How Does Union Strength affect Economic Development in Latin America?

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Abstract

This case study analyzes the effects of union strength on economic development in Argentina, Mexico, and Peru. This topic has formerly been given restricted scrutiny. Economic development in this paper is operationalized comprehensively, rather than as isolated factors. The theory tested is whether union strength has a diminishing returns effect on various economic development indicators. By testing the effects of union strength against various economic development indicators, this study finds that unions correlate positively with research and development as well as wages. However, union strength has a diminishing returns effect on productivity, equality, employment, and social well-being, and overall on economic development. This may be due to the measures used in the study. This Index could only rely on indicators for which country-specific and regional data was available, so more research is necessary to draw more confident conclusions.

Keywords: Unions, Economic development, Diminishing returns effects, Wages, Productivity, Equality, Employment, Social well-being, Argentina, Mexico, Peru

Introduction

Understanding the role of labor unions and worker rights in the larger Latin American economy, and, specifically, their effect on national development, can be vital in explaining the process of economic development. This insight could allow Latin American governments to formulate strategic policies relating to worker rights and unions that skillfully spur economic growth. Alternatively, this understanding could induce other social groups to mobilize, in association with unionized classes, to support socio-political, and therefore socio-economic, change in their respective countries. Unions are decreasing in influence: leaving them vulnerable to government policy which can either revive or destroy them.

A trade union can be defined as an organization "whose purpose is to improve the material welfare of members, principally by raising wages above the competitive level" (Booth, 1995, p. 51). The purpose of this study is to determine whether the effects of unionization expand further than this intended purpose to include a general increase in economic development.

The expected effects of strong labor unions and worker rights on national development are positive overall, depending on the metric employed to operationalize "development" in the analysis. For example, unionization promotes job security and raises wages, which could signify a higher standard of living for more people, less income disparity, more research and development, and expanded economic and emotional wellbeing.

Conversely, there are those that argue that unionization is a negative development marker. Such arguments generally expose a political bias for a capitalist economic model that views unions as an impediment to growth. Arguments to this effect are that strong unionization inhibits GDP

growth by stifling competition and that, in the rare cases where unions are left unchecked, economic progress may be hindered by unregulated strikes and underproductive workers.

In Latin America, unions have held an important role in political mobilization, especially in the 20th century when union membership was substantial enough to have noticeable impacts on business and industry. Most economic growth in Latin America has generally been associated with the dictatorial periods, while the unions were more visible during periods characterized by democracy. Union influence on policy-making lessened after the 1980s when Latin American governments liberalized the economy in response to a debt crisis (Rios-Avila, 2014). The union-friendly reforms prior to this period did not satisfactorily address changes in the economic structure and the circumstances of globalization, and the influence of unions diminished (Anner, 2008). More research is necessary to understand the historical impact of unions on economic growth.

Literature Review

The existing literature on the effects of unionization is mixed: with some finding that unions have a positive, others a negative, and still others a statistically insignificant effect for virtually all the facets of the economy. This area of study calls for further research, particularly in Latin America. This research would be an essential aid in formulating policies that aid development.

The existing data and research highlight several recurring themes, as follows:

- Union functions
- Union structure
- "Growth" in general terms
- Productivity
- Wages or Income

- Wage Gap or Income Inequality
- Employment or Unemployment
- Research and Development (R&D) or Innovation or Investment
- Social Well-being

I view these topics comprehensively as indicators of economic development. Countries exhibiting high levels of multiple indicators may be considered relatively well-developed.

The Function of Trade Unions

The roles and functions of unions have shifted over time, but Ewing (2005) identifies five main existing functions of trade unions. These represent the different stages in the evolution of a trade union organization's maturity. In order, they are: 1) a *service* function – providing services and benefits to members; 2) a *representative* function – representing the individual or collective interests in the workplace; 3) a *regulatory* function – direct multi-employer collective bargaining, or indirect involvement through policymaking; 4) a *government* function – through voter mobilization; and 5) a *public administration* function – through lobbying and policy enforcement.

