Economic History and Cliometrics Lab

Working Paper # 17

Local Impacts of Economic Liberalization:

Evidence from the Chilean Agricultural Sector

JOSÉ IGNACIO CUESTA

FRANCISCO A. GALLEGO

FELIPE A. GONZÁLEZ

This Version: September, 2013

INSTITUTO DE ECONOMÍA
FACULTAD DE CIENCIAS ECONÓMICAS
Y ADMINISTRATIVAS

Economic History & Cliometrics Lab

www.ehcliolab.cl

Economic History and Cliometrics Laboratory Working Paper Series

The EH Clio Lab WP series disseminates research developed by lab researchers and students quickly in order to generate comments and suggestions for revision or improvement before publication. They may have been presented at conferences or workshops already, but will not yet have been published in journals.

The EH Clio Lab is a research group that applies economic tools –theory as well as quantitative tools applied in economics- to the study of economic history. The current two main research topics: (i) "The Republic in Numbers" and (ii) papers on more specific historical issues and problems, using data both from the República and other sources. The latter consists in the collection and construction of a large number of statistical series about Chile`s development process during the past two centuries.

The EH Clio Lab receives funding from CONICYT / Programa de Investigación Asociativa (Project SOC 1102), Republic of Chile.

Local Impacts of Economic Liberalization: Evidence from the Chilean Agricultural Sector
José Ignacio Cuesta, Francisco A. Gallego and Felipe A. González
Economic History and Cliometrics Lab Working Paper # 17
September, 2013

Abstract

What are the local impacts of an economic liberalization? We try to answer this question exploiting the fact that different counties had different effective rates of protection before the trade liberalization process - that made tariffs low and uniform- started. Using a novel dataset from agricultural censuses over a period of 50 years we find that agricultural output growth and specialization increased by more in counties that were initially more unprotected by the tariff structure, while average plot size and land concentration decreased after this process in those counties. Inversely, we find that agricultural output growth decrease for initially more protected counties. Effects are both economically and statistically significant and imply relevant resource reallocation processes within agricultural production, which we describe in terms of changes in inputs demand patterns, and changes in productivity.

JEL codes: F13, O18, O19, O24

Keywords: Trade Liberalization, Chile, Agriculture, Tariffs

Local Impacts of Economic Liberalization: Evidence from the Chilean Agricultural Sector*

José Ignacio Cuesta
University of Chicago

Francisco A. Gallego
Pontificia Universidad Católica de Chile and EH Clio Lab

Felipe A. González
U.C. Berkeley

September, 2013

Abstract

What are the local impacts of an economic liberalization? We try to answer this question exploiting the fact that different counties had different effective rates of protection before the trade liberalization process –that made tariffs low and uniform– started. Using a novel dataset from agricultural censuses over a period of 50 years we find that agricultural output growth and specialization increased by more in counties that were initially more unprotected by the tariff structure, while average plot size and land concentration decreased after this process in those counties. Inversely, we find that agricultural output growth decrease for initially more protected counties. Effects are both economically and statistically significant and imply relevant resource reallocation processes within agricultural production, which we describe in terms of changes in inputs demand patterns, and changes in productivity.

*Paper prepared in honor of Professor Vittorio Corbo, a great economist, teacher, mentor and role model for several generations of economists at PUC-Chile and elsewhere. His teachings and research on the effects of economic policy on economic outcomes in Chile (e.g. Corbo 1985; Corbo et al. 1991; Corbo et al. 1995; Corbo 1997; Corbo et al. 2005, just to mention a few) inspired the writing of this paper. We would like to thank José Miguel Sánchez (our discussant) and Ricardo Caballero and Klaus Schmidt-Hebbel (the editors) for comments, and Carlos Alvarado, Amanda Dawes, Daniela Marshall, Guillermo Marshall, and Antonia Paredes for superb research assistantship, and the CONICYT/Programa de Investigación Asociativa SOC 1102 for financial support. The usual disclaimer applies.

1 Introduction

Protectionist trade policies aim at protecting some sectors –typically but not exclusively manufacturing– from international competition. In doing so they tend to produce unintended consequences. In particular, they tend to create some *taxed* sectors that use protected inputs, typically in the agriculture sector, and end up facing *negative* effective rates of protection (ERP hereafter). In this way protectionism distorts the allocation of resources and creates disincentives for the production of some goods. This was the case of the tariff structure in Chile before the massive process of economic and trade liberalization that started in the mid 1970s. Before the liberalization period, average tariffs reached levels as high as 220% with also a high dispersion and with the existence of several non-tariff barriers (NTBs hereafter) that after 1975 were quickly eliminated.[1] This tariff structure create a lot of heterogeneity in the ERP between and within sectors. For instance, while agriculture had negative ERPs (about -27% in 1960-1969, according to Hachette 2011), sectors outside agriculture had positive high ERPs (of about 73% according to Hachette 2011).

In this paper, we take advantage of this heterogeneity in ERPs across goods, and the fact that different areas in the country produced different goods, to study how the decrease in the level and dispersion of tariffs affected agriculture production and other outcomes at the local level. This way we exploit the fact that counties with different conditions for the production of different goods were heterogeneously affected by the decrease in tariffs. In this sense, we take a "differential exposure approach" (Goldberg and Pavcnik 2007), which relies on the fact that counties are heterogeneously affected by the trade liberalization process given their different production structures, and is closely related to a paper by Topalova (2010), which studies the local effects of trade liberalization in India after the liberalization period in the early 1990s.[2] The cost of using this approach is that we cannot identify the effects of liberalization on the *overall* growth of the country. In particular, we study what happened to the production of sectors that were initially either taxed or protected by the tariffs structure, either through effects on the intensive margin or effects on productivity. Thus we only address in this paper partial equilibrium effects of trade liberalization.

To measure agriculture output, we use agriculture census information to construct a measure of agriculture production at the county level for the pre-liberalization (1955 and 1965) and post-liberalization (1997 and 2007) periods. To measure the effective rates

[1] See Lederman (2005) for a detailed description of the liberalization process.

[2] This approach assumes some degree of imperfect mobility of factors (in particular labor) across different sectors, which might be adequate in the case of developing countries (see Topalova 2010 for a general discussion and Bruhn and Gallego (2012) for a discussion on the case of the Americas).

of protection we use information for three sub-sectors from Hurtado et al. (1990, HMV hereafter): fruits, livestock, and primary products, and from a fourth from De la Cuadra (1974) (DLC hereafter): forestry. Next, using production information for each county, we construct an index of production-weighted ERP for each county.

In terms of the main results of the paper, we find that ERPs have an economically and statistically significant effect on agriculture output. Increasing *negative* ERP in the pre-liberalization period by one standard deviation increases post-liberalization output growth by about 12 log points when considering total output. In contrast, a similar calculation for counties having *positive* ERPs before liberalization implies a decrease in output growth by about 32 log points. This result confirms that some areas of the country were effectively protected before liberalization and that this protection implied higher than efficient production levels. However, we find evidence that while in the case of the negative ERPs (i.e. initially taxed areas) the output expansion operates both though effects on the intensive margins and on productivity (TFP) improvements, in the case of counties facing positive ERPs (i.e. initially protected areas) the output decrease is mostly due to effects on the intensive margin with no noticeable effects on TFP levels.

We also find that not only production increased in the counties benefiting from the elimination of negative ERPs, but also that there was an increase in output specialization. This probably reflects the fact that these counties, when ruled by the right incentives in an open economy, moved towards a higher specialization in the production of goods in which they have comparative advantage. This is another positive effect of the trade liberalization process, as counties could benefit from this specialization. However, we cannot measure how much of this increase in output is due to the increase in efficiency.

