# Sectoral Origins of Income Taxation: Industrial Development in Latin America and The Case of Chile (1900-2010)

Héctor Bahamonde

*PhD Candidate • Political Science Dpt. • Rutgers University

e:hector.bahamonde@rutgers.edu

w:www.hectorbahamonde.com

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**Abstract**

Building on the fiscal sociology paradigm, and the importance of the income tax for state-building, this paper outlines the conditions under which endogenous investments in fiscal institutions were most likely to occur in Chile and more generally in Latin America, starting in 1900. The paper contributes to the literature on state and fiscal development by presenting a historical comparative macro-structural argument centered on inter-elite conflicts. I use the case of Chile to sketch the theory, and several analyses of panel-data to suggest a possible generalization of the argument. My analyses and case study strongly suggest that strong states saw the emergence of a strong industrial sector with enough economic and political leverage to interrupt the political monopoly held by the landed elite which had inherited its privileges since colonial times, leading to subsequent sectoral compromises.

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# I. Introduction

*The only important coercion which is crucial to development is taxation*

Arthur Lewis, 1965

*The budget is the skeleton of the state stripped of all misleading ideologies*

Schumpeter, 1991

According to most political economists, fiscal sociologists, development economist and economic historians, fiscal capacities are a prerequisite for state-building. Unfortunately, there have not been much attempts to explain *why* and *how* state and fiscal capacities in the developing world emerged.[1] With a few exceptions, much effort has been devoted to understanding the relationship between the politics of taxation and state capacities in a number of European cases. In a recently edited volume, Monson and Scheidel [2015, 3] explain that the "New Fiscal History has furnished a valuable set of concepts and questions but so far its scope has been limited to post-classical Europe."[2] In fact, the bulk of research on Latin America has mostly focused on *recent* tax reforms.[3] However, the *origins* of the fiscal Latin American state remains relatively unclear. Additionally, since wars in Latin America have been rare,[4] it is difficult to extend models based on external threats originally developed to understanding the medieval European case.[5] Importantly, the role of sectoral conflicts within a context of economic structural transformation, taxation and state-building has been overlooked.[6] A few exceptions are Gallo [1991, 7-8], Waldner [1999, 3] and Saylor [2014, 8] who consider elite conflicts to study state-making and fiscal development.[7] Building on the fiscal sociology paradigm, I propose that the development of the modern fiscal apparatus in Chile was product of sectoral conflicts and compromises that took place around in the 1920's between the industrial and agricultural political elites. The paper presents several panel-data analyses covering

[1] Di John [2006, 5].

[2] Some important exceptions are Yun-Casalilla et al. [2015] and Monson and Scheidel [2015] who study a number of premodern states.

[3] Fairfield [2013] studies different strategies policymakers pursue to tax elites starting in 1990. Mahon [2004] and Focanti et al. [2013] study the causes of tax reform in Latin America starting in the 1980s and 1990, respectively. Similarly, Ross [2004] studies the relationship between taxation and representation between 1971 and 1997, whereas Sokoloff and Zolt [2007] study the evolution of tax institutions comparing the U.S. with Latin America.

[4] Centeno [2002].

[5] Tilly [1992]. See also Besley and Persson [2009].

[6] For example, Schneider [2012, 2] argues that even when "[t]here has been significant attention given to the role of revenues in building early Western European states, and even some attention given to formative moments of state-building in developing countries [but] we have limited insight into what happens when economies change significantly, with new leading sectors, new patterns of social organization, and new requirements of state authorities."

[7] Wheeler [2011] studies how inter-elite cooperation and agreements positively impacted state-making in Europe.

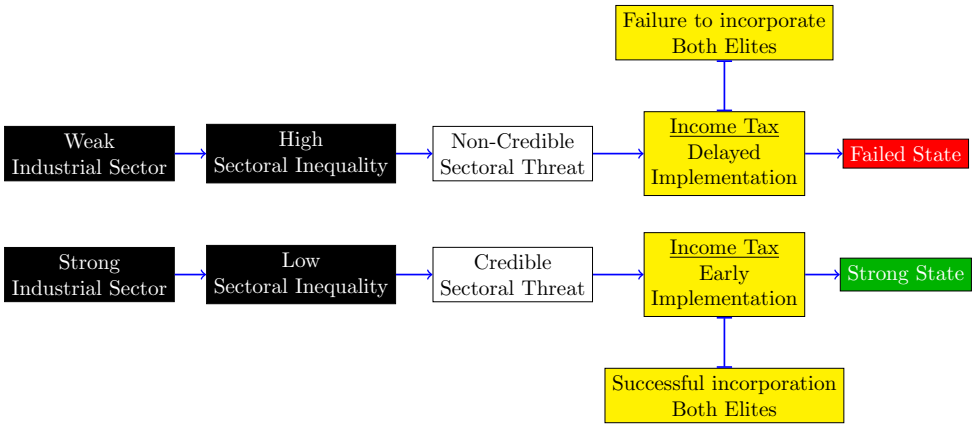
almost 100 years of sectoral outputs to suggest that this theory could be potentially generalized to other countries in the region.

Dan's comment: endogeneity

Boucoyannis2015a Representation thus presupposed strong state capacity to tax.

I argue that the implementation of the income tax in Latin America was product of an intersectoral conflict that took place around in the early 1900's between the agricultural and industrial sectors. Before the income tax law was implemented, political institutions and social norms, largely inherited from the colonial period, were designed to promote biased agricultural development. The emergence of a new industrial sector rose a new politically-disenfranchised elite who demanded political and economic reforms. Industrial elites accepted to be income taxed by agriculturalist incumbents in exchange of having a more open political system and being their industries protected via tariffs. Critically, the tax was not important because of the new revenue it collected,[8] but because its implementation required a series of sectoral compromises, triggering a series of other institutional investments, such as the implementation of checks-and-balances (to monitor tax spending) and the development of skilled bureaucracies. This argument is situated within the broader literature on political and economic development. Particularly, the argument is situated within the broader fiscal sociology paradigm, putting emphasis on how fiscal development was important for state-making.

