

State Formation in Latin America: Structural Transformations and The Political Roots of Fiscal Capacities

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Abstract

There is a very strong consensus on the role of fiscal capacities on state formation. Unfortunately, current theories focused on Latin America do not explain satisfactorily the origins of fiscal capacities. Taking a sectoral politics approach, this paper argues that the political monopoly pursued by agricultural economic elites was broken contingent on the emergence of a strong industrial sector. This major structural transformation triggered a series of institutional investments, as long as economic, political and social changes, planting the seed of states with high capacities. When agricultural monopolists were not challenged, these institutional investments never existed or were weak. We test this theory using cross-national panel data from 1900 to 2010 for a sample of Latin American countries. The Chilean example is offered as a shadow case to illustrate the mechanisms at work. Both approaches strongly confirm the theory.

This paper elaborates on these insights by tracing the *political origins* of income taxation. As argued later in the paper, economic equality paired with political inequality introduced endogenous incentives to build both *state* and *democratic* institutions.

4,387 words, total

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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 “strong” states. Much effort has been devoted to understand the relationship between the politics of taxation and state capacities in a number of the European cases. However there is still much work to do to understand the development of post-colonial Latin American fiscal capacities. For example, though the consensus on the importance of fiscal capacities exists, the political and economic *origins* of fiscal capacities in Latin America are still unclear. *Why do some countries have more effective fiscal capacities than others? What have been the factors that led post-colonial Latin American countries to self-impose a system to directly tax individuals? What is the relationship between fiscal capacities and state-building in the Latin American context?* These questions are key to understand the development of the modern state in Latin America. Particularly, it is difficult to extend models originally developed to understand the medieval European case as wars in Latin America have been insufficient to mobilize domestic resources. Moreover, elite structures were very different, challenging the standard assumptions and incentives of these models. In this paper we shall inquire what were the *conditions* that promoted the implementation of fiscal capacities and trace its origins in the Latin American context.

Taxation is one of the most important capacities a state can have. Without internal revenue, states cannot perform any of the activities states are supposed to perform. In this paper we explain the origins of fiscal capacities. This paper argues that the implementation of a modern fiscal system was possible due to an inter-elite dispute that took place around the 1900’s and a posterior bargaining process between these two elites. This dispute was between an elite invested in agriculture and an emerging and politically excluded industrial sector. We argue that when the rate of industrial output was fast enough to compensate for long-term losses relative to delayed access to liquidity, agriculture elites did not expropriated that wealth but rather imposed an income tax. That is, when industrial growth is promising in the long-run, agricultural incumbents were better off encouraging (via protectionist tariffs) and taxing it (via an income tax), rather than expropriating it (and having immediate access to those resources). In exchange for taxation, the industrial

class demanded political representation in the form of a competitive oligarchic system. Both the taxation and political representation dimensions triggered a series of institutional investments such as institutions of checks-and-balances to monitor tax spending, including the development of professional bureaucracies. The income tax law was the tipping point that transformed “weak” states in “strong” states. When industrial output was slow, landowners - who were political monopolists - faced higher opportunity costs and rather than “wait and tax” industrial output “tomorrow”, shifted to expropriation-type strategies “today”. In these cases, the agricultural political monopoly was not broken, and the endogenous incentives to invest in institutions to share political power and improve bureaucratic bodies never existed. These countries were then trapped in an underdevelopment sub-optimal equilibria. The paper tests these relationships using econometric methods for panel data, particularly hazard models, and qualitative/historical evidence. Both methodologies strongly support the argument.

II. TAXATION AND STATE FORMATION

Broadly defined, states¹ have two general capacities. On the one hand, some scholars focus on *legal capacities*, studying the role of contract enforcement and property rights protection (see Cárdenas [2010], Besley and Persson [2010] and Strayer [2005]. But for a criticism, see Kurtz [2013, 57].). On the other, the literature explores *fiscal capacities* and how states are capable (or not) to levy taxes. This paper focuses on the latter. The origins of fiscal capacities, and its relationship with state-building, are still subject to great debate. Starting with Tilly [1992]², the idea that international conflicts forced motivated kings to levy taxes to pay for regular armies, gained much scholarly support³. As the argument goes, local elites accepted to be taxed in exchange for political representation and provision of public-goods⁴. However, these mechanisms have been recently challenged⁵. Particularly, outside Europe, the relationship between war and state formation is still contested⁶. For example, Centeno [2002] finds that there were not enough wars to mobilize domestic sources of revenue, and that the few wars that existed were financed by acquiring debt. Others find that the relationship between conflict and state-building is conditional on *prior* state capacities. For example, Arias [2013, 665] finds that in México, “a focal central authority” was required prior to be

¹Following Stephens et al. [1992, p. 6], we define “state” as “the set of organizations involved in making and implementing binding collective decisions, if necessary by force”.

²See also Ames and Rapp [1977, 162, 170] where they argue that in Europe, “[m]edieval taxation developed from the “extraordinary” revenues, and ultimately became the fiscal basis of government [...] When governments found efficient sources of tax revenues in wartime it would have served their best interests to make these incomes permanent and unconditional”.

³See for example Ertman [1997].

⁴Stasavage [2011]. See also Levi [1989].

⁵Boucoyannis [2015].

⁶But see Besley and Persson [2009, 1218]. They find that “The United States first introduced a form of income taxation in 1861 during the Civil War, and the Internal Revenue Service (IRS) was founded on the back of this with the Revenue Act of 1862”.

able to centralize fiscal institutions in the presence of external threats. However, it is not clear where *prior* centralization comes from. Given all these theoretical and empirical difficulties, some have gone up in the “ladder of abstraction”, and replaced “war” for “interstate rivalries”⁷, while others have interacted the presence of military conflict and state-military alliances⁸. Though taxation and state-building are acknowledged to be linked, it is not clear what the *origins* of fiscal capacities are⁹.

This paper acknowledges the possible influence of external threats. However it presents an argument based on *domestic political and economic* conflicts that lead early Latin American countries to invest in fiscal institutions. If most of the state formation literature emphasizes financial *needs* caused by wars, this paper is novel since it changes the focus to *domestic incentives* elites had to to legally *robber* (i.e. “tax”) domestic profit via an income tax. We present historic evidence about how this new institution triggered a series of other institutional investments.

Building on the “fiscal sociology” paradigm, we argue that the political economy of public finances offers “the key” for a theory of the state¹⁰. According to Schumpeter [1991, 108], “[t]axes not only helped to create the state. They helped to form it”. From a historical perspective, this paradigm proposes that 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 private or *individual* economies¹¹. From a theoretical perspective, the mere concept of “tax state” might be misleading: “tax” has so much to do with “state” that the expression “tax state” might almost be considered a *pleonasm*¹².

Not all kind of taxes play a *formative* role. Broadly speaking, there are two general types of taxes, *indirect* and *direct* taxes. Indirect taxes are, for our purposes, are taxes that are collected by a third party, i.e. not the state. Hence indirect taxes do not need the development of strong fiscal capacities. According to, Best [1976, 53] “indirect taxes are but substitutes for direct taxes”, and hence they are typically administered by weak states¹³. Since indirect taxes are easier to levy, this kind of revenue is generally considered “unearned income”¹⁴ or “easy-to-collect source of revenues”¹⁵. Given the low costs states have to incur to collect indirect taxes, they have a nearly null impact on state-building, stable domestic alliances and bureaucratization. As Campbell [1993, 177] puts it, “[i]n Latin America [...] when the state depends heavily on the taxation of international trade [...] the state apparatus tends to be less developed because the collection of tariffs and duties does not require an elaborate fiscal structure”. One clear example is custom duties. They are very simple to levy and

⁷Thies [2005].

⁸López-Alves [2000, 37].

⁹A rather counterintuitive argument is presented by Lange and Balian [2008, 314]. They introduce the “instigating” model, where they find that states with high levels of state infrastructural power contain more violence.

¹⁰Musgrave [1992, 99].

¹¹Moore [2004b, 298]. This view is also shared by Schumpeter [1991, 100] and Lewis [1965, 42] - See epigraphs.

¹²Schumpeter [1991, 101].

¹³This view is also supported by Moore [2004a, 14].

¹⁴Moore [2004b, 304].

¹⁵Coatsworth and Williamson [2002, 10].

hence and do not require any major institutional development nor major structural transformation to collect them. As Bertola and Ocampo [2012, 132] explain, since “[c]ustoms administrations were concentrated in a few critical locations, especially ports, [c]ustoms duties seemed to be an attractive means of boosting revenues”.

Direct taxation involves a *compulsory transfer* from private hands to the government sector for public purposes¹⁶, and hence they are harder to collect¹⁷. Political alliances should exist to overcome logistic, institutional and political domestic challenges associated to direct taxation. Critically, domestic actors, and specially economic elites, should agree to comply with direct taxation, hence national agreements are required to sustain these kind of policies. This is a huge obstacle given the conflictual nature of taxation. For example, some have argued that “tax struggles are among the oldest forms of class struggle”¹⁸. These conflicts are more likely to resolve in favor of direct taxation where income inequality *within the elite* is low. As Tani [1966, 157] explains, absence of “wealth groups” makes passing the income tax law easier. In fact, among all types of direct taxes, the most invasive one (and hence the most difficult one to levy) is *income taxation*. This type of tax is quite complex since it classifies and transfers private income into public property¹⁹. 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”²⁰.

Income taxation is intrinsically a conflictual device. For example, Best [1976, 50] argues that “tax revenues depend upon the interests of different classes as they attempt to use political power via the state for their own needs and purposes”²¹. Building on a macro-historical and class-centered standpoints²², we argue that when inter-class inequality between economic elites is low, the political system is power-balanced and none of the elites have enough capacities to dominate over the other in a monopolistic way. In these kind of scenarios, political agreements are more likely occur. We argue that, right after the end of colonization in the early 20th century, the agriculture class, who would monopolize political power, saw the emergence of a politically excluded industrial class. When the industrial sector was strong, the initial agriculture-oriented political monopoly was contested. Neither sector was able to dominate the other. However, cooperation between the two was incentive-compatible. Agriculturalists wanted to income tax industrialists, and in exchange they wanted to be incorporated into the political system, giving way to the 20th century oligarchic republics²³. This

¹⁶Cfr. Raja Chellia, “Trends in Taxation in Developing Countries”, in Migdal [1988, 282].

¹⁷Kurtz [2013, 62].

¹⁸Goldscheid (1925), in Campbell [1993, 168].

¹⁹Musgrave [1992, 98].

²⁰Aidt and Jensen [2009, 171].

²¹Furthermore, he 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” (in Best [1976, 71]). For a similar analysis, see also Campbell [1993, 169].