This paper comes to complement three strands of the literature. First, this paper adds to an incipient literature on the local effects of liberalization on economic activity and other broader development indicators. This strand includes papers by Topalova (2010), Edmonds et al. (2010), Khandelwal and Topalova (2011), among others,[3] all of which study the Indian case and exploit changes in tariffs structure across time and industries in order to estimate local impacts of trade reforms. The main difference between theirs and our approach is that, in contrast to the case of India, in the case of Chile the trade reform mostly took to zero the negative ERPs existent in the pre-reform period, thus providing a cleaner experiment for testing the impact of tariffs reductions in local contexts.

Second, we complement the empirical literature on the effects of liberalization on economic growth and other economic outcomes in Chile. This area is vast and takes different approaches going from time-series analyses (e.g., Rojas et al. 1997; Coeymans

[3]For instance, McCaig (2011) uses a similar approach for estimating the impact of tariffs reduction in Vietnam over different poverty and demographic variables.

1999; Fuentes et al. 2006, Schmidt-Hebbel 2006) to detailed studies using longitudinal information at the sectoral level (e.g. Corbo et al. 1991, Pavcnik 2002 and Alvarez and Fuentes 2003 for productivity effects in the manufacturing sector and Beyer et al. 1999 and Gallego (2012) for the effects of trade liberalization on the skill premium).[4] This paper adds a new point of view to the empirical results by presenting empirical estimates of the effects of the trade reforms on agriculture output at the county level. We think this contribution is important as our analyses deals in a better way with endogeneity issues and also adds the regional dimension to an area with few studies looking at the regional effects of the Chilean trade reform.[5] However, one limitation of our dataset is that we cannot identify clearly the effects of the trade reforms on *productivity* from the effects on total output.

Finally, we also contribute to the literature on the computation of ERP for Chile in the agriculture-forestry sector (Balassa 1971, Behrman 1976, De la Cuadra 1974, Varas 1975, and Hurtado et al. 1990 just to mention a few). In particular, we compute ERPs for different counties of the country. This contribution is important as we do find significant variation across different sectors and present some empirical analyses to identify some empirical correlates to these measures.

The rest of the paper is organized as follows. Section 2 presents a brief description of the historical background of Chilean trade policies. Section 3 presents the data construction and Section 4 some descriptive statistics of our measures of production and ERPs at the local level. Empirical results on the effect of the trade reform on agriculture output and other economics outcomes are in Section 5. Finally, a discussion of results and concluding remarks are in Section 6.

2 Historical Background of Chilean Trade Policy[6]

Before the 1950s, trade policy was characterized by multiple instruments (quotas, tariffs, multiple exchange rates) that aimed to protect the economy (Ffrench-Davis, 1973). According to Lederman (2005), this process started in the late and early 1920s, when, using econometric techniques, he finds the main structural break in trade-related variables.

[4]Some papers going back to Harberger (1959), Varas (1975) and Coeymans (1978) use (different types of) models to compute the potential effects of trade liberalization on different economic outcomes such as input and output levels and growth.

[5]One exception to this is the paper by Pardo and Meller (2002), who find the speed of GDP converge increases in regions with bigger increases in trade openness.

[6]This is only a brief description of the historical background of the Chilean trade policy. Many papers present more detailed description (e.g., Corbo et al. 1995, Corbo 1997). The more up-to-date source of information is Lederman (2005). The book presents a detailed description of the political economy of trade policies in Chile since the beginning of the nineteenth century up to the present.

This process was consolidated in the so-called industry-substitution industrialization (ISI) period during the Radical period covering from 1938 to 1952 (with the Radical Governments of Pedro Aguirre Cerda 1938–1941, Juan Antonio Ríos 1942–1946, and Gabriel González Videla 1946–1952).[7] The policy objective was to reach a vigorous growth path (see Prebisch 1950 for an example). However, only 10 years later there was a general feeling that protectionism was not the adequate policy to reach economic development. Even Raúl Prebisch, a vigorous defender of protectionist policies after the Great Depression, acknowledge this a couple of years later when he argued that protectionism ("excessive tariffs duties and restrictions") "has deprived the Latin American countries of the advantages of specialization and economies of scale" (Prebisch 1963, cited by Hirschman 1968). The first attempt to move towards a relatively open economy was made by the Klein-Saks mission during the 1950s during the government of Carlos Ibañez del Campo. However, their recommendations were not particularly effective in terms of results (Ffrench-Davis, 1973). After several attempts to move away from protectionist policies, the liberalization process took place during the mid 1970s.

Lederman (2005) classifies the period 1927–1956 as the institutionalization of protectionism, the period from 1956 to 1973 as one of macroeconomic instability and delegitimization of protectionism, and the period after 1973 as the period of unilateral trade liberalization. Figure 1 presents the average tax on imports and exports during the XX century (Díaz et al., 2010). We can see in this figure the policy volatility during the 1950s and 1960s, partly reflecting different policies that did not had the expected results together with a situation of serious macroeconomic instability.[8] It is also evident the sharp liberalization process that reduced the average tax before 1980.

Another central characteristic of trade policy during the pre-liberalization period is the high dispersion in tariffs and, therefore, ERPs in different sectors. Lederman (2005) identifies that while the mode of tariffs in 1973 was about 90%, the maximum tariff could be as high as 220% (and covering about 8% of all the products). In addition, there were a number of NTBs in operation. The rationale for this variance in the treatment of different sectors come from the idea to favor some sectors: (i) manufacturing over agriculture and agriculture over mining and industries producing intermediate goods (until the 1960s); (ii) import substitution over export promotion; and (ii) goods imports over non-good international transactions (Behrman, 1976). In particular, the most protected subsectors tended to be the traditional, "easy" import-substitution ones. These industries started

[7] See Hirschman (1968) for the main characteristics of the ISI process in Latin America, its evolution, and the principal difficulties it encountered during its implementation.

[8] Actually, Lederman (2005) presents quantitative and qualitative evidence suggesting that governments during the 1950s and 1960s were very active in implementing policies that *both* decreased *and* increase trade protection.

to receive specific protection in most cases since the 1897 tariff Law and consolidated their protection levels even before the Second World War (Behrman, 1976).

While the implementation of the trade reform started in the mid 1970s under the Pinochet dictatorship, the antecedents to that policy change started some years earlier. The main economic program was developed some time after the right wing candidate Jorge Alessandri lost the 1970 presidential election against the socialist Salvador Allende, in the middle of an economic and social crisis. The authors of this program included some of those who would become Finance Ministers during the Pinochet regime, Sergio de Castro and Sergio De la Cuadra. Reforms proposed in the so-called "Program for Economic Development" were radical in shape and scope.

The liberalization process occurred mainly between 1974 and 1990. Although at the beginning of the process the government did not have a clear picture of the deepness and timing of the liberalization, in the first five years of the process all quantitative restrictions and exchange controls were reduced from 100% to a uniform 10% tariff (except automobiles) in 1979 by the Finance Minister Sergio de Castro. However, there was a short period in which tariff increased to 35% after the financial crisis of 1983-84. Finally, tariffs came down reduced again to 11% in 1991 (Edwards and Lederman, 1998).[9]

This process was not isolated, as it was implemented together with several reforms to eliminate a persistent inflationary process, to modernize the financial sector, and with a massive privatization program.[10] The program to implement the reforms was divided into two parts: diagnosis and implementation. The specific points of the trade reform included: (i) engineer a real exchange rate depreciation, (ii) implement a crawling peg exchange rate regime, (iii) reduce import tariffs to a uniform level, (iv) eliminate all import licenses and prohibitions and (v) implement export promotion schemes. However, it was not explicit about the timing and speed of these reforms (Corbo et al. 1995 and Edwards and Lederman 1998).