**Figure 1:** *Causal Mechanism*




Some scholars situate the relevant state-building critical juncture at the end of the colonial period, before the class compromises I identify in this paper. For example Kurtz [2009, 2013] explains that the first critical juncture corresponded to the post independence political economy,

[8] Public economists usually focus on tax revenues. However, higher revenues do not mean higher stateness levels. For example, since American institutions were deliberately designed to limit the exercise of state power, the U.S. taxes very little (Fukuyama [2004, 6]). However, it is not reasonable to say that the U.S. has a "weak state." Moreover, high taxation levels do not necessarily imply higher levels of state capacities either. Kiser and Tong [1992, 301] explain that in the Ming (1368-1644) and Qing (1644-1911) China, higher taxes were in fact "the result of rulers' lack of power. Chinese rulers consistently attempted to limit official's excessive extractions from the masses, but were unable to do so."

stressing whether local rural elites recruited their workers through servile means. In turn, Soifer [2015, 6] argues that the critical tipping point was whether "local administrators were outsiders in the communities in which they served." Both critical junctures happened *before* 1900. While the process of state-building started before 1900, the paper identifies the income tax as an important *additional* building block in that process. Elsewhere I have argued that the economic structural transformation characterized by "a secular decline of agriculture and substantial expansion of manufacturing"[9] imposed tight constraints on the way politics was run by the incumbent landowning class. The emergence of an efficient industrial sector not only altered the structure of the economy but also the inter-sectoral balance of *political* power, triggering a series of inter-sectoral compromises. Particularly, the implementation of the income tax overthrew the political institutions and practices that permitted agricultural economic expansion *at the expenses* of the industrial sector, setting in motion a path of long-term *economic* development.[10] In this paper I expand on this idea by arguing that the emergence of the industrial sector *accelerated* the implementation of the income tax law, setting countries in a path of *political* development. For the former I provide evidence from a series of duration models, and for the latter I leverage the case of Chile.

## II. Taxation and State Formation

According to the fiscal sociology approach, the great modern cleavage was not the rise of capitalism (Marx) nor the rise of modern bureaucracy (Weber), but the rise of the "tax state," which developed institutions to penetrate individual economies.[11] It was Schumpeter who called for a systematic study of public finances, and to treat taxation both as cause and consequence of large-scale changes in the structure of the economy and the state.[12] I use this framework to contend that the expansion of the fiscal system embodied specially in the implementation of the income tax was the spring of the political structural transformation that took place around in the 1900's. Faster industrial output nurtured a new demanding political elite, leading to a string of institutional investments, setting countries in a long-term path of institutional development. I agree with Musgrave [1992, 99], since taxation (specially on incomes) requires such a high degree of state penetration, public finances offer the key for a theory of state development.

The fiscal sociology paradigm is vast.[13] Without trying to survey all of it, this paper follows the classical approach famously suggested by Schumpeter in that it sees "taxation in terms of group conflicts [and] class interests."[14] Similarly, Seligman in 1895 argued that "[f]iscal conditions

[9] Johnston and Mellor [1961, 567].
[10] Bahamonde [2017].
[11] Moore [2004b, 298]. See epigraphs (Schumpeter [1991, 100] and Lewis [1965, 42]).
[12] Martin et al. (in Martin et al. [2009, 2]). See also Schneider [2012, 35] who argues that "[p]ublic finances are causal and symptomatic. Revenues are necessary to build states; the act of gathering revenues structures societies; productive societies and capable states generate revenues."
[13] For an excellent overview of both classic and new fiscal sociology refer to Martin et al. [2009, Ch. 1].
[14] Monson and Scheidel [2015, 14].

are always an outcome of economic relations,"[15] while Goldscheid in 1925 famously argued that "tax struggles are among the oldest forms of class struggle."[16] This paper is situated within this tradition, emphasizing the sectoral conflicts between agricultural and industrial elites in Latin America. As others have argued, political development and particularly "state formation will be more likely to the degree that powerful individual actors form two groups on the basis of *divergent* economic and political interests."[17] Since state centralization affects landowners and industrialists in different ways,[18] this approach is specially relevant for the Latin American case. Agriculturalists systematically resisted taxation as land fixity increased the risk premium of their main asset,[19] while industrialists' preferences toward taxation were more elastic as capital could be reinvested in nontaxable sectors.[20] Taxation has always been conflictual since it has an important coercive element. As Martin et al. argue "a tax is not a fee paid in direct exchange for a service, but rather an obligation to contribute."[21] What makes taxation relevant, conflictual and coercive is not the tribute itself (and the potential promise of provision of public goods), but its compulsoriness. Regardless of an individual's race, religion, culture or any other kind of status, the state classifies its subjects according to their incomes and oblige them to pay, punishing whoever refuses to do so. From a sociological standpoint, this "generality makes taxation a crucial element in the development of the 'imagined community' (Anderson [2006]) [...] Taxation enmeshes us in the web of generalized reciprocity that constitutes modern society."[22]

Not all kinds of taxes have the same level of positive impact on state-building. Indirect taxes do not need to develop a strong fiscal apparatus.[23] According to Best [1976, 53], "indirect taxes are but substitutes for direct taxes,"[24] and hence they are typically administered by weak states.[25] Since indirect taxes are, *ceteris paribus*, easier to levy,[26] this kind of revenue is generally considered "unearned income"[27] or "easy-to-collect source of revenues."[28] Given the relatively lower costs states have to incur to collect them, indirect taxes have a very low impact on state-building. In

