrangement did not become effective. In 1939 the Companhia Brasileira Mineração e Siderurgia (the Brazilian Mining and Steel Company) was set up, as a last-ditch effort to stave off nationalization, holding ownership of the mines and the railroad. The Farquhar syndicate (the non-Brazilian partners) owned one-half of CBMS shares, and a Brazilian partner held the remaining half of the shares. In order to further distance foreigners from direct claims to mineral resources, Farquhar established the Companhia Itabira de Mineração as a subsidiary of CBMS.<sup>91</sup>

Simultaneously with alterations to the Mining Code in 1937, the Brazilian government again explored alternative options for developing a modern steel industry that would separate steel from its iron ore ambitions. A proposal for a state monopoly of steel production (the “Denizot Plan”) did not proceed because the Finance Ministry refused to approve the bond issue that would have been necessary to finance the plant. In this instance, the debate between public and private enterprise played out vociferously within the State policy apparatus.<sup>92</sup> Factions of Brazilian industrialists and politicians had begun debating the merits of a state-owned enterprise to ensure politically crucial steel production.

Prominent Brazilian industrialists took an increasingly active role in pressing for domestic steel production to supply their needs, and were willing to work with the Vargas regime to develop mixed public-private schemes toward this end. Guilherme Guinle, Henrique Lage and Alexandre Siciliano, among the most prominent industrialists in Rio de Janeiro and São Paulo, were the most active proponents to suggest alternative solutions to the Brazilian “steel problem.”<sup>93</sup> Their plans differed with respect to the preferential protection they might require, the location of plants and organizational dynamics. Nevertheless, all suggestions required a

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<sup>91</sup> PF, Box 8, Folder 104 “Itabira Memo” 1942 and Box 5, Folder 59, “Memo on financial requirements of Cia. Brasileira de Mineração e Siderurgia,” August 1940. *Leis e Decretos*, Decreto 2351, 28 June 1940. Separating ownership of the mines from the holding company was important, in part because of outstanding questions about the legality of earlier bond issues by the railroad in the French franc market. However, by 1939 the foreign ownership component, given Farquhar’s majority holding in CBMS, remained a question. By then, the national government was considering operating a steel plant in the Rio Doce Valley, allowing the Itabira mines to continue in operation. In a private letter to Alexander Malezonoff, his business partner and consulting engineer, Farquhar attributed the Brazilian position to the insistence of the Army.

<sup>92</sup> Wirth, “Brazilian Economic Nationalism,” 118-23 and Rache, *A grande siderurgia*, p. 10.

<sup>93</sup> Wirth, “Brazilian Economic Nationalism,” pp. 101-12 and Pedro Paulo Zahluth Bastos, “Roots of Associated Developmentalism: Comments on the Prussian Style Strategy and Pan-American Cooperation during the Estado Novo Regime (1937-1945),” *Revista Economia* 5, no. 3 (December 2004): p. 301.

prominent role for the State in financing. State ownership had co-existed with private enterprise in infrastructure (for example, railroads, urban transportation, telegraph, etc.) and banking – sectors that were widely perceived to have significant value as public goods. Nothing suggests that either ambitious industrialists in other sectors or smaller-scale steel producers already operating in Brazil believed that they could undertake the expansion of steel production on a scale sufficient to create the broad-based industrial economy of their aspirations without significant government participation for capital and technological-organizational support.

Expressions of military interests in industry strengthened further in 1938, and the government insisted on linking the construction of a steel plant to accommodate shipbuilding demands of the Navy to any Itabira project.<sup>94</sup> By 1939, the government, pursuing another alternative to separating the iron ore and steel productions projects, attempted to entice the U.S. Steel Corporation into an arrangement to develop an integrated steel plant in Brazil. When the federal government revoked its 1927 contract with Itabira Iron Ore in August 1939, asserting that the company had not abided by the terms of the contract, Farquhar may have been the only person claiming to be surprised.<sup>95</sup> The revocation, combined with the strengthened Mining Code of 1937, constraining foreign access to the subsoil and tightly regulating authorizations to concessions, rendered the probability of large-scale private-sector iron-ore mining very low. Farquhar's options for shares of Itabira Iron Ore became useless,<sup>96</sup> and he began promoting a project for the Export-Import Bank to participate in iron ore mining in the Rio Doce Valley, in the hopes that this would provide an avenue to resurrect the value of his options.<sup>97</sup>

The outbreak of World War II provided the Brazilian government with an extraordinary opportunity. British demand for war-time equipment increased its need for iron ore while it faced serious shortages, with the shut-down of its traditional peacetime supplies from Sweden. Further, war-diplomacy goals of the Allies sought to limit German presence in the Brazilian economy<sup>98</sup>

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<sup>94</sup> PF, Box 7, Folder 87, Letter from Percival Farquhar to E.F. Turner (Legal Secretary of Itabira Iron Ore Co.) 25 October 1938.

