Structural Transformations and State Institutions in Latin America, 1900-2010

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April 26, 2017

Abstract

The paper proposes an alternative channel to explain the emergence of political and economic development in Latin America. Historically, agriculturalists had been a hegemonic group protected by institutions that originated in colonial times. These norms had survived due to institutional inertia, perpetuating their advantaged position. Building on the fiscal sociology and dual sector models, I argue that a structural transformation marked by a secular decline of agriculture and substantial expansion of manufacturing helped political development by promoting the emergence of an industrial political elite. Industrialization altered the status quo not by increasing incomes (*á la* modernization theory) but by supporting the rise of a political challenger. Importantly, the structural transformation required both sectors to grow in a balanced fashion, leveling both elites in their relative political and military capacities. Under egalitarian conditions to engage in conflict, there were no incentives to make war, and thus conflict was avoided generating a status of inter-sectoral cooperation. I use the Chilean and Argentinean cases to illustrate the theory. In an effort to suggest that this hypothesis could be generalized to other countries in Latin America, I provide a number of time series analyses (VAR models, impulse response functions and Granger-causality tests) for a dataset spanning approximately 100 years on agricultural and industrial sectoral growths.

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*I thank Robert Kaufman, Daniel Kelemen, Douglas Blair, Paul Poast, John Landon-Lane, Mark Pickup, Paul Kellstedt, Henry Thomson, Quintin Beazer and Ira Gang for all the helpful comments. I also thank the participants of the 75th Annual Conference of the Midwest Political Science Association, the School of Arts and Sciences and the Political Science Department at Rutgers for granting me a Pre-Dissertation Award (2016) that helped me to continue with this project. All errors are my own.

I. Sectoral Conflicts and Development

> *Practically all governments are engaged in promoting one [group]. There are [...] landlord governments against the peasants and the industrialists*
>
> Lewis [1965, 410]

The literature on political and economic development is vast. Without trying to survey all of it, there seems to be an agreement in that strong institutions cause better economic performance. For example North [1990, 3] asserts that the idea that "institutions affect the performance of economies is hardly controversial." However, most explanations focus property rights protection.[1] I find that this is a limitation since regimes that do not respect property rights (for example, dictatorships) grow at levels that sometimes even surpass democratic countries. While I still think that institutions matter for economic growth, this paper seeks to contribute to this literature by introducing an alternative channel, particularly, emphasizing the role of sectoral conflicts on political and economic development. I build on the *fiscal sociology* paradigm to argue that fiscal institutions are product of a sectoral conflict. In turn, borrowing from the *dual sector* model I document how the secular structural transformation (i.e. the gradual emergence of the industrial sector) triggered a major political transformation reverting the backward institutional order implemented since colonial times, producing long-term economic growth. More generally, this paper explains how political development is associated with economic growth. I use sectoral outputs from 1900 to 2009 to proxy the emergence of the industrial sector in a number of Latin American countries,[2] vector autoregressive models (VAR), Granger-causality tests and impulse response functions (IRFs). The results strongly suggest that before the income tax law, institutions were designed to give unfair advantage to the agricultural sector, locking countries in a backwards economic suboptimal equilibrium. The income tax law, as an institution that improved the overall state institutional capabilities reverted that. As a consequence, after the implementation of the income tax law countries show clear patterns of long-term economic growth.

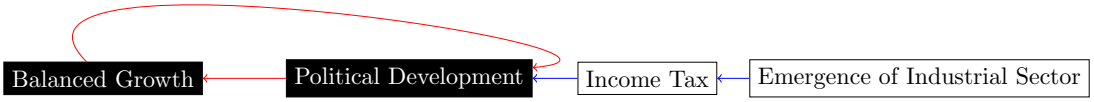
The political development literature has traditionally focused on socio-economic cleavages and potential alliances between a *homogeneous* ruling elite and politically excluded segments of the society, traditionally peasants or other disenfranchised groups such as the bourgeoisie. Moore [1966], Tilly [1992], Boix [2003], Stasavage [2008] and Acemoglu and Robinson [2009] are among the most prominent examples supporting this view.[3] In this paper I focus on political divisions *among* the

[1] Johnson and Koyama [2016].

[2] The actual data availability might vary by case.

[3] Acemoglu and Robinson [2009, 293] explain that 'all members of the elite have identical endowments so there is no heterogeneity among the elites.' However, later in the book (p. 289) they briefly consider preferences over

Figure 1: *Causal Mechanism*



elite. The elite-sector approach is hardly new. Just to mention some examples, O'Donnell and Schmitter [1986] emphasized the positive impact of elite outsiders on democratic transitions, Ansell and Samuels [2014] and Boix [2015] examine the role of economic inequality/equality among the elite on democratization, Waldner [1999] studies how the formation of a modern state should coincide with the incorporation of lower classes to produce developmental states, Saylor [2014, 8] looks at the "coalitional basis of state building" while Mares and Queralt [2015] examine how income taxation in Europe is associated with inter-elite conflicts, particularly between the landed elite and the industrial elite. While political economists have already recognized the relevance of sectoral conflicts and the structure of the economy, the focus has been on democratic development.[4] Using the same conflictual-sectoral approach as a starting point, the paper stresses how these structural conflicts are associated with institutional *and* economic development.

I argue that the emergence of the industrial sector lowered the levels of inter-sectoral inequality making possible higher levels of inter-sectoral contestation, forcing industrial and agricultural political elites to make institutional agreements. I identify one such compromise, the implementation of the income tax. Elsewhere I have argued that the rise of the industrial sector accelerated the implementation of the income tax law,[5] causing long-lasting positive impact on state institutions and political development.[6] In this paper I study how the implementation of the income tax set states in a path of political development causing long-term *modern* (i.e. 'balanced') economic growth (see Figure 1). Economic sectors not only shape the economic landscape. Given that each economic sector has a corresponding political arm, the *sectoral* conflict is also a *political* conflict.[7] Critically, balanced growth put both sectors in an equilibrium of economic interdependence, where no sector predominated. The political correlate is that if both sectors grow in a balanced fashion, no political elite has more power than the other. Importantly, long-run balanced growth implies the emergence of the industrial sector, but industrial expansion does not imply long-run balanced growth. For example, the emergence can be rapid followed by a progressive decay. This paper is concerned with

democracy of industrialists and agriculturalists.

[4] See specially Ansell and Samuels [2014] and Acemoglu and Robinson [2009].

[5] Bahamonde [2017b].

[6] Bahamonde [2017c].

[7] See Ansell and Samuels [2014] and Bahamonde [2017a].

the change in the institutional order that permitted *long-run* economic development.[8]

An elite divided on an *economic* cleavage should at the same time be divided on their *political* preferences, particularly regarding their attitudes towards taxation.[9] Taxation affects landowners and industrialists in a different way.[10] Agriculturalists will systematically resist it as land fixity increases the risk premium of their main asset.[11] In contrast, industrialists' preferences toward taxation are more elastic as capital can be reinvested in nontaxable sectors.[12] However, class conflicts are more likely to resolve in favor of direct taxation when income inequality *among the elite* is low.[13] When inequality among the elite is high, there are no incentives to cooperate, and rather elites rule in a monopolistic way. However, given that similar degrees of sectoral economic development can be converted into armies of similar capabilities,[14] elites will have incentives to make agreements rather than engaging in conflict when their economic/military capacities are similar. In other words, when levels of inter-elite inequality are low, war is more likely to exhaust all existent assets without producing positive outcomes for either sector,[15] putting then pressures to reach agreements instead of engaging in armed conflicts.