[15] In Martin et al. [2009, 7].
[16] In Campbell [1993, 168].
[17] Hechter and Brustein [1980, 1085]. Emphasis is mine
[18] Acemoglu and Robinson [2009, 289].
[19] Robinson [2006, 512].
[20] Hirschman [1970] and Ronald Rogowski in Drake and McCubbins [1998, ch. 4]. However, see Bates and Lien [1985, 15].
[21] in Martin et al. [2009, 3].
[22] Martin et al. (in Martin et al. [2009, 3]).
[23] However, see Brewer [1990, 56]. The English state made extensive use of its navy to prevent smuggling and enforce the excise, an indirect tax. The excise employed an important number of state agents and helped to develop skilled state bureaucracies and an efficient fiscal system.
[24] However, under certain circumstances, indirect taxes are more efficient. Kiser [1994, 291] explains that when the levels of tax variability are high, direct taxation can actually have negative effects, specially when overtaxation is a possibility.
[25] This view is also supported by Moore [2004a, 14].
[26] Krasner [1985, 46] explains that "tariffs and export taxes are easier to obtain than direct taxes, which require high levels of bureaucratic skill and voluntary compliance."
[27] Moore [2004b, 304].
[28] Coatsworth and Williamson [2002, 10].

fact, when early Latin American states depended heavily on international trade taxes, the state apparatus tended to be less developed.[29] Since customs administrations in the region have always been concentrated in a few critical locations, especially ports, tariffs and customs duties did not require an elaborate fiscal structure.[30]

Direct taxes are more likely to produce long-lasting positive effects on state-building. Since direct taxation involves a compulsory transfer from private hands to the government sector for public purposes,[31] it is harder to collect,[32] requiring stronger domestic alliances to sustain these kinds of policies. Following the fiscal sociology paradigm, in this paper I focus on the income tax. From a historical standpoint, its introduction "was one of the major events in fiscal history that contributed to the growth in *government* observed during the past 150 years."[33] Since taxing incomes involves transforming private income into public property,[34] this form of taxation demands the development of both stronger state institutions and efficient monitoring and enforcement technologies.[35] As others have pointed out, "administrative constraints are identified as the main constraint to the ability of states to collect [the] income tax."[36] Political alliances should exist to overcome these logistic, institutional and political domestic challenges. Critically, economic elites, should agree to comply with the income tax.[37] Beramendi et al. [2016] argue that in fact Latin American "capitalist elites [*preferred*] to shoulder a higher tax burden through progressive direct taxation, which they [viewed] as the least-worst economic option," fostering fiscal expansion.[38] Since tax revenues depend upon the interests of different classes as they attempt to use state power for their own purposes,[39] class conflicts are more likely to resolve in favor of direct taxation where income inequality *among the elite* is low.[40]

Here I focus on how the emergence of the industrial sector lowered the levels of inter-sectoral inequality making possible higher levels of inter-sectoral contestation, forcing industrial and agricultural political elites to make institutional agreements. Given that similar degrees of sectoral economic development can be converted into armies of similar capabilities,[41] elites will have incentives to make agreements rather than engaging in conflict when their economic/military capacities are similar. That is, lower levels of inequality force cooperation by positing credible military threats to the

[29] Campbell [1993, 177].
[30] Bertola and Ocampo [2012, 132].
[31] *Cfr.* Raja Chellia, "Trends in Taxation in Developing Countries," in Migdal [1988, 282].
[32] Kurtz [2013, 62].
[33] Aidt and Jensen [2009, 171]. Emphasis is mine.
[34] Musgrave [1992, 98].
[35] Lieberman [2002, 99].
[36] Di John [2006, 5].
[37] Best [1976, 71] argues that the "actual composition of taxes can be viewed as dependent upon the distribution of power rather than as an expression of the free choice of the majority of the people."
[38] They particularly argue that progressive taxation is better relative to "trade taxation, which can negatively impact the industrial sector" (p. 18).
[39] Best [1976, 50].
[40] Tani [1966, 157] explains that the absence of "wealth groups" makes passing an income tax law easier.
[41] Boix [2015].

incumbent elite. Furthermore, when levels of inter-elite inequality are low (and military capacities are similar), war is more likely to exhaust all existent assets without producing positive outcomes for either sector,[42] increasing the opportunity costs of conflict. Figure 4 shows sectoral outputs for a number of Latin American countries. Using Cox proportional hazard regressions I model the *contribution* of each sector on the 'hazard' of implementing the income tax law. I find that the emergence of the industrial sector *accelerated* the implementation of the income tax. The faster the industrial expansion, the lower the inter-sectoral inequality levels, the more credible the threat for agricultural incumbents. I also find that *only*-agricultural growth *stagnates* political development by *delaying* the implementation of the tax. This was crucial for political development: when the income tax was imposed late in history, its implementation did not reflect the foundational structure of early sectoral conflicts, an important feature according to the fiscal sociology, truncating the development of state institutions. For example, Chile imposed the income tax law in 1924, and the *Servicio de Impuestos Internos* is among the finest tax institutions in Latin America. However, Guatemala imposed the income tax law very late, in 1963, and by 1967 the national income tax office employed 194 people, and only 9 of whom had graduated from college.[43]

## III. Unpacking the Mechanisms: Chile 1850-1950

Historians still debate whether agriculturalists and industrialists comprised two different elites. Some claim that this dualism is incorrect.[44] They argue that there was a blurry class division between the mining, banking and agricultural sectors.[45] For example, landowners were also invested in industry.[46] However, others have pointed out that it was common practice that industrialists had to invest in real state *just* to obtain credit. Kirsch [1977, 59] explains that "in a *rural society* land offered one of the best guarantees for loans [since] loans could not be secured by equipment, machinery, or inventory. Only real estate was acceptable collateral."[47] There were also instances where miners were invested in banking. However, Segall [1953] argues that Chilean bankers, after the crisis of the mining sector around the 1870s, acquired a number of mineral deposits given as collateral years before. Finally, there is very strong historical statistical evidence that suggests that not only the two sectors were embedded in a structural macroeconomic interdependence but also

[42] Richard Salvucci in Uribe-Uran [2001, 48].
[43] Di John [2006, 5].
[44] See for example Mamalakis [1976, 125].
[45] Bauer [2008, 30, 44, 94, 108].
[46] Kirsch [1977, 57, 95] who cites Bauer [2008]. See also Coatsworth and Williamson [2002, 23] argue that "[t]he only landowners that mattered in 19th century Latin American politics were those for whom land represented but one asset in a much broader portfolio." In the same vein, Bauer [2008, 180] argues that "[m]iners and merchants bought haciendas but landowners in turn invested in banks, insurance companies, commercial firms and the incipient industrial sector."
[47] Emphases are mine.

followed independent growth processes.[48] Overall, these findings point out to a situation of sectoral distinctiveness.