²²For a similar approach, see also Stephens et al. [1992].

²³We propose a roughly simultaneous process. However, Rota [2016, 43] suggests a different timing. He explains that “[t]he modernization of bureaucracy *preceded* the process of democratization”. Emphasis is mine.

political compromise between the two sectors was the critical juncture that helped to create the endogenous incentives to overcome the initial lack of administrative skills to collect direct taxes. Direct taxation required endogenous generation of know-how to be able to collect, administer and enforce income taxation. Weak states, are usually trapped in sub-optimal equilibrium and engage in low-cost and inefficient taxation methods. As others have argued, “administrative constraints are identified as the main constraint to the ability of states to collect revenues in general and direct taxes such as income tax in particular”²⁴. For example, “[i]n 1967 the national income tax office in Guatemala employed 194 people, only 9 of whom had graduated from a college”²⁵.

III. SLOW INDUSTRIAL GROWTH AND LACK OF CONTESTATION

When industrial growth was slow, the initial monopolistic conditions that agriculturalists enjoyed were not dramatically contested. Under these circumstances, the necessary structural transformations that led to institutions of state-building were not achieved. Building on the “stationary bandit” concept ²⁶, rulers are better off by encouraging investment and economic development in their territory in exchange of a tax (rather than moving from one place to another to rob). This is specially true when development is fast. Generalizing this idea, rapid industrial output outweighs the costs of delayed liquidity access, and hence a tax is imposed to capture revenue for the elites in power. Slow growth, on the contrary, shifts the incentives to capture that revenue immediately via expropriation. This idea is consistent with [Ansell and Samuels \[2014, 76\]](#) who argue that when inter-sectoral inequality is high, the landed elite expropriates indirectly through “market-distorting policies”, harming rising elites such as the industrial elites. It is also consistent with [Acemoglu and Robinson \[2000, 126\]](#) too, in that potentially political losers instead of blocking²⁷ innovation, impose a tax²⁸. In the same line, [Boix \[1999\]](#) points out that elites allow both technological and political progress only if that benefit them too. That said, we do not present an argument of *economic losers*, in which monopolies block substitute technologies. Contrary to [Acemoglu and Robinson \[2000, 127\]](#), industrial development is not blocked by agricultural elites “because there is no credible commitment to compensate them once economic changes have been implemented”. However, expropriation/blocking acts as a way for rulers to provide instantaneous liquidity (i.e. immediate access to monetary resources).

²⁴Di John [2006, 5].

²⁵Di John [2006, 5].

²⁶Olson [2000].

²⁷Inter-sectoral competition and the decision of whether expropriate or tax the industrial sector, link with the “barriers to technology adoption” literature. See [Parente and Prescott \[1994\]](#).

²⁸It is important to stress that we do *not* refer to domestic technological innovation. For the Latin American cases, technological innovation should be considered as exogenous. As [Bertola and Ocampo \[2012, 135\]](#) explain, “[t]he main two vehicles for international technology transfer [...] were foreign investment and immigration [...] [m]any immigrants already had the experience of living in an industrial civilization; they brought with them knowledge, practical experience, an entrepreneurial and technical culture, a work ethic, knowledge of new forms of commercial organization”.

Could rapid industrial growth cause expropriation? We argue that slow industrial output causes expropriation/economic blocking. However, one could argue the reverse. Given that economic changes alter the distribution of political power, when the industrial sector grows, so do the incentives for agricultural incumbents to expropriate them (rather than tax them, as we argue). For example Robinson [1999, 28] argues that “[i]f development changes the political equilibrium, then this may deter elites from creating institutions and adopting policies which stimulate development”, engaging in predatory policies. However, this paper presents an argument that generalizes this idea by incorporating *degrees* of development. If development is fast, incumbent elites should rather impose a tax, as Olson [2000]’s “stationary bandits” do. We claim that when industrial growth is slow, the *political* threat of being displaced by a weak economic sector is non-credible. Under these conditions, political concessions are not required and institutional investments are less likely. Though Boix [2015, 73] argues that “states only exist to counteract a potential situation of conflict between agents with *different* economic interests and military capacities”²⁹, we argue that there will exist “spontaneous cooperation” when there are incentives and need to cooperate, and that happens when their political, economic and military capacities are relatively similar (but not equally distributed). Critically, our theory is stylized in the sense that we assume that economic, military and political power are expression of the same latent concept. Ultimately, barriers to technology adoption and industrial development were not blocked because of the fear of the elites of being politically *or* economically displaced. In the short run, expropriation meant for the elites access to immediate liquidity. In the long run, however, it meant suppressing political and military contestation. Importantly, where industrial output was slow, political or/and economic threats coming from the industrial sector were non-credible. Finally, historians confirm that expropriation was an inter-sectoral issue. Bulmer-Thomas [2003, 255, 342-343] explain that it was very common to nationalize non-agricultural assets such as transport companies, financial institutions, and mining industries, specially oil³⁰.

IV. ISSUES IN THE LITERATURE

Though we argue that inter-elite power balance and political compromises generated the necessary conditions of institutional investments, a simple association between bureaucratization/institutionalization and political development would be incorrect. Several authors correctly argue the linkage between (“wrong”) kind of institutions and political (under)development. For example, Mahoney [2010, 26] suggests that there is a negative association between “mercantilist institutions” (which did require developed bureaucracies) and political (under)development (Perú). Similarly Acemoglu et al. [2002] explain how colonial mercantilist countries show little economic growth. This paper explains the

²⁹Emphasis is mine.

³⁰One interesting possibility could be to develop a count model of number of expropriation conditional on the relative sizes of each sector. We are unaware of such dataset. We leave this for future research.

origins of income taxation and how it played an important role in the formation of national states *after* the independence.

Bureaucratization *per se* does not cause state capacities either. For example, Soifer [2016]³¹ explains that when bureaucratization relied in the hands of “local” elites, that created weak states as they were more likely to pursue their own personal agendas (rather than the central level’s). On the contrary, when the central state sent their own agents (in what he calls “deployed rule”), as they owed their jobs and source of income to the central level, they were more likely to pursue state goals. However, one important issue arises. Even when deployed bureaucrats depend on the central level (as Soifer correctly points out), it remains unclear the mechanisms under which principal-agent problems are solved in favor of the central level. It is still a possibility that, even when perceiving income from the central level, the agenda that is pursued in the periphery is the agent’s and not the state’s. In contexts of poor infrastructure and slow communication between the two levels, what is it that makes the agent’s agenda to coincide with the state’s? One could argue that the agent fears to be replaced, losing his source of income. However, human capital during the formative years of late 19th century run in short supply. That is, there were not enough capable individuals to perform complex administrative duties³². In fact, Tavernier [2014, 208] argues how the *vecinos notables* were the first skilled bureaucrats in the early stages of state building in Chile. They would usually have other important sources of income, as they were usually lawyers and businessmen. Skilled individuals were so scarce that even individuals with lack of formal training but still capable of performing well as public servants were scarce. Sagredo [1997, 293-294] documents how *Director Supremo* Ramón Freire practically forced, against his will, businessmen Pedro Nolasco Mena to serve as secretary of state³³. Income was not important at all for him. In fact, the day Nolasco Mena swear in office he stated that he was not willing to perceive income as a way to protest against Freire³⁴.

Inter-elite conflict has a disputed role in the literature. In our theory³⁵ the degree in which agricultural elites are contested (here through increasing industrial output differentials), is what forces both parties to reach agreements. Cooperation is a conflictual outcome that is incentive-compatible due to the unbalance produced between inter-elite economic equality and inter-elite political inequality. The intuition is very simple. If one elite has more economic power³⁶, there

³¹I HAVENT READ THIS ONE. UNPUBLISHED. CHECK ARGUMENT.

³²PUT HERE THE EXAMPLE WHERE THE CHILEAN STATE WAS COMPETING TO MONOPOLIZE THE AVAILABILITY OF LAWYERS.

³³Nolasco Mena argued that he was a “comerciante práctico, que sin las leyes del cálculo ni los principios de economía giro, como todos los del país, una casa de comercio pasivo: he ahí la historia de mis disposiciones: no conozco la estadística, no he visto siquiera la complicada legislación de hacienda, jamás serví una oficina de ella, no puedo, de consiguiente, aventurarme sin temeridad a la administración del ministerio”. Nonetheless, Freire forced him to serve.

³⁴That day, Nolasco Mena stated: “he jurado bajo la protesta siguiente: Protesto que, forzado contra mí conciencia a admitir el Ministerio de Hacienda, no soy responsable de derecho por falta de libertad, ni de hecho por la insuficiencia confesada del manejo; renuncio al sueldo que no puedo ganar sin desempeñar; que se me de testimonio de esta protesta y de mi reclamo anterior y se imprima”.

³⁵And in Ansell and Samuels [2014]’s theory too.

³⁶Which potentially translates into military power.

are no incentives nor needs to cooperate with other groups, as their most preferable outcome can be obtained without cooperation. On the other hand, once each elite reaches similar levels of development, their goals depend on their mutual cooperation. Specially, when there exists a disparity between economic equality and political inequality. Kurtz [2009, 2013] builds a theory where “the oligarchic elites [...] despite [their] substantial divisions over some of the questions of the day, [agree] to maintain the capacity for the effective projection of force and to impose the necessary tax burdens on themselves to finance [a strong state]”³⁷. What makes these elites to reach a sustained agreement is the absence of repressive labor practices³⁸. That is, the existence of the legal right to leave the farm³⁹. Structurally, our theory follows Kurtz’s in the sense that we also believe that the organization of the economy causes (endogenous) changes in the institutional order, specially in what respects to taxation. In fact, it complements it as one possibility for why laborers do not have other choice than staying in the farm is the industrial sector not being strong enough to attract labor. Industrialists, being excluded from the political system (as they were), cannot alter these repressive institutions from the inside. Hence, in our theory, incorporation of all important elites (economic sectors in our theory) is crucial for state-building. However, it departs from Kurtz’s theory as our theory sees potential conflict as the the tipping point of eventual political agreements.

There are ongoing measurement and conceptual debates in the literature. Though many scholars find that income taxation is either one of the most important state-capabilities⁴⁰ or the one characteristic that explains considerable variance of state capacities⁴¹, others have argued in favor of others measurements of “stateness”. For example, some scholars have argued in favor of military conscription or censuses⁴². Multidimensional measurements are also very popular. Contrasting several existent indexes of state capacities, Fukuyama [2004, 7] argues that “stateness” is a two-dimensional concept, namely, the *scope of state activities*, which refers to different state functions and the *strength of state power*, or the ability of states to execute policies. In a later work, however, Fukuyama [2013, 347] suggests a different two-dimensional framework, *capacity* and *autonomy*. Similarly, Mann [2008, 357] argues that “stateness” is a two-dimensional concept too, one being the *despotic* and an the other one being the *infrastructural* power concept⁴³. Soifer [2012] proposes a three-dimensional measurement of state capacity, namely *security*, *administrative* and *extractive*. Multidimensional conceptualizations of state capacities do improve our understanding of the complexity of state capacities⁴⁴. Beyond being a measurement commentary, this paper develops

³⁷Kurtz [2009, 508].

