HAVE DELAYED INDEPENDENCE AND POOR INITIAL INSTITUTIONS BEEN ECONOMICALLY COSTLY FOR LATIN AMERICANS?

A Thesis by

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The following faculty members have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Art with a major in Economics.

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Miles Williams, Committee Chair

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Jen-Chi Cheng, Committee Member

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Dinorah Azpuru, Committee Member
ABSTRACT

This paper tests the hypothesis that the timing of independence in Latin America and the institutions in place at the time of independence had a joint effect on the developmental paths of the countries. A new variable is presented - the interaction term between the timing of independence and initial institutions, and then tested with Multiple OLS Regressions. The findings support the notion that earlier independence in conjunction with better initial institutions may have had a positive influence on long-term economic growth in Latin American countries using data from 1990-2004.
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INTRODUCTION

Despite its wealth of natural resources and labor force, Latin America has fallen behind the United States in terms of per capita income over the course of the last 200 years. Figure 1 below shows the comparative GDP per capita levels of Latin America as a whole and the U.S. from 1971-2009, in constant 2000 dollars.

![Figure 1. Latin America vs. U.S. GDP Per Capita](image)

As can be seen, this income gap has been growing steadily. A fairly substantial body of research exists that has investigated potential reasons for the existence and continuing increase in unequal incomes. In this thesis, two major theories on the unequal economic growth between the U.S. and Latin America are discussed, and then combined within an econometric framework to shed further light on what may have influenced the lagged development of Latin America.
By many measures, the economic performance of Latin America since independence has been disappointing. Coatsworth (2005) notes that in the 1700s, Latin Americans enjoyed per capita incomes that were similar to those in Western Europe and the colonies that would become the U.S. However, by 2000 the per capita income in the U.S. was $28,129, while in Latin America it was only $5,844. What happened in that time to lead to such a drastic income gap?

Many researchers have pointed to the colonial experience of Latin America as an important factor in its lower development relative to its closest neighbor, the United States. In an influential paper, Acemoglu et al. (2002) discuss the ‘Reversal of Fortune’ following the colonial era that began in the 1500s. According to their paper, the European colonial powers developed institutions of private property in areas that were poor, and introduced extractive properties in prosperous societies. They stress the importance of private property as a requirement for potential investors to expect returns on investments. This incentive and opportunity to invest will lead to a more prosperous society (e.g., Smith [1778], North & Thomas [1973], Locke [1980], North & Weingast [1989], and Olson [2000]).

Acemoglu & Robinson (2006) later go on to suggest that the poor institutions implemented by the colonizers are persistent, and that those former colonies that inherited extractive institutions tend to have relatively weak institutions still today. This hypothesis is supported by Przeworski (2005), who claims that the disintegration of colonial institutions following independence left the region without effective channels to absorb and resolve conflicts, both political and economic. According to his paper, the post-independence institutions remained oligarchical and exclusionary, much like those of the colonial rulers before
independence. This in turn led to persistent inequality, which caused economically costly political turmoil.

Furthermore, Przeworski & Curvale (2006) find that an effective institutional framework is necessary to prevent economic stagnation. They illustrate the modern difficulties in Latin America for absorbing and resolving political conflicts, and find that strong and stable political institutions are conducive to growth in the region. Likewise, Fenmore & Volgy (1978) found that short-term changes in economic performance are correlated with political stability.

Torche & Lopez-Calva (forthcoming) investigate the importance of a stable middle class to economic development and claim, “a stable and secure middle class is more likely to invest in long-term well-being and to make political choices that support those investments.” Political stability, and thus institutional effectiveness, promote economic investment and furthers economic growth (Alesina & Perotti, 1996).

The combined research presented above provides a strong argument that colonial institutions and their successors may be partly at fault for the relatively low levels of development in Latin America. But was it strictly the institutional quality that caused Latin America to be left behind in terms of growth?