In all Latin American economies during and right after the colonial period, agriculture was the most important sector.[49] And by extension, the economic interests of the agricultural elite were the only economic interests represented in politics.[50] For example, Collier and Collier [2002, 106] argue that initially the "national government was dominated by the central part of the country, with owners of large agricultural holdings playing a predominant role."[51] Moreover, political institutions and social norms inherited from the colonial period were designed to allocate economic inputs (and hence *growth*) in a way that benefited the landowning class only, and that this situation was reverted after the income tax was implemented (only in the strong-state cases).[52]

There existed an important asymmetry. While the industrial sector was growing, they were kept from participating in politics with the same privileges and conditions landowners had. Consequently, it was easy for the agricultural elite to produce policies that were designed to enhance their sector. Zeitlin [1984, 13] argues that "landowners controlled both the vote and the labor power of the agrarian tenants (*inquilinos*) and dependent peasants (*minifundistas*), and this was the *sine qua non* of their continuing political hegemony." In Congress, and the presidency itself, landowners were the single most important group,[53] leaving the modern sector heavily under-represented.[54] Consequently, fiscal pressures in favor of agricultural taxes were minimal compared with mining taxes,[55] leaving the agricultural sector systematically - and substantially - undertaxed relative to other sectors.[56] Historians explain that "[i]n those areas where the government did interfere in the countryside, the effect was to strengthen the position of the landowning class."[57] For example, the little public infrastructure that existed benefited the agricultural sector.[58]

For nearly 400 years, mining was the most important activity outside of agriculture. Eventually, the mining sector failed to catch up with more efficient technologies better suited to exploit low-grade

[48] Bahamonde [2017]. To be sure, each time-series has its own innovation process (as for the different unit root tests performed). Moreover, both sectors are cointegrated, i.e. they are in a long-run equilibrium.

[49] Keller [1931, 13].

[50] Wright [1975, 45-46].

[51] Similarly, McBride [1936, 15] explains that "Chile's people live on the soil. Her life is agricultural to the core. *Her government has always been of farm owners. Her Congress is made up chiefly of rich landlords.* Social life is dominated by families whose proudest possession is the ancestral estate." Emphases are mine.

[52] Bahamonde [2017].

[53] Bauer [2008, 45].

[54] As Baland and Robinson [2008, 1748] argue, "[c]ongressional representation was heavily weighted in favor of rural districts."

[55] As explained, mining was one of the first manifestations of industrial activity.

[56] Best [1976, 56]. Bauer [2008, 81] provides a very plausible explanation for why the agricultural sector was "structurally" protected against taxation. As he explains, "[t]he availability of an easily accountable source of public revenue - bags of nitrate or bars of cooper - meant that any need for the Chilean government to intrude into the affairs of landowners was reduced [...] the state kept its political hands off the countryside until the overwhelming urban demands for more food and political support in the 1960s." Zeitlin [1984, 38] also points out that "public revenues came almost exclusively from taxes on mining and its exports."

[57] Bauer [2008, 118].

[58] Rippy [1971], Marichal [1989], Zeitlin [1984], Bauer [2008].

ores,[59] and collapsed. After the mining boom, mining elites shifted their focus to what is considered the first *true* industrial work which began under agricultural auspices: the cotton mills.[60] The first industries were called *obrajes* and beyond textiles, early industrialists processed other agricultural goods.[61] The industrial sector was boosted by favorable international conditions, many times stimulating a positive complementarity between two industries. Industrial activities started very small,[62] progressing "from the shop to the factory during the latter half of the nineteenth century."[63] Importantly, modern industrialization did *not* begin with ISI, but around 1900. Bertola and Ocampo [2012, 129] finds that the "fact that manufacturing was alive and thriving in Latin America before the 1929 crash is now beyond question." Similarly, Haber [2005, 2] finds that the "development of large-scale, mechanized (and even "heavy") industry can be dated back to the 1890s."[64]

In Chile, the industrial elite was composed by an incipient, yet strong and cohesive group of individuals. As historian Francisco Encina explains, "[i]t was precisely this segment of the dominant class that consummately personified the development of Chilean capitalism (mineowner and banker, railroad magnate and manufacturer, shipper and trader, *hacendado* and miller were [...] not only close associates, or drawn from the same family, but they were the same individuals)."[65] In the process of going from mineowners to proto-industrialists, this incipient elite developed a strong sense of social *class*.[66] Sectoral interests were organized as follows. The *Sociedad de Fomento Fabril* (SOFOFA) was founded in 1883 to represent the interests of the the industrial sector against the interests of the agricultural sector, represented by the *Sociedad Nacional de Agricultura* (SNA), founded 45 years earlier. The SNA "was the most powerful associational interest group in nineteenth-century Chile,"[67] and according to Wright [1975, 51], it clearly thought of itself as a social class. By the 1920s, industrialists started to "form trade associations to engage in lobbying and propaganda as more coherent interest groups."[68]

[59] Kirsch [1977, 53].

[60] See Rippy [1971, 231]. As Bethell [1986, 271] argues, "[t]he first power looms were brought [in Perú, Ecuador, and Venezuela] in the 1840s, 1850s; but in all three they were a failure, some of the early mills in Ecuador being destroyed by an earthquake. It was not until after 1890 that the textile industries of these nations began to operate with reasonable success. Guatemala's first cotton mill was established in 1882, and between that date and 1910 a few mills appeared in Chile, Argentina, Uruguay, and Colombia."

[61] For example, animal grease and tallow, dried and cured meats, flour, bread, beer, wines and spirits, being most of them for domestic consumption (Bethell [1986, 272]). Sugar was used in the production of chocolate, candies and biscuits (Bertola and Ocampo [2012, 129]).

[62] Marichal [1989], Rippy and Pfeiffer [1948, 68].