The argument considers that agriculturalists had been a hegemonic group protected by practices inherited from institutions originated in colonial times, and that subsequent institutional investments reverted this situation causing long-term economic growth. However, others have argued that the independence wars around in the 1800's contributed to the collapse of all colonial institutions, including the privileges the landowning sector had. For example Mahoney [2010, 191] explains that the "wars of independence were violent and destructive; they saw the collapse of the colonial fiscal system [...] and the elimination of the colonial political order."[16] However, the collapse of a number of institutions does not necessarily mean the collapse of the legacies of *the* colonial political economy. Capoccia and Kelemen [2007, 349] argue that "[e]ven where various institutions are interconnected, the occurrence of a critical juncture for one institution need not constitute a critical juncture with respect to all of its counterpart." Following their advice of finding "the decision-making process, [and] identify[ing] which decisions were most influential," I find in this paper that the landed elites did have privileges that the industrialists did not have *because* of the inertia of colonial institutions, specially in Chile. In fact, elsewhere I find that the implementation of the income tax was product of a series of inter-elite compromises that aimed to equate the political privileges of the two sectors,

[8] Bahamonde [2017b] is more concerned with the emergence/timing of the modern sector itself.
[9] See for example Llavador and Oxoby [2005].
[10] Acemoglu and Robinson [2009, 289].
[11] Robinson [2006, 512].
[12] Hirschman [1970] and Ronald Rogowski in Drake and McCubbins [1998, ch. 4]. However, see Bates and Lien [1985, 15].
[13] Tani [1966, 157] explains that the absence of "wealth groups" makes passing an income tax law easier.
[14] Boix [2015].
[15] Richard Salvucci in Uribe-Uran [2001, 48].
[16] See also Saylor [2014, 55] and López-Alves [2000, 27-28, 35-36].

putting countries in a path of political development.[17] In this paper I focus on the intertwined relationship between political *and* economic development.

While the process of state-building had started earlier[18] the implementation of the income tax was an important building block in this process.

The income tax did not just contribute to the state in revenue, it did so by triggering other state institutions that generated long term *political* development.[19] In this paper I expand on this idea by arguing that political institutions of state-building such as the income tax law set in motion a path of long-term *economic* development. In sum, when the elite structure was faint and the agricultural sector inefficient, by means explained in the next section, the emergence of the industrial sector was compromised or delayed. I claim that in these situations landowners were never challenged and there were less pressures to centralize the state, making further institutional investments less likely.

The crux of the argument is that an economic structural transformation characterized by "a secular decline of agriculture and substantial expansion of manufacturing"[20] imposed tight constraints on the way politics was run by the incumbent landowning class.

These gradual long-term changes not only altered the structure of the economy but also the balance of political power. Analytically, I consider sectoral conflicts the spring of fiscal development, which in turn translates into economic development.

While the agricultural sector dominated most of the economy, the landowning class controlled most of the politics.[21] In turn, the lack of an economic challenger prevented political contestation and further institutional investments. However,

The following section introduces the *dual sector model*, where I explain the mechanics of industrial expansion and why it is relevant for political development. Next I present the Chilean and Argentinean cases to illustrate the theory and to provide some historical context. The two cases exemplify different aspects of the argument. The Chilean case stresses the initial structural advantages the landowning sector had and the inter-sectoral competition aspects. The Argentinean case explains a recurrent issue in Latin American economic history, namely, whether the export-oriented and import-oriented sectors overlapped with the the agriculture/industry cleavage. Then, in an effort to suggest that this hypothesis could be generalized to other countries in Latin America, in the econometric section I provide evidence of different vector autoregressive models (VAR), Granger-causality tests and impulse response functions (IRFs) for a subset of Latin American countries and explain why when there were economic structural transformations there were also sectoral political conflicts and subsequent investment in institutional capacities. Lastly, I provide some final remarks.

[17] Bahamonde [2017b].
[18] See for example Kurtz [2013] and Soifer [2016].
[19] Humud (1969, p. 154) explains for the Chilean case that the income tax did generate considerable resources, and that "1930 would become second only to import duties in size," in Bowman and Wallerstein [1982, 451-452].
[20] Johnston and Mellor [1961, 567].
[21] See for the Chilean case Zeitlin [1984, 13], Bauer [2008, 45], Baland and Robinson [2008, 1748] and Best [1976, 56].

II. Structural Transformations and the Dual Sector Economy Model

> *When by the improvement and cultivation of land [...] the labour of half the society becomes sufficient to provide food for the whole, the other half [...] can be employed [...] in satisfying the other wants and fancies of mankind*
>
> Smith [1904, I.11.59]

The *dual sector* or *balanced growth* model explains the mechanics of economic modern growth,[22] by emphasizing the importance of macro-structural gradual transformations. The model argues that the economic system is divided into two sectors loosely defined as 'advanced or modern sector' or 'manufacturing sector,' and as 'backward or traditional sector,' or 'agriculture.'[23] The basic intuition of this paradigm is that in order for the industrial sector to develop, it needs *first* an efficient and strong agricultural sector. Contingent on efficient agricultural productivity, the industrial sector goes from a low-productivity sector to high-productivity, eventually surpassing the agricultural sector. If the agricultural sector lacks economic efficiency, the industrial sector will hardly develop, leaving the country in an economic trap. This literature is vast. While in this section I explain the core of it, there are many current theoretical and methodological applications and extensions of the dual sector model.[24] I claim that this model is relevant for political development since it explains the rising of the industrial economic sector which in turn nurtured the emergence of an industrial political elite which challenged the post-colonial status quo.

It was Lewis [1965, 151] who popularized the idea that "[t]he secret of most development problems is to maintain a proper balance between sectors." The dual nature of the economy has been widely accepted and forms part of "a long tradition in development economics."[25] And while dichotomizing the entire economy in just two sectors might sound as too much of an oversimplification,[26] I follow Dixit [1973, 325] in that the dual economy model provides a significantly better description of the

[22] Gollin et al. [2002, 160].

[23] Jorgenson [1961, 311]. Importantly, I follow Kuznets [1967, 87] in that "mining is combined with [...] industry because of the large scale of its productive unit, its close connection with manufacturing, and the distinctive trend in its share in product and resources." Similarly, Debowicz and Segal [2014, 237] includes mining within the industrial sector.

[24] Just to name a few examples, Thirlwall [1986], Mathur [1990], Hatton and Williamson [1991], Blunch and Verner [2006], Tiffin and Dawson [2003], Kanwar [2000] and McArthur and McCord [2017] study sectoral growth, shock persistence, and other related topics using the same theoretical framework and methodology I employ in this paper (or some variation of it).

[25] Kelley et al. [1972, 8].