Przeworski (2006) suggests that the timing of Latin American independence was also detrimental to future performance:

“The U.S. reached independence exactly in time to reap the fruit of the technological revolution that shook England after 1750, while continental Latin American countries became independent some 35-50 years later. Hence, the gap that emerged by 1820 could be due to the fact that the U.S. was quietly growing … between 1800-1820, while Latin American countries fought for independence.”
This theory that Latin American countries ‘missed out’ on the Industrial Revolution because they were busy fighting for independence offers some good insight into the post-Revolution economic performance discrepancies between Latin America and the U.S. However, in the seminal work of Barro (1996) on the determinants of economic growth, he finds strong empirical support for the conditional convergence hypothesis, in which a country with lower initial real per capita GDP will presumably experience higher growth rates.

As Przeworski & Curvale (2006) point out however, by 1820 the per capita income gap between the U.S. and Latin America was already noticeable, even though the Industrial Revolution did not fully take hold in the U.S. until approximately 1810 with the Boston Manufacturing Company (Boorstin & Kelley, 1992). If Latin American countries were starting off their new independence with lower per capita incomes, then according to Barro, they should have been growing faster than the U.S. But this has not been the case, and something remains to be explained.

According to Acemoglu et al. (2002), Latin America faced an opportunity to industrialize following independence, but could not capitalize because doing so would have required that the broad population have secure property rights. They go on to say that societies with strong institutions could take advantage of the industrialization opportunity, while countries with poor institutions failed to do so.

Coatsworth (2008) adds that the more attractive option for Latin America at the time was what Jeffrey Williamson and others have called ‘de-industrialization,’ referring to the enticement to favor intensive raw material production over manufacturing, as the latter would have needed strong and effective governments in order to thrive.
As Przeworski (2005) and Przeworski & Curvale (2006) note, the institutions that followed independence in Latin America were not necessarily better off in the beginning than those imposed by the colonial powers. The region still faces many problems, including conflict resolution.

This thesis presents the hypothesis that there may be an interaction effect between the timing of independence and the institutions that were implemented at that time. Together these would have influenced a country’s likelihood of industrializing, thus setting the stage for long-run economic growth. In the following section, a detailed description of the data is given.
DESCRIPTION OF DATA

For the empirical portion of this paper, the extensive dataset of Finkel et al. (2006) was pared down to include only the 20 Latin American countries with and independence dates prior to 1900, with the exception of Panama, which gained independence in 1903 (See Appendix). This criterion was selected because the paper is examining the effects of the timing of independence with respect to the Industrial Revolution. Countries that achieved independence much later than 1900 would not be facing the same problems of both establishing newly independent institutions and industrializing at the same time. 300 country-year observations remain from 1990-2004.

The dependent variable used throughout the analysis is the annualized percentage change in GDP ($gdpgro$) and GDP per capita ($gdppcgro$). The assumption behind this variable is that a country’s institutional quality and timing of independence should have an effect on long term growth, not per capita income or total output.

The primary variable of interest for this analysis is the interaction term, $inter10$. This variable is calculated by dividing the Polity IV Executive Constraint score for a given country by the number of years after the beginning of the Industrial Revolution that a country gained independence and multiplying by 100 to give whole numbers:

$$inter10 = \left( \frac{ExecutiveConstraint_{(AtYearOfIndependence)}}{(YearOfIndependence - 1760)} \right) * 100$$

Using this formulation, if two countries achieve independence in the same year but one has a higher Executive Constraint score, that country will have a higher interaction score. Likewise, if two countries have the same initial Executive Constraint score at their respective
time of independence but one became independent earlier, that one has a higher interaction score. Countries with higher interaction scores are expected to experience higher growth rates.

The Polity IV dataset contains long-running historical data, with data points as early as the first year of independence for most of the countries included in this paper. For others, measurement begins within a few years after independence. Following the example of Acemoglu et al. (2002), the earliest available observation of a country’s Executive Constraints directly following independence is used to measure initial institutional quality.

There are many accounts of the actual beginning of the Industrial Revolution in England, but Toynbee (1884) broadly describes it as the period between 1760-1840. Therefore, 1760 is designated as the approximate beginning of the British Industrial Revolution for this paper.