Union Structure

Unions range in structure from centralized to decentralized, meaning that collective bargaining is either carried out at the national/multi-company level or at the firm or plant level (Katz, 1993). The literature shows that decentralized unions appear to have a more positive effect on innovation and technology licensing than centralized unions (Mukherjee and Pennings, 2005 & 2011). Decentralized unions that promote firms to engage in cooperative R&D, which in turne contributes to economic growth.

Economic Growth

Unions have direct and indirect effects on economic growth. The effects emphasized depend on the method of research used, so results are mixed. For example, Ji, Chang, and Huang (2016) minimize unionization's impact on economic growth while Kuder (2015) finds that, in the United States, a decrease in unionization level produces an increase in the rate of economic growth. McGuire (1999) finds that labor union strength exerts a weak positive effect on growth in Latin America specifically.

If we examine specific findings the results are even more varied. Irmen and Wigger (2003) view wage-oriented unions as redistributing income from the owners of capital to the workers, thus fostering economic growth if the workers' marginal propensity to save overtakes that of the capitalist. Chang and Hung (2016) note the possibility of both high unemployment and high growth coexisting because each unionized worker delivers more work in terms of hours than a non-unionized worker would. McCallum and Blais (1987) note the positive effects special interest groups, proxied by unions, have on the growth-promoting properties of the welfare state. Holcombe and Gwartney (2010) state that unions are in line with economic freedom, which enhances growth, but that union-promoted labor law restricts economic freedom thus inhibiting and burdening the economy. Aghion, Caroli, and García-Peñalosa (1999) focus their research on the effects of inequality on the rate of growth and find that the two are inversely related. Therefore, if unions can reduce inequality, they may boost the rate of economic growth.

Productivity

It is difficult to find consensus on the effects of unionization on productivity overall, although Latin America-specific studies show a positive relationship (Cassoni, Labadie, and Fachola, 2002; Rios-Avila, 2014). On the other hand, Addison and Hirsch (1989) find that unionization actually

has a negative impact on the productivity growth rate of firms and industries, and Hirsch and Link (1984) conclude that there is no support for the view that unionization produces a net positive increase in productivity.

However, unionization seems to be related to increased productivity in Latin America because unionization can cause firms to invest in more capital-intensive technologies in response to wage inflation (Cassoni, Labadie, and Fachola, 2002). Menezes-Filho, Zylberstajn, Chahad, and Pazello (2002) find that the relationship between unionization and productivity is concave, indicating that union density first promotes productivity up to a certain point before then reducing productivity in a manner reminiscent of the law of diminishing returns. Indirect effects on productivity include the significant positive correlation of union wage premiums with outsourcing, which is related to higher labor productivity (Magnani and Prentice, 2010).

Wages or Income

The notion that unionization increases wages for union members is well supported (Hara and Kawaguchi, 2008; Fichtenbaum and Olson, 2002; Menezes-Filho, Zylberstajn, Chahad, and Pazello, 2002; Cassoni, Labadie, and Fachola, 2002; Rios, 2013; Lee, 1978; Ji, Chang, and Huang, 2016; Ashenlelter, 1971; Johnson and Mieszkowski, 1970; Schultz and Mwabu, 1998). Menezes-Filho, Zylberstajn, Chahad, and Pazello, (2002) again find the relationship between unionization and wages to be concave, and that union density helps increase wages up to a certain point but then reduces them or causes stagnation beyond that point.

The effect on non-unionized workers is less certain. Some hold that union members gain higher wages at the expense of non-members (Johnson and Mieszkowski, 1970; Schultz and Mwabu, 1998). Heywood (1993) argues that under an efficient bargains model, union wage increases spillover and correspond to higher non-union wages. However, Pencavel (1991, p. 174)

criticizes studies that find a positive spillover effect, noting that "the direction and magnitude of this correlation is disturbing fickle."

Wage Gap or Income Inequality

Unionization has been found to have beneficial effects for wage distribution by reducing inequality among members (Gottschalk and Smeeding, 1997; Hara and Kawaguchi, 2008; Rios 2013). However, the result is a wider wage differentiation between union members and comparable non-union workers.

Existing studies on income inequality and unionization offer contradicting conclusions. Gottschalk and Smeeding (1997) state that "the net impact of unions on the distribution of earnings is ambiguous." Unionization may produce reductions in income inequality in the long run (Herzer, 2016). Schultz and Mwabu (1998) hold that reducing unionization would redistribute wage payments to lower-wage non-union workers and the poor who are often marginalized from participating in the labor force. McGuire (1999) found that labor union strength in Latin America has a weak negative effect on income equality, potentially because unions persuade governments to create policies that support urban workers or particular sectors, neglecting the poorer rural population or shanty town inhabitants.

Employment or Unemployment

An increase in unionization is correlated with a decrease in employment (Chang and Hung, 2016; Ji, Chang, and Huang, 2016; Long, 1993; Schultz and Mwabu, 1998). In one case, Schultz and Mwabu (1998) estimated that if the relative wage increases from unionisation were halved, employment would rise by a few percentage points and participation would also increase

"substantially." In another study, Long (1993) notes that unionized firms experienced slower employment growth than similar non-union firms.

A Latin America-specific study finds that greater unionization translates into an increase in employment and a decrease in labor turnover (Cassoni, Labadie, and Fachola, 2002). Finally, Menezes-Filho, Zylberstajn, Chahad, and Pazello (2002) point to a concave relationship between labor unions and employment.

Research and Development (R&D) or Innovation or Investment

Studies on whether R&D, innovation, and investment are impacted by the level of unionization in a particular industry lean towards exposing a negative bearing (Rios-Avila, 2014; Addison and Hirsch, 1989; Bradley, Kim, and Tian, 2017). In a recent study, Bradley, Kim, and Tian (2017) note that patent counts and citations "decline significantly" after the introduction of unions. One explanation is that unions engage in rent-seeking over long-term tangible and intangible capital, which may decrease firms' investments in physical capital, R&D, and other innovations (Addison and Hirsch, 1989).

Cassoni, Labadie, and Fachola (2002) point towards unionization actually promoting investment and the use of capital-intensive technologies, finding that, because of the increase in wages, firms substitute labor with capital. Conversely, Ji, Chang, and Huang (2016) find unionization has no significant real impact on investment.

Social Well-Being

Results indicating the relation between unionization and well-being are, again, mixed. This indicator of development is observed through a variety of lenses including domestic welfare, job satisfaction, life satisfaction, and others. For example, unionized workers are less affected by

anxiety related to organizational change in the workplace, indicating that unions have a mediating effect (Bryson, Barth, and Dale-Olsen, 2013). Flavin and Shufeldt (2016) note that unionized workers have higher levels of life satisfaction and that union membership is a strong predictor of quality of life.

The positive effects seem to spill over to non-union members and society at large as well. Bandyopadhyay and Bandyopadhyay (2001) find that stronger wage-oriented unions are related to higher domestic welfare. To Flavin, Pacek, and Radcliff (2010), unions have a positive impact on the life satisfaction of all citizens.

On the other hand, other studies indicate negative results. Haile, Bryson, and White (2015) find union members have lower job satisfaction than comparable non-unionized workers. The relationship between unionization and job satisfaction is found to be rather country-specific, and it only impacts those material aspects of job satisfaction they can more feasibly change (Hipp and Kolins Givan, 2015).

McGuire (1999) finds that in East Asia and Latin America, labor union strength negatively affects human development. His study shows that unionization has negative effects on progress in infant survival rates and life expectancy levels. McGuier attributed this negative effect to the fact that governments may respond to unions and other interest groups with policies that are urban- and sector-focused which neglect more marginalized populations.

Theory

This paper aims to contribute a testable theory to the topic of unionization and economic development in Latin America. There is a clearly identifiable gap in the literature with regards to the effects of labor unions on economic growth, broadly, and in Latin America, specifically. My

theory is that unionization has a diminishing returns effect on economic development in Latin America.

Prior research has mostly focused on the effects of union strength on single indicators of economic development, such as GDP, for example, rather than viewing indicators in conjunction with one another. Thus the existing literature may not provide a complete picture. My aim is to consider all of the effects of unionisation as intermingling features of a whole model of development: analyzing the effects on GDP, on wages, on employment (and so on for each indicator listed in the literature review) to determine the comprehensive effect of union strength on economic development.

I theorize that unionization has a diminishing returns effect on economic development, depending on its centralization and strength. Menezes-Filho, Zylberstajn, Chahad, and Pazello (2002) find that unionization in Latin America can have a concave effect on some of the indicators that I use to gauge economic development. I expect that unionization is beneficial to economic development up to a certain point before yielding diminishing returns, eventually producing negative effects.

First, in terms of union structure, it is anticipated that the more unions in Latin American countries lean towards a "centralized" structure, the less beneficial they become to national economic development. Mukherjee and Pennings (2005 & 2011) found that decentralized unions have a more positive relation to innovation and technology licensing than centralized unions.

Additionally, the strength of unions is anticipated to have a "diminishing returns" effect on employment, wages, and inequality. It could be argued that, since unions raise wages and reduce wage inequality for members (Gottschalk and Smeeding, 1997; Hara and Kawaguchi, 2008; Rios

2013), if membership were near-universal, wage inequality would virtually disappear. However, as Menezes-Filho, Zylberstajn, Chahad, and Pazello (2002) find that unions in Latin America have a concave effect not only on wages but also on employment, the above argument does not hold. There may well be a point where unionization levels become so bloated that wages and employment suffer. If unionization passes the equilibrium point, then it risks exacerbating inequality which Aghion, Caroli, and García-Peñalosa (1999) conclude reduces growth rates. This may fit, not only, with McGuire's (1999) finding that unionization raises both growth and inequality, but also with the notion of a concave effect because of inequality's detrimental effect over the long run.

The hypotheses (HP) tested are as follows:

- HP1: The more centralized unions are, the less R&D there is.
- HP2: As a country's union strength increases on the Union Strength Index, economic growth and productivity initially increase before reaching diminishing returns.
- HP3: As a country's union strength increases on the Union Strength Index, wages initially increase before reaching diminishing returns.
- HP4: As a country's union strength increases on the Union Strength Index, income inequality initially diminishes before increasing again.
- HP5: As a country's union strength increases on the Union Strength Index, employment initially increases before reaching diminishing returns.
- HP6: As a country's union strength increases on the Union Strength Index, social well-being initially increases before reaching diminishing returns.

- HP7: As a country's union strength increases on the Union Strength Index, overall economic development, as measured in my Economic Development Index, initially increases before reaching diminishing returns.

In the following section, I will outline how the countries for this comparative case study will be selected. I will then review the control, independent, and dependent variables. Finally, I shall explain how I intend to operationalize the variables.

Methodology

This research is organized as a comparative case study of three different Latin American countries: Argentina, Mexico, and Peru. I chose these countries because of their specific similarities and differences in relevant variables, using the most similar system design method of research. This means I hold the control variables (CVs) constant across cases to avoid having my results skewed by intervening variables, while I allow the independent variable (IV) and the dependent variable (DV) to vary. Any change in the DV is attributable directly to the IV. Accordingly, the three cases selected have uniformity in intervening variables, differences in levels of unionization, and variation in economic development.

Variables that are controlled for (CVs) include inflation, natural resource income as a percentage of GDP, population growth rate, political stability and structure, culture, and human capital (using educational attainment as a measure). Argentina, Mexico, and Peru are similar for each CV, as explained below. Levels of political stability are comparable across the selected cases. All three countries considered here are presidential representative democratic republics with three government branches and a multi-party system.

It should be noted that neither inflation nor human capital is as perfectly controlled for as they ideally would be. Inflation in Latin America was unfathomably high after the 1980s. In 1990, some countries had and inflation rate of over 100%, while others had it in the thousands. If the average (arithmetic mean) inflation for the era is taken starting a few years after 1990, the stability increases and the similarities among countries magnify.

For human capital, comparable data is also difficult to attain as it is a rather difficult concept to measure. Comparative descriptions like the Human Capital Report were unavailable in the 1990s. Comparable country-specific data is also difficult to come by, as the departments of education for many Latin American countries did not collect data on educational attainment, and those that did often used differing measures. Thus, the most direct measure I can employ for educational attainment (as a proxy for human capital) is the literacy rate as gathered by the World Bank.

Controlled variable 1: Inflation

Inflation can erode a county's purchasing power, thus impacting the economic development of a country. Dissimilar rates between countries in this study could interfere with the relationship between union strength and economic development, thereby voiding any attribution of an effect in the DV to the IV. Although it is difficult to control for inflation in Latin American countries in the 1990s, the three cases chosen have agreeably similar rates relative to neighboring countries at the time. The mean inflation between the years 1992-2005 was 6.77% for Argentina, 13.49% for Mexico, and 13.47% for Peru (Public Data, 2017a).

Controlled variable 2: Population Growth

Population growth may also affect economic development, as it may result in growth in the labor force. Choosing countries with similar population growth rates allows me to discount the possibility that economic development in one case is attributable to this variable. The trend in many Latin American countries was a slightly declining population growth rate. The three selected countries, however, all had similar rates of population growth: Argentina's average population growth rate between 1990-2005 was 1.21%, Mexico's mean was 1.50%, and Peru's average was 1.60% (Public Data, 2017b).

Controlled variable 3: Natural Resource Income

The natural resources of the three selected countries may differ, however, for the purpose of this study, the revenue gained from the resources – i.e., how well these resources are managed and channeled into the market, is what is of interest rather than what resources each country possesses. The most important natural resources in Argentina include "oil, natural gas, coal, minerals, and the forest" (TheGlobalEconomy.com, 2017a). It's natural resource rents as a percent of GDP average 2.15% between 1990-2005 (World Bank, 2018). Mexico contains stores of natural resources including oil, minerals, coal, natural gas, and the forest (TheGlobalEconomy.com, 2017b). Despite these resources being funneled into the economy, they only composed 3.17% of Mexico's GDP between 1990-2005 (World Bank, 2018). Peru has similar natural resources. The rents it reaped from these natural resources between 1990-2005 made up 2.42% of its GDP (World Bank, 2018). Thus, the three countries possessed similar natural resource revenues as a percentage of GDP for the period in study.

Controlled variable 4: Human Capital

Human capital is key for economic development, and imbalances in this variable across cases could cause the relationships observed to be severely spurious. With limited data on the educational attainment of the Argentinian labor force in the 1990s, the World Bank determined that the literacy rate (% of people aged 15 and above) for the Argentinian labor force in the 1990s was 96.1% (Reyes and Sawyer, 2016). The literacy rate in Mexico was lower but relatively similar at 87.6% (Reyes and Sawyer, 2016). The same can be said of the Peruvian labor force at 87.2% literacy (Reyes and Sawyer, 2016).

Independent Variable: Unionization

Unionization is commonly operationalized in terms of density and centralization. McGuire's (1999) Labor Strength Index is a useful tool. He uses data from the International Labour Organization (ILO) from 1997 weighed against four dimensions of unionization to measure union strength. The first two dimensions determine density levels (the proportion of the unionized labor force), while the second two combined calculate unions' function and structure. The four dimensions are:

> (1) union members as a proportion of the non-agricultural labor force; (2) the proportion of formal-sector workers under collective contracts; (3) the dominant level of collective bargaining (national/sectoral, company/plant, or both); and (4) the number of major ILO conventions ratified. (McGuire, 1999)

On the Labor Strength Index, Argentina scores 0.67, ranking 20th in a 93-country dataset, Mexico scores -0.15, ranking 47th, and Peru scores -0.83, ranking 81st (McGuire, 1999, Table 1).

In terms of the Labor Strength Index, Argentina ranked strongly in all four dimensions. Unions were centralized. They were politically and legally influential as exemplified by the

number of ILO treaties Argentina ratified. And, union membership in the non-agricultural sector and the percent of formal sector employees covered by collective contracts circa 1995 were both impressively high (McGuire, 1999, Table 1).

Mexico has somewhat weaker labor strength than Argentina. The union membership was high, but there is no information on contract coverage in those years, and the dominant level of collective bargaining took place at the firm level between 1985-1995 (McGuire, 1999, Table 1). The Mexican government ratified the same number of ILO conventions as Argentina as of 1996 (McGuire, 1999, Table 1).

Peru's score is low on the Labor Strength Index in the 1990s. Membership was very low, data on collective contract coverage is lacking, and, as in Mexico, unions in Peru organized collective bargaining mainly at the firm level (McGuire, 1999, Table 1). Peru also ratified fewer ILO conventions than Argentina and Mexico in the relevant period.

Dependent Variable: Economic Development

The dependent variable (DV) is the umbrella term "economic development," and is operationalized using various proxies. The individual indicators of economic development, i.e. proxies, include change in GDP/productivity, wages, inequality, employment levels, R&D (gauged in terms of the number of patents per year), and social well-being (measuring life expectancy and life satisfaction). Data observed to gauge these indicators relate to the 1990-2000s period to provide a comprehensive enough picture of the economic environment while avoiding the extreme circumstances of both the so-called "Lost Decade" in Latin America and the Great Recession of the late 2000s.

To interpret the final effect of unionization on economic development, I created the Economic Development Index. The three countries were chosen for their differing levels of unionization. For each given country, each proxy of economic development is valued designating "Very Low" to "Very High" levels. I sum up a country's scores on all the proxies to reach the country's overall economic development score ranging from "Very Low" to "Very High." The economic development scores of the three countries will then be compared to determine the net effect of unionization on economic development.

Index

To comprehensively calculate economic development in a systematic way, it is useful to scale all the indicators on one index. Each indicator were weighed against the baseline for the region, and a difference of (X) from that baseline was scored as (Y) or (-Y), depending on the direction of the difference. On a seven-point scale, ranging (-3) to (+3), lower values are associated with less development and higher values with more development. Each integer on the Index scale denotes the cutoff point for the interval (X) of the given indicator. For example, in the case of R&D, an increase from (+1) to (+2) on the Index scale indicates an increase of 100 patent applications. Each indicator is scaled slightly differently on the Index.

In order, the rankings (-3) to (+3) translate to: "Very Low," "Low," "Medium-Low," "Medium," "Medium-High," "High," and "Very High" levels of economic development for each indicator.

The regional average for each indicator is scored as (0) on the seven-point scale, which translates to "Medium" levels of the given indicator. To have a "buffer zone" surrounding (0) for countries with near-baseline scores to be ranked at (0) as well, each cutoff interval is halved, and

half is added to the baseline value while half is subtracted from the baseline value. This provides seven equal intervals to be used in scale. Using the example of R&D, if each interval represents 100 patents, then the buffer zone for (0) will be the baseline of 317 patents +/- 50 patents.

The country-specific data in the table is the same as one used in the paper itself and comes from a variety of sources. The more complex regional averages will be explained below.

Available data for R&D, as proxied by patent applications, is severely limited for Latin America.[1] Interval cutoffs are every 100 patent applications, so the buffer zone will be 317 +/- 50 patent applications. Therefore, "Medium" levels of R&D in a country range from 267 to 367 patent applications every year; "Very Low" from 0-67; "Low" from 67-167; "Medium-Low" from 167-267; "Medium-High" from 367-467; "High" from 467-567; "Very High" from 567 and above.

Figure 1. R&D Scale

0		**67**		**167**		**267**	**317**	**367**		**467**		**567**		**667<**
|	-100	|	-100	|	-100	| -50	| +50	|	+100	|	+100	|	+100 |
	-3		**-2**		**-1**		**0**			**+1**		**+2**		**+3**

Public Data (2017) reports the average GDP per capita, based on purchasing power parity. The regional average for 1990-2005 is $10,888.60. Interval cutoffs are every $1500, so the buffer zone will be $10,888.60 plus or minus $750. Thus, "Medium" levels of GDP per capita, PPP, in a country range from $10,138.60 to $11,638.60, "Very Low" from below $5,638.60 to $7,138.60;

[1] The regional average for the era of interest must be calculated using the World Bank data available for 1993 (World Bank, 2017). The countries in the region (excluding the Caribbean) for which there is data that will be used to calculate the regional 1993 patent application average are: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, and Venezuela. The regional average in 1993 was 317 patent applications.

"Low" from $7,138.60-$8,638.60; "Medium-Low" from $8,638.60-$10,138.60; "Medium-High" from $11,638.60-$13,138.60; "High" from $13,138.60-$14,638.60; "Very High" from $14,638.60 and above.

Figure 2. GDP per capita, PPP, Constant 2005 $ Scale

<5638.6	**7138.6**	**8638.6**	**10138.6**	**10888.6**	**11638.6**	**13138.6**	**14638.6**	**16138.6<**
| -1500	| -1500	| -1500	| -750	| +750	| +1500	| +1500	| +1500	|
-3	**-2**	**-1**	**0**	**+1**	**+2**	**+3**		

Wages as a share of GDP are reported for individual countries for 1990 and for 2000 in Abeles, Amarante, and Vega (2014). I first calculated the 1990-2000 average for each country,[2] and then I calculated the regional averages for the same time period.[3] The regional average for 1990-2000 was 47.8%. Interval cutoffs are every 5%, so the buffer zone will be 47.8 plus or minus 5, thus, "Medium" levels of wages in a country range from 45.3 to 50.3 percent of GDP. The "Very Low" level ranges from below 30.3 to 35.3 percent; "Low" from 35.3-40.3 percent; "Medium-Low" from 40.3-45.3 percent; "Medium-High" from 50.3-55.3 percent; "High" from 55.3-60.3 percent; "Very High" from 60.3 percent and above.

[2] although only data from 2000 was available for Guatemala and Uruguay,
[3] The regional average was calculated using data for Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

Figure 3. Wages as a Share of GDP Scale

<30.3	**35.3**	**40.3**	**45.3**	**47.8**	**50.3**	**55.3**	**60.3**	**65.3<**
| -5	-5	-5	-2.5	+2.5	+5	+5	+5 |	
-3	**-2**	**-1**	**0**		**+1**	**+2**	**+3**	

Regional data for the Gini coefficient average is unavailable for 1998 and has, therefore, been personally calculated using World Bank data[4] (2017). Because income inequality negatively affects economic development, the value on the Index must be adjusted and the sign (+/-) of the difference from the regional mean should be flipped. For example, a 2-point increase from the regional mean would indicate that the given country has 2 points more inequality, or is 2 points worse off than the region, an increase in inequality being matched with a decrease in score on the Economic Development Index. For this indicator, each 2-point difference in the Gini coefficient shall correspond to a 1-point difference on the Index scale. The regional average Gini coefficient in 1998 was 53.4. Interval cutoffs are every 2 Gini-points, so the buffer zone will be 53.4 plus or minus 1 Gini-point. "Medium" levels of Income Inequality in a country range from 52.4 to 54.4 using the Gini coefficient. "Very Low" from below 46.4 to 48.4; "Low" from 48.4-50.4; "Medium-Low" from 50.4-52.4; "Medium-High" from 54.4-56.4; "High" from 56.4-58.4; "Very High" from 58.4 and above. Recall the signs will be flipped to show a positive effect on Economic Development for lower levels of inequality and vice versa.

[4] The twelve countries for which data is available, and which have been included to calculate the arithmetic mean for the region are: Argentina, Belize, Brazil, Chile, Costa Rica, Ecuador, El Salvador, Honduras, Mexico, Nicaragua, Panama, and Peru.

Figure 4. Income Inequality Scale

<46.4	**48.4**	**50.4**	**52.4**	**53.4**	**54.4**	**56.4**	**58.4**	**60.4<**
| -2	-2	-2	-1	+1	+2	+2	+2 |	
+3	**+2**	**+1**		**0**		**-1**	**-2**	**-3**

The unemployment average for Latin America is also reported in Public Data (2017). Unemployment has a negative effect on economic development, so the scoring must be adjusted. The same method would be employed as for income inequality to readjust the score for unemployment. The regional unemployment average for 1991-2005 was 9.8%. Interval cutoffs are every 2%, so the buffer zone will be 9.8 plus or minus 2: "Medium" levels of wages in a country range from 8.8 to 10.8 percent unemployment. "Very Low" levels range from below 2.8 to 4.8 percent; "Low" from 4.8-6.8 percent; "Medium-Low" from 6.8-8.8 percent; "Medium-High" from 10.8-12.8 percent; "High" from 12.8-14.8 percent; "Very High" from 14.8 percent and above. Recall the signs will be flipped.

Figure 5. Unemployment Scale

<2.8	**4.8**	**6.8**	**8.8**	**9.8**	**10.8**	**12.8**	**14.8**	**16.8<**
| -2	-2	-2	-1	+1	+2	+2	+2 |	
+3	**+2**	**+1**		**0**		**-1**	**-2**	**-3**

Social well-being encompasses two indicators (life expectancy and self-reported satisfaction), reported completely differently. To make up for this discrepancy, I first report the average life expectancy for the region (Public Data, 2017) and calculate the mean self-reported happiness score from every country in Central and South America reported in Ortiz-Ospina and Roser[5] (2017). I then calculate the percent difference between a given country's score on life expectancy and the regional average life expectancy. I do the same for self-reported life satisfaction. To come up with a single social well-being score for the given country, I calculate the average of the two differences. This provides an average-difference score from the regional mean to gauge how well the given country fares from the regional norm. Both the original values for each proxy and the average difference value are listed on the Index.

The regional social well-being average for 2005 will be represented as 100%. Interval cutoffs are every 5% difference from the baseline of 100%, so the buffer zone will be 100 plus or minus 2.5%. "Medium" levels of Social Well-being range from 97.5 to 102.5 percent; "Very Low" levels range from below 82.5 to 87.5 percent; "Low" from 87.5 to 92.5 percent; "Medium-Low" from 92.5 to 97.5 percent; "Medium-High" from 102.5 to 107.5 percent; "High" from 107.5 to 112.5 percent; "Very High" from 112.5 percent and above.

[5] this excludes Belize, Guyana, Suriname, and French Guiana

Figure 6. Social Well-Being Scale

<82.5	**87.5**	**92.5**	**97.5**	**100**	**102.5**	**107.5**	**112.5**	**117.5<**
| -5	-5	-5	-2.5	+2.5	+5	+5	+5 |	
-3	**-2**	**-1**		**0**		**+1**	**+2**	**+3**

A country's overall score can naturally only fall between +/-18: there are 6 indicators, and each indicator can only be between +/-3. There are 37 possible integer scores on this Index including (0). Dividing 37 by 7 (to have a final 7-point scale) provides the value for each interval to be scored from (-3), meaning "Very Low" to (+3), meaning "Very High" levels of economic development. The quotient is 5.29, rounded to two decimal points. The buffer zone around (0) is 2.64, rounded to two decimal points. "Medium" economic development scores range from -2.64 to 2.64; "Very Low" from -18 to -13.22; "Low" from -13.22 to -7.93; "Medium-Low" from -7.93 to -2.64; "Medium-High" from 2.64 to 7.93; "High" from 7.93 to 13.22; and "Very High" from 13.22 to 18.

Figure 7. Economic Development Index Scale

-18	**-13.22**	**-7.93**	**-2.64**	**0**	**2.64**	**7.93**	**13.22**	**18**
| -5.29	-5.29	-5.29	-2.64	+2.64	+5.29	+5.29	+5.29 |	
-3	**-2**	**-1**		**0**		**+1**	**+2**	**+3**

The next section will provide an overview of the facts that are pertinent to testing the hypotheses.

Case Study Results

In the section above, I listed the similarities across cases in terms of intervening variables and outlined the differences in levels of union strength, providing the basis for a viable comparison of the variables of interest. This section is dedicated to laying out the relevant facts for each of the countries with regards economic development.

Argentina

Unions were greatly impacted by Juan Peron, both during his years as Secretary of Labor and as President of Argentina. Many unions had and continue to maintain links with Peron's Justicialist Party (Gonzalez, Medwid, and Trajtemberg, 2009). The Law on Contract Employment was passed in 1974 and was amended several times since (Bronstein, n.d.). With the trade liberalization of the late 20th century, the traditional industrial sector contracted while the service sector expanded, and unions (most active in the industrial sector) were weakened (Gonzalez, Medwid, and Trajtemberg, 2009