<sup>95</sup> PF, Box 7, Folder 95, Letters by Farquhar to: Minister of Communication and Public Works (19 June 1940), Leith (13 March 1939), and Vice President (of Brazil) Eurico Dutra (undated.)

<sup>96</sup> Farquhar was the major participant in the new Brazilian company, and he hoped to sell his Itabira Iron Ore Co. options to CBMS.

<sup>97</sup> PF, Box 7, Folder 87, Letter to Malezomoff, 5 April 1939 and Folder 88. He hoped to sell his options to CBMS, who would, in this plan, be the corporate venue for Export Import Bank-financed ore mining.

<sup>98</sup> Farquhar had worked with Fritz Thyssen of Vereinigte Stahlwerke A.G. to develop German participation in Itabira, both as an equity holder (for as much as 30% of total equity) and as a consumer of Itabira iron. In April

and to strengthen hemispheric allegiances. These circumstances created new international economic dynamics for Brazil. At the same time, the war reinforced earlier concerns about trade disruptions impeding the supply of capital goods within Brazil.

In 1941, technical assistance and financing (\$20 million) from the US Export-Import Bank enabled the Companhia Nacional Siderúrgia to organize and build a large integrated-steel plant, relying on imported coal, at Volta Redonda.<sup>99</sup> The Volta Redonda project had two crucial short-term implications for iron ore mining in Vale do Rio Doce: it separated the goals for domestic steel production from the ambitions for iron ore mining and export, and the project established the framework for similar technical assistance and Export-Import Bank loans (\$14 million) for a State-owned iron-ore mining company at the Itabira mines in 1942.

The Washington Accords of 1942 between the governments of the United States, Great Britain and Brazil<sup>100</sup> tackled the war-related iron ore supply problems simultaneously with Brazilians' continued desire to export iron ore. The British government bought the shares of the Itabira Iron Ore Company and transferred ownership to the Brazilian government.<sup>101</sup> The Export-Import Bank loan and technical assistance ensured upgrading of mining, railway and port facilities, and provided commitments of coal imports from the United States. The British and (secondarily) the US governments committed to Brazilian ore purchases for a fixed period, repairing British supply disruptions. The Washington Accords committed the Allies to purchase 750,000 tons of Itabira ore a year, for three years, and included production plans for 1 million

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1936, they worked on an agreement in which Vereinigte Stahlwerke would commit to purchase 1.5 – 2 million tons of ore per year, with payments partially in coal (coke to fuel the IIO steel factory. PF, Box 6, Folder 80 (various letters from Farquhar to Thyssen, 1930-1936) and Folder 83 [letter from Farquhar to Fred Brandi, Dillon Reed, 21 January 1935.]

<sup>99</sup> Wirth, *The Politics of Brazilian Development 1930-1954* and Wirth, "Brazilian Economic Nationalism." This arrangement was tied to an agreement for the U.S. military to build a base in the northeast of Brazil in support of war operations in northern Africa. Discussion with the Export-Import Bank for foreign, state-guaranteed, credit first occurred during 1937, and the following year, a proposal was seriously considered for a state-owned monopoly-protected steel plant, which included provisions to expropriate the iron mines. The reliance on imported coke was recognized as a vulnerability, which could be partially offset by domestic charcoal, in an emergency. The initial capacity of the Volta Redonda plant was planned to be 335,000 tons per year of steel in various forms and strengths; this plan was expanded as early as 1942. (Vivacqua, *Nova política*, p. 334.)

<sup>100</sup> CVRD, *Companhia Vale do Rio Doce*, 186-88. Also see PF, Box 5, Folder 69. The enabling legislation for the Accords within Brazil is *Leis e Decretos*, Decreto-lei #4352, 1 June 1942.

<sup>101</sup> The Estrada de Ferra Vitória a Minas was transferred to the Brazilian government (free of dubious French-issued bonds), with the concession to improve and operate the railroad issued to the Cia. Brasileira de Mineração e Siderurgia – the Brazilian chartered firm that Farquhar organized in 1940 to accommodate the national-origin requirements of mining rights. This transfer became very complicated; but ultimately Farquhar became a major shareholder of CBMS. (PF, Box 6, Folder 75.)

tons per year (more than five times the 185 thousand tons of pig iron produced nationally in 1940; see Table 1.)<sup>102</sup> Given the confusions about the possibilities of private Brazilian ownership, in contrast to the state-ownership, and the credibility offered by linking the State to local entrepreneurs, the formation of a privately owned enterprise was not considered.