The Polity IV data subset Executive Constraints (excon) is used throughout as a measure of property rights. “Operationally, this variable refers to the extent of institutionalized constraints on the decisionmaking powers of chief executives, whether individuals or collectivities. Such limitations may be imposed by any "accountability groups." In Western democracies these are usually legislatures. Other kinds of accountability groups are the ruling party in a one-party state; councils of nobles or powerful advisors in monarchies; the military in coup-prone polities; and in many states a strong, independent judiciary. The concern is therefore with the checks and balances between the various parts of the decision-making process” (Eckstein & Gurr, 1975). The index ranges from 1 (Unlimited Authority) to 7 (Executive Parity or Subordination).

Acemoglu et al. (2004) support this measure, claiming that restraints on the executive and political power of the elites are “typically conducive to the emergence of better economic institutions … [implying] that economic institutions protecting the rights of a broad cross-section are more likely to arise when political power is in the hands of a relatively broad group
containing those with access to the most important investment opportunities. When groups holding political power are narrower, they may protect their own property rights, and this might encourage their own investments, but the groups outside the political elites are less likely to receive adequate protection for their investments.”

Barro (1996) acknowledges that political freedoms and rights may have some effect on growth, but also identifies several other variables that empirically enhance growth. The first of these variables is education, measured in this paper by literacy, defined as “the percentage of people ages 15 and above who can, with understanding, read and write a short, simple statement on their everyday life” (World Bank, 2005). A second is total life expectancy at birth, lifexp. Finally, he finds that lower birth rates (brate) are associated with higher economic growth.

Another significant variable according to his work is the Government Consumption as a percentage of GDP minus spending on education and defense (adjgovcons). This measure of government expenditure specifies expenses that do not enhance productivity, he argues, and finds that higher nonproductive spending and the associated taxation reduce growth rates.

Barro also asserts that improved terms of trade are conducive to growth by stimulating a change in domestic employment and output. The World Bank calculates annual Terms of Trade (tot) data as the ratio of (price exports) / (price imports).

Gregorio (1993) shows a strong negative relationship between growth and inflation in Latin American countries from 1950-1985. Judson & Orphanides (1999) also find evidence of negative correlation between inflation and growth, particularly for those countries that do not maintain low levels of inflation. Latin America has experienced higher rates of inflation than members of the Organization for Economic Cooperation and Development countries, especially
since World War II, but most countries managed to reduce inflation drastically during the 1990s thanks to economic restructuring and stabilization (Hofman, 2001).

Because Latin America has a history of high inflation, which has been linked to poorer economic performance, inflation is incorporated into certain specifications of the regressions to distinguish its effects from those of the timing of independence and institutional quality.

In order to control for the potential geography effects on growth as hypothesized by Jared Diamond (1997) and Engerman & Sokoloff (2000), a variable for Arable Land as a percentage of total land area (arland) is included. Dummy variables are also tested to indicate whether a country had significant fuel exports (>5% of total exports) or ore and metal exports (>2% of total exports), and whether the country is an island or is landlocked.

In the next section, these variables are used in various regression specifications to investigate first if the variables discussed above are indeed significant within Latin America, and then whether consistent and significant relationships can be identified between the two measures of growth and the variable of interest, the new interaction term for years since independence and initial institutions.
METHODOLOGY

In this section, an initial multiple regression including all variables was run for each of the two dependent variables, GDP growth and GDP per capita growth. From this initial specification, insignificant variables (according to p-value) are then removed from the model one by one, until the explanatory power of the model begins to decrease and/or all remaining variables exhibit statistical significance. Table I provides the regression coefficients and robust standard errors\(^1\) for the independent variables when GDP growth is the dependent variable.

The variable of interest, \( \text{int10} \), shows significance in all specifications except (7), and in all specifications in which the R-Squared value is above 0.12. Additionally, the coefficient remains near 0.3 in all regressions. These robust findings suggest that the combined effects of the timing of independence and the quality of institutional property rights may have had a persistent and positive effect on growth from 1990-2004 in Latin American countries that gained independence before or around the 19\(^{th}\) century.