[26] This is a stylized theory. Of course, in reality, there are other economic activities such as logging, mining and others. Given its dependence on capital, mining has always been considered industrial. The Chilean case illustrates this.

economy because "it reflects several vital social *and* economic distinctions."[27] Johnston and Nielsen [1966, 280] also explain that "[t]he reality found in most underdeveloped countries approximates this dichotomy [...] sufficiently." In fact, Lindert and Williamson [1985, 354] explain that the dual-sector model is "the dominant paradigm used by Third World observers." However, "balanced growth is almost axiomatic as a desirable objective, for both developed *and* under-developed countries."[28] For example, Bergquist [1986, 8] explains that "Colombia's two traditional political parties crystallized in the 1840's and reflected in many respects the dual nature of the Colombian economy." While this is a stylized model which approximates a good-enough description of reality, Dixit [1973, 326] is right in that a "major drawback of dualistic theories [...] is the total neglect of the service sector." However, the literature is consistent in that the third sector necessarily develops *after* the industrial sector is developed.[29]

Economic development depends on the emergence of the industrial sector which in turn depends on the development of a productive agricultural sector.[30] As Kuznets [1961, 59] puts it, "economic growth is *impossible* unless there is a substantial rise in product per worker in the agricultural sector."[31] Following Jorgenson [1961, 311], Ranis and Fei [1964, 59], Jorgenson [1967, 291], Skott and Larudee [1998, 279-280] and Vollrath [2009, 290], the industrial sector is assumed to use capital and labor (having increasing returns to scale), while the agriculture sector is assumed to use only land (which is fixed) and labor.[32] This implies that the industrial sector is *structurally* protected: even when the agricultural sector is efficient, *ceteris paribus*, it cannot grow faster than an efficient industrial sector. The fixity of land requires countries to industrialize in order to grow, and for that they need first an efficient agricultural sector. This insight is shared by many other development economists. Hayami and Yamada [1969, 105] for example argue that "[i]ndustrialization and modern economic growth are basically *conditioned* by the level of agricultural productivity."[33] There are two main reasons for why agricultural development is a prerequisite of industrial development: efficient agricultures are more likely to supply the industrial sector with cheap foodstuff and cheap labor. In Johnston [1951, 498]'s words, "[e]xpanded agricultural productivity releases people from the land for employment in industry [and] provides food for the growing population." This structural transformation is the key of economic growth. If the expansion of the agricultural sector is compromised, it will necessarily compromise the expansion of the industrial sector as well.[34] The

[27] Emphasis is mine.
[28] Streeten [1959, 169]. Emphasis is mine.
[29] Galenson [1963, 506-507, 513] and Baer and Herve [1966, 95-96].
[30] Johnston and Mellor [1961, 567] argue that this process "seems to be a necessary condition for cumulative and self-sustaining growth."
[31] Emphasis is mine.
[32] And while agriculture also needs capital (Federico [2008, 40]), its *main* input is land.
[33] Emphasis is mine.
[34] In fact Landon-Lane and Robertson [2003, 2] find that an important source of growth in developing economies is "derived through the reallocation of resources [particularly] by drawing labour moving out of traditional sector employment into the modern sector."

political correlate is that a weak inter-sectoral economic cleavage engendered a weak *political* elite structure, leaving the *agricultural* political elites uncontested. Institutional investment then is more likely to happen when levels of sectoral conflict due to sectoral equality/balance is high. As Hechter and Brustein [1980, 1085] explain, "state formation will be more likely to the degree that powerful individual actors form two groups on the basis of divergent economic and political interests."

The first reason for why a productive agricultural sector is key to industrial development is that more efficient agricultural techniques make agricultural production less labor intensive, allowing landowners to free workers which the industrial sector can rely on. The need for an improvement in agricultural production as a necessary step prior to industrialization "has been termed the 'prerequisite' hypothesis."[35] Technologies such as "crop rotation, pest control, seed breeding [and] fertilizer use [represent] the major potential source of agricultural labor productivity,"[36] increasing also "non-agricultural value added per worker."[37] Nicholls [1961, 339-340] shows that advanced industrial countries initially had relatively more developed and productive agricultural sectors. In fact, Gallo [1991, 57] finds that in Bolivia, *a primarily agricultural economy*, "[t]he tools employed in production were few and rudimentary, the use of fertilizers was minimal, and methods for conservation of the soil were practically unknown until the beginning of the 1950s." However, highly industrialized countries such as Japan, the U.K., the U.S.S.R. and Taiwan adopted *prior industrialization* very efficient agricultural technologies such as higher-yielding varieties, fertilizers and other activities that improved farm practices.[38]

Surplus of labor naturally leads to a reallocation of redundant workers into the industrial sector, which is the crux of economic development.[39] Nurkse [1953] in fact argues that development *means* to employ the surplus labor.[40] The literature coincides in that the 'natural role' of the agricultural sector is to provide labor to the industrial sector.[41] For example, Dixit [1973, 326] argues that the "agricultural sector *must* fulfill [...] its dual role of supplier of labour to industry and of food for the industrial labour force."[42] While Lewis [1954] in his canonical work argued that there existed an 'unlimited' supply of agricultural labor, a word of caution is in order. The meaning of the supposedly 'unlimitedness' of labor should *not* be taken literally, as in reality means *redundant labor force*.[43] In fact, Nurske [1961, 225] points out that the concept "is commonly used to denote all types of rural

[35] Kelley et al. [1972, 133].
[36] Ranis and Fei [1964, 62].
[37] McArthur and McCord [2017].
[38] Johnston and Mellor [1961, 571] and Johnston [1951, 507-508]. Similarly Caselli [2005, 723] explains that poorer economies have inefficient agricultural sectors which at the same time are the mayor source of employment.
[39] Ranis and Fei [1964, 7] and Leibenstein [1957b, 51].
[40] Similarly, Matsuyama [1991, 621-622] points out that "[i]ndustrialization [*consists of*] a shift of resources from agriculture to manufacturing."
[41] Ranis and Fei [1964, 114] argue that "labor reallocation [...] is the *inevitable* and *natural* consequence of the continuous expansion of agricultural labor productivity." Emphases are mine.
[42] Emphasis is mine.
[43] See Ranis and Fei [1964, 203] and Jorgenson [1967, 289].

unemployment."[44]

The second reason for why a productive agricultural sector is key to industrial development is because efficient techniques in agricultural production are able to supply cheaper foodstuff.[45] "It is *self-evident* that without increasing food output, the capitalist sector must remain in a stationary state."[46] Food surplus is a direct consequence of efficiency, and it is just as important as labor reallocation. In sum, as Kuznets [1961, 60] explains it, if "output per worker in agriculture does not rise substantially, economic growth in the first case will be stopped by scarcity of agricultural products, and in the second case by scarcity of labour."

The structural transformation affected the labor structure as well. In fact, Harris and Todaro [1970, 134-135] explain that while "the creation of an additional job in the urban area reduces agricultural output through induced migration," the opposite is not true.[47] This implies that agriculture-industry productivity differentials "may even increase with development."[48] Actually, Serrano and Pinilla [2016] find that in Latin America there has been a declining role of agricultural exports as industrialization levels have increased. That said, it is important to say that "the agricultural sector declines relative to the overall economy but continues to expand absolutely."[49] In other words, it is the "the proportional contribution of agriculture to the growth"[50] what decays, implying that in the long run the agricultural sector "must also grow,"[51] specially given the continuing dependence on a constant supply of food.[52] Next section presents two cases with special references to structural transformations and political development.