	<u>Pig Iron</u>	<u>Steel</u>	<u>Laminated iron</u>
1930	35.3	21.0	20.9
1936	78.4	73.7	62.9
1937	181.0	76.4	71.4
1938	118.6	89.7	78.7
1939	160.0	114.1	101.0
1940	185.3	141.0	135.3
1950	729.0	788.6	572.5

Sources: Vivacqua. *A nova política do subsolo* pp. 327-28 and CVRD. *A mineração no Brasil*, p. 179.

Export-Import Bank financing presented Brazilians with the opportunity to obtain substantial foreign credit and technical assistance, without sharing the ownership of the enterprise. As a result, the new firm could represent itself as being fully “Brazilian,” even as the value of the long-term foreign loan exceeded the equity invested in the new company. The original \$14 million loan from the Export Import Bank, equated to about 137% of the original equity.<sup>103</sup> Fifty-six percent of the equity (Cr\$200 million, common shares) that capitalized the Companhia Vale do Rio Doce (the company emerging as a result of the Washington Accords), was held by the Brazilian government; public institutions and domestic steel producers were the major owners of the remaining 44%. The State’s share of equity increased to 65% with a capital increase in 1944.<sup>104</sup> Increased long-term debt of US\$5 million from the Export Import Bank

<sup>102</sup> Pimenta, *Companhia Vale do Rio Doce*, p. 47 and PF, Box 7, Folder 89. This level of production compares with the 4 million tons per year that Farquhar projected in 1919 CVRD, *Companhia Vale do Rio Doce*, pp. 154-61.

<sup>103</sup> This conversion is based on the fixed annual exchange rate of Cr\$19.6=US\$1, for the period 1942-1944 (Marcelo de Paiva Abreu [ed.], *A ordem do progresso: Cem anos de política econômica republicana* [Rio de Janeiro: Editora Campus, 1990], Statistical Appendix, column 32.)

<sup>104</sup> In 1944, the State took 83.7% of the Cr\$100 million capital increase, raising State ownership to 65%. (Pimenta, *Companhia Vale do Rio Doce*, pp. 9-12.)

(bringing its loans to 124% of equity) in 1945 and Cr\$300 million in domestic bond markets, issued from 1944 to 1946, demonstrated the State's ability to leverage its success with CVRD. When first listed on the Rio de Janeiro stock exchange, CVRD and CSN (in 1943 and 1942 respectively) had the highest levels of statutory capital on the exchange.<sup>105</sup> In 1952 the Brazilian State took full ownership of Companhia Vale do Rio Doce.<sup>106</sup>

The only substantive difference between the organization of CVRD and the enterprise that Farquhar had been proposing for eighteen years was ownership.<sup>107</sup> With the establishment of CVRD, ownership of one of the largest reserves of Brazil's most important mineral resource in the middle of the twentieth century returned to the sovereign state.

The Vargas regime had not started with a commitment to bring industry into the public sector,<sup>108</sup> and the Companhia Vale do Rio Doce was not a monopoly. The company overshadowed, without eliminating, private sector production. A large, centrally controlled and vertically integrated enterprise emerged simultaneously with relatively small firms in the private sector. Among other firms in Brazil that considered exporting iron ore during the 1920s and 1930s were A. Thun, J.A. Abdo, and the St. John d'el Rey Mining Co. Nevertheless, CVRD quickly came to dominate iron ore mining and exports (see Tables 1 and 2.) Similarly, a number of firms manufactured steel, and at least ten new producers had opened during the 1930s, while continuing to import 75% of the laminated steel that it used.<sup>109</sup> State ownership offered crucial advantages. The protections and subsidies offered to CVRD (and CSN) with respect to capitalization, infrastructure (railway and port) support, tax and trade preferences ensured their dominance. Their organization as limited-liability joint-stock companies, in which the State was the majority shareholder, inextricably tied public and private interests.

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<sup>105</sup> Derived from Câmara Syndical dos Corretores de Fundos Públicos da Capital Federal, Instituto Brasileiro de Mercados de Capitais, *Relatórios da Câmara Syndical dos Corretores de Fundos Públicos da Capital Federal*, annual series, Rio de Janeiro, Imprensa Nacional: 1942-1944.