Regression (2) yields the highest explanatory power, and offers further insight into Latin American growth factors. Nearly all of Barro’s variables remain significant, with the exception of Life Expectancy, thus supporting his findings that higher levels of Literacy, and lower Government Consumption and Inflation are associated with higher growth. However, Birth Rate exhibits a significant positive relationship with growth, which is quite unexpected. In previous research, authors have found that higher birth rates are generally inversely related to growth. Weintraub (1962) suggests that as incomes rise, families may have more opportunities to raise additional children.

\(^1\) Kezdi (2003) describes the use of robust standard errors for this type of regression model.
## TABLE  I
ANOVA Results for Multiple Regressions on GDP Growth (%) | Dependent variable is GDP Growth (%)
---|---
**Independent Variable** notation | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8)
---|---|---|---|---|---|---|---|---
Interaction Term for Years since Independence and Institutions at time of Independence | 0.332764** | 0.3332118** | 0.3205148** | 0.3259994** | 0.3244599** | 0.259549** | 0.2361182 | 0.2841991**
inter10 | (0.1542112) | (0.1545952) | (0.1554236) | (0.153834) | (0.1535232) | (0.1447147) | (0.1450774) | (0.1443882)
Executive Constraints | 0.0089965 | 0.0089991 | 0.0085531 | 0.0089991 | 0.0085531 | 0.0089991 | 0.0085531 | 0.0089991
excon | (0.0171995) | (0.0171751) | (0.0170676) | (0.0171995) | (0.0171751) | (0.0170676) | (0.0171995) | (0.0171751)
Literacy | 0.0978873 | 0.1010306* | 0.0823006* | 0.0847961** | 0.0807933* | 0.1233406*** | 0.1234902*** | 0.1193981***
literacy | (0.065466) | (0.0593714) | (0.0433712) | (0.0423991) | (0.0417056) | (0.0312157) | (0.0312157) | (0.0317969)
Life Expectancy | -0.0577351 | -0.0623414 | -0.0577351 | -0.0623414 | -0.0577351 | -0.0623414 | -0.0577351 | -0.0623414
lifexp | (0.1373861) | (0.1304042) | (0.1373861) | (0.1304042) | (0.1373861) | (0.1304042) | (0.1373861) | (0.1304042)
Birth Rate | 0.8639714** | 0.8682221** | 0.8989159** | 0.9210304** | 0.8542991** | 1.29182*** | 1.321028*** | 1.166769***
birate | (0.4262274) | (0.4254477) | (0.4228142) | (0.4205385) | (0.4051304) | (0.3403599) | (0.3403795) | (0.35296)
Government Consumption (% of GDP | -0.1595711** | -0.1592434** | -0.1560414** | -0.1564266** | -0.156185** | -0.1765638** | -0.2000691***
adjgovcons | (0.0734405) | (0.0761030) | (0.0720872) | (0.0719737) | (0.0718756) | (0.0764993) | (0.0763706) | (0.0868278)
Terms of Trade | 2.79E-13 | 2.80E-13 | 2.58E-13 | 2.58E-13 | 2.34E-13 | 1.88E-13 | 1.88E-13 | 1.88E-13
tot | (1.84E-13) | (1.84E-13) | (1.77E-13) | (1.77E-13) | (1.72E-13) | (1.7E-13) | (1.7E-13) | (1.7E-13)
Inflation | -0.0007193* | -0.000704* | -0.0006908* | -0.000671* | -0.0006042 | -0.0006067 | -0.0006042 | -0.0006067
inflation | (0.0000035) | (0.00000349) | (0.000004165) | (0.000004161) | (0.000004047) | (0.000004047) | (0.000004047) | (0.000004047)
Arable Land (%) | -0.0546735 | -0.0518556 | -0.052863 | -0.052863 | -0.052863 | -0.057505 | -0.057505 | -0.057505
arland | (0.0420391) | (0.0368443) | (0.0363635) | (0.0363577) | (0.0363635) | (0.036105) | (0.036105) | (0.036105)
Fuel Export Dummy | -1.662441*** | -1.65753*** | -1.569373*** | -1.569373*** | -1.569373*** | -1.40861*** | -1.40861*** | -1.40861***
fueldummy | (0.6042766) | (0.591822) | (0.5245476) | (0.5194847) | (0.5194847) | (0.5156986) | (0.5156986) | (0.5156986)
Ore / Metal Export Dummy | 0.2891358 | 0.276841 | 0.3237842 | 0.3242341 | 0.3242341 | 0.3242341 | 0.3242341 | 0.3242341
oredummy | (0.5145088) | (0.4887537) | (0.4538779) | (0.4531641) | (0.4531641) | (0.4531641) | (0.4531641) | (0.4531641)
Island Dummy | 0.1196461 | | | | | | | |
island | (1.111982) | | | | | | | |
landlock | (1.032866) | (0.9995379) | (0.6721128) | (0.6721573) | (0.651683) | (0.6695786) | (0.6734244) | (0.6990984)
R-Squared | 0.1288 | 0.1288 | 0.1288 | 0.1288 | 0.1288 | 0.1288 | 0.1288 | 0.1288
Number of Observations | 298 | 298 | 298 | 298 | 298 | 298 | 298 | 298