³⁸Kurtz [2013, 83].

³⁹Kurtz [2013, 39,67].

⁴⁰See for example Besley and Persson [2011], Kurtz [2013, 2009], Cohen [1994], Gallo [1991], López-Alves [2000], Thies [2005] and Soifer and vom Hau [2008], Soifer [2008].

⁴¹See for example, Kurtz [2013, 60-62], Hanson and Sigman [2013, 15] and Centeno [2002].

⁴²For the latter, see for example, Lee and Zhang [2013].

⁴³Soifer and vom Hau [2008, 224] argue in favor of the infrastructural approach proposed by Mann [1984].

⁴⁴As Fukuyama [2004, 9] explains, “[a] country like Egypt, for example, has very effective internal security apparatus and yet cannot execute simple tasks like processing visa applications or licensing small businesses efficiently”. In

a theory for the origins of, what we believe, is one of the *main* state capacities. Moreover, from an empirical and conceptual standpoints, parsimonious explanations about a complex phenomena⁴⁵ enjoy from different advantages.

Finally, it is important to say that our theoretical model does not require European-like degrees of industrialization. As Bertola and Ocampo [2012, 131] confirm it, most Latin American countries did *not* experience a proper industrialization *process*, and hence it is inaccurate to say that the industrial sector “had become a strong engine of economic growth”. However, even when Latin America did not experience an industrial *revolution*, the modern sector did experience clusters of development (see Figure 1).

The purpose of this paper is to explain the origins of *strong* and *weak state* capacities. We do so by tracing their origins of *strong* and *weak fiscal* capacities. It is important to stress that this paper does not equate *higher taxation levels* with *higher levels of “stateness”*. For example, since “American institutions [were] deliberately designed to weaken or limit the exercise of state power”⁴⁶, the U.S. taxes very little. However, it is not reasonable to say that the U.S. has a “weak state”. Rather, this paper proposes that the *development* of a direct tax system, particularly, *income taxation*, is causally related to the origins of state capacities and other institutional developments⁴⁷. Fiscal economists do not necessarily look at the actual tax-to-GDP ratio either, but rather at “tax efforts”. This index measures the ratio between the proportion of actual collection and taxable capacity⁴⁸. Moreover, as explained in the *argument* section and illustrated in our *case study*, the income tax system was fundamental for the formation of the LA states, not the for the actual tax money levied but for the set of institutions and political compromises that were needed to implement such a system.

The problem at hand is of the greatest importance. The idea that higher fiscal capacities are related to more capable states is widely accepted by many political economists. However, it is unclear what the *origins* of income taxation are. Much effort has been devoted to the study of tax reforms. For example, Fairfield [2013] studies different strategies policymakers pursue to tax elites starting in 1990. Mahon [2004] and Focanti et al. [2013] study causes of tax reform in Latin America starting around 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. We share Di John [2006, 5]’s diagnosis in that “[t]here is no attempt to explain *why* and *how* administrative capacities change. Second, there is no explanation as to why tax capacities differ across countries”⁴⁹. Acknowledging these contributions, we expand on these prior findings by presenting a comparative macro-structural

Singerman, (1995).

⁴⁵Mann [1984, 112] argues that “[t]he state is undeniably a messy concept”.

⁴⁶Fukuyama [2004, 6].

⁴⁷See for example Besley and Persson [2014, 117], where they argue that “[t]axation has played a central role in the development of states”.

⁴⁸For example, Best [1976, 54] calculates tax efforts for Central America. See also Cohen et al. [1981, 905].

⁴⁹Emphases are mine

argument which traces under which conditions endogenous investments in fiscal capacities were more likely to happen in Latin America starting in 1900.

The remainder of this paper proceeds as follows. First, we present and develop our [argument](#). Taking a sectoral politics approach, the paper argues that the political monopoly pursued by agricultural economic elites was broken when an emerging industrial sector accepted to be income-taxed in exchange for industrial tariffs (i.e. protectionism) and political representation, leading to the 19th century political oligarchies. These political and economic concessions between the two sectors were accelerated by unfavorable international conditions. A decline on imported goods decreased import taxes, putting internal pressures to generate internal revenue. Second, in the [historical](#) section, we present Chile as a shadow case to illustrate in more detail the mechanisms at work. Third, in the [econometric](#) section, we test the theory using cross-national panel data on sectoral outputs from 1900 to 2010 for a sample of Latin American countries. Finally, we conclude with a brief [discussion](#).

V. ARGUMENT

Our argument comes in four parts for both the “weak” and “strong” state cases. We first layout our theory in abstract. Then we develop each part of the argument in more detail. Next [section](#) illustrate the causal mechanisms at work.

Strong State Cases First, following the inertia of the colonial period, early independent Latin American states were governed by agricultural elites. Later around 1900s, an incipient industrial sector established. This sector was conformed by newcomers who were politically excluded. Second, in the strong state cases, industrial output rates were faster than agricultural rates. Third, political elites could play one of the next two strategies. They could either *tax* or *expropriate* industrial output. In cases where industrial output is fast, the benefit of taxing a small sum of money “today” via taxation compensates the long-term losses associated of having those resources “tomorrow”. Consequently agricultural elites are better off taxing industrial output. Fourth, in exchange, the industrial class demanded commercial protectionism (tariffs) and political representation, giving way to the Latin American oligarchic political systems. Both taxation and political representation triggered a series of institutional investments such as institutions of checks-and-balances. These institutions were able to monitor and enforce income taxation, including the development of professional bureaucracies.

Weak State Cases Similarly, these nations were governed by agricultural monopolistic elites. However, in the weak state cases, agricultural incumbents faced slower industrial growth. This sector did not promise enough resources to tax from in the long run. It was too risky to “wait” and

tax those resources in the future. Hence, incumbents were better off expropriating or blocking the small industrial output. The agricultural political monopoly was never challenged, the traditional economy was not broken and the endogenous incentives to invest in institutions designed to improve bureaucracies and split political power never existed.

I. Agricultural Monopoly

By definition, monopolies limit the entrance of alternative goods. In general, monopolies generate waste and negative externalities. In this case, and as the [historical](#) section illustrates, we argue that *political* monopolies, that is, a situation where political competition is either naturally or artificially limited, generate political and economic distortions. In the weak-state cases, the agricultural sector could easily impose policies convenient for them, at the expenses of the non-represented segments of the society. One of these segments was the industrial elite. States that eventually transited to the strong condition, *also* started under a monopolistic rule. However, for several reasons we explain in this paper, the industrial sector managed to challenge agricultural elites, triggering a series of institutional investments and other structural transformations.

II. Industrial Output Speed Rates and Economic Contestation

There were many factors that explain the first industrial boom in LA. Among these, tariffs oriented to protect the *agricultural* markets unintentionally helped to protect the domestic industrial sector. Since the first industries processed raw agricultural materials, better conditions for the land helped (along with favorable international markets) industrialists make their way into the economy. [Figure 1](#) shows output differentials (in logarithmic scales) from 1900 to 2010 for a sample of Latin American countries⁵⁰. Additionally, each plot shows two vertical lines. The green line shows when the system was opened for contestation⁵¹, while the sky blue line shows when the income tax law was passed⁵². Contrary to [Bulmer-Thomas \[2003, 241\]](#), we do *not* find that “[e]verywhere [...] industrial growth exceeded agricultural growth”. Chile had a very contested political economy: both sectors had approximately the same size. In fact, the industrial sector not only caught up agricultural output but also surpassed it around 1930, which is around the time when income taxation was imposed. The total opposite happened in Nicaragua. This country never had a strong industrial sector.

⁵⁰We use the *Montevideo-Oxford Latin American Economic History Data Base (MOxLAD)*, specifically the *agriculture value-added* and *manufacturing value-added* variables. The former measures “the output of the sector net of intermediate inputs 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. Finally, “the depreciation of reproducible assets or depletion/degradation of natural resources were not deducted”. Details about this dataset are presented in the [data](#) section.

⁵¹We proxy this using Boix’s data on democratization. See [Boix et al. \[2012\]](#).

⁵²Author’s data. Based on several reports and official information. We discuss and justify our sample in the [data](#) section.

Sectoral output differentials measure the levels of inter-elite conflict. In other words, [Figure 1](#) operationalizes the degree in which the agricultural sector was “challenged” (or not) by an incipient industrial sector. We build on theories that claim that economic and political competition (or the lack of) have a positive (or negative) impact on state capacities. For example, [Kurtz \[2009, 481\]](#) argues that where “no faction can easily become permanently dominant”, state capacities should be higher. Similarly, [Geddes \[1991\]](#) argues that competition between two rival parties of about the same size create the incentives to invest in political institutions. [Cárdenas \[2010, 40\]](#) in his formal and empirical models also finds that “concentration of political and economic power reduces the incentives to invest in state capacity”. However, he models inequality between *élites* and *citizens*. We expand on this idea by modeling the period *before* full democratization existed and also by modeling the interest of two types of elites. This paper also builds on theories on the sectoral origins of income taxation. As development economists argue, there is an intrinsic sectoral conflict between the two sectors regarding generation of income and its potential taxation. For example, [Best \[1976, 55\]](#), argues that “the sectoral origin of income is an important determinant of tax potential [...] the agricultural sectors in Central America preclude[d] effective income taxation”. Similarly, [Mares and Queralt \[2015\]](#) study how income taxation in Europe is associated to between-elites conflicts, particularly between the landed elite and the industrial elite⁵³. Taxation and state formation has been studied in Africa too. For example, [Sanchez de la Sierra \[2014\]](#) studies the relationship between taxation and state formation in Eastern Congo. This paper elaborates on these insights by tracing the *political origins* of income taxation. As argued later in the paper, economic equality paired with political inequality introduced endogenous incentives to build both *state* and *democratic* institutions.