It is important to stress that the liberalization process in Chile was always thought to reduce tariff towards a uniform structure. For instance, Harberger (1991) argues that the existence of different distortions across industries is costly because it enables different economic-interest groups to lobby for specific trade policies for their supposedly "strategic" sector. Thus, trade barriers were not only reduced but also simplified in terms of its structure, reducing their dispersion across products.

This big trade policy change that decreased the average *and* dispersion of tariffs provides us with a significant shock that affects in a different way different counties. In particular, as we document below, before the reform there was a high variance in

[9]This path of liberalization is clearly reflected in Figure 1.

[10]See Harberger (1985), Edwards and Edwards (1991), Bosworth et al. (1994) and, especially, Corbo et al. 1995 for a deeper analysis of these reforms.

effective rates of protection across sectors and, therefore, across counties. Thus, the liberalization period that drastically reduced most tariffs to a uniform level implies that different counties where affected by changes in trade policy with different intensities. We exploit exactly that cross-county variation to identify differential effects of the trade liberalization period on economic outcomes at the local level.

3 Data Construction

3.1 Output and Specialization

We use output measures constructed using information available in the agricultural censuses of 1955, 1965, 1997 and 2007,[11] which were applied by the Chilean Institute of Statistics (INE) and information on prices taken collected in the INE's wholesale prices series. The censuses provide information for a subset of products on quantity of production and surface used in the production process, which we use to build county level measures of output for the sectors of forestry, fruits, livestock and primary products. We value each of the products at what we call long-term undistorted prices (i.e. the average price of each type of product over the 1993-2006 period) and use them to compute total and sectoral output changes and growth rates for all rural counties located between regions IV and X of Chile. We focus in the rural counties in this part of the country because they concentrate almost all the agricultural activity of the country. We end up having information for about 214 counties.[12]

Using this output dataset we construct indicators of specialization for each county, which we will use to discuss potential impacts of trade liberalization on specialization patterns across counties. In particular, we construct two specialization variables: firstly, we simply use a dummy indicator for each sector that equals 1 when a county is specialized in a determined sector at a determined period (i.e., it is the sector with the highest share of production); and secondly, we build Herfindahl-Hirshmann indexes for sectoral output concentration in each county at each period.

[11] These are the only censuses presenting county-level information. The agricultural censuses between 1965 and 1997 do not include county-level information.

[12] Given the changes in county boundaries and the creation and consolidation of some counties in Chile, we created a set of counties that keep the same information over the time period included in the analysis. This implies that in some cases we have to merge modern counties to make the data consistent with the 1955-1965 county definitions and boundaries.

3.2 Quantifying Agricultural Trade Distortions

In this section we present the construction of an index of effective rate of protection (ERP) at the *county* level. We use ERPs, because they capture effects of tariffs on both the final and input prices. In addition, the local dimension of the index is very important, as trade barriers will unevenly affect the production in different geographical zones depending on whether the products produced are relatively protected or unprotected by trade tariffs. Thus, we construct a local ERP index that tries to capture the unequal effects of the tariffs on production in different counties within the country.

3.2.1 Effective Rates of Protection

Several papers have constructed ERP for several goods and sectors in Chile (a non comprehensive list includes Balassa 1971; De la Cuadra 1974; Varas 1975, Behrman 1976 and Hurtado et al. 1990, among others). We base our computations in DLC and HMV.

ERPs are defined by the authors in the following way:

$$\text{ERP} = \frac{V_A^i - V_A^{i*}}{V_A^{i*}}$$

where V_A^i is value added per unit of product, at the prevailing prices; $V_A^i = P_i - \sum_i P_j a_{ij}$, where P_i is actual price of the final good i, P_j is actual price of input j, and a_{ij} is the amount of input j needed to produce one unit of good i. On the other hand, $V_A^{i*} = P_i^* - \sum_i P_j^* a_{ij}$, where P_i^* is the undistorted price of final good i, and P_j^* is the undistorted price of input j. The calculations also include adjustments for exchange rate differences, as follows:

$$\begin{aligned} P_i^* &= \frac{P^i}{(1+t^i)} \frac{E^*}{E_0} \\ P_j^* &= \frac{P^j}{(1+t^j)} \frac{E^*}{E_0} \end{aligned}$$

with t^i and t^j being the import tariffs on product i and input j respectively. Given the way in which the ERPs are estimated, a negative value indicates a taxed industry and positive one a protected one. E^* and E_0 are introduced to consider the potential effects of liberalization on the exchange rate. HMV construct ERPs for 1969, which they argue is a "representative year in terms of output mix" and in their calculations they include 43% of the total agriculture production. Calculations by DLC for the forestry sector correspond to the second half of the 1960s, and are adjusted in order to make them comparable with HMV's calculations.

3.2.2 The Index

To obtain an index for each county we take the following steps:

1. Using the information from the agricultural censuses, we obtain the proportion of the total production that corresponds to each of the four subsectors we consider for each year.

2. We use the values calculated by HMV in order to obtain an ERP for Fruits, Livestock and Primary Products; and the values calculated by DLC in order to obtain an ERP for Forestry.

3. Finally, we calculated weighted averages of the ERPs across counties and time, where the weights are the shares of the total output represented by each subsector *before* the reform was implemented (i.e. including output information from the 1955 and 1965 censuses).

Therefore, the ERP index we use interacts differences in the output mix through counties and time with ERPs in each subsector:

$$\text{Agricultural Distortion Index}_{ct} = \sum_{s \in S} \omega_{sct} ERP_s$$

where $\omega_{s,c,t}$ is sector s total production in county c during year t over total agricultural production in county c and year t, and S is the set of four agricultural sectors. This index is an appropriate measure of agricultural trade distortions for each county in each period under the assumption that the products for which HMV and DLC built ERPs are representative of the output in the sectors covered by this study.

We do not construct specific indices for 1997 and 2007 because, as documented by Dornbusch and Edwards (1994) and Lederman (2005), trade tariffs in Chile had by then been already reduced to remarkably low levels and been equalized through different products, which allows us to focus our empirical strategy on the initial levels of distortion (i.e. the indices for 1955 and 1965).

4 Descriptive Statistics

4.1 Output and Specialization

We start presenting some stylized facts about output levels and specialization. Figure 2 presents total agricultural output per county per year. It is noticeable that (i) agricultural output grew strongly over the 1955-2007 period and that (ii) southern counties'

–counties in regions 6 through 10– participation in national agricultural output is remarkably larger that participation of counties located in the northern area–regions 4 through the Santiago Metropolitan Area. Table 1 presents annual output growth across sectors and time, showing that (i) both Fruits and Forestry grew strongly during the period of study with annual growth rates of 4.2% and 4.9% respectively, while Primary Products grew remarkably less, reaching only a growth rate of 1%; and, interestingly, (ii) there is substantial heterogeneity in these growth rates across counties, which reveals the existence of huge differences in terms of sectoral composition of output, among other factors.