* Significant at 10%  
** Significant at 5%  
*** Significant at 1%
Another notable finding is the apparent negative relationship between significant fuel exports and growth. According to how the variable is derived, it appears that countries with ratios of fuel exports to total exports of over 5% are expected to have lower growth over time. This has been called the “Dutch Disease” by previous authors, who found that the discovery of gas in the North Sea led to an appreciation of Dutch currency, which had adverse consequences for other exports and imports, and thus growth.

Finally, it seems that within Latin America, having no access to the ocean is quite detrimental to growth. According to the geography theorists such as Jeffrey Sachs (2001), this is most likely due to a landlocked country’s inability to partake in nautical trade. Sachs finds similar results, showing that in temperate climates near the ocean, per capita income is 2.3 times greater than the world average.

In Table II on the next page, the same methodology was used for regressions with GDP per capita growth as the dependent variable. All variables are included except Birth Rate, which is intrinsically factored into the dependent variable.

Again, \textit{inter10} shows significance and robustness in all regressions except (7), in which the explanatory power has decreased considerably from the first four regressions. This finding again supports the hypothesis of the paper that the interaction term has had a persistent effect on economic growth, using two different measurements of growth.

Unlike the previous model with GDP growth as the dependent variable, it appears that Literacy is highly associated with per capita GDP growth. This may suggest that for a country as a whole, there may be other factors driving growth, but when examining growth at the per capita level, being able to read is positively related to the average income of its citizens. It follows that higher investment in education may lead to improved economic growth.
### TABLE II

ANOVA Results for Multiple Regressions on GDP Per Capita Growth (%)