Intra-elite (in)equality and regime type plays a fundamental role in our argument. There have been important recent contributions lately (see for example [Acemoglu and Robinson \[2009, Ch. 9\]](#) and [Ansell and Samuels \[2014\]](#)). Building on this literature, we introduce the state capacities question. Our findings are consistent with [Stephens et al. \[1992, 9\]](#), in that “[c]onsolidation of state power was an essential prerequisite for democratization”. One of our main contributions is the idea that inter-elite political inequality paired with inter-elite economic equality plays a fundamental role in political/institutional development. [Garfias \[2015\]](#) finds in México the exact opposite: *unequal* relative distribution of political and economical power causes state formation. The proposed mechanism is that ruling elites, taking advantage of their transitory strengthened position, expropriate weaker elites and send bureaucrats to control local weakened bosses (his proxy for state capacities). We find that political monopolies were broken when the excluded industrial sector gained economic leverage.

⁵³However, state-capacities are tangentially studied.

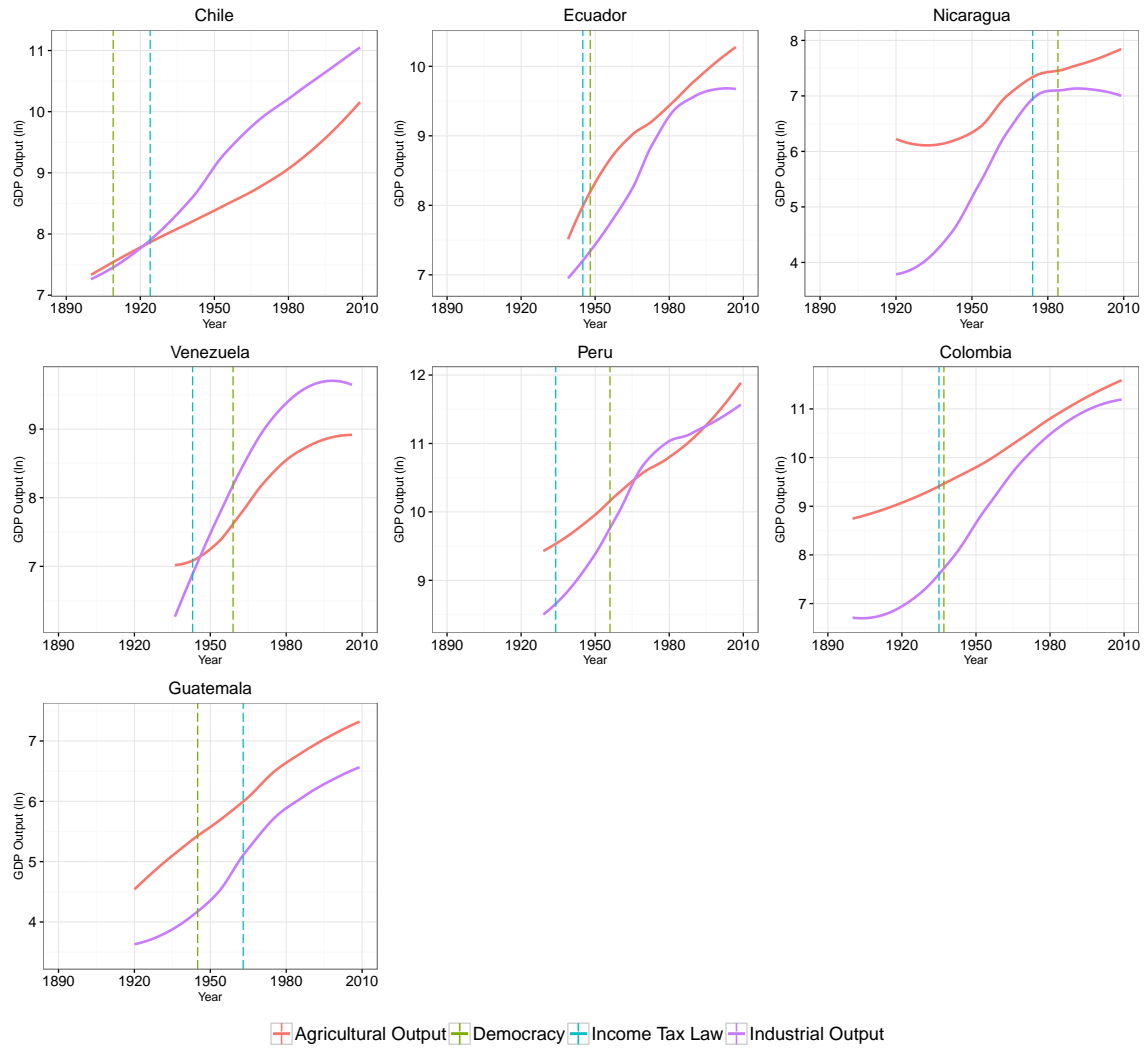


Figure 1: *Industrial and Agricultural Outputs, and Political Contestation*

```
## Call:
## coxph(formula = wlw.S ~ constmanufact^2 + constagricult^2 + strata(eventno) +
##       cluster(country), data = wlw, method = "efron")
##
##               coef exp(coef) se(coef) robust se      z      p
## constmanufact -0.001852  0.998149  0.001658  0.000635 -2.92 0.0036
## constagricult  0.000467  1.000467  0.000499  0.000180  2.59 0.0096
##
## Likelihood ratio test=4.9 on 2 df, p=0.0864
## n= 702, number of events= 14
```

```
## Call:
## coxph(formula = dur.dep.t.v.S ~ log(manXevent) + log(agrXevent) +
##       log(exports) + strata(eventno) + cluster(country), data = dur.dep,
##       method = "efron")
##
##               coef exp(coef) se(coef) robust se      z      p
## log(manXevent) -0.4827    0.6171   1.8231    0.9607 -0.50 0.62
## log(agrXevent) -0.0559    0.9456   2.0181    0.7738 -0.07 0.94
## log(exports)   -0.5047    0.6037   1.1710    0.6075 -0.83 0.41
##
## Likelihood ratio test=2.97  on 3 df, p=0.396
## n= 234, number of events= 14
## Call:
## coxph(formula = dur.dep.elap.t.S ~ constmanufact + constagricult +
##       strata(eventno) + cluster(country), data = dur.dep, method = "efron")
##
##               coef exp(coef) se(coef) robust se      z      p
## constmanufact -0.001852  0.998149  0.001658  0.000635 -2.92 0.0036
## constagricult  0.000467  1.000467  0.000499  0.000180  2.59 0.0096
##
## Likelihood ratio test=4.9  on 2 df, p=0.0864
## n= 234, number of events= 14
## Call:
## coxph(formula = dur.dep.t.v.S ~ constmanufact + constagricult +
##       strata(eventno) + cluster(country), data = dur.dep, method = "efron")
##
##               coef exp(coef) se(coef) robust se      z      p
## constmanufact -0.00348    0.99652  0.00374    0.00147 -2.37 0.018
## constagricult  0.00141    1.00141  0.00180    0.00068  2.08 0.038
##
## Likelihood ratio test=5.27  on 2 df, p=0.0717
## n= 234, number of events= 14
```

III. Taxation, Expropriation and the Industrial Sector

Higher levels of inter-elite economic equality, propitiated by healthy industrial outputs, were able to break the initial monopolistic conditions that were beneficial to the traditional sector. Building on the “stationary bandit”⁵⁴ concept, this paper develops two possible strategies for agricultural political incumbents. Each one is best response depending on the rate of industrial growth. The first strategy is to engage in *predatory practices*, expropriating industrial output and enjoying short-term benefits associated to immediate liquidity. Just expelling industrial elites and taking over the industries is not efficient. Since human capital and technology are non-transferable between the two sectors⁵⁵, if this strategy is pursued, industrial output is exhausted in the long run. In consequence, agricultural elites are better off expropriating industrial elites rather than taking over their industries. Since they don’t know how to manage them, they end up bankrupting industry. Due to the benefits associated to industrial expropriation “today” offset the benefits of rather encouraging industrial production and tax it “tomorrow”, expropriation is best response when the rate of industrial growth is slow. In simply words, the long-term benefits of having a secured, *but excessively small* source of tax revenue *do not* offset the benefits associated to have immediate monetary resources product of the expropriation. The second strategy consists of *institutional investments* that allowed agricultural incumbents to “rob” industrial output in small doses at a time through a direct taxation system.

In cases where industrial growth kept growing at faster rates, agricultural political incumbents incorporated a proportional fiscal mechanism to capture increasing tax rates. Particularly, the system had to be able to monitor closely industrial magnates and their personal incomes. In other words, an *income tax* had to be implemented⁵⁶. This strategy is best response when industrial growth rates are fast. Since the long-term benefits of having a secured large tax source for the future offset the short-term costs of enjoying that revenue in the future, agricultural elites were better off taxing industrial output rather than expropriating it. Again, expelling the industrial elites was not efficient due to the non-transferability of human capital and technology. Hence, agricultural incumbents were better off having a rather small tax revenue secured for the future than having a relatively larger sum of money “today”, but exhausting it and having nothing “in the future”. In fact, it was in the agricultural incumbents’ interest to protect and encourage industrial growth as that would translate into higher revenues for the treasury. As other have explained before, by imposing an income tax system, the treasury appoints itself as the investor’s partner who will always share in the investor’s gains and losses⁵⁷.

⁵⁴Olson [2000].

⁵⁵For example, machines used to make glass can’t be used to grow potatoes.

⁵⁶We build on the idea that political elites generally are better able to impose/raise taxes during economic booms. For example, Campbell and Allen [1994, 647] argue that “economic development should be directly related to individual and corporate income tax rates”. Also, Besley and Persson [2011, 59] argue that “investing in fiscal capacity becomes more attractive [...] when wages or incomes [...] are higher”.

⁵⁷Domar and Musgrave [1944, 389].

Cases that experienced low industrial output rates tended to engage in expropriation, nationalization and forced loaning. Our theory builds on the relationship between inter-elite (in)equality and political development⁵⁸. Agricultural rulers decide to expropriate because their discount factors exceed the benefits associated to taxed industrial output in the long-run. Technology and human capital are assumed to be non-transferable. Hence, given small industrial growth rates, agricultural elites are better off having access to immediate liquidity, even when those resources get exhausted in the long run.

IV. Income taxation and Institutional Investments

When it comes to taxation, the public economics literature focuses mostly on tax revenues. However, the *politics* of taxation is an equally important matter⁵⁹. We claim that the new income tax was not important because of the extra revenue income taxation brought the treasury but because of the introduction of endogenous state institutions. Higher levels of inter-elite equality -i.e., higher levels of inter-elite contestation- led to the imposition of income taxation. This endogenous disturbance triggered a series of institutional investments. Most notably, the introduction of political representation for the industrial elites and industrial tariffs. It is important to stress that this is a situation of “*quasi-voluntary compliance*”⁶⁰. Even when the industrial sector in strong-state cases continue having increasing outputs (and hence, higher taxes to pay), they are still better off paying income taxes to continue receiving economic protection (tariffs) as we explain below.