Figure 3 presents how sectoral composition varies over time. It is easy to note that: (i) Primary Products strongly lost relevance in the counties' output mix decreasing their participation from 45% to 8.5% between 1955 and 2007, (ii) Fruits in the northern counties and Forestry in the South strongly increased participation, (iii) Forestry increased output participation in both geographic areas from 39% to 51%, (iii) Livestock also increased participation from 7% to 31%; (iv) specialization patterns vary both between regions and time, with the most radical changes occurring between 1965 and 1997, as expected, given this is the longer time period but also the period in which most of the trade liberalization process was implemented. This view of the Chilean agricultural sector development is reinforced by our calculations of the mean output shares represented by each of the four sectors considered in the study, as shown in Table 2, where additionally we can note that there is considerable variance in terms of agricultural output composition both across counties and over time.[13]

Moreover, when examining sectoral specialization at the county level (Table 3), the above-mentioned changes appear strongly: counties specialized in Primary Products decreased from 152 in 1955 to only 16 in 1997, while counties specialized in Forestry, Fruits and Livestock increased from 45, 8 and 9 in 1955 to 86, 55 and 57 respectively in 2007, thus revealing the presence of production reallocation through the period of study.

Table 3 also presents summary statistics for the Herfindahl-Hirschman Indexes (HHI) calculated at the county level for each year, which show a clear increase in the degree of specialization, moving from 0.54 in 1955 up to 0.63 in 2007, which is equivalent to a 17% increase. This pattern suggests that the trade liberalization process might have induced switches in production decisions towards products for which different counties had comparative advantage but were formerly strongly taxed or protected by trade tariffs that distorted production decisions. Besides, there is also heterogeneity in this dimension, implying there were both counties that were highly specialized and others that held

[13]This heterogeneity also appears when looking at summary statistics for these output shares within regions, meaning that even between counties with somehow similar geographic characteristics we observe non-trivial differences in terms of their agricultural output composition.

relatively more balanced compositions of their agricultural output.[14]

4.2 Agricultural Trade Distortions

As explained in section 3.2, we built on ERPs constructed by previous research in order to generate measures of trade distortions in agriculture. The ERPs that we use for our calculations are 0.27 for Forestry, -0.51 for Livestock, -0.22 for Primary Products, and -0.20 for Fruits. Therefore, Forestry is the only sector that was relatively protected in the 1960s. On the other hand, the other three sectors are relatively taxed, with Livestock and Primary Products being more strongly taxed than Fruits. As said before, we combine these differences in initial levels of sectoral trade distortions with the already described heterogeneity in the agricultural output composition in order to build a county level index of agricultural trade distortions.

Figure 4 shows the distribution of ERP across counties for 1955 and 1965. According to our calculations, 15% and 12% of the counties in the sample were protected in 1955 and 1965 respectively –mainly those that were highly specialized in forestry–, while the remaining ones were taxed.

Table 4 complements the previous figures by presenting summary statistics at the county level for the ERP indexes (in rows labeled "All"). As it can be observed, the situation in 1955 and 1965 is almost the same in terms of trade distortions, reaching for both years a mean ERP of -0.125 and -0.146, meaning that counties in the sample were, in average, taxed by trade tariffs. Additionally, it is easy to observe from the same table that there is a high variance in the values of the index.

Regarding this heterogeneity, we now study how much of that variance is explained by just geographical or climate patterns. If this is the case, we would be just plotting a mapping of the huge dispersion in climate and geographic characteristics observed in Chile. In order to somehow rule out this possibility, we analyze the variation of the index both by region and by sector in the counties that are specialized. Panels A and B in Table 4 show that effectively there are certain regularities in the values of the indexes that are related to geographical or productive characteristics, mainly that regions and counties more specialized in forestry are more protected than the other regions, as expected, but that at the same time within each region, and within each sector of specialization, the

[14] In fact, results for the calculation of this indexes show that for each year, there are both counties with HHIs under 30%, which implies a highly balanced output composition and counties with HHIs of more that 95%, which implies almost complete specialization. This heterogeneity is observed within counties specialized in the same sector too, which implies that even between somehow similar counties, specialization levels vary substantially. Obviously, some of this variance may be related to the *size* of the county, thus in some empirical analyses we control for proxies for the size of the county and results are robust to these controls.

indexes still vary substantially.

5 The Local Impacts of Trade Liberalization on Economic Outcomes

Using the theoretical and historical motivation described above, we develop in this section an empirical investigation of the local effects of trade liberalization on economic outcomes, in particular agriculture output, demand for inputs, productivity, patterns of specialization.

We first describe the empirical methodology we use to study these relationships. Our main estimating equations are as follows:

$$\hat{y}_i = D_i\alpha + D_i * PP_i\beta + \mathbf{X}_i^{'}\gamma + e_i, \tag{1}$$

where i refers to county, $\hat{y}$ is the change of the log of an economic outcome along the period of trade liberalization with respect to the previous period (i.e., agriculture output growth, proxies for input use, and proxies for production specialization, among other variables), D is the *absolute value* of the ERP in the pre-reform period, PP is a dummy that takes a value of 1 if the ERP of the county is positive before liberalization, $\mathbf{X}$ is a vector of control variables (including initial y, the intensity of the Chilean agrarian reform in the county, and region fixed-effects, among others),[15] and e is an error term. We use Huber-White robust standard errors to deal with potential heteroskedasticity.

The effect of initial negative ERPs is therefore captured by α, which we expect to be positive, as higher initial levels of protection implied that the reform decreased by more the negative protection of the area. In turn, the effect of positive ERPs is captured by $\alpha + \beta$. The sign of this effect depends upon two sources with opposite potential effects: the size of the decrease in output because decreased protection and the size of the productivity and re-allocation effects that trade liberalization may have produced.

Notice that we control for initial output levels and, therefore, our results are not driven by mean-reversion or conditional convergence effects after the liberalization period. In addition, by controlling for the agrarian reform index (which measures the share of land that changed owners as a consequence of the Agrarian reform at the county level) we aim to capture the extent of one of the main political reforms affecting agriculture in the same period. Similarly, we include other controls that may capture omitted variables correlated with the impacts of the reform. Among these we include a vector of climate and geographic controls at the county level (i.e., dummies for whether the county is outside the Chilean central valley or it is landlocked, annual rainfall, number of dry

[15] Notice that regions in Chile are composed of groups of counties.

months, average temperature, and distance to the closest port) and a vector of variables that may be correlated with initial levels of trade protection through political economy arguments, such as share of right wing votes, total votes, ratio of unskilled workers over total workers, and total workers.

There are two data limitations we should mention. First, we do not have measures of NTBs at the county level. This is a limitation for our approach if changes in this variable are important and are correlated with changes in our ERP index. Edwards and Lederman (1998) argue that the most important part of the trade reform was the decrease and homogenization of ERP across sectors and that changes in NTB were of secondary relevance. Thus, we think this limitation is not important, but we still mention it and leave a more detailed analysis for future research. Second, we do not have measures of other reforms –different than the agrarian reform– at the county level. Again, the interpretation of our results would be affected if changes in other policies are correlated with changes in ERPs at the county level. We do not have evidence of this but we think that by controlling for a vector of variables that include political economy dimensions we probably capture the determinants of changes in other policies. As we discuss below our results remain mostly unchanged when doing this.[16]

5.1 Effects on Local Output

Table 5 presents the results of estimating (1) with agricultural output growth as the dependent variable. Results imply that counties that where initially more taxed experience higher levels of agriculture output growth through the liberalization period. The size of the impact is not only statistically but also economically significant: a one-standard-deviation increase in the absolute value of the initial level of negative ERP –equivalent to an increase of about 0.08 in ERP– increases agriculture output by 13.6 log points –equivalent to 0.11 standard deviations of the variable–. Inversely, the effect of liberalization for counties that were initially protected by the tariffs structure is negative. In fact, we find that a one-standard-deviation increase in positive ERPs decreased agricultural output growth by about 19.2 log points –equivalent to 0.16 standard deviations of the variable–.