[63] Rippy [1971, 235].

[64] For example, Rippy and Pfeiffer [1948] and Pfeiffer [1952] explain that by the 1870's the carriage industry was on a firm basis.

[65] In Zeitlin [1984, 30], emphasis in original. He describes several last names which are still associated with the Chilean elite, such as Ossa, Edwards, Vicuña Mackenna, Matta, Goyenechea, Cousiño, Urmeneta, Gallo and Subercasaux. Emphasis in the original. Similarly, Wright [1975, 48] supports the thesis that nitrate development led to the development of an "incipient industrial establishment."

[66] Kirsch [1977, 41] explains that the founding of the SOFOFA clearly reflected a "tension created by the *awareness* of the incongruence between the actual exploitation of economic forces and the potential that could be extracted from them through industrialization," emphases are mine.

[67] Wright [1973, 244].

[68] Weaver [1980, 107].

Both economic sectors were *similarly developed* but only agriculturalists had access to fair political representation. This asymmetry led these two 'antagonistic elites'[69] to two bloody civil wars. Zeitlin [1984, 23] argues that the civil wars challenged a "large landed property [elite against a] productive capital [elite]." However, war was not sustainable over time. Given their relative similar degrees of economic development, both elites could mobilize armies with relatively *similar capabilities*.[70] War was then more likely to exhaust all existent assets without producing positive outcomes for either sector.[71] Consequently, Chilean agricultural and industrial elites opted for a political compromise.[72] Three institutional components were considered: an income tax, industrial protectionism, and equal access to the state. The faster the industrial growth, the higher the pressures to impose a tax to capture increasing industrial incomes. This is in line with Besley and Persson [2011, 59] who argue that "investing in fiscal capacity becomes more attractive [...] when wages or incomes [...] are higher."[73] In 1924 the income tax law was passed. As others have observed, the non-agricultural "(reluctantly) accepted taxation, *while demanding state services and expecting to influence how tax revenues were spent*."[74] Additionally, the SOFOFA pursued an agenda in favor of protective industrial tariffs. Sokoloff and Zolt [2007, 122] explain that the expansion of "manufacturing production [...] helped to nurture the development of a powerful constituency for higher tariffs."[75] Eventually, in 1939 the CORFO was created. The agency planned, directed and supported emergent industries by providing "various sorts of credits, subsidies [and] government investments."[76] This was of the greatest importance since the money market was primarily established to "meet the credit needs of landowners."[77]

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## IV. Econometric Analyses

Following the economic development typology suggested in Mahoney [2010, 5], nine polities were selected. Three 'higher level' countries (Argentina, Chile and Venezuela), three 'intermediate level' countries (Mexico, Colombia and Perú), and three 'lower level' countries (Ecuador, Nicaragua and Guatemala). I proxy sectoral leverage and specifically, the degree in which the industrial elites challenged incumbent landowners, using industrial and agricultural sectoral growth rates as presented

[69] Keller [1931, 37-38].
[70] Boix [2015].
[71] Richard Salvucci in Uribe-Uran [2001, 48].
[72] Geddes [1991] argues that competition between two rival parties of about the same size creates clearer incentives to invest in political institutions.
[73] Similarly, see Campbell and Allen [1994, 647] who explain that "economic development should be directly related to individual and corporate income tax rates."
[74] Carmenza Gallo, in Brautigam et al. [2008, 165]. Emphases are mine. She refers specifically to nitrate producers, one of the first industrial activities.
[75] Similarly, Lederman [2005, 53] argues that the timing of protectionist and income taxation cycles matches. See for a similar view Haber [2005, 18].
[76] Collier and Collier [2002, 393].
[77] Kirsch [1977, 59].