The progressive industrialization of the economy, while structural transformation, brought a very important change, namely the breaking of the political monopoly led by the agricultural elite. In turn, political competition brought several economic and political changes. Since open political systems are the most effective ones for processing and aggregating diverse interests⁶¹, industrialists were willing to be taxed in exchange of political representation. That way, both sectors could introduce institutions for macroeconomic stabilization and other regulatory institutions. Moreover, as simply promising keeping income tax rates constant was not credible, industrialists had all positive incentives to seek political representation. A new competitive oligarchy was born. This goes in line with several political economists who find that in *less* developed countries, higher tax collection levels are associated to strong political party systems⁶². Political scientists also find that higher levels of political competition are associated with better institutional designs. We provide further details in our [case study](#).

The introduction of the income tax not only brought political agreements (in the form of political participation within an oligarchic republic structure), but also inter-sectoral economic compromises.

⁵⁸See [Ansell and Samuels \[2014\]](#).

⁵⁹[Focanti et al. \[2013\]](#).

⁶⁰[Levi \[1989\]](#).

⁶¹[Rodrik \[2000, 3\]](#).

⁶²[Di John \[2006, 8\]](#).

The most important one was the introduction of higher/newer tariffs designed to protect the industrial sector. Protectionism boosted industrial production and enhanced other structural transformations, such as the rising of the middle class and higher levels of urbanization. A common misconception is that industrial protectionism started with the ISI. “The fact that manufacturing was alive and thriving in Latin America before the 1929 crash is now beyond question”⁶³. ISI in fact is a continuation of older policies. Haber [2005, 3-4] explains that “governments followed policies designed to subsidize and protect industry in the decades after 1950 precisely because industrialists and industrial workers had been protected since the 1890s”. Building on this research agenda, we claim that early industrialists were able to bargain tariffs in exchange for income taxation. This insight goes in line with Lederman [2005, 53] who argues that the timing of protectionist and income taxation cycles match. In fact, the industrialists *as a sector*, gathered around this issue in quite an organized way, reinforcing their class self-image. As Sokoloff and Zolt [2007, 122] argue, the expansion of the “manufacturing production [...] helped to nurture the development of a powerful constituency for higher tariffs”. The introduction of higher/newer tariffs was key for the subsequent development of the industrial sector. As Haber [2005, 15] argues, “virtually none of [the industrial development] would have existed had it not been for tariff protection”⁶⁴.

These transformations triggered a sequence of other institutional investments. Now that both sectors had access to political and military resources, the two elites were interested in protecting each other’s property from mutual expropriation. Property rights protection has been associated to economic growth. For example, Grossman and Helpman [1994a, 35] argue that secured property rights shifts the incentives to invest in “[i]nnovation [which in turns] sustains both capital accumulation and growth”⁶⁵. Economic growth expanded the tax base too. That is why taxation has also been associated to property rights protection. Timmons [2005, 531] explains that “[t]he more money a state raises from progressive taxes as a percentage of GDP [...] the better it protects property rights”⁶⁶. Alternative models developed to understand the European case suggest that the bourgeoisie seeks protection against the expropriative policies of the king. However, we claim that in Latin America *institutions protected the elite from themselves*. Higher levels of economic growth have also been associated to accumulation of human capital. Brown and Hunter [2004, 842] find that “[Latin American] democracies devote a higher percentage of their educational resources to primary education”. In turn, human capital accumulation sat down the foundations for the emergence of the middle class composed by “urban professionals, state employees in the private sector, artisans

⁶³Bertola and Ocampo [2012, 129].

⁶⁴See also Coatsworth and Williamson [2002, 21]. There is some debate on whether protectionism is associated to economic growth, however. Coatsworth and Williamson [2002, 10] argue that “protection was associated with faster growth in the European core and their English-speaking offshoots [...] but it was *not* associated with fast growth in [...] Latin American periphery” (emphasis in the original).

⁶⁵This model has been so called “protection for sale model”.

⁶⁶See also Rodrik [2000, 6] for a general overview.

and craftsmen”⁶⁷. As Collier and Collier [2002, 394] suggest, “the middle classes did well under [the competitive oligarchies regimes]. The size of the middle class expanded significantly not only as a result of economic growth in general, but also as a result of growing public employment as the state expanded”⁶⁸. These economic structural transformations were deeply linked to the seeds of early democratic development. As Stephens et al. [1992, 7] argue, “capitalist development is associated with democracy because it transforms the class structure”. This paper focuses on one of these class transformations, particularly *within* the elites, namely, the emergence (or not) of an industrial class and the decline (or not) of the agricultural/traditional sector.

VI. UNPACKING THE MECHANISMS: ILLUSTRATIVE CASE, CHILE 1850-1930

In this section, we illustrate our theory by bringing the Chilean case to the analyses. From an economic standpoint, before and during the colonial period, agriculture was the most important sector. Besides supplying European markets with raw materials, Latin American economies supplied “a variety of tropical foods and [other] goods [such as] sugar, coffee, and tobacco [...] The demand for such items was stimulated by the rising consumption of the new and prosperous European bourgeoisie”⁶⁹.

Politically, agriculturalists monopolized the political realm⁷⁰. Collier and Collier [2002, 106] argue that the

“national government was dominated by the central part of the country, with owners of large agricultural holdings playing a predominant role within a framework in which this cohesive elite increasingly absorbed the elites of the urban commercial and incipient manufacturing sector”.

The historiography has contradictory references, however. Some say that they were obvious antagonists. Some have argued, for example, that the landed elite conformed very strong economic and political monopolies⁷¹. Others have claimed that this antagonism is wrong⁷². The main argument against this vision is that there was a very blurry division between these “two” classes⁷³. For example, landowners were also invested in industry⁷⁴. However, there are some stylized facts that

⁶⁷Stephens et al. [1992, 185].

⁶⁸Geddes [1996, 12] explains that government officials are self-interested individuals, and hence “their responses differ”. However, we assume that the political interests of bureaucrats, presidents and congresses, are in line with their respective sectoral interests. Thus, we consider that “the state” is itself an actor.

⁶⁹Marichal [1989, 74].

⁷⁰Wright [1975, 45-46].

⁷¹McBride [1936, 15] argues 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.

⁷²See for example Mamalakis [1976, 125].

⁷³Bauer [2008, 30, 44, 94, 108].

⁷⁴Coatsworth and Williamson [2002, 23] argue that “[t]he only landowners that mattered in 19th century Latin America politics were those for whom land represented but one asset in a much broader portfolio”. In the same line,

strongly suggest that *in general*, agricultural elites were *primus inter pares*. First, historiographic evidence suggests that the agricultural sector did monopolize politics. 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 group⁷⁵, leaving the modern sector heavily under-represented. As Baland and Robinson [2008, 1748] argue, “[c]ongressional representation was heavily weighted in favor of rural districts where the peasantry historically formed a pliable and controllable mass base for conservative and reactionary groups”. Second, and as a consequence, fiscal pressures in favor of agricultural taxes were minimal as opposed to mining taxes (as we explain below, one of the first manifestations of industrial activity). As Best [1976, 56] explains, “when all central government taxes are considered, agriculture is still substantially undertaxed relative to the other sectors”⁷⁶. The fiscal structure was heavily biased against non-agricultural interests. As explained by others, “public revenues came almost exclusively from taxes on mining and its exports”⁷⁷. Though there was an agricultural income tax, it was weak and abolished after the civil war of 1891. This bias was consistent with any type of governmental interference. Historians argue that “[i]n those areas where the government did interfere in the countryside, the effect was to strengthen the position of the landowning class”⁷⁸. The secretary of the treasury Benavente, right after the independence in 1823, addressed a mostly agricultural congress to propose an income tax. The congress rejected his idea specially due to pressures of the landowning class⁷⁹. The few public infrastructure that existed, was in favor of agriculture too. The state would either invest huge amounts of money or borrow resources to build infrastructure capable to mobilize agricultural goods, starting with the gold rush in both California and Australia⁸⁰. For instance, in Chile, a foreign investor “was contracted to build a second state-sponsored railroad that would connect Santiago with the south-central agricultural districts”⁸¹. This was not an isolated issue, but a clear pattern. Presidents also engaged in the same deliberated practices. For example, “the Montt regime did invest in the construction of Chile’s railways but only in the Central Valley and south-central zones [b]ut there was no public investment [...] in railroads built in the Norte

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”.

⁷⁵Bauer [2008, 45].

⁷⁶Bauer [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”.

⁷⁷Zeitlin [1984, 38].

⁷⁸Bauer [2008, 118].

⁷⁹Sagredo [1997, 306]. It is important to stress that during this period, “political parties” did not follow very clear ideological divisions. Most of the secretaries/ministries were recruited due to their technocratic skills.

⁸⁰Rippy [1971], Marichal [1989], Zeitlin [1984], Bauer [2008].

⁸¹Rippy [1971, 85].

Chico mining provinces, which in fact provided most of the state's tax revenues"⁸².

poner esa ley donde dice q las municipalidades seran encargadas de cobrar el impuesto, lo q ayudo a descentralizar y expandir el poder nacional a traves del territorio.

The origins of the the industrial sector are much older than the ISI policies of the 1950s. "The development of large-scale, mechanized (and even "heavy") industry can be dated from the 1890s in the region's larger economies"⁸³. For almost 400 years, mining was the most important activity not related to agriculture. "Minerals had to be processed near the areas where they were mined in order to keep transport costs to a minimum. This led to the construction of foundries and, at times, refineries, which became the cornerstones for the early stages of the industrialization of the mining-based economies"⁸⁴. Although it was very important during the colonial period, not only "Latin American's consumption of industrial metals continued to be very small until toward the end of the nineteenth century", but also it was very rudimentary showing little or no technological refinement⁸⁵. Most mineral-related industry (if not all) was foreign owned, except for Chile⁸⁶. Mining elites made their fortunes during the 1840s-1850s during the mining boom. After the boom, the mining elite shifted to the first "true" industrial work which actually was born under agricultural auspices, i.e. the cotton mills⁸⁷.

The first "industries" were called *obrajes*⁸⁸. Though servile and slave labor were used at the end of the colonial period, all labor was free and waged starting in the independence period. "Large-scale *obrajes* existed alongside smaller units of production - modest workshops and prosperous artisan-dominated enterprises - in virtually all urban centres"⁸⁹. Beyond cotton and the textile industries, early industrialists also processed other agricultural goods⁹⁰. Other industries for domestic consumption too developed around 1900⁹¹. The industrial sector was boosted by the international scenario too. For example, "[m]eat exports required the development of cold-storage technologies"⁹². From an international trade perspective, Haber [2005, 5] argues that given a change in the metallic

⁸²Zeitlin [1984, 41].