<table>
<thead>
<tr>
<th>Independent Variable Notation</th>
<th>(1) ( \beta ) Coefficient (Robust s.e.)</th>
<th>(2) ( \beta ) Coefficient (Robust s.e.)</th>
<th>(3) ( \beta ) Coefficient (Robust s.e.)</th>
<th>(4) ( \beta ) Coefficient (Robust s.e.)</th>
<th>(5) ( \beta ) Coefficient (Robust s.e.)</th>
<th>(6) ( \beta ) Coefficient (Robust s.e.)</th>
<th>(7) ( \beta ) Coefficient (Robust s.e.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interaction Term for Years since Independence and Institutions at time of Independence</td>
<td>-0.2460665** (0.1461879)</td>
<td>-0.2459152* (0.1459469)</td>
<td>-0.2473037** (0.1471737)</td>
<td>-0.2400861* (0.1453903)</td>
<td>-0.2115977 (0.1417577)</td>
<td>-0.2465756** (0.140193)</td>
<td>-0.2052964 (0.141569)</td>
</tr>
<tr>
<td>Executive Constraints ( \text{excon} )</td>
<td>-0.0096588 (0.0092054)</td>
<td>-0.0096955 (0.0091221)</td>
<td>-0.0096445 (0.0090246)</td>
<td>-0.0096955 (0.0091221)</td>
<td>-0.0096445 (0.0090246)</td>
<td>-0.0096955 (0.0091221)</td>
<td>-0.0096445 (0.0090246)</td>
</tr>
<tr>
<td>Literacy ( \text{literacy} )</td>
<td>-0.1270955 (0.0570693)</td>
<td>-0.1150524 (0.0513328)</td>
<td>-0.1199247*** (0.046565)</td>
<td>-0.1192362** (0.0464137)</td>
<td>-0.1381618*** (0.0415273)</td>
<td>-0.1265878*** (0.0435405)</td>
<td>-0.0761935*** (0.0198677)</td>
</tr>
<tr>
<td>Life Expectancy ( \text{lifexp} )</td>
<td>-0.1681284 (0.1356812)</td>
<td>-0.1735857 (0.1219157)</td>
<td>-0.1809911 (0.1186185)</td>
<td>-0.1824011 (0.1181957)</td>
<td>-0.2033985* (0.114983)</td>
<td>-0.1542639 (0.12199)</td>
<td></td>
</tr>
<tr>
<td>Government Consumption (% of GDP) ( \text{adjgovcons} )</td>
<td>-0.1580183*** (0.0629298)</td>
<td>-0.1579128*** (0.0622126)</td>
<td>-0.1573867*** (0.0621416)</td>
<td>-0.1578367*** (0.0620337)</td>
<td>-0.1784511*** (0.0622201)</td>
<td>-0.1973068*** (0.0569511)</td>
<td>-0.189935*** (0.05566)</td>
</tr>
<tr>
<td>Terms of Trade ( \text{cot} )</td>
<td>3.78E-13** (1.71E-13)</td>
<td>3.87E-13** (1.62E-13)</td>
<td>3.87E-13** (1.62E-13)</td>
<td>3.86E-13** (1.61E-13)</td>
<td>3.35E-13** (1.60E-13)</td>
<td>3.18E-13** (1.57E-13)</td>
<td>2.71E-13* (1.57E-13)</td>
</tr>
<tr>
<td>Inflation ( \text{inflation} )</td>
<td>-0.0007057 (0.0004414)</td>
<td>-0.0007054 (0.0004393)</td>
<td>-0.0007073 (0.0004396)</td>
<td>-0.0007135 (0.000438)</td>
<td>-0.0006452 (0.000438)</td>
<td>-0.0006921 (0.0004688)</td>
<td></td>
</tr>
<tr>
<td>Arable Land (%) ( \text{arland} )</td>
<td>-0.0440994 (0.0360727)</td>
<td>-0.0435156 (0.034925)</td>
<td>-0.0385013 (0.0286774)</td>
<td>-0.0367245 (0.0283856)</td>
<td>-0.0440994 (0.0360727)</td>
<td>-0.0435156 (0.034925)</td>
<td>-0.0385013 (0.0286774)</td>
</tr>
<tr>
<td>Fuel Export Dummy ( \text{fueldummy} )</td>
<td>-1.545439*** (0.5968233)</td>
<td>-1.54167*** (0.6029059)</td>
<td>-1.567934*** (0.6016492)</td>
<td>-1.55*** (0.599138)</td>
<td>-1.438725** (0.5994237)</td>
<td>-1.428525** (0.5977934)</td>
<td>-1.099145** (0.5069249)</td>
</tr>
<tr>
<td>Ore / Metal Export Dummy ( \text{oredummy} )</td>
<td>0.0788445 (0.4919532)</td>
<td>0.2580537 (1.086684)</td>
<td>0.2185881 (1.05798)</td>
<td>0.0788445 (0.4919532)</td>
<td>0.2580537 (1.086684)</td>
<td>0.2185881 (1.05798)</td>
<td>0.0788445 (0.4919532)</td>
</tr>
<tr>
<td>Island Dummy ( \text{island} )</td>
<td>0.2580537 (1.086684)</td>
<td>0.2185881 (1.05798)</td>
<td>0.2580537 (1.086684)</td>
<td>0.2185881 (1.05798)</td>
<td>0.2580537 (1.086684)</td>
<td>0.2185881 (1.05798)</td>
<td>0.2580537 (1.086684)</td>
</tr>
<tr>
<td>Landlocked Dummy ( \text{landlock} )</td>
<td>-2.636661*** (0.9502531)</td>
<td>-2.66374*** (0.9041199)</td>
<td>-2.699786*** (0.8876067)</td>
<td>-2.714395*** (0.8841311)</td>
<td>-2.645712*** (0.9044824)</td>
<td>-2.39649*** (0.9487318)</td>
<td>-1.39274*** (0.5370856)</td>
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<tr>
<td>R-Squared</td>
<td>0.1233</td>
<td>0.1232</td>
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<td>0.1225</td>
<td>0.1182</td>
<td>0.1067</td>
<td>0.1020</td>
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<td>299</td>
<td>299</td>
<td>299</td>
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* Significant at 10%
** Significant at 5%
*** Significant at 1%
Government Consumption maintains a significant and negative relationship with per capita growth. As discussed by Barro (1996), big government appears bad for growth, as greater nonproductive expenditures tend to reduce growth rates. Unlike the previous set of regressions, Terms of Trade become significant and positive on the growth of per capita GDP. Barro explains this relationship by claiming that improved terms of trade raise domestic income and consumption by stimulating positive changes in employment and output.