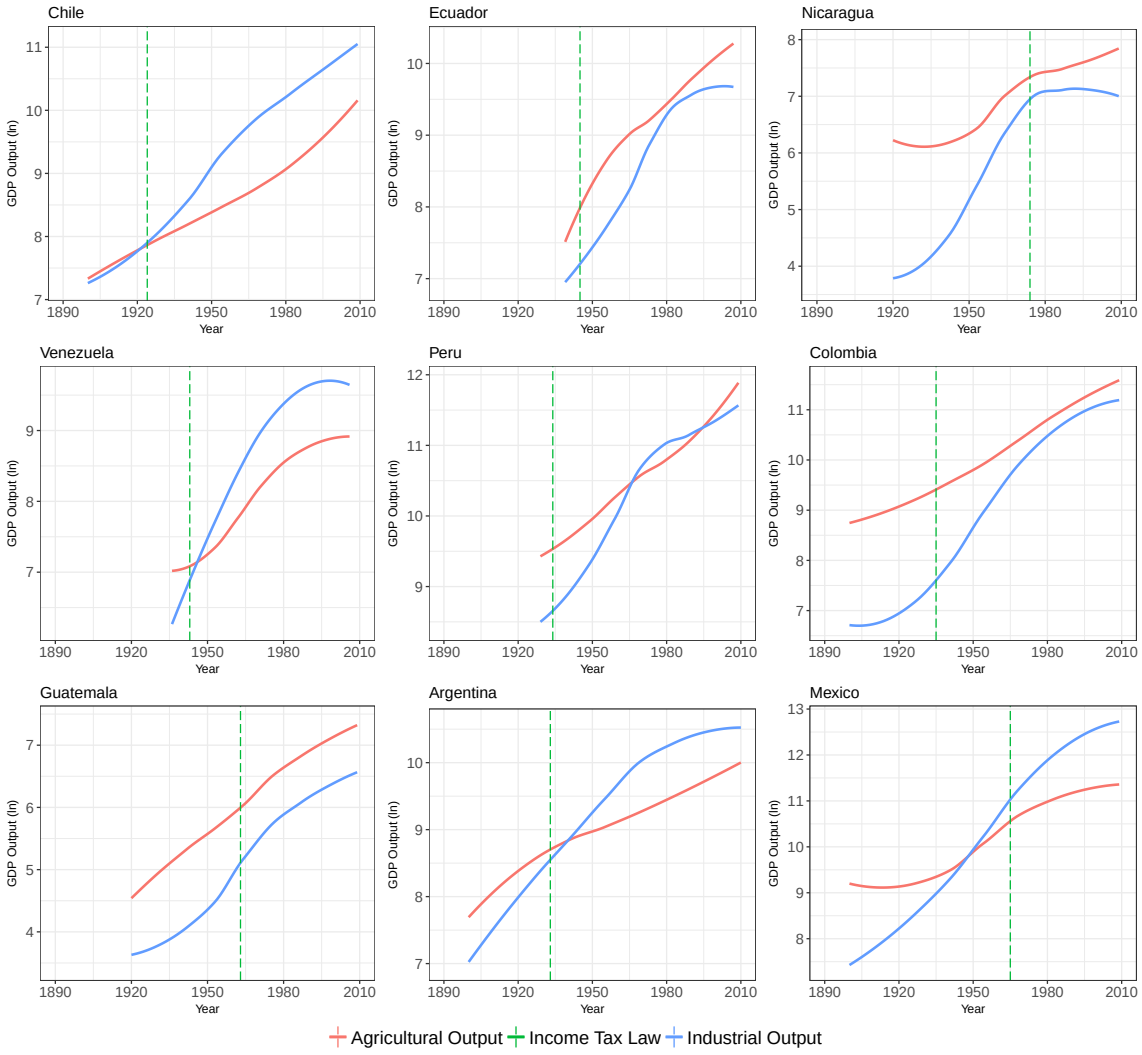


**Figure 2:** *Industrial and Agricultural Outputs, and The Passage of the Income Tax Law*

in the MOxLAD data.[78] The dataset spans from 1900 to (potentially) 2010.[79] According to Astorga et al. [2005, 790], these data provide extended comparable sectoral value-added series in constant purchasing power parity prices.[80] Using secondary information, Table 1 states when the income tax was implemented, what specific law it was, and its corresponding source(s). Figure 2 shows both sectoral outputs (independent variables) and the year when the income tax law was passed (dependent variable). Since population has been associated with the probability elites expand the franchise,[81] and consequently the tax base, I include total country-year population as a control variable.

[78] "These data build on the studies and statistical abstracts of the Economic Commission for Latin America, but also rely on Mitchell's International Historical Statistics, International Monetary Fund's International Financial Statistics, the World Bank's World Development Indicators and a variety of national sources." I used the *agriculture value-added* and *manufacturing value-added* variables. The former measures "the output of the sector net of intermediate inputs

| Country | Available Data | Year Income Tax | Law | Source |
|---|---|---|---|---|
| Chile | 1900 - 2009 | 1924 | *Ley* 3996 | Mamalakis [1976, 20] and LeyChile.Cl (official) |
| Peru | 1929 - 2009 | 1934 | *Ley* 7904 | Gobierno del Perú [1934] (official) |
| Venezuela | 1936 - 2006 | 1943 | *Ley* 20851 | *Gaceta Oficial* (official) and Ventura and Armas [2013, 27] |
| Colombia | 1900 - 2009 | 1935 | *Ley* 78 | Figueroa [2008, 9] |
| Argentina | 1900 - 2010 | 1933 | *Ley* 11682 | Infoleg.Gob.Ar (official) |
| Mexico | 1900 - 2009 | 1965 | *Ley de Impuesto sobre la Renta* | Díaz González [2013, 130-133] and Diario Oficial (official) |
| Ecuador | 1939 - 2007 | 1945 | - | Aguilera and Vera [2013, 135] |
| Nicaragua | 1920 - 2009 | 1974 | *Ley* 662 | Legislacion.Asamblea.Gob.Ni (official) |
| Guatemala | 1920 - 2009 | 1963 | *Decreto* 1559 | Instituto Centroamericano de Estudios Fiscales [2007, 165] |

**Table 1:** *Sample, Data Available and Year the Income Tax was Implemented*

Before estimate the models, it is important to rule out the possibility that income taxation and sectoral development are not linked through a spurious, time-dependent relationship. The occurrence of the outcome of interest (taxation) should not be directly related to time itself, but to the rise of the industrial elite (proxied by industrial growth). Within the framework of survival analyses, Figure 3 shows the failure rate of the sample average country of implementing the income tax if industrial development had increased by half ('rapid') or not ('slow').[82] The figure strongly suggests that the implementation of the income tax law is largely accelerated when the size of the industrial sector increases, and that this relationship does not depend directly on time.

Table 2 shows 5 models.[83] Following Aidt and Jensen [2009], Model 1 computes the lagged conditional hazard ratio of a country which has not yet adopted the income tax adopts it in a given year as a function of the relative size of the agricultural and industrial sectors.[84] Countries

and includes the cultivation of crops, livestock production, hunting, forestry and fishing." The later "[r]eports the output of the sector net of intermediate inputs." Both of them are expressed in local currency at 1970 constant prices.

[79] As I explain later, I test this argument within the duration model approach. Since countries are censored once they implement the income tax law, they leave the sample potentially before 2010.

[80] Using a similar strategy, Thies [2005] also uses data on taxation and compare those data between cross sections.

[81] Engerman and Sokoloff [2005, 892-893].

[82] 'Failure' in this case means 'implementing' the income tax law.

[83] All tables were produced using the `texreg` package (Leifeld [2013]). All Cox models were computed using the `survival R` package (Therneau [2015]). The GEE logistic regression was computed using the `geepack` package (Hojsgaard et al. [2016]). This paper was written in LaTeX using the dynamic report `R` package `knitr` (Xie [2016]), for fully replicable research. The simulations were performed using the `simPH R` package (Gandrud [2015]).

[84] I do not combine both variables nor do I construct an index. Since I am interested in the contribution of each individual sector in the acceleration of the implementation of the income tax law (keeping constant the other), keeping both variables separately is a better strategy. See Figure 4.