⁸³Haber [2005, 2]. For example, Rippy and Pfeiffer [1948] and Pfeiffer [1952] explain how by the 1870's the carriage industry were put on a firm basis.

⁸⁴Bertola and Ocampo [2012, 129].

⁸⁵Rippy [1971, 230].

⁸⁶Stephens et al. [1992, 165, 176, footnote 5, 324].

⁸⁷See Rippy [1971, 231] and Bethell [1986, 271]. 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 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" (Rippy [1971, 232]).

⁸⁸I.e., Proto-industrial redoubts.

⁸⁹Bethell [1986, 271]. Emphasis in original.

⁹⁰For instance, they processed animal grease and tallow (for soap and candles), dried and cured meats, flour, bread, beer, wines, spirits - most of these were for domestic consumption (Bethell [1986, 272]). Other food industries, such as sugar (Bertola and Ocampo [2012, 129]) to be used in the production of chocolate, candies, biscuits. Vegetable oils were also very important. "The flour mills were probably the first of the Chilean industrial plants to utilize steam power" (Rippy and Pfeiffer [1948, 300]).

⁹¹Some examples are tobacco, pottery, felt hats, matches, footwear, specially in Argentina, Brazil, Chile, Uruguay and Perú (Rippy [1971, 235]).

⁹²Bertola and Ocampo [2012, 129].

standard, “exchange rate depreciation resulted in the expansion of the tradables sectors at the expense of non-tradables”. Lower transportation costs and higher demand for processed grains in Europe also played a big role boosting early industrial production. As Bauer [2008, 68] argues, “[b]ad harvests in Europe and disruptions caused by wars were other factors that enabled Chilean grain to be sold on European Markets”.

Industrial work started very small⁹³, progressing “from the shop to the factory during the latter half of the nineteenth century”⁹⁴. In Chile, almost all non-agricultural produce were personified by an incipient, yet strong group of individuals. As historian Francisco Encina described it,

“[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 most frequently not only close associates, or drawn from the same family, but they were same individuals: Ossa, Edwards, Vicuña Mackenna, Matta, Goyenechea, Cousiño, Urmeneta, Gallo, Subercasaux)”⁹⁵.

Most critically, the early industrial class was greatly dominated by foreign investors⁹⁶. Pfeiffer [1952, 139] explains how “[u]nlike a majority of her neighbors, Chile was one of the few Latin-American nations which managed to make substantial progress in the development of industries other than those producing consumer goods considerably before the turn of the last century” and how the most extensive industrial operations had been dominated by English firms.

SHOULD I PROVIDE MORE ON THE FOREIGN NATURE OF THE INDUSTRIAL SECTOR?

From the process of going from mineowners to proto-industrialists, this incipient elite developed a strong sense of social *class* which consistently sought political representation and influence. Collier and Collier [2002, 109] explain that the *Alianza Liberal* was

“the political expression of the new groups that began to emerge in the late 19th century with the expansion of the commerce and industry and the opening of the new mining areas [...] As these groups gained social and economic importance, they began to emerge as a political force”.

Additionally, during the 1920s industrialists started to “form trade associations to engage in lobbying and propaganda as more coherent interest groups”⁹⁷, such as the *Sociedad de Fomento Fabril* (SOFOFA) 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 in

⁹³Marichal [1989], Rippy and Pfeiffer [1948, 68].

⁹⁴Rippy [1971, 235].

⁹⁵In Zeitlin [1984, 30]. Emphasis in the original. Similarly, Wright [1975, 48] supports the thesis that the nitrate development did lead to the development of an “incipient industrial establishment”.

⁹⁶Rippy and Pfeiffer [1948, 295].

⁹⁷Weaver [1980, 107].

1838. The society “was the most powerful associational interest group in nineteenth-century Chile”⁹⁸, which was clearly self-conceived in class terms⁹⁹

The structural transformation of the industrialization of the economy brought an unstable combination that was not sustainable: a situation of *inter-elite economic equality paired with inter-elite political inequality* was not an equilibrium. Agricultural elites did not have a political counterpart and hence engaged in several predatory practices. Additionally, the fiscal deficit originated in the deceleration of trade taxes put domestic fiscal pressures for rulers to draw on industrial output too. Agricultural exports in Chile, such as wheat production, had a boom between 1865-1875 until 1880¹⁰⁰. However, “[t]he importance of trade taxes as sources of public revenues began a steady decline in 1918, which lasted until 1925. This downfall is explained by the fall of export revenues caused by the collapse in the prices of Chile’s major exports during the war”¹⁰¹. For these two reasons (fiscal pressures and lack of political counterpart), governments before the 1920s held several confiscatory policies. As some historians have argued, incumbents engaged in “nationalization by means of naturalization, government intervention, and government participation”¹⁰². Chile, Perú, Uruguay, among others, went through a clear processes of nationalization of non-agricultural assets around the 1920s¹⁰³. In Chile, for example, these two sectors had enough antagonistic preferences that they confronted each other in two bloody civil wars. Zeitlin [1984, 23] argues that the civil wars challenged a “large landed property [elite against a] productive capital [elite]”.

FIX THIS

- Particularly, “the real story of Chilean industrialization belongs to the Parliamentary period”¹⁰⁴ (1891-1925).

- As Figure 1 suggests, Chilean industrial output had relatively similar levels when compared to the agricultural sector, however.

We argue that this situation of sustained industrial growth forced agricultural elites to redefine their strategies, and rather than confront the industrial sector, encourage it. Industrial output was large enough to compensate the costs of having access to economic resources in the future. In 1924 then the income tax law was passed. As others have observed, “[t]here was visible bargaining: [the non-agricultural sector] (reluctantly) accepted taxation, *while demanding state services and expecting to influence how tax revenues were spent*”¹⁰⁵. The industrial sector heavily campaigned for policies favorable to them, particularly, economic protection. For example, the SOFOFA pursued

⁹⁸Wright [1973, 244].

⁹⁹Wright [1975, 51].

¹⁰⁰Bauer [2008, 68-69-70]. See also Lederman [2005, 55]. Declining custom duties also happened in several other countries of Latin America. See Bulmer-Thomas [2003, 245].

¹⁰¹Lederman [2005, 54-55].

¹⁰²Rippy [1971, 238].

¹⁰³Chua [2010].

¹⁰⁴Collier [1977, 683].

¹⁰⁵Carmenza Gallo, in Brautigam et al. [2008, 165]. Emphases are mine. She refers specifically to nitrate producers.

an agenda in favor of protective industrial tariffs¹⁰⁶. Consistent with the economic literature on lobby¹⁰⁷, “protection pattern[s] [differ] between politically organized and non-organized sectors”¹⁰⁸. The SOFOFA was able to set the agenda regarding tariffs. In particular, “by the early 1920s Chile’s manufacturers were no longer just demanding (and obtaining) protective tariffs, they actively lobbied for government subsidies to establish a range of new industries”¹⁰⁹. Moreover, the Aguirre Cerda government in 1939 created the CORFO an agency that “undertook the responsibility for economic planning and direction by identifying certain industrial sectors to support through various sorts of credits, subsidies [and] government investments”¹¹⁰.

Economic and political concessions had the expected outcomes on the formation of fiscal capacities, and ultimately, on state capacities. Going from skilled bureaucracies able to monitor personal incomes to oligarchic congresses were needed. Oligarchic competition allowed keeping each elite accountable. This insight is consistent with Kurtz [2013, 36] who explains how the “incorporation of upper-class actors from all major factions into the national political system - while maintaining the exclusion of the popular sectors - [was] crucial to enabling cooperation in state building and public goods provision activities”¹¹¹. New fiscal resources were targeted to improve key functions of the state, such as public administration and the army. As other have observed, the early Chilean government “was able to impose a substantial tax [...] and pay the salaries of government and military employees”¹¹². Eventually, as the relative size of the industrial sector increased, industrial elites were able to gain ground in politics, managing to impose other important institutions such as the secret ballot. This institutional modification came to correct a long-standing situation that had had precluded industrialists compete on equal terms with the agricultural incumbents. As Baland and Robinson [2008, 1749] argue, “[t]he introduction of the secret ballot had an immediate impact on the balance of political power in Chile [as] landowners could no longer effectively control the votes of rural labor”.

WORK HERE FIRST

VII. ECONOMETRIC ANALYSES

In this section we test that inter-elite economic equality posited challenges to agricultural political incumbents. Following Aidt and Jensen [2009], we model the conditional hazard ratio that a country which has not yet adopted the income tax adopts it in a given year as a function of the relative sizes of the agricultural and industrial sectors. We compute these hazard ratios using several functional

¹⁰⁶Lederman [2005, 54] and Haber [2005, 18].

¹⁰⁷Grossman and Helpman [1994b].

¹⁰⁸Goldberg and Maggi [1999, 1136].

¹⁰⁹Haber [2005, 18].

¹¹⁰Collier and Collier [2002, 393].

¹¹¹This alliance between elites was key to centralize power and to “impos[e] substantial taxation” (Kurtz [2013, 37]).

¹¹²Bauer [2008, 80]. He refers particularly to “nitrate exports”, another non-agricultural source of growth.

forms. First, we assume a Cox proportional hazard parametrization to compute the hazard rate of a country at a given year to “fail” (i.e., implement the income tax law) conditional on baseline covariates¹¹³. Countries drop out of the sample when they adopt the income tax. Additionally, we employ other functional forms too. We also assumed a generalized estimating equation (GEE) functional form which are usually used to analyze longitudinal and other correlated data especially when they are binary¹¹⁴. This model estimates the conditional likelihood of implementing the income tax conditional on a set of covariates. We also assumed a conditional logit form (“fixed effects” model) to control for country-specific effects. In order to correct time dependency, we included different time-transformed variables, in the form of a lagged dependent variable to account for partial adjustment of behavior over time¹¹⁵ and time-transformed functions. Panel-corrected standard errors¹¹⁶ were also included. Additionally, in order to test that income taxation initiated a *path* of institutional investments, particularly the incorporation of an oligarchic system, we incorporated a generalization of the Cox models, and estimated an Andersen-Gill model¹¹⁷. Using a slightly different data structure, we estimated the *jointly* occurrence of income taxation *and* democracy, within a multiple failure-time framework¹¹⁸. All these models strongly suggest that faster industrial outputs are strongly correlated to the imposition of the income tax law, but also to the *jointly* realization of the income tax and democracy.