In column (2), we add a vector of additional geographic and climate controls and find

[16]Still, we have implemented a couple of robustness exercises in order to assess the importance of these data limitations. First, we have controlled for a proxy for price distortions in agriculture final goods and find that our results do not change significantly. As price distortions in final goods should capture the impact of NTBs, we think that the absence of NTBs is not important for our results. Second, we have run regressions controlling for the share of votes supporting Pinochet in the 1988 plebiscite, as a proxy for political economy factors affecting (or been caused) by the implementation of other policies. Again, results do not change significantly.

that the main effects are not affected. Finally, in column (3) we add control variables for relevant county level variables that may play a role in terms of determining agricultural output at the local level and find that the main effects remain statistically significant and that the point estimate barely changes in size. This suggests that the effects we find are not driven by omitted variables that, through political economy channels, may affect our estimates. In our preferred specification in column (3), results one-standard-deviation changes in the county ERP are of 11.7 log points for initially taxed counties and of -32.2 log points for initially protected counties.

In all, results so far imply that, as expected, the distortions in operation under the pre-1975 tariffs structure had significant impacts on the cross-sectional growth rates of agricultural output: after the trade liberalization reforms, counties with initial negative ERPs grew faster than counties with an ERP of 0 and counties with positive ERPs grew slower than counties with an ERP of 0, thus suggesting that reducing distortions imposed by the complex pre-reform tariffs structure might have led to a better allocation of resources in agricultural production.

5.2 Effects on Inputs Use, Productivity, and Specialization

Now we study the impact of trade liberalization on several margins. In Table 6 we analyze the impacts on input use (in particular, labor, land use and tractors–as a proxy for capital use) and, next, on TFP –as computed using a translog production function with constant returns to scale on land, labor, and capital.[17] In columns (1) to (3), we find that the growth rate of labor use do not change significantly for counties with different levels of ERP in the pre-reform period. In the case of land, we find a *decrease* in land use for counties that were relatively more taxed in the pre-reform period (Valdés and Jara, 2008 also document this pattern). In column (3), we find that capital use –tractors– move similarly to the patterns we found for output in Table 5. These results suggest that the previous estimates reflect a significant effect on the extensive margin, with shifts in the use of both land and capital. Then, in column (4) we present regressions for the log change of TFP and interestingly we find that (i) in the case of initially taxed counties, there was a significant TFP increase after the trade reforms and, therefore, an important part of the change in output documented before is related to increases in TFP; while (ii) in the case of initially protected counties, the effect is not statistically different from 0, thus suggesting that most of the effects we identify in Table 5 were associated to impacts in the intensive margin and not to productivity effects.

[17]Estimates without imposing CRT yield similar results. See Corbo and Meller (1979) for an application of trans-log production functions for the case of Chilean establishments. A more general description of this function appears in Christensen et al. (1973) and Jorgenson (1988) and an application to the agriculture sector in Udry et al. (1995).

Next, we study how the trade reform affected specialization at the county level. We implement this exercise because, as we discussed above, one of the margins probably affected by the elimination of trade distortions is product specialization at the county level. Thus, in Table **??** we study two proxies for specialization: (i) the Hirshmann-Herfindahl (HH) index of product concentration and (ii) the maximum share in the sub-sectors included in the sample at the county level. Columns (1) and (2) present results for both variables. The pattern in this case is not as clear. However, it is interesting to note that the higher reduction in output growth in initially more protected sectors we documented in Table 5 seems to be associated with a higher posterior concentration of production in these counties. This is an obvious consequence of the incentives created by facing a more open economy.

Finally, trade reform could affect another margin: the size and concentration of land-holdings and the number of different agriculture firms (exploitations). This is expected as the decrease in distortions may change the marginal return to consolidate plots for agricultural production. We study this hypothesis in columns (3) through (5) in Table **??**. In both cases we find that in counties that were initially more taxed both the average size of plots and the Gini index for land concentration decreased significantly. Consistently, the number of agricultural exploitations follows the opposite pattern through the post-reform period: counties that were initially more taxed present post-reform increases in the number of agriculture firms, which is not observed for counties that were initially more protected.

These results probably reflect the changes in incentives that trade openness creates: while in the pre-liberalization period –with negative ERPs– the land value for agriculture use was very low, landowners tended to use land for other purposes that needed big shares of the land to be profitable (see, for instance, Robinson and Baland 2008), in the liberalization period the decrease in negative ERPs produced changes in the extensive and intensive margins that decreased in average the size of the agriculture production and land concentration.[18]

6 Conclusions

The economic liberalization abruptly implemented in Chile during the 1970s offers a unique opportunity to study the impact of this process on several economic outcomes at the local level. We take advantage of (i) the initial differences in agricultural production and specialization patterns across counties and (ii) the different levels of effective rates of protection across sectors in order to construct a measure of tariffs-related price distortions

[18]Notice that we are already controlling for the intensity of the agrarian reform at the county level in these regressions in order to rule out its effects on these outcomes.

before trade liberalization took place. Then, we use the fact that effective rates of protection across different sectors were dropped to a low and uniform tariff structure to estimate how this process affected several economic outcomes across counties.

Besides contributing with the construction of a panel dataset of counties over a period of 50 years –mainly by merging different datasets related to one of Chile's most important economic sectors–, we find, in line with the previous literature, that trade liberalization affected counties differently in several economic outcomes. Agricultural output grew faster in counties that were relatively more taxed in the pre-reform period, probably by allowing expansions on the extensive margin but also more product specialization and a more efficient allocation of resources, which is reflected in increases in TFP in these counties. Inversely, we find that counties that were relatively more protected in the pre-reform period grew slower through the post-reform period, which seems to be related mostly to changes in the intensive margin and not to productivity effects. These results not only contribute to different parts of the existing literature of the economic effects of a liberalization, but also shed light on Chile's growth path during the last fifty years, mainly by analyzing trends across counties exposed differently to one of Chile's most emblematic economic policies in the past decades.

These results are relevant in terms of understanding the effects of economic policies such as trade liberalization on economic development. Even though, a number of questions remain open in two lines. First, we still need a better understanding of the economic mechanisms through which the impacts we estimated were caused. Second, and related to Topalova (2010) and other papers, we need also more evidence on the impact of trade liberalization on broader development measures, such as poverty and inequality, among others. While Topalova (2010) finds that factors immobility played a relevant role in explaining the increase that the Indian tariffs reform caused on poverty in certain regions, it might be the case that the Chilean reform had different impacts on poverty in counties that were harmed by the reform (i.e. initially protected counties), mostly due to the fact that the Chilean economy operates under a very flexible structure. Both of these are relevant topics for future research.

References

Alvarez, Roberto and Fuentes, Rodrigo: «Trade Reforms and Manufacturing Industry in Chile». *The Central Bank of Chile Working Papers*, 2003.

Balassa, Bela: *The Structure of Protection in Developing Countries*. John Hopkins Press, 1971.

Behrman, Jere H.: *Foreign Trade Regimes and Economic Development: Chile*. NBER, 1976.