<sup>106</sup> CVRD, *Companhia Vale do Rio Doce*, p.201.

<sup>107</sup> Farquhar went on to become one of the organizing partners and major shareholders of Acesita (Companhia Aços Especiais de Itabira), an important specialty steel manufacturer in the Brazilian market. Acesita remains in operation. (PF, Box 6, Folder 73.)

<sup>108</sup> Wirth, "Brazilian Economic Nationalism," pp. 116-21.

<sup>109</sup> Nelson Coelho de Senna, *A terra mineira* (Belo Horizonte: Imprensa Oficial do Estado de Minas Gerais, 1926), Vol. 1, p. 239; CVRD, *Companhia Vale do Rio Doce*, p. 178-80 and PF, Box 7 Folder 86, citing a survey from 1936.

	<u>tons (000)</u>	<u>% of total Brazilian iron exports</u>
1942	35.4	11.2
1943	62.9	19.5
1944	127.2	61.8
1945	101.7	33.9
1946	41.0	63.6
1947	174.3	88.6
1948	385.3	64.3
1949	471.9	69.9
1950	721.8	81.8

Source: CVRD. *A mineração no Brasil*; p. 202.

The ambition to develop ore exports was intended initially to generate the capital necessary for steel production. Iron mining and steel production were treated as basic infrastructure, offering the public benefits that extended beyond those that producers could capture, and requiring financial resources beyond their command. Given the goals of large-scale industrialization and the creation of powerful centralized governance, defining iron and steel as a public good was one application of tactics used in other activities.<sup>110</sup> The major impediment to such a move was the need to organize and finance a large technologically sophisticated capital-intensive company; exogenous circumstances provided a solution to this problem. This experience moved the State into a sector of production otherwise in the private realm, and was of a scale much larger than prior public endeavors.

## CONCLUSION

Until the Brazilian government revoked the Itabira Iron Ore Company contracts in 1939 and organized the Companhia Vale do Rio Doce in 1942, each of the issues defining the subsoil rights debate prevented the development of Brazil's richest iron ore reserves. During this period,

<sup>110</sup> The Vargas regime also assumed a central role in such other activities that it defined as a "public good," such as labor organization and ultimately the Brazilian State owned many industrial concerns.

subsoil and mining rights were fundamentally re-structured and transferred to the federal realm. Despite the “grandfathering” of existing holdings, the Mining Code of 1934 signaled the federal Government’s increasing determination to acquire control of the rights to natural resources in order to develop large-scale metallurgical industries. The prospects for a foreign company to mine and export iron ore from Brazil diminished rapidly. Simultaneously, each step of business negotiations made it increasingly unlikely that anybody other than the State could control large-scale resource extraction.

The Vargas regime redefined subsoil rights simultaneously with establishing the iron and steel as a public good. These changes were not *sui generis* innovations with the Vargas regime; they drew upon deeply established practices from the colonial era. Private ownership of mineral rights had prevailed for only about forty years of Brazilian history. Recognizing a fundamental need for economic growth, sporadic state-supported efforts to develop iron mining and manufacturing dated to the seventeenth century. Reinstating colonial concepts of public sovereignty over the subsoil and the effective conflation of military and economic security rendered private sector development of the mining and metals manufacturing sectors infeasible. These efforts contributed to a massive push towards the manufacturing of capital goods within Brazil, embedded the State in the center of the industrial sector and “marked the advent of the new orientation to the iron and steel problem with a new constitutional regime of juridical and economic unity that strengthened the Union”.<sup>111</sup>

The initial arrangement with the US Export-Import Bank that allowed the development of the integrated-steel plant at Volta Redonda was a pre-requisite for the second loan, financing CVRD. It allowed for a separation of the steel production and mining ambitions of the Vargas government, without compromising either. “[S]teel mills were to serve as a very valuable instrument of national colonization. The Vale do Rio Doce [was] given privileged conditions in order to harmonize mining with steel production”.<sup>112</sup> Similarly, CVRD and CSN anticipated further incursions of the State into core resource industries. The experiences with state-owned iron ore mining informed Brazilian petroleum exploration. The Brazilian government organized

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<sup>111</sup> Vivacqua, *Nova política*, p. 322.