I. Data and Sample

We estimate all models using the MOxLAD dataset¹¹⁹. This dataset provides extended comparable sectoral value-added series in constant purchasing power parity prices¹²⁰. Our sample is given by all Pacific coast countries for which we have available data, that is, Chile, Ecuador, Nicaragua, Venezuela, Perú, Colombia and Guatemala (see Figure 1). The time span goes from 1900 to (potentially) 2010. Observations are left-censored before the timespan, and right-censored after the timespan. However, as stated before, countries dropout of the sample once they impose the tax income for the Cox models, and when *both* democracy and the income tax happen (for the Andersen-Gill model). The timing of democracy and the imposition of the income tax laws are depicted in Figure 1.

¹¹³Box-Steffensmeier and Jones [2004].

¹¹⁴Hanley [2003].

¹¹⁵Wawro [2002].

¹¹⁶I.e., “robust variance”.

¹¹⁷Therneau and Grambsch [2000, 185-].

¹¹⁸This data structure is different in the sense that countries drop out of the sample once *both* income taxation *and* democracy occur.

¹¹⁹“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”.

¹²⁰See Astorga et al. [2005, 790].

II. Results

INCLUDE FRAILTY MODELS, CONTROL FOR HETEROGENEITY AND EVENT-DEPENDENCE: p 240, Box-Steffensmeier2006a, Box-Steffensmeier2006b, Box-Steffensmeier2014, Andersen1982: “which is the Cox model with robust standard errors” (according to Box-Steffensmeier2014:2); Include Lange2006 1426 (16) variable on prior levels of pre-colonial development. It has 3 categories. Put it as factor as control variable.

Better not to include frailty, since these are countries and not a sample from a larger population. That is, Colombia is not a sample of all possible colombias.

Include [survival:plot] as the “dependent variable”. Make the argument that it’s not really about time. Faster industrialization does cause countries to implement the income tax law earlier. Motivate this graph to rule out “supurious duration dependence” (not sure if this is the correct term, though) (survival is separate from T itself : my variables accelerate failure).

GEE doesn’t model time. Yi is only linear to Xi, and the hazard is assumed to be flat. It does not model time dependence!!! // no temporal dependence. Include this discussion for the non-cox models. THis should apply for GEE and Cond. Logit. INCLUDE Carter2010 PAPER WHERE THEY INCLUDE POLINOMIALS FOR THE TIME VARIABLE (SEE DAY 4 ADV MLE ZORN SLIDES) - THEY INCLUDE POLYNOMIALS FOR THE TIME TREND.

Given this GEE “problem” (hazards are not flat), consider estimate a Weibull with “shape(VARIABLE)” (think of a variable that has not linear effects in failure) to model time dependence.

include a substantive interpretation of the hazard ratios (ver slides the Zorn, y como lo calcula - primera semana de clase.)

Also, see my own discussion on the correlation structure of the GEE in my Brazilian paper. Make sure that I have the corr. structure that is appropriated to panel data.

DO NOT use Andersen-Gill: events are assumed to be INDEPENDENT. I argue the exact opposite: TAXATION and DemOCRACY are linked/correlated. See slides DAY 6 Zorn and “Elapsed” / “Gap” time models. (Events have different baseline hazards). Consider “Marginal (WLW)” model: you’re at risk for semi simultaneous time - events start to pop up, they happen sequentially, but the risk happens more or simultaneously (i think this is the “best” model – cancer example.

Include Soifer2013a in the democracy/redistribution/tax capacity section: Makes an important point to the distribution and regime type literature. Argument is that distribution requires state capacities. “the relationship between inequality and democracy is conditional on the strength of the state: where the state is strong, inequality shapes the emergence and stability of democratic and authoritarian regimes in ways consonant with our theories. But where the state is weak, inequality has no effect on regime type. This shows that in weak state contexts, the origins of democ- racy and dictatorship are not fundamentally economic”

include Kurtz [2013, 57], and how he contests the notion that regime type and state-building processes run through different channels. He criticizes, for ex., the measurement of state capacity using “property rights protection”.

Kurtz [2013, 60-61]: “the best measures would be [one] that all (or nearly all) states consider to be of primary importance = for these can be assumed to be pursued vigorously across contexts, and variations in success will depend principally on variation in the effectiveness of institutions, not on opportunity costs or political will” I both agree and disagree with this definition. (1) I agree in that taxation is the best measurement of state capacities. However, one caveat applies (and this is how my theory/measurement is better) - not ALL taxes play a generative role - income taxation does. Finally, (3) I disagree in that income taxation is product of an “opportunity cost” and it is derived of “political will” - income taxation is a political product that gets stuck through institutional path dependency.

“Art. 104: Los municipios estara<cc><81>n obligados a enviar semestralmente a la Direccion de Impuestos Internos una copia autorizada del rol de patentes industriales, comerciales y profesionales. Art. 105: Los municipios, notarios, conservadores de bienes raices, Ministros de fe pu<cc><81>blica y, en jeneral, todo funcionario pu<cc><81>blico estara<cc><81>n obligados a suministrar los datos y antecedentes que solicite la Direccion de Impuestos Internos, so pena de las sanciones que establece el artículo 106 de la lei.”

in order strong states to exist, some necessary conditions should meet. “First, there must be a compelling collective elite interest in strengthening the central state, and second, doing so must be reasonably understood as nonthreatening to the fundamental material interests of nearly all politically relevant fragments of the upper class. If, by contrast, the central state is seen as the tool of one particular faction [...] then efforts at political centralization will likely detonate [social unrest]” (Kurtz [2013, 86-87]). HOWEVER SPECIFY IN WHICH WAY MY THEORY IS SLIGHTLY DIFFERENT (DONT FORGET TO TALK ABOUT THE ISSUE OF “CONFLICT/DISBALANCE OF POWER” AS A WAY TO PROIDUCE STATE BUILDING.)

Table 1 shows six models¹²¹. The first three are Cox models, under different time-transformations. The fourth model is a conditional logistic regression (“fixed effects” model). The fifth model is an Andersen-Gill model which predicts the jointly realization of both the income tax and democratization. Finally, the sixth model shows a GEE logistic regression model. All these results strongly suggest that higher levels of industrial output are associated to the imposition of the income tax¹²². In substantive terms, as the size of the industrial sector catches up with the size of the agricultural

¹²¹All tables were produced using the `texreg` package (?). 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 L^AT_EX using the dynamic report R package `knitr` (Xie [2016]), for fully replicable research.

¹²²“Because the coefficients are parameterized in terms of the hazard rate, a positive coefficient indicates that the hazard is increasing as a function of the covariate (and hence, the survival time is decreasing) and a negative sign indicates the hazard is decreasing as a function of the covariate” (Box-Steffensmeier and Jones [2004, 50]).

	Cox-PH: Time Transformed	Cox-PH: Logged	Cox-PH: Lagged	Conditional Logit: FE	Cox-PH: Andersen-Gill	Logit GEE
Manufacture Output _{tt}	0.28*** (0.07)					
Agricultural Output _{tt}	-0.25*** (0.07)					
Manufacture Output (ln)		31.64*** (3.79)		0.92*** (0.16)	5.06* (2.33)	2.73** (0.97)
Agricultural Output (ln)		-24.26*** (3.31)		-0.43 (0.23)	-9.91* (4.30)	-2.80* (1.24)
Total Population (ln)		61.98*** (7.32)	93.50*** (11.41)			6.11* (2.56)
Manufacture Output _{t-1} (ln)			47.50*** (5.84)			
Agricultural Output _{t-1} (ln)			-35.99*** (4.70)			
Urban Population (ln)					-0.97 (0.80)	
(intercept)						-48.54** (17.91)
AIC	31.25	11.54	10.87	3248.15	19.97	
R ²	0.11	0.21	0.22	0.32	0.09	
Max. R ²	0.24	0.24	0.24	1.00	0.32	
Num. events	7	7	7	447	4	
Num. obs.	181	181	174	621	48	621
Missings	0	0	0	0	186	
PH test	0.00	0.99	1.00		1.00	
Num. clust.						7

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Robust Standard Errors in All Models

Table 1: *Structural Origins of Income Taxation: Income Tax Law and Democratic Development*

incumbents, the political monopoly of the latter is broken, giving way to a series of political and economic bargains. Here we have theorized (and demonstrated in our [historical](#) case study) that in exchange for the income tax, industrial tariffs were implemented along with more secure conditions for industrial newcomers to participate in politics. The Andersen-Gill model strongly suggests that this is the case. Some times, we control for different measures of population density. Population has been associated to the probability in which elites expanded the franchise. Denser populations also expand the tax base. The scarcity of people meant that local and state governments were extremely concerned with attracting migrants. Because population inflows would lower the cost of labor, and boost land values and tax revenues, these societies were induced to adopt institutions attractive to immigrants. Among these, were cheap land and political participation¹²³.

¹²³[Engerman and Sokoloff \[2005, 892-893\]](#).

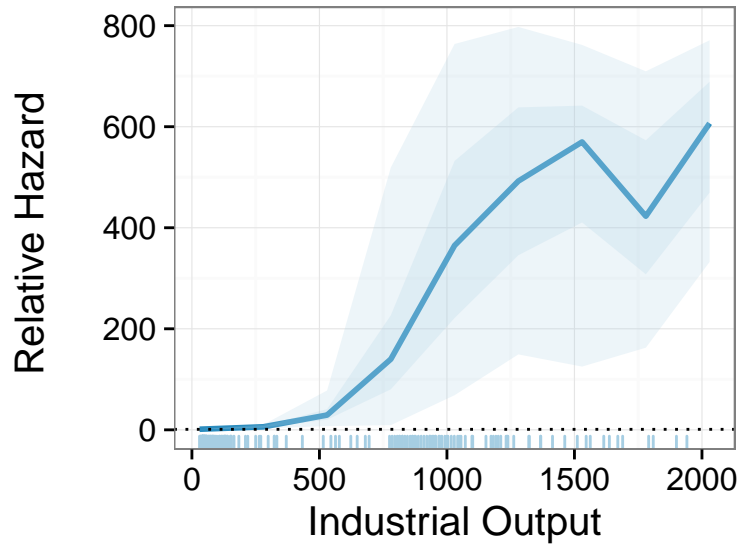


Figure 2: *Relative Hazards of Implementing The Income Tax: Industrial Output*

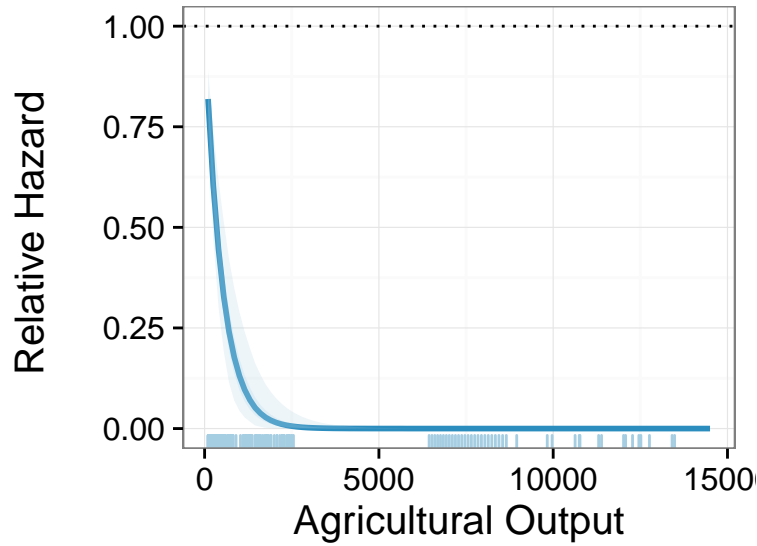


Figure 3: *Relative Hazards of Implementing The Income Tax: Agricultural Output*

Following Gandrud [2015] and King et al. [2000], Figure 2 and Figure 3 show 2,000 simulations from a variant of the main model (model 2 in Table 1)¹²⁴ and show their individual simulated predictions in two separate plots¹²⁵. These plots strongly suggest that higher industrial output substantively

¹²⁴It is important to stress that *both* sectors are included in the model, and hence, one sector acts as the control variable of the other sector.