Beyer, Harald; Rojas, Patricio and Vergara, Rodrigo: «Trade Liberalization and Wage Inequality». *Journal of Development Economics*, 1999.

Bosworth, Barry; Dornbusch, Rudiger and Labán, Raúl: *The Chilean Economy: Policy Lessons and Challenges*. The Brookings Institution, 1994.

Bruhn, Miriam and Gallego, Francisco: «Good, Bad, and Ugly Colonial Activities: Do They Matter for Economic Development». *The Review of Economic and Statistics*, 2012.

Coeymans, Juan Eduardo: «Foreign Trade Liberalization and its Effects on Employment». *Documento de Trabajo N.59, Instituto de Economía, Universidad Católica de Chile*, 1978.

——: «Determinantes de la Productividad en Chile». *Latin American Journal of Economics*, 1999.

Corbo, Vittorio: «Reforms and Macroeconomic Adjustments in Chile during 1974–1984». *World Development*, 1985.

——: «Trade Reform and Uniform Import Tariffs: The Chilean Experience». *American Economic Revie: Papers and Proceedings of the Hundred and Fourth Annual Meeting of the American Economic Association*, 1997.

Corbo, Vittorio; Hernández, L. and Parro, F.: «Institutions, Economic Policies and Growth: Lessons from the Chilean Experience». *The Central Bank of Chile Working Paper*, 2005.

Corbo, Vittorio; Luders, Rolf and Spiller, Pablo: «The Insitutional Foundations of Economic Reforms: The Case of Chile», 1995.

Corbo, Vittorio; Tybout, James and De Melo, Jaime: «The Effects of Trade Reforms on Scale and Technical Efficiency: New Evidence from Chile». *Journal of International Economics*, 1991.

De la Cuadra, Sergio: «La Protección Efectiva en Chile». *Documento de Trabajo N.22, Instituto de Economía, Universidad Católica de Chile*, 1974.

Díaz, José; Wagner, Gert and Luders, Rolf: «La República en Cifras 1810-2000», 2010.

Dornbusch, Rudiger and Edwards, Sebastián: *Chilean Economy: Policy Lessons and Challenges*. chapter "Exchange Rate Policy and Trade Strategy". Brookings Institution, 1994.

Edmonds, Eric V.; Pavcnik, Nina and Petia Topalova, 2010: «Trade Adjustment and Human Capital Investments: Evidence from Indian Tariff Reform». *American Economic Journal: Applied Economics*, 2010.

Edwards, Sebastián and Edwards, Alejandra Cox: *Monetarism and Liberalization: The Chilean Experiment*. The University of Chicago Press, 1991.

Edwards, Sebastián and Lederman, Daniel: «The Political Economy of Unilateral Trade Liberalization: The Case of Chile». *NBER Working Paper No. 6510*, 1998.

Ffrench-Davis, Ricardo: *Políticas Económicas en Chile 1952–1970*. Centro de Estudios de Planificación Nacional, 1973.

Fuentes, Rodrigo; Schmidt-Hebbel, Klaus and Larraín, Mauricio: «Sources of Growth and Behavior of TFP in Chile». *Latin American Journal of Economics*, 2006.

Gallego, Francisco: «Skill Premium in Chile: Studying Skill Upgrading in the South». *World Development*, 2012.

Goldberg, Pinelopi Koujianou and Pavcnik, Nina: «Distributional Effects of Globalization in Developing Countries». *Journal of Economic Literature*, 2007.

Hachette, Dominique: *Latinoamérica en el Siglo XX*. Ediciones UC, 2011.

Harberger, Arnold: «Using the Resources at Hand More Effectively». *American Economic Review: Papers and Proceedings of the Seventy-first Annual Meeting of the American Economic Association*, 1959.

——: «Observations on the Chilean Economy 1973–1983». *Economic Development and Cultural Change*, 1985.

——: «Towards a Uniform Traiff Structure», 1991. University of Chicago..

Hirschman, Albert: «The Political Economy of Import-Substituting Industrialization in Latin America». *Quarterly Journal of Economics*, 1968.

Hurtado, H.; Muchnik, E. and Valdés, A.: «Trade, Exchange Rate, and Agricultural Pricing Policies in Chile». *The Political Economy of Agricultural Policies, World Bank Comparative Studies, World Bank*, 1990, **I and II**.

Khandelwal, Amit and Topalova, Petia: «Trade Liberalization and Firm Productivity: The Case of India». *The Review of Economics and Statistics*, 2011.

Lederman, Daniel: *The Political Economy of Protection: Theory and the Chilean Experience*. Stanford University Press, 2005.

McCaig, Brian: «Exporting out of poverty: Provincial poverty in Vietnam and U.S. market access». *Journal of International Economics*, 2011.

Pardo, Andrés and Meller, Patricio: «El Rol de las Exportaciones en el Crecimiento Económico Regional'», 2002.

Pavcnik, Nina: «Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants». *Review of Economic Studies*, 2002.

Prebisch, Raúl: «The Economic Development of Latin America and its Principal Problems», 1950.

——: «Towards a Dynamic Development Policy for Latin America», 1963.

Robinson, James and Baland, Jean-Marie: «Land and Power: Theory and Evidence from Chile». *American Economic Review*, 2008, **98(5)**, pp. 1737–1765.

Rojas, Patricio; López, Eduardo and Jiménez, Susana: «Determinantes del Crecimiento y Estimación del Producto Potencial en Chile: El Rol del Comercio». *Centro de Estudios Públicos*, 1997.

Schmidt-Hebbel, Klaus: «El Crecimiento de Chile». *The Central Bank of Chile Working Paper*, 2006.

Topalova, Petia: «Factor Immobility and Regional Impacts of Trade Liberalization: Evidence on Poverty from India». *American Economic Journal: Applied Economics, American Economic Association*, 2010.

Varas, Juan Ignacio: «El Impacto de una Liberalización del Comercio en el Sector Agrícola Chileno». *Latin American Journal of Economics*, 1975.

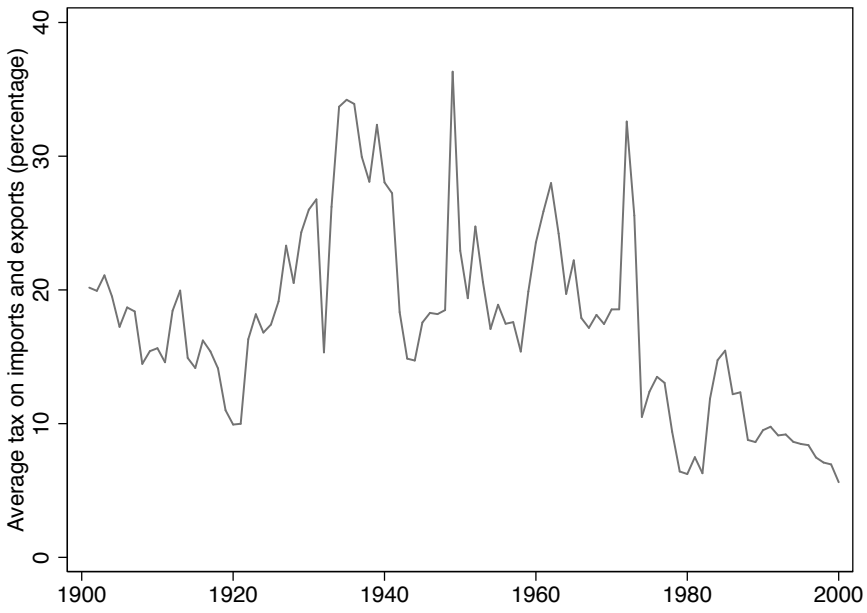


FIGURE 1: Average tax on imports and exports (Díaz et al., 2010)