The findings for Fuel Exports and being Landlocked are consistent with the first set of regressions, in that both are associated with lower growth rates.

As the statistical investigation has shown, the new interaction variable has consistently and robustly displayed a positive relationship with growth over a century after independence. These findings are significant, however further research may be necessary to better untangle the interactive effects of initial institutions and the timing of independence. Longer time series should be investigated, as there may be some underlying trends affecting the statistical outcomes within the data used for this paper, from 1990-2004. More rigorous econometric testing may also be necessary to identify instruments for the model. There may also be endogenous factors which could not be measured that affected the timing of independence, the initial institutions, and future growth. Finally, not all factors that affect economic growth can be calculated and regressed, so omitted variable bias may be present.

Despite these potential drawbacks, this paper has lent considerable support to the hypothesis that institutions and the timing of independence may have worked hand in hand to help shape the developmental paths of Latin American countries after independence.
CONCLUSION

In this paper, I suggested that two common theories on the development of Latin America since independence may actually be intertwined to have an interactive effect on long-run growth.

The first theory is that the colonial powers implemented poor institutions during their rule. Following independence, the newly free Latin American countries had no reference for constructing strong institutions and governments. With no other guide to follow, the institutions after independence embodied many of the same exclusionary and elitist traits as their predecessors, leading to political inequality and turmoil. Over time, this inequality and unrest has been economically costly.

A second, closely related theory emphasizes the timing of independence as a crucial factor in determining initial potential for long-run growth. Researchers have suggested that Latin America ‘missed out’ on the Industrial Revolution because they were still busy fighting the European colonial powers for independence. This delay set the countries behind on the developmental path, and they have not been able to catch up to those countries such as the U.S. who were able to industrialize during those key years.

This thesis formulated an interaction term to represent a combination of the two theories, and used econometric methods to test this new variable for a significant relationship with growth in the region. As the research shows, there is substantial statistical evidence to support the idea that the timing of independence and the initial institutions that followed independence may have had a combined effect on future economic growth.

Using two separate measures of economic growth and models based on previous literature, the new interaction term repeatedly exhibited a significant relationship with growth.
This paper concludes that within the confines of these econometric methods, it appears that having an earlier date of independence combined with having better institutions at the onset of independence has had a positive effect on future growth for Latin American countries.
REFERENCES
REFERENCES


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APPENDIX
### APPENDIX

<table>
<thead>
<tr>
<th>Countries included in the data:</th>
<th>Year of Independence</th>
<th>Initial Executive Constraints Score</th>
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<tbody>
<tr>
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<tr>
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<tr>
<td>Costa Rica</td>
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</tr>
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<td>3</td>
</tr>
<tr>
<td>El Salvador</td>
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<td>3</td>
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<tr>
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<td>3</td>
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<tr>
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</tr>
<tr>
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