<sup>112</sup> Vivacqua, *Nova política*, p. 330.

and capitalized Petróleo Brasileiro (Petrobrás) in 1954, based on its claims to subsoil rights and the firm-ownership model of CVRD.<sup>113</sup>

Within Brazil, the formation Companhia Siderúrgica Nacional and Companhia Vale do Rio Doce initiated state-ownership as a tool of state-directed import-substituting industrialization. These activities occurred almost two decades before the formal articulation of structuralist (or dependency) economic perspectives and policies predominated throughout Latin America.<sup>114</sup> Nevertheless, they clearly anticipated the ideologies and goals of ISI policies that took strong shape in the 1950s. In the cases of iron mining and steel manufacturing, state economic activity did not displace domestic industry. Rather, Brazilians were determined to keep this sector within the domestic sphere, and displace foreign entrepreneurs. Brazilian industrialists looked to the State to support their efforts. The State-owned enterprise became a substitute for foreign business interests, when domestic capital, technology and organization did not meet the needs. The insistence on domestically owned strategic enterprise, and the concept of “economic nationalism” did not represent withdrawal from the global economic arena. Rather, it re-defined the terms of participation.

Their own history strongly shaped Brazilian actions. However, the international context also supported the trajectories within which these businesses formed. Whether assessing industrial history from the perspective of traditional “Gerschenkronian” analyses, focusing on changing organizational forms required by different conditions and timing of entry, or from a more recent comparative history of industrial protectionism, the Brazilian experience did not fall outside of normative practices.<sup>115</sup> Industrial organization arranged around the nation, and orchestrated (including protected) by the State had long and broad precedent. Practices defined by national interests deepened globally with conditions of war and depression that prevailed

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<sup>113</sup> The first attempt to establish a national petroleum company, the Companhia Nacional de Petróleo, occurred in 1939 (Vivacqua, *Nova política*, p. 353-56, 488.) Petrobrás remains state-owned; it is a monopoly provider of petroleum, ethanol and some other fuels in Brazil. Petrobrás is (in 2005) the world’s seventh largest energy company (in sales volume, refining capacity and reserves) and the largest company in Latin America (<http://www.petrobras.com.br>). (Given the difficulty of measuring company size on a consistent and current basis, Petrobrás ranks twentieth in size of reserves globally, by *Petroleum Intelligence Weekly*, 9 May 2006 [<http://bigcatchronicles.blogharbor.com>].)

<sup>114</sup> Joseph L. Love, "The Rise and Decline of Economic Structuralism in Latin America: New Dimensions," (*Latin American Research Review* 40, no. 3 [October 2005]: 100-25) offers a useful overview. Love also identifies that structuralist policies were widely in effect in the 1930s and 1940 (p. 107).

<sup>115</sup> Alexander Gerschenkron, *Economic Backwardness in Historical Perspective* (Cambridge, Mass.: Harvard University Press, 1962) and Ha-Joon Chang, *Kicking Away the Ladder Development Strategy in Historical Perspective* (London: Anthem, 2002).

during the first half of the twentieth century. Brazilians took these practices further, to include the ownership of enterprise in areas that most, but not all, developed economies left to the private sector. For much of the remainder of the twentieth century, the Brazilian State's position as the major iron and steel producer became a paradigm of state-led industrialization. It also gave the government an extraordinary role in directing other industrial development through the mechanism of managing the supply of core inputs.<sup>116</sup>

If measured in the long-term, Brazilians met their ambitions of large-scale steel production and iron ore exports. Today, both the Companhia Siderúrgica Nacional and Companhia Vale do Rio Doce have been privatized, and remain among the largest companies in Brazil; they have global operations and their equity shares traded globally as well as in São Paulo.<sup>117</sup> CVRD is the world's "fifth largest mining and metal company", and "largest producer and exporter of iron ore in the world;" the company mines and manufactures a variety of industrial metals.<sup>118</sup> The transition from infant to mature industry does not inevitably lead to privatization. Petrobrás, the petroleum and energy monopolist, remains a state-owned company. Further, these questions are not unique to Brazil. The pendulum between nationalizing and privatizing natural resources throughout Latin America has not ceased, as the current controversy about the mandated re-negotiation of contract terms for natural gas and water in Bolivia (portrayed in the US press as a "nationalization") fully demonstrates – with a Brazilian company, Petrobrás, in the role of foreign exploiter of natural resources.

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<sup>116</sup> This practice was in addition to infant-industry protections of subsidies, tax preferences, trade preferences, etc., and to the range of other enterprises that the State established full, majority or partial ownership positions.

<sup>117</sup> CSN and CVRD were privatized in 1993 and 1995, respectively. ([www.csn.com.br](http://www.csn.com.br) and [www.cvrd.com.br](http://www.cvrd.com.br).)

<sup>118</sup> [www.cvrd.com.br](http://www.cvrd.com.br).

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