¹²⁵The `simPH` package does not handle natural logs well. Hence, we estimated an alternative model that considers

boosted the introduction of the income tax, while higher agricultural output systematically diminished the risk of the introduction of the income tax. Altogether these results strongly argue in favor of the theory presented here, namely, income taxation was possible once the status quo which was favorable to the agricultural sector, was broken in order to give way to a path of institutional investments.

III. Robustness Checks

Cox *proportional* models rest on the assumption that hazard rates are *proportional* to time dynamics¹²⁶. Non-proportional hazard model are becoming an increasing problem across all subfields in political science¹²⁷. In this section, we test whether this assumption holds. Non-significant p-values indicate that the proportionality assumption holds. Also, [Figure 4](#) shows how the spline fitted lines are constant across time. Each of the seven dots represent the regression coefficients of our seven countries¹²⁸. All in all, steady splines confirm that the hazard rates are, in fact, *proportional*.

##	rho	chisq	p
## log(constmanufact)	0.0213	0.000706	0.979
## log(constagricult)	-0.0409	0.003579	0.952
## log(totpop)	0.0987	0.021272	0.884
## GLOBAL	NA	0.347609	0.951

the same sample and specification than the main model (model 2), but without taking the natural log on the variables considered. In the appendix section, [Table 2](#) shows the results. The numbers differ from the main results in [Table 1](#) because the scales are different.

¹²⁶[Box-Steffensmeier and Jones \[2004\]](#).

¹²⁷[Licht \[2011\]](#).

¹²⁸This is for our main model, column 2 in [Table 1](#).

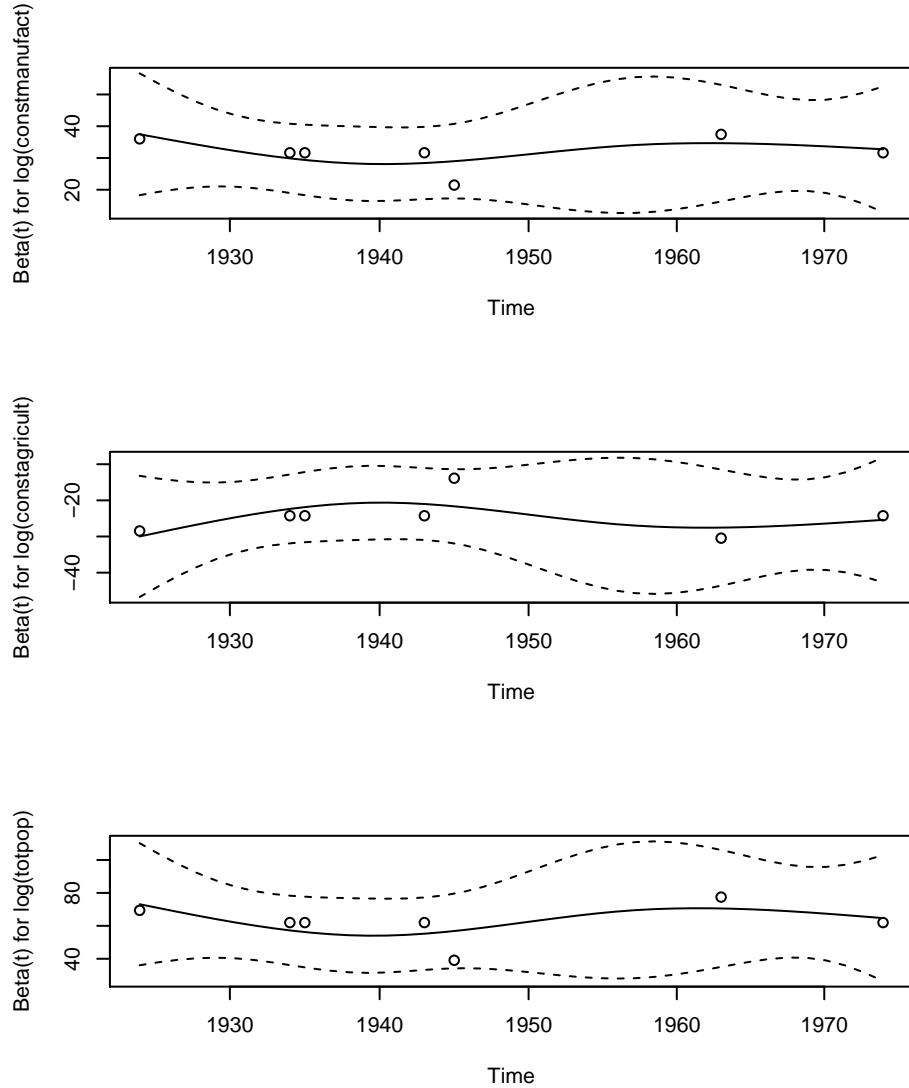


Figure 4: Graphical Plots of the Estimates against Time

VIII. DISCUSSION

This paper built not only on the fiscal sociology approach but also on the sectoral politics paradigm. States capacities, we argued, are part of a larger “package”, where both economic and political structural transformations take part also. The development of a strong industrial sector output not only generated domestic incentives for the imposition of an income tax. It also broke old paradigms of semi-servile labor. Though the post-colonial agricultural sector used waged labor, it

took several decades of state penetration to completely eliminate all traces of semi-servile labor. In many agricultural redoubts, still today, we can see servile and semi-servile traditions and customs. From the get-go, industrial work, had none of that. In part, urbanization and the separation of place of work and place of residence (specially for the working class), prevented the industrial sector to adopt non-modern practices. Kurtz [2006, 2009, 2013]¹²⁹ explains how labor-repressive agrarian economy is negatively associated to state capacities. Expanding on that idea, we argued that states that were able to make political and economic concessions could secure via institutional investments the foundations of the modern state. It was a necessary condition to abandon any type of repressive labor, and that was possible due to the development of a strong industrial sector.

¹²⁹He argues that labor-repressive agrarian economies leave local elites extremely vulnerable to the centralization of authority. And such, agrarian elites will resist the taxation necessary to support military modernization or even collective defense (Kurtz [2006].).

IX. APPENDIX

I. Additional Graphical Representations

Figure 5 shows two simple plots of the conditional hazard rates. These two pieces of information strongly suggest, conditional on both covariates, industrial output increases the risk of imposing an income tax law.

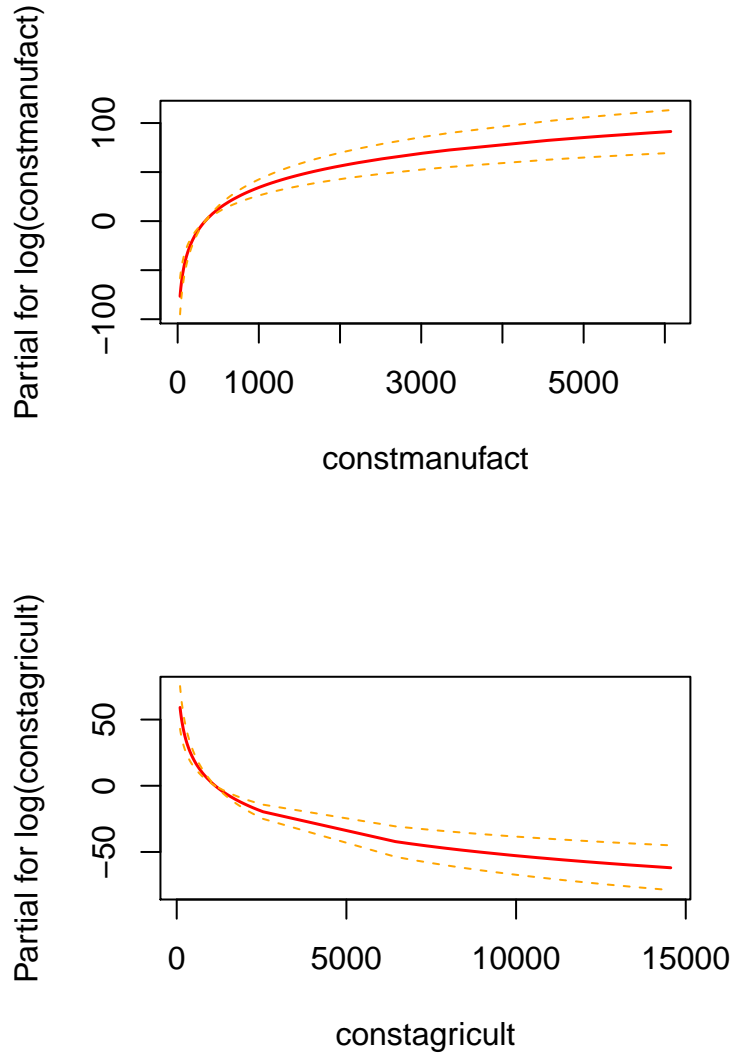


Figure 5: *Graphical Plots of the Estimates*

II. Model used for Simulation Plot

Table 2 shows the estimates used to compute the 2,000 simulations in the Figure 2 and Figure 3 figures.

	Cox-PH
Manufacture Output	0.01*** (0.00)
Agricultural Output	-0.00*** (0.00)
Total Population	0.00*** (0.00)
AIC	17.99
R ²	0.18
Max. R ²	0.24
Num. events	7
Num. obs.	181
Missings	0
PH test	0.49

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Robust Standard Errors in All Models

Table 2: *Structural Origins of Income Taxation: Model Used to Compute Simulations*

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