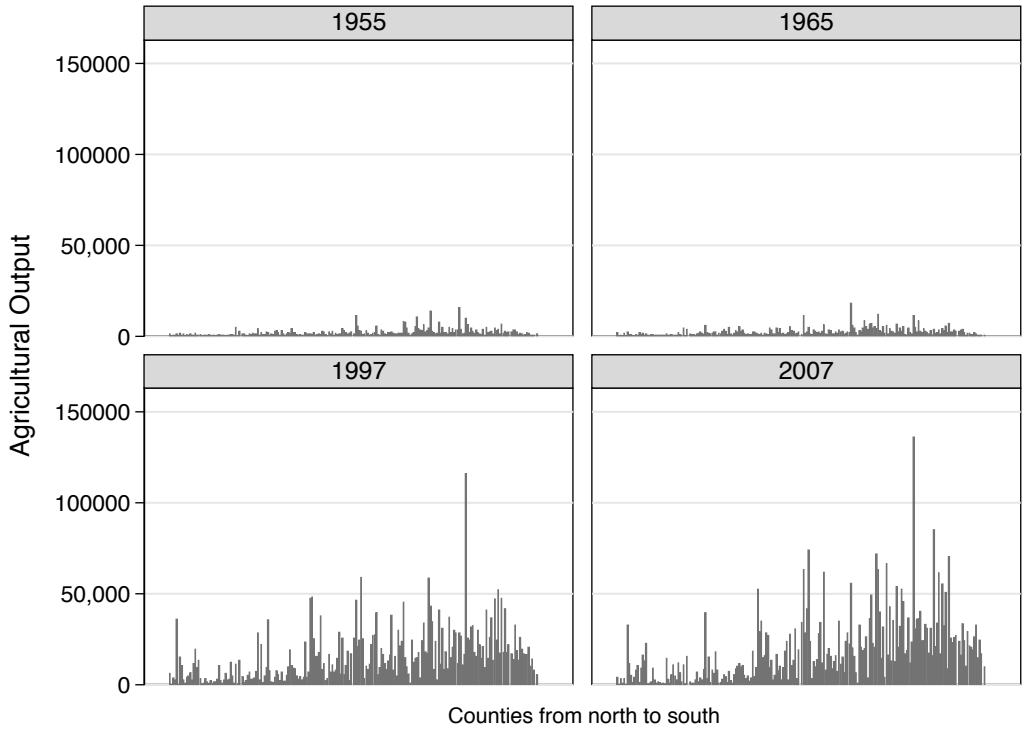
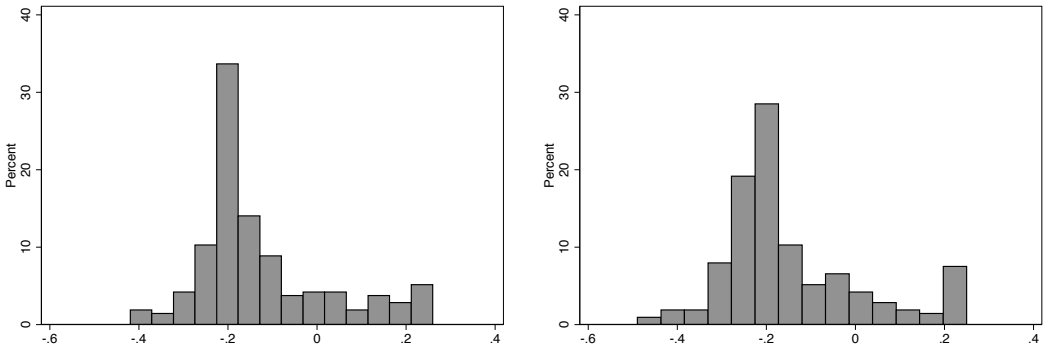


FIGURE 2: Total agricultural output per county and year



(a) 1955 (b) 1965

FIGURE 3: ERP Index Histograms per Year

TABLE 1: Annual Compounded Growth Rates by Sector

Sector	Years	Mean	SD	National
Forestry	1955-1965	-0.014	0.148	0.009
	1965-1997	0.052	0.107	0.062
	1997-2007	0.174	0.559	0.056
Fruits	1955-1965	0.02	0.148	0.010
	1965-1997	0.002	0.113	0.051
	1997-2007	0.124	0.444	0.049
Livestock	1955-1965	0.075	0.099	0.044
	1965-1997	0.096	0.051	0.115
	1997-2007	-0.118	0.198	-0.019
Primary Products	1955-1965	0.011	0.054	0.017
	1965-1997	-0.005	0.038	0.017
	1997-2007	-0.04	0.098	-0.016

TABLE 2: Total Output Share represented by each Sector

Sector	Year	Mean	SD
Forestry	1955	0.248	0.274
	1965	0.227	0.275
	1997	0.29	0.312
	2007	0.37	0.357
Fruits	1955	0.123	0.141
	1965	0.134	0.169
	1997	0.156	0.254
	2007	0.241	0.328
Livestock	1955	0.098	0.136
	1965	0.135	0.157
	1997	0.41	0.319
	2007	0.27	0.303
Primary Products	1955	0.532	0.245
	1965	0.503	0.249
	1997	0.144	0.164
	2007	0.119	0.155

TABLE 3: Number of counties specialized in each sector

Sector	1955	1965	1997	2007
Forestry	45	48	68	86
Fruits	8	15	35	55
Livestock	9	16	95	57
Primary Products	152	135	16	16
Hirshmann-Herfindahl	0.541	0.531	0.586	0.632
	(0.151)	(0.159)	(0.202)	(0.218)

TABLE 4: Descriptive statistics of the index by region and sector of specialization

	1955		1965	
	Mean	SD	Mean	SD
Panel A: Index by region and year				
4	-0.208	0.089	-0.262	0.087
5	-0.146	0.109	-0.177	0.095
MR	-0.225	0.083	-0.242	0.070
6	-0.185	0.089	-0.209	0.085
7	-0.121	0.157	-0.139	0.130
8	0.040	0.159	0.049	0.170
9	-0.073	0.146	-0.106	0.136
10	-0.200	0.075	-0.224	0.101
All	-0.125	0.150	-0.146	0.156
Panel B: Index by sector of specialization and year				
Forestry	0.122	0.094	0.098	0.109
Fruits	-0.179	0.026	-0.189	0.057
Livestock	-0.345	0.071	-0.352	0.072
Primary Products	-0.183	0.064	-0.203	0.059

TABLE 5: Effects on Local Agricultural Output

Dependent variable: Change in log Agricultural Output			
	(1)	(2)	(3)
Initial negative ERP (α)	1.794**	1.923**	1.548**
	(0.874)	(0.870)	(0.774)
Positive value of ERP (β)	-4.099***	-5.228***	-5.420***
	(0.733)	(0.866)	(1.031)
Initial positive ERP ($\alpha + \beta$)	-2.305***	-3.305***	-3.872***
F-test $\alpha + \beta$ (p-value)	0.010	0.000	0.000
Initial log output	-0.950***	-0.920***	-0.774***
	(0.227)	(0.236)	(0.252)
Agrarian reform index	-0.791**	-0.751**	-0.748**
	(0.329)	(0.341)	(0.332)
Land gini	-7.605***	-5.748**	-4.864*
	(2.208)	(2.528)	(2.672)
Right wing % votes			0.311
			(0.603)
Log total votes			-0.121
			(0.088)
Log (unskilled / total workers)			-0.098
			(0.084)
Log total workers			-0.212
			(0.171)
Region fixed effects	Yes	Yes	Yes
Geographic controls	No	Yes	Yes
Counties	188	182	182
R^2	0.382	0.410	0.432

Notes: Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. All regressions include a constant term.