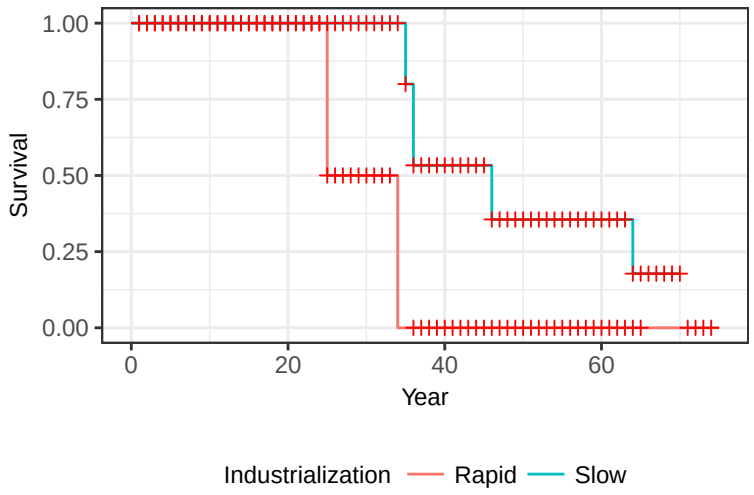


**Figure 3:** *Kaplan-Meier Curves: Size of the Industrial Sector and the Accelerated Rate of the Imposition of Income Tax Law*

drop out of the sample when they adopt the income tax. Model 2 is also a Cox regression, but with lagged logged variables. By including time-transformed variables, in the form of a lagged dependent variable (to account for partial adjustment of behavior)[85] or "the use of the natural log transformation [to capture] different forms (or "shapes") of the baseline hazard,"[86] Models 1 and 2 are specially well-equipped to account for possible time dependency. Model 3 shows the estimated coefficients of a generalized estimating equation (GEE). Generalized estimating equations were introduced by Liang and Zeger [1986] to fit clustered, repeated/correlated and panel data.[87] This method is especially well suited when the data are binary.[88] GEE methods require analysts to parameterize the working correlation matrix. Though Hedeker and Gibbons [2006, 139] explain that "the GEE is robust to misspecification of the correlation structure,"[89] Zorn [2006, 338] explains that whereas the choice of estimator makes little or no difference, the unit on which the data are grouped makes a big difference. Hence, following the advice of Hardin and Hilbe [2013, 166], who point out that when "the observations are clustered (not collected over time) [...] the exchangeable correlation structure" should be used, I assume an "independence" working covariance structure, which corrects for small-sized panel designs.[90] From a substantive standpoint, GEE models provide an estimated

[85] Wawro [2002].
[86] Box-Steffensmeier and Jones [2004, 75].
[87] Zorn [2006, 322].
[88] Hanley et al. [2003].
[89] Carlin et al. [2001, 402] argue that "[r]elatively minor differences in estimates may arise depending on how the estimating equations are weighted, in particular within the generalized estimating equation (GEE) framework." Westgate and Burchett [2016] and Gardiner et al. [2009, 227] make the same point.
[90] Hardin and Hilbe [2013, 166] explains that if "the number of panels is small, then the independence model may be the best; but [analysts should] calculate the sandwich estimate of variance for use with hypothesis tests and

marginal mean, or the *weighted average* of all cluster-specific effects (or conditional means). Model 4 is a conditional logit (or "fixed effects" model). One important advantage of this strategy is the ability to account for country-specific effects. For example, fiscal development could be a function of country-specific prior state-building capacities.[91] A number of scholars rightly argue that post-colonial state capacities are in part a function of pre-colonial state-capacities.[92] Fixed-effects should be able to account for this and other unobserved or hard-to-measure covariates, which if left unaccounted for, would introduce omitted variable biases.[93] Model 5 accounts for possible spatial-temporal dependence.[94] Given that most of the countries I am modeling are contiguous neighbors, it is reasonable to expect a "domino" effect. Theoretically, being the first country to implement the income tax does not require the same level of domestic effort than being the last one. Early-implementers have no prior experience and hence, it should be harder for them to pass the law. To account for this possible spatial-temporal dependence, a cumulative count of countries which have implemented the law at time $t$ was included.[95] All in all, the models suggest that the rise of a strong industrial sector largely accelerated the implementation of the income tax law. Moreover, a strong agricultural sector not only has zero impact on fiscal development, but a negative one (models 1, 3 and 4). Both pooled results in model 3 and model 4 give the same results. Importantly, model 4 accounts for country-specific non-measured sources of variation, such as country-specific prior levels of state and fiscal capacities, cultural and geographic differences, among others. I do not find that there was spatial-temporal dependence (model 5).

Using the estimations from Model 1 in Table 2, I follow Gandrud [2015] and King et al. [2000], and in Figure 4 simulate 1000 times the Hazard Rate of implementing the income tax law conditional on industrial and agricultural growth rates.[96] Even though the outcome of interest does *not* depend *directly* on time,[97] countries in time *do* experience an increase in their sectoral outputs.[98] Consequently, it will be necessary to account for the natural tendency of sectoral outputs to grow in time by allowing estimations to vary with time.[99] Since the Hazard Rate "is the probability that a case will fail at time $t$,"[100] I take advantage of this quantity of interest which allows dependency on both time *and* the covariates.[101] Figure 4 strongly suggest that the faster the agricultural sector develops, the less likely the implementation of the income tax is. This relationship does *not*

interpretation of coefficient," which is what I report in Table 2.

[91] I thank Matthias vom Hau for this suggestion.

[92] Wimmer [2015, 10], Mahoney [2010] and Lange et al. [2006, 1426].

[93] Angrist and Pischke [2008].

[94] I thank both Christopher Zorn and David Darmofal for this suggestion.

[95] I clustered the standard errors at the counting variable level. Clustering by the counting variable allows me to cluster by early or late implementers.

[96] Box-Steffensmeier and Jones [2004, 15] explain that the Hazard Rate is the most common quantity of interest analysts focus on. Figure 4 shows 90% confidence intervals.

[97] Please refer to Figure 3.

[98] Please refer to Figure 2.

[99] The economics literature refers to these kinds of time series 'integrated' or I(1) processes.

[100] Licht [2011, 231].