III. Brief Historical References: Chile and Argentina

Chile: A Story of Elite Competition and Compromises Historically, Chilean agriculturalists had been a hegemonic group protected by norms and institutions that originated in colonial times. Those norms had survived due to institutional inertia, perpetuating their advantaged position.[53] As Collier and Collier [2002, 106] argue, the "national government was dominated by [...] owners of large agricultural holdings,"[54] while Zeitlin [1984, 13] explains that "landowners controlled both the

[44] Or as Leibenstein [1957a, 102-103] puts it, "where the existing labor supply could cultivate more land without loss of efficiency." In any case, Sen [1966] explains that a number of important predictions made by the dual sector model do not need this assumption to hold for the model to work. On a separate note, Ranis and Fei [1964, 99], Skott and Larudee [1998, 280] and Fields [2004, 730] argue that a pool of *redundant* agricultural workers (a 'reserve army') is what prevents a rise in industrial wages.

[45] See Jorgenson [1961, 312] and Ranis and Fei [1964, 157].

[46] Ohkawa [1961, 21]. Emphasis is mine.

[47] See also Johnston and Nielsen [1966, 280].

[48] Kelley et al. [1972, 110].

[49] Nerlove [1994, 14].

[50] Kuznets [1961, 45].

[51] Ranis and Fei [1961, 534].

[52] Nicholls [1963, 2].

[53] This idea also applies for Mexico. "The principal source of its wealth was not its mines, Humboldt noted, but agriculture." Amaral and Doringo, in Uribe-Uran [2001, 13].

[54] See also McBride [1936, 15] who 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

vote and the labor power of the agrarian tenants [and] peasants [...] and this was the *sine qua non* of their continuing political hegemony." Similarly, Baland and Robinson [2008, 1748] explain that "[c]ongressional representation was heavily weighted in favor of rural districts." In the presidency also, landowners were the single most represented group.[55]

While on the one hand institutions, policies and other practices were biased against industrial elites, on the other, rapid industrial growth incentivized industrial elites to form pressure groups to offset the bias against them. The little public infrastructure that existed benefited the agricultural sector only. Zeitlin [1984, 41] explains that "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 Chico mining provinces." To address this situation, industrialists started to "form trade associations to engage in lobbying and propaganda."[56] Eventually, these interests groups turned into political parties.[57] These new groups, backed by their economic leverage, put pressures to open the political system in a way that allowed industrial elites to gain egalitarian political conditions and equal access to state power. While initially both elites confronted each other in two civil wars,[58] conflict was not sustainable over time. Given their relative similar degrees of economic development, both elites could mobilize armies with similar capabilities. Under egalitarian conditions to engage in conflict, there were no incentives to make war, and thus conflict was avoided generating a status of inter-sectoral cooperation.[59] War was then more likely to exhaust all existent assets, leaving no clear winners after the conflict.[60] Consequently, Chilean agricultural and industrial elites opted for a political compromise. The keystone of these inter-elite compromises was the implementation of the income tax in 1924, which marked the beginning of an institutionalization path. 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*."[61] The expansion of political rights *among the elite* and the rise of the industrial sector shared the same timing. As Collier [1977, 683] has pointed out, "the real story of Chilean industrialization belongs to the Parliamentary period," which goes from 1891 to 1925.

Both sectors were efficient. While some have argued that the agriculture sector was a backwards sector,[62] Robles-Ortiz [2009, 511] has been the main referent to argue the contrary. He explains that agriculturalists adopted different mechanization processes, remarkably increasing its productivity

dominated by families whose proudest possession is the ancestral estate."

[55] Bauer [2008, 45].

[56] Weaver [1980, 107].

[57] Collier and Collier [2002, 109].

[58] Zeitlin [1984, 23] argues that the civil wars challenged a "large landed property [elite against a] productive capital [elite]."

[59] Boix [2015].

[60] Richard Salvucci in Uribe-Uran [2001, 48].

[61] Carmenza Gallo, in Brautigam et al. [2008, 165]. Emphases are mine. She refers specifically to nitrate producers, one of the first industrial productions.

[62] Keller [1931, 231] argues that there existed in Chile a "lack of scientific and technical knowledge" in the agricultural sector. My translation.

and output. As predicted by the dual economy model, this led to a reallocation of labor, "especially in the 1870s with the onset of the nitrate economy [when] thousands of men left the countryside."[63] In fact, Segall [1962, 18] explains that the mining sector attracted so much labor that the countryside eventually run out of enough labor. He explains that by 1843, the landowning elite taking advantage of its advantaged political position would implement in Congress a law granting policeman the duty to *force* unemployed individuals without a known contract to work forcefully in the fields.[64] Moreover, the scarcity of rural labor around 1873 forced to pay laborers "twice as much as peons earned in the winter,"[65] exacerbating the inter-sectoral conflict.

Argentina: A Story of Structural Imbalances In Argentina, there were two elites as well. Traditionally, it has been argued that the economic cleavage was between an export-oriented sector and an import-oriented sector. Based on the observation of others, I consider the overlap between the export and agricultural sectors, and the overlap between the import and the industrial sectors. As Díaz-Alejandro [1966, 25] argues in his classic series of papers, "while the correspondence between exports and rural products, and between imports and manufactured goods has not been perfect [...] such correspondence has been quite close."[66]

This case presents an interesting paradox. The Argentinean industrial sector was weaker compared to the Chilean industrial sector, however the former grew faster than the later. As some have argued, there "is little disagreement among economists that the period from 1875 to the eve of World War I [was] the Golden Age [...] of Argentinean economic history."[67] However, as Bulmer-Thomas [2003, 136] puts it, Argentina "had a relatively backward industrial structure for a country of its income and wealth. *Indeed, industrial labor productivity was lower than in Chile* [...] *despite Argentina's superior income per head.*"[68] The paradox can be explained by Argentina's weak inter-elite structure, but particularly by the weakness of the industrial elite. The literature seems to agree on this point. Bulmer-Thomas [2003, 188] explains that among the factors that explain Argentina's failure was "a social infrastructure geared to agroexports [*and*] *a powerful rural elite*." A relatively powerful traditional sector suffocated the full potential of the modern sector, denying industrialists "the same status [the] agroexports" had.[69] And while the landed elites did promote industrialization via protectionist tariffs, they did so by imposing "modest tariff protection"[70] which moreover were "not always consistent."[71] Thus, while agriculturalists were more cohesive than industrialists, they

[63] Robles-Ortiz [2009, 499].
[64] Segall [1962, 18].
[65] Robles-Ortiz [2009, 503].
[66] The same idea can be applied to the Colombian case. McGreevey [1971] explains that the two major exports comprised two agricultural produce, tobacco (1845-1975) and coffee (1890-1930). Importantly, the "cultivation of coffee [...] created a class of agricultural smallholders." (241).
[67] Campos et al. [2016, 209].
[68] Emphases are mine.
[69] Bulmer-Thomas [2003, 143].
[70] Bulmer-Thomas [2003, 188].
[71] Bulmer-Thomas [2003, 143].

were still a weak class on its own. As others have argued, landowners had a hard time obtaining "certain types of inputs (fertilizers, tractors, etc.) which could conceivably have allowed it to react to the decline in the real prices [...] by increasing productivity."[72] Agricultural research was very limited too.[73] Not surprisingly, "in 1952 Argentina even had to spend precious foreign exchange to import wheat,"[74] suggesting a complete mis-allocation of agricultural resources, and overall, supreme inefficiency regarding food production.

In sum, these remarks suggest that *un*balanced economic growth is associated with inter-sectoral political disparities, compromising long-term economic growth and further investments in state institutions. In an effort to suggest that this hypothesis could be generalized to other countries in Latin America, next section provides evidence of different time-series models.

IV. Time Series Analyses: Vector Autoregressive Models and Granger Causality Tests

> *what a sector does is not fully attributable or credited to it but is contingent upon what happens in the other sectors*
>
> Kuznets [1961, 41]

> *Structural change is clearly an endogenous process, driven by a variety of economic forces [...] also in the statistical sense*
>
> Temple and Wößmann [2006, 212]

Granger-causality Tests The emergence of a new industrial sector rose a new politically disenfranchised elite who demanded political and economic reforms, ending years of political asymmetries. In exchange for these demands, the industrial sector accepted to be income-taxed, setting countries in a path of both political and long-run economic development. The income tax, as an institution that contributed to develop further state capacities and institutional development, should then be associated with long-term economic growth, and consequently with a secular relative decline of agriculture and substantial relative expansion of manufacturing. To confirm this hypothesis, the theory should pass a number of tests. First, *before* the inter-sectoral compromises (i.e., before the income tax law was implemented), political institutions and social norms inherited from the colonial

[72] Díaz-Alejandro [1967, 157].
[73] Díaz-Alejandro [1970].
[74] Díaz-Alejandro [1967, 157].

period were designed to allocate economic inputs (and hence *growth*) in a way that benefited the landowning class only. Hence, I expect the transference of economic inputs to go *from* the industrial sector *to* the agriculture sector, a *backwards* equilibrium as stated by the dual sector model. Second, *after* the income tax was implemented, we should see a *reversion* of the flow of inputs, generating growth *from* the agricultural sector *to* the industrial sector. In econometric terms, we should see that the income tax reverted the way in which one sector 'Granger-caused' the other.[75] Lutkepohl [2006, 42] explains that if some variable X forecasts variable Y (and not vise versa), X is said to 'Granger-cause' Y. According to Granger [1980, 349], this concept of 'causation' is based on the idea "that the future cannot cause the past."[76]

To test this hypothesis I utilize the MOxLAD data, particularly the *agriculture value-added* and *manufacturing value-added* variables.[77] The dataset spans from as early as 1900 to as late as 2010.[78] Table A1 specifies the available time-spans. Using secondary information, the table also states *when* the income tax was implemented, what the law was and its corresponding source(s).[79] Following Mahoney [2010, 5] I consider two 'advanced' economy countries (Chile and Argentina), two 'intermediate' countries (Mexico and Colombia) and two 'less advanced' countries (Guatemala and Nicaragua). Figure 2 shows the sectoral outputs for each country, both before and after the income tax law was implemented.

In Table 1 I test for Granger-causation, i.e. the directionality in which economic growth was produced both prior and after the implementation of the income tax law.[80] The table strongly suggests that the income tax caused a structural transformation in (almost) all 'developed' countries, namely Chile, Colombia and Mexico. In all these cases the income tax reverted the initial inter-sectoral growth equilibrium suggesting a contested elite structure, as the case of Chile conveys. Before the income tax law, industrial development Granger-caused agricultural development, and after the income tax law, the agricultural sector Granger-caused industrial development (all p-values are significant at the .05 level).[81] These results suggest that the implementation of the income tax was associated to the overthrowing of the political institutions and practices that permitted agricultural expansion at the expenses of the modern sector, and that the reversion of the original backwards macroeconomic structure set in motion a path of long-term economic development.[82]

[75] This is not an experimental design, and hence the term 'causation' should be taken loosely. As Beck [1992, 241] explains, cointegration is not causal.

[76] See Durr [1992, 197] for a similar definition.

[77] 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."

[78] According to Astorga et al. [2005, 790], this dataset provides extended *comparable* sectoral value-added series in constant purchasing power parity prices.

[79] Some countries implemented some kind of income tax before, however these laws lacked enforcement, they were weak or not at all followed. In Table A1 in the Appendix section I establish the year that the literature seems to agree for when the law was implemented and properly enforced.

[80] Specifically, the tests were computed after estimating the reduced form VAR specified in Equation 1.

[81] Except for the Mexico after the implementation of the income tax (p-value = .06).

[82] See specially next section.

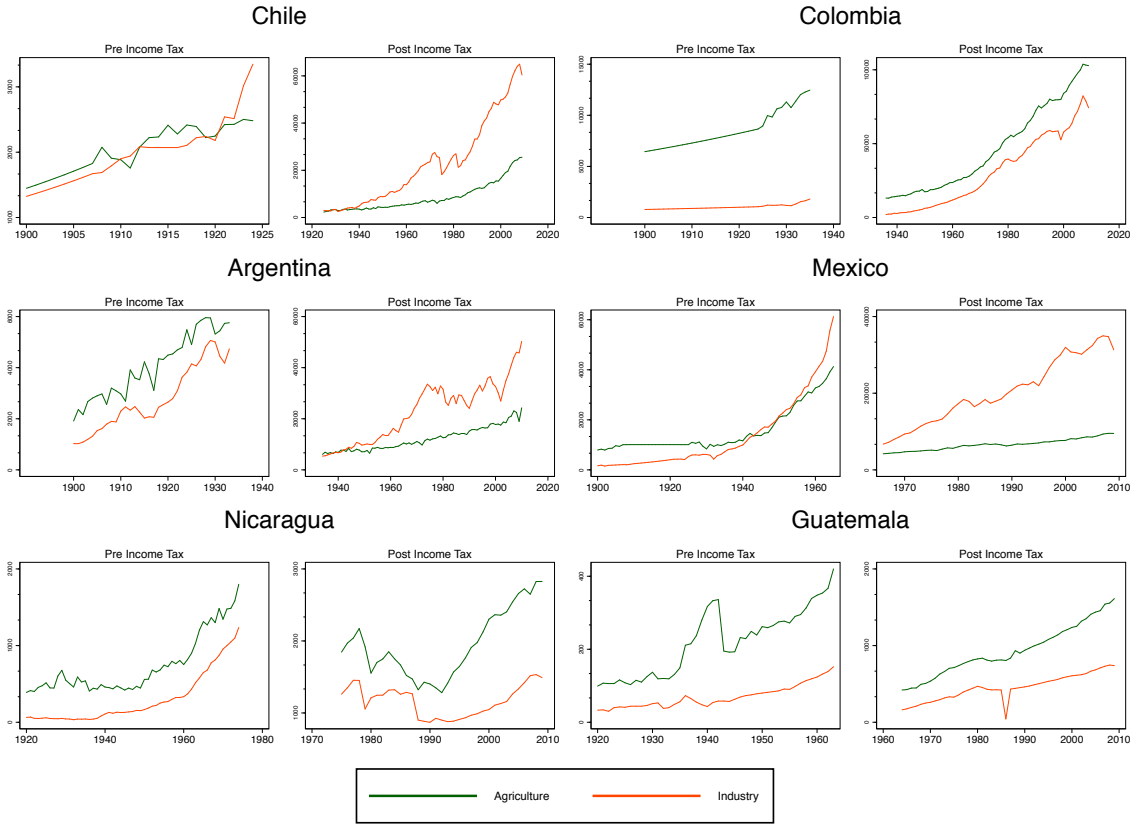


Figure 2: *Sectoral Outputs Before and After the Implementation of the Income Tax Law*

In Nicaragua and Guatemala the tests suggest the exact opposite (all p-values are significant at the .05 level).[83] The implementation of the income tax in these countries did *not* revert the initial backward macroeconomic equilibrium because when lately implemented, the tax did not reflect the inter-sectoral tensions, challenges and compromises proper of the contested political economies. The industrial sector never had enough economic leverage to politically confront the landowning elite (see Figure 2) and hence industrialists never posed credible threats to the status quo, relaxing the endogenous incentives to invest in state institutions. The Argentinian case is different. In line with the historical references, the Granger tests are inconclusive, and no significant results were found, suggesting a weak inter-sectoral cleavage structure.

Vector Autoregressive Models (VAR) and Impulse Response Analysis (IRF) Once we have determined the directionality of economic growth is associated with the imposition of the income tax law, it is necessary to establish the inter-sectoral long-run economic equilibrium. This

[83] Except for the pre income tax period test of Guatemala, which is significant at the .1 level.

Country	Pre/Post Income Tax	Sample	Directionality	chi2	P-value
Chile	Pre	1905 - 1924	Agriculture → Industry	3.55	0.47
			Industry → Agriculture	12.13	0.02
	Post	1928 - 2009	Agriculture → Industry	11.92	0.00
			Industry → Agriculture	5.37	0.07
Colombia	Pre	1902 - 1935	Agriculture → Industry	4.96	0.03
			Industry → Agriculture	10.44	0.00
	Post	1938 - 2009	Agriculture → Industry	4.32	0.04
			Industry → Agriculture	1.63	0.20
Argentina	Pre	1903 - 1933	Agriculture → Industry	4.19	0.12
			Industry → Agriculture	.42	0.81
	Post	1937 - 2010	Agriculture → Industry	.18	0.91
			Industry → Agriculture	1.37	0.50
Mexico	Pre	1902 - 1965	Agriculture → Industry	.73	0.39
			Industry → Agriculture	11.57	0.00
	Post	1969 - 2009	Agriculture → Industry	5.56	0.06
			Industry → Agriculture	1.32	0.52
Nicaragua	Pre	1923 - 1974	Agriculture → Industry	.48	0.79
			Industry → Agriculture	6.83	0.03
	Post	1977 - 2009	Agriculture → Industry	.014	0.91
			Industry → Agriculture	4.96	0.03
Guatemala	Pre	1924 - 1963	Agriculture → Industry	2.18	0.54
			Industry → Agriculture	6.72	0.08
	Post	1966 - 2009	Agriculture → Industry	.58	0.45
			Industry → Agriculture	6.05	0.01

Table 1: *Granger Causality Wald Tests*

relationship is an endogenous one.[84] If this endogeneity is not accounted for, the error term and the regressors will be correlated, and so OLS will be inconsistent. Additionally, growth rates are usually integrated. 'Unit root' or 'integrated' *I(1)* vectors[85] are time-series that "wander" up and down, yet they never revert to a given mean.[86] Moreover, two integrated vectors that are mutually endogenous, such as industrial and agricultural outputs, imply a 'cointegrated' CI(1) relationship, imposing additional statistical restrictions.[87] A "set of integrated time-series is said to be cointegrated if some linear combination of the series in levels produces a stationary series," or *I(0)*.[88] The economic literature generally coincides in that economic growth is an I(1) process, and

that sectoral development is a CI(1) process.

Integration and cointegration are assumptions that should be tested. The first step is to find strong evidence of integration in each of the series. In Table A2 I show several unit root tests.[89] The table indicates that all variables, periods, sectors and countries have I(1) processes. The second step is to find evidence of cointegration.[90] Substantively, cointegration would mean that there is a long-lasting mutual inter-sectoral economic *dependence*, allowing *both* sectors to grow in a balanced fashion. The political correlate of balanced growth is that both elites would have the same economic leverage to influence the state and policy outcomes. In turn, failure to find evidence of cointegration would imply coordination failures between the two sectors (economic backwardness), the delayed emergence of a political challenger, the lack of a sectoral political conflict, and consequently a politically unchallenged landed elite. Given that the maximum number of cointegrated vectors in bivariate cointegrated series is 1, I only test for the minimum number of cointegrated relationships.[91] I expect to find evidence of cointegration only in the 'developed' cases. Following Johansen [1988], Table 2 indicates that all 'developed' and 'semi-developed' countries have cointegrated series, while 'less developed' countries do not have cointegrated series.[92]

Cointegration "implies a particular kind of model" to estimate the series.[93] If traditional methods are used, given the interdependent relationship of these kinds of time-series, the results will be spurious.[94] I use the vector-autoregressive approach (VAR) specified in Johansen [1988] which among several advantages, is estimated via MLE. Another advantage is that VAR models do not need to specify the number of cointegrated vectors as opposed to error correction models.[95] Formally, I will model the next reduced form VAR in differences, one per country, both before and after the income tax law was passed:

$$\begin{aligned} \triangle M_{t_m} = &\quad \alpha_m + \beta_m \triangle M_{t-l} + \beta_m \triangle A_{t-l} + \epsilon_{t_m} \\ \triangle A_{t_a} = &\quad \alpha_a + \beta_a \triangle M_{t-l} + \beta_a \triangle A_{t-l} + \epsilon_{t_a} \end{aligned} \tag{1}$$

[84] Tiffin and Dawson [2003, 33].

[85] The order of integration could be higher than 1. However, for simplicity sake, I restrict my analyses to I(1) processes, which is the most common strategy in applied econometric analyses of time series.

[86] Box-Steffensmeier et al. [2014, 129].

[87] See Granger [1981] and Engle and Granger [1987]).

[88] Durr [1992, 193].

[89] I show the test statistic and its associated MacKinnon approximate p-value in parenthesis for the ADF and Phillips-Perron tests. Both trend and drift were tested in all tests, when applicable. As I did not find any differences, I show the test statistic with no trend nor drift and one lag. The lags in the KPSS test were selected via an automatic procedure. "+" indicates that the test is barely significant or non-significant.

[90] I use VAR regressions, which do not necessarily need cointegrated vectors (see Box-Steffensmeier et al. [2014, 161, 164]). Cointegration, however, is important from a substantive standpoint in this paper.

[91] Box-Steffensmeier et al. [2014, 165].

[92] Since I am interested in the long-run equilibrium, I do not split the sample before and after the implementation of the income tax.

[93] Wooldridge [2002, 571]. Cointegrated vectors, ECM and VAR models are widely common in political science too. Just to mention some examples, refer to Ostrom and Smith [1992], Krause [1997], Fish and Choudhry [2007], Haber and Menaldo [2011], Sobel and Coyne [2011], Herzer and Vollmer [2012, 489] and Blaydes and Kayser [2011].

[94] Ostrom and Smith [1992, 142-143].

[95] Box-Steffensmeier et al. [2014, 164].

Country	Number of Cointegrated Vectors (rank)	Restrictions	Lags	Log-Likelihood	Trace
Chile	at least 1		5	-1665.9736	0.3799
Argentina	at least 1		3	-1802.292	4.7657
Colombia	at least 1		2	-1805.6773	10.0076
Mexico	at least 1		4	-1978.1322	1.0274
Nicaragua	at least 0		2	-1020.221	11.5297
Guatemala	at least 0		3	-859.2802	16.5493

Table 2: *Johansen Tests for Cointegration*

Notice that in both lines the different dependent variables are expressed as a function of the *same* set of lagged independent variables. Since the number of lags l varies by country *and* time-span (i.e. before/after the income tax law), Equation 1 is in standard form. Table A3 describes the optimal lags specified in each country regression.[96] Most tests give satisfactory results.

Given that "it is often difficult to draw any conclusions from the large number of coefficient estimates in a VAR system,"[97] econometricians usually turn to the analyses of *impulse response functions* (IRFs), which are derived from VAR analyses.[98] "Impulse responses trace out the response of current and future values of each of the variables to a one-unit increase in the current value of one of the VAR errors."[99] Figure 3 shows four panels for each of the six countries, one for the response of agriculture to industrial growth (left column), one for the response of industrial growth to agricultural growth (right column), both before (top row) and after (bottom row) the implementation of the income tax. Similar to the Granger-causality tests, I expect politically 'developed' countries to have gone through a process of structural transformation reverting the initial backwards development trap. However, this time I am able to observe the intensity of the responses and how long it took them to die out. The X-axis is expressed in years. The Y-axis is *not* growth, but response to equilibrium. That is, the reaction of one sector once the other one is shocked.[100]

Figure 3 suggests that all 'developed' countries switched from a backwards equilibrium to a modern economic growth strategy after the income tax was implemented. For example, a shock to industrial growth in Chile before the tax has a positive and increasing effect on agriculture. However, after the income tax is adopted, a shock on industry has a negligible effect on agricultural output. This suggests that the political institutions before the tax were oriented to channel all economic

[96] The next information criteria were used to determine the appropriate lag length: final prediction error, AIC, Schwarz's Bayesian information criterion, Hannan and Quinn criterion as well as the corresponding likelihood-ratio test statistics. The same criteria are used to compute the optimal lag length in Table 2. The table also shows a summary of different post-estimation tests when the optimum lag length specified in the table was used. A check mark indicates that the tests was passed successfully, a check-minus mark indicates that the test was passed somewhat successfully, and a cross mark denotes failure to reject specification problems. Detailed results are available upon request.

[97] Lütkepohl and Krätzig [2004, 159].

[98] The raw VAR regression tables are available upon requests.

[99] Stock and Watson [2001, 106]. See also Lütkepohl [2005, 51].

[100] That is why the "shape of the [IRFs] indicate [...] the dynamic responses of the variables [and since the variables] are I(0) the impulse responses [...] should converge to zero" (Enders [2014, 364]).

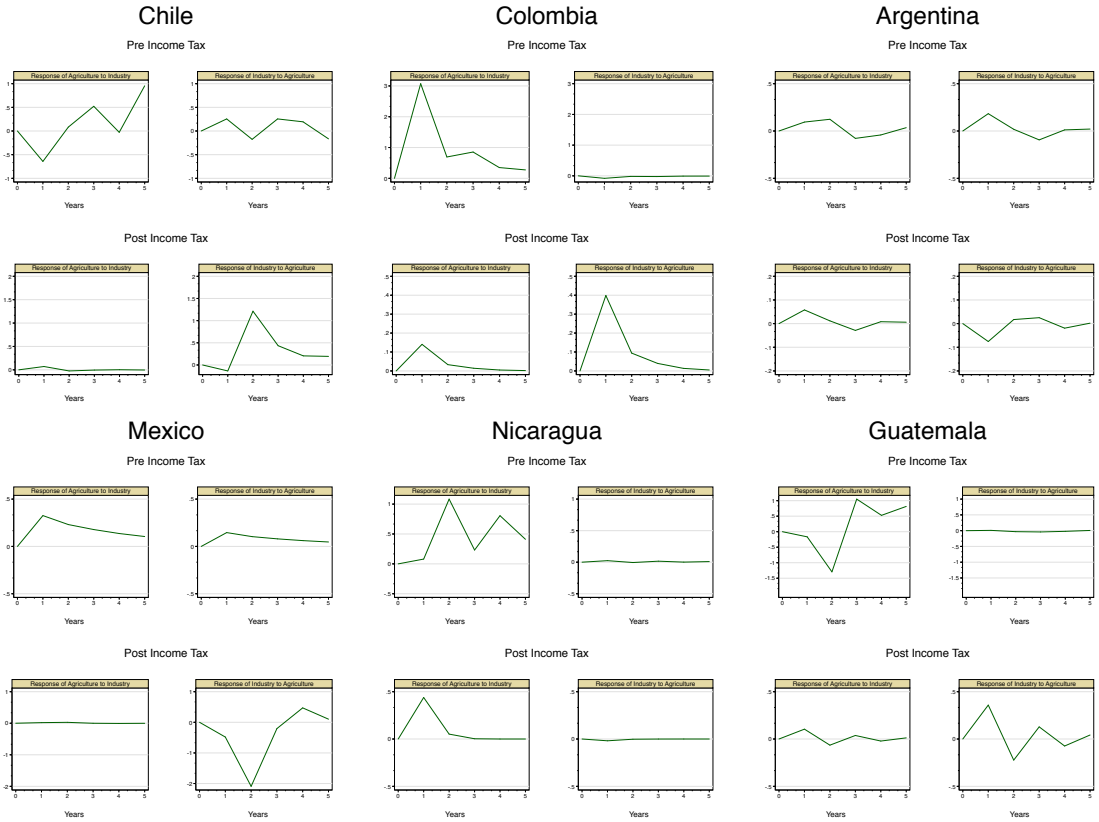


Figure 3: *VAR Impulse Response Functions: Sectoral Responses to Each Other's Growths*

resources in a way such that to give advantage to the agricultural sector and the landed elites. This situation was reverted after the income tax law. Colombia and Mexico show a similar pattern. While the analyses on the Argentinean case suggest that there is a long-term inter-sectoral relationship (Table 2), according to Figure 3 and Table 1 this relationship is weak, indicating weak inter-sectoral complementarity. Nicaragua and Guatemala are the prototypical backward cases. In each case, the economy was designed to develop the agricultural sector completely at the expenses of the industrial sector. This goes in line with the null findings of cointegration in Table 2 and Granger-causality tests in Table 1. In these cases the effect of a shock to agricultural output on industrial output is zero both before and after the implementation of the income tax law, suggesting a situation of *unbalanced* economic growth. The political correlate is the lack of a strong political challenger. Figure 2 suggests that the industrial sector was always week, indicating that their corresponding political elites were unable to contest the landowning class. In both cases the implementation of the income tax did not revert the initial backward macroeconomic equilibrium because when implemented, it did not reflect the inter-sectoral tensions, challenges and compromises proper of the contested political economies.

V. Discussion

Elites split along economic interests will use state power to influence certain policies and hence, growth and state building in different ways. I have argued that the emergence of the industrial sector caused political development by rising a political challenger. The argument differs deeply from modernization theory. What causes political development is not industrialization *per se*, but the development of a productive landed elite which supplied labor and cheap foodstuff to the modern sector, promoting *balanced* economic development between the *two* sectors. In turn, balanced growth politically empowered *both* economic elites. When there were weak inter-sectoral linkages and lack of economic complementarity between the two sectors, countries not only failed to grow, but also produced uncontested political environments, and investments in political institutions were less likely. The radical transformation of the economy is a precondition for political development.

Two brief historical references were discussed. The Chilean case stressed the importance of sectoral competition and the role of income taxation, while the Argentinean case focused on an important issue, namely, the overlap between the export/agriculture and import/industry, a recurrent topic in Latin American economic history. Time-series analyses, particularly, Granger-causality tests and VAR models (and IRF analyses) were presented in an effort to suggest that this theory can be applied to other countries in the region. There are good reasons to believe that the theory has general applicability to other cases.

VI. Appendix

Country	Available Data	Year Income Tax	Law	Source
Chile	1900 - 2009	1924	*Ley* 3996	Mamalakis [1976, 20] and LeyChile.Cl (official)
Colombia	1900 - 2009	1935	*Ley* 78	Figueroa [2008, 9]
Argentina	1900 - 2010	1933	*Ley* 11682	Infoleg.Gob.Ar (official)
Mexico	1900 - 2009	1965	*Ley de Impuesto sobre la Renta*	Díaz González [2013, 130-133] and Diario Oficial (official)
Nicaragua	1920 - 2009	1974	*Ley* 662	Legislacion.Asamblea.Gob.Ni (official)
Guatemala	1920 - 2009	1963	*Decreto* 1559	Instituto Centroamericano de Estudios Fiscales [2007, 165]

Table A1: *Sample, Data Available and Year the Income Tax was Implemented*

Country	Time Frame	Sector	Augmented Dickey-Fuller	Phillips-Perron	KPSS	Conclusion
Chile	Pre	Agriculture	-1.185 (0.68)	-1.241 (0.66)	.107^{+}	I(1)
		Industry	2.310 (0.99)	2.556 (0.99)	.113^{+}	I(1)
	Post	Agriculture	4.557 (1.00)	5.40 (1.00)	.289	I(1)
		Industry	0.908 (0.99)	1.458 (0.99)	.249	I(1)
	All	Agriculture	5.521 (1.00)	6.722 (1.00)	.31	I(1)
		Industry	1.582 (0.99)	2.305 (0.99)	.314	I(1)
Colombia	Pre	Agriculture	2.709 (0.99)	2.414 (0.99)	.204	I(1)
		Industry	2.103 (0.99)	3.257 (1.00)	.183	I(1)
	Post	Agriculture	2.392 (0.99)	3.156 (1.00)	.282	I(1)
		Industry	0.520 (0.98)	1.044 (0.99)	.241	I(1)
	All	Agriculture	4.256 (1.00)	5.893 (1.00)	.372	I(1)
		Industry	1.674 (0.99)	2.707 (0.99)	.374	I(1)
Argentina	Pre	Agriculture	-0.849 (0.80)	-1.201 (0.67)	.0801^{+}	I(1)
		Industry	-0.495 (0.89)	-0.378 (0.91)	.115^{+}	I(1)
	Post	Agriculture	1.197 (0.99)	1.093 (0.99)	.277	I(1)
		Industry	0.228 (0.97)	0.381 (0.98)	.0901^{+}	I(1)
	All	Agriculture	1.484 (0.99)	1.401 (0.99)	.332	I(1)
		Industry	1.007 (0.99)	1.237 (0.99)	.183	I(1)
Mexico	Pre	Agriculture	4.601 (1.00)	5.552 (1.00)	.288	I(1)
		Industry	5.803 (1.00)	10.776 (1.00)	.29	I(1)
	Post	Agriculture	0.599 (0.9876)	0.497 (0.99)	.109^{+}	I(1)
		Industry	-1.255 (0.65)	-0.982 (0.76)	.113^{+}	I(1)
	All	Agriculture	3.431 (1.00)	3.607 (1.00)	.341	I(1)
		Industry	0.672 (0.99)	2.020 (0.99)	.367	I(1)
Nicaragua	Pre	Agriculture	2.473 (0.99)	2.355 (0.99)	.25	I(1)
		Industry	4.958 (1.00)	9.100 (1.00)	.244	I(1)
	Post	Agriculture	-0.154 (0.94)	0.154 (0.97)	.2	I(1)
		Industry	-1.237 (0.6577)	-1.176 (0.68)	.189	I(1)
	All	Agriculture	0.636 (0.99)	0.759 (0.99)	.116^{+}	I(1)
		Industry	-0.164 (0.94)	-0.090 (0.95)	.123	I(1)
Guatemala	Pre	Agriculture	-0.393 (0.91)	-0.343 (0.92)	.0639^{+}	I(1)
		Industry	1.358 (0.99)	1.704 (0.99)	.199	I(1)
	Post	Agriculture	1.786 (0.99)	1.965 (0.99)	.162	I(1)
		Industry	-0.998 (0.75)	-1.352 (0.61)	.0915^{+}	I(1)
	All	Agriculture	3.349 (1.00)	3.714 (1.00)	.321	I(1)
		Industry	0.413 (0.98)	0.017 (0.96)	.288	I(1)

Table A2: *Unit Root Tests for Agricultural and Industrial Growth*

Country	Time Frame	Number of Lags	LM	Normally Tests			Stability Condition
				Jarque-Bera	*Skewness*	*Kurtosis*	
Chile	Pre	4	✓	✓	✓	✓	✓
	Post	2	✓	✓⁻	✓⁻	✓⁻	✓
Colombia	Pre	1	✓⁻	✗	✗	✗	✓
	Post	1	✓	✓⁻	✓⁻	✓⁻	✓
Argentina	Pre	2	✓	✓	✓	✓	✓
	Post	2	✓	✓⁻	✓	✓⁻	✓
Mexico	Pre	1	✓	✓⁻	✓⁻	✓⁻	✓
	Post	2	✓	✓	✓	✓	✓
Nicaragua	Pre	2	✓	✓⁻	✓⁻	✓⁻	✓
	Post	1	✓	✓⁻	✓⁻	✓⁻	✓
Guatemala	Pre	3	✓	✗	✓⁻	✓⁻	✓
	Post	1	✓⁻	✓⁻	✓⁻	✓⁻	✓

Table A3: *Lag Length and Post-Estimation Results*

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