TABLE 6: Input Use and Productivity

	Dependent variable: Δ log y			
	Workers	Land	Capital	TFP
	(1)	(2)	(3)	(4)
Initial negative ERP (α)	0.449	-0.933*	1.430**	1.839***
	(0.679)	(0.546)	(0.629)	(0.527)
Positive value of ERP (β)	-0.671	1.900***	-3.315***	-3.209***
	(0.926)	(0.620)	(1.102)	(0.863)
Initial positive ERP ($\alpha + \beta$)	-0.222	0.967*	-1.885*	-1.370
F-test $\alpha + \beta$ (p-value)	0.811	0.068	0.093	0.149
Agrarian reform index	0.511**	0.134	0.453**	-0.349
	(0.204)	(0.234)	(0.217)	(0.289)
Initial land gini	4.484	-2.595	-5.062	-2.085
	(2.809)	(1.598)	(3.214)	(1.985)
Initial log y	-0.089	-0.115*	-0.010	-0.008
	(0.108)	(0.067)	(0.092)	(0.095)
Region fixed effects	Yes	Yes	Yes	Yes
Geographic controls	Yes	Yes	Yes	Yes
Counties	182	182	180	182
R^2	0.540	0.430	0.483	0.178

Notes: Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. TFP stands for Total Factor Productivity.

TABLE 7: Effects on input use and specialization

	Dependent variable: Δ log y				
	HHI	Specialization	Plot size	Land Gini exploitations	Number of
	(1)	(2)	(3)	(4)	(5)
Initial negative ERP (α)	0.472	0.965	-1.041*	-0.056**	0.587*
	(0.301)	(0.600)	(0.612)	(0.026)	(0.353)
Positive value of ERP (β)	2.814***	1.069	0.141	-0.040	-1.105*
	(0.422)	(0.964)	(0.807)	(0.051)	(0.620)
Initial positive ERP ($\alpha + \beta$)	3.286***	2.034*	-0.900	-0.096*	-0.518
F-test $\alpha + \beta$ (p-value)	0.000	0.066	0.338	0.092	0.473
Agrarian reform index	-0.283**	-0.319*	-1.388***	-0.006	0.486***
	(0.113)	(0.171)	(0.347)	(0.007)	(0.165)
Initial land gini	-2.708***	4.342	-2.759	-0.046	1.439
	(1.000)	(2.811)	(2.206)	(0.168)	(1.589)
Initial log y	-2.124***	-0.599*	-0.000***		-0.013
	(0.240)	(0.316)	(0.000)		(0.067)
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Geographic controls	Yes	Yes	Yes	Yes	Yes
Counties	188	188	188	188	188
R^2	0.641	0.353	0.332	0.328	0.191

Notes: Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. All regressions include a constant term. HHI: Herfindahl-Hirschman Index, a measure of output concentration by sector.

ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER SERIES

CERDA, RODRIGO: "THE IMPACT OF GOVERNMENT SPENDING ON THE DURATION AND THE INTENSITY OF ECONOMIC CRISES: LATIN AMERICA 1900-2000". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #1, 2009.

GALLEGO, FRANCISCO; WOODBERRY, ROBERT: "CHRISTIAN MISSIONARIES AND EDUCATION IN FORMER AFRICAN COLONIES: HOW COMPETITION MATTERED". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #2, 2009.

MATTA, JUAN JOSÉ: "EL EFECTO DEL VOTO OBLIGATORIO SOBRE LAS POLÍTICAS REDISTRIBUTIVAS: TEORÍA Y EVIDENCIA PARA UN CORTE TRANSVERSAL DE PAÍSES". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #3, 2009

COX, LORETO: "PARTICIPACIÓN DE LA MUJER EN EL TRABAJO EN CHILE: 1854-2000". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #4, 2009

GALLEGO, FRANCISCO; WOODBERRY, ROBERT: "CHRISTIAN MISSIONARIES AND EDUCATION IN FORMER COLONIES: HOW INSTITUTIONS MATTERED". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #5, 2008.

BRUHN, MIRIAM; GALLEGO, FRANCISCO: "GOOD, BAD AND UGLY COLONIAL ACTIVITIES: DO THEY MATTER FOR ECONOMIC DEVELOPMENT". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #6, 2009.

GALLEGO, FRANCISCO: "HISTORICAL ORIGINS OF SCHOOLING: THE ROLE OF DEMOCRACY AND POLITICAL DECENTRALIZATION". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #7, 2009.

GALLEGO, FRANCISCO; RODRÍGUEZ, CARLOS; SAUMA, ENZO: "THE POLITICAL ECONOMY OF SCHOOL SIZE: EVIDENCE FROM CHILEAN RURAL AREAS". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #8, 2010.

GALLEGO, FRANCISCO: "SKILL PREMIUM IN CHILE: STUDYING SKILL UPGRADING IN THE SOUTH". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #9, 2010.

GALLEGO, FRANCISCO; TESSADA JOSÉ: "SUDDEN STOPS, FINANCIAL FRICTIONS, AND LABOR MARKET FLOWS: EVIDENCE FROM LATIN AMERICA". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #10, 2010.

BRUHN, MIRIAM; GALLEGO, FRANCISCO; ONORATO, MASSIMILIANO: "LEGISLATIVE MALAPPORTIONMENT AND INSTITUTIONAL PERSISTENCE". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #11, 2010.

GONZÁLEZ, FELIPE: "LAND REFORM AND GOVERNMENT SUPPORT: VOTING INCENTIVES IN THE COUNTRYSIDE". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #12, 2010.

LAFORTUNE, JEANNE: "MAKING YOURSELF ATTRACTIVE: PRE-MARITAL INVESTMENTS AND THE RETURNS TO EDUCATION IN THE MARRIAGE MARKET". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #13, 2012.

LAFORTUNE, JEANNE; TESSADA, JOSÉ: "SMOOTH(ER) LANDING? THE DYNAMIC ROLE OF NETWORKS IN THE LOCATION AND OCCUPATIONAL CHOICE OF IMMIGRANTS". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #14, 2012.

LAFORTUNE, JEANNE; TESSADA, JOSÉ; GONZÁLEZ-VELOSA, CAROLINA: "MORE HANDS, MORE POWER? ESTIMATING THE IMPACT OF IMMIGRATION ON OUTPUT AND TECHNOLOGY CHOICES USING EARLY 20TH CENTURY US AGRICULTURE". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #15, 2013.

BEYER, HARALD; GALLEGO, FRANCISCO: "EDUCATION AND PRODUCTIVITY: SOME NEW EVIDENCE AND IMPLICATIONS FOR CHILE". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #16, 2013.

CUESTA, JOSÉ IGNACIO; GALLEGO, FRANCISCO A.; GONZÁLEZ, FELIPE A.: "LOCAL IMPACTS OF ECONOMIC LIBERALIZATION: EVIDENCE FROM THE CHILEAN AGRICULTURAL SECTOR". ECONOMIC HISTORY AND CLIOMETRICS LAB WORKING PAPER #17, 2013.