[101] Box-Steffensmeier and Jones [2004, 15].

| | (1) Cox (1 lag) | (2) Cox (1 lag, ln) | (3) Logit GEE | (4) Conditional Logit (FE) | (5) Spatial Dependence |
|---|---|---|---|---|---|
| Manufacture Output$_{t-1}$ | 1.451* | | | | |
| | (0.569) | | | | |
| Agricultural Output$_{t-1}$ | −0.859 | | | | |
| | (0.740) | | | | |
| Total Population | −0.000*** | | | | |
| | (0.000) | | | | |
| Manufacture Output$_{t-1}$ (ln) | | 1.279· | | | |
| | | (0.710) | | | |
| Agricultural Output$_{t-1}$ (ln) | | −0.819 | | | |
| | | (0.788) | | | |
| Total Population (ln) | | −0.844 | 0.065 | 1.012* | −0.842 |
| | | (0.531) | (1.219) | (0.405) | (0.830) |
| Manufacture Output (ln) | | | 1.543*** | 0.970*** | 1.277 |
| | | | (0.333) | (0.161) | (1.036) |
| Agricultural Output (ln) | | | −1.107** | −1.185*** | −0.818 |
| | | | (0.369) | (0.292) | (1.071) |
| AIC | 22.788 | 25.093 | | 4135.812 | 25.091 |
| $R^2$ | 0.021 | 0.013 | | 0.392 | 0.013 |
| Max. $R^2$ | 0.078 | 0.080 | | 0.995 | 0.078 |
| Num. events | 9 | 9 | | 570 | 9 |
| Num. obs. | 281 | 272 | 842 | 842 | 281 |
| Missings | 0 | 0 | | 0 | 0 |
| PH test | 0.937 | 0.722 | | | 0.217 |
| Num. clust. | | | 9 | | |

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{cdot}p < 0.1$. Robust standard errors in all models

**Table 2:** *Sectoral Origins of Income Taxation: Income Tax Law and Industrial Development*

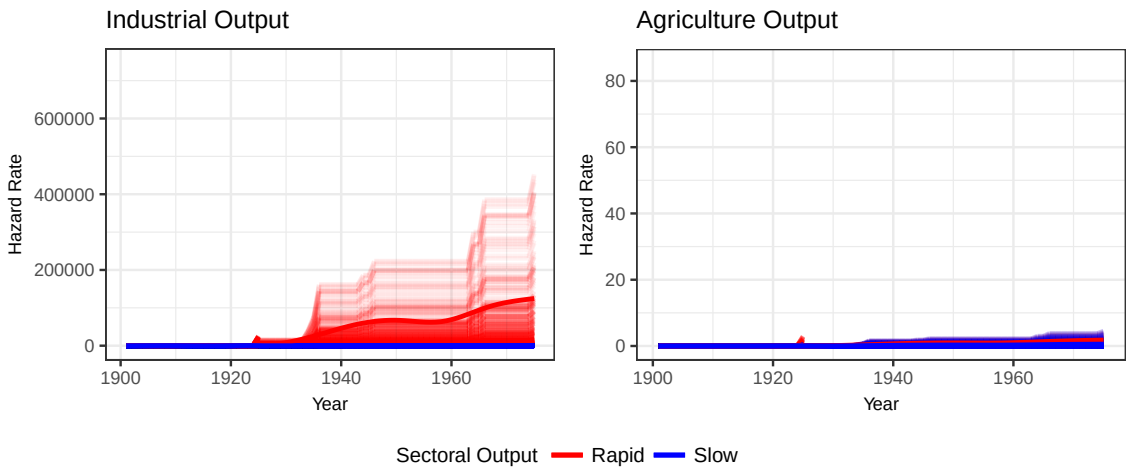


**Figure 4:** *First Differences of Industrial Output, Agricultural Output and Democratic Experience*

change at later stages of development, suggesting that polities with a strong elite of landowners are not associated with fiscal development. However, rapid industrial development is associated with the implementation of the income tax. The stronger the industrial sector, the faster the tax is implemented, suggesting that the rise of a new elite invested in sectors different than traditional agriculture contribute to state-building by accelerating the modernization of the fiscal apparatus.

## V. Discussion: Slow Industrial Growth and Lack of Contestation

Historically, agriculturalists had been a hegemonic group protected by practices inherited from institutions originated in colonial times. Those norms had been survived due to institutional inertia, perpetuating their advantaged position. The emergence of a strong industrial elite altered not only the structure of the economy but also the inter-sectoral balance of political power, making unsustainable the political monopoly run by the landed elites. The Chilean case suggested that the income tax was product of a series of inter-sectoral compromises that were possible due to the increased leverage this new elite accumulated. The income tax, as a state-building institution, led to further institutional investments. The panel-data analyses strongly suggested that as the size of the industrial grew, the rate of acceleration of implementing the income tax rose. The cross-country panel analysis suggests that this argument could be extended to other cases.

The paper claimed that countries with fast industrial growth rates nurtured an industrial class strong-enough to challenge the traditional sector, forcing landowners to grant political concessions to industrialists. One of the most important concessions was the opening of the post-colonial political system, which granted access to industrial organized groups. Importantly, the industrial elite accepted the income tax in exchange for the ability to participate in equal terms in politics.

In terms of economic compromises, the industrial sector managed to articulate its demands as a coherent class, including in the bargain protectionist industrial tariffs. And such, the mechanisms specified in the paper stress the idea that it is inter-elite *equality* what causes state formation and cooperation, not inter-elite inequality as other scholars have claimed.[102] Industrialization was important as a *contestation* device, not in the way modernization theorists have argued. That is, it was not faster *overall* economic growth what helped to form modern state institutions, but balanced *sectoral* growth that led to the emergence of a political challenger. Finally, the process of state-building had started earlier, way before the implementation of the income tax (as others have correctly observed), but the implementation of the income tax was an important building block in this process.

[102] Boix [2015, 73] argues that states only exist to counteract potential conflict between agents with *different* economic interests and military capacities. See also for a similar view Madsen et al. [2017].

**Word count**: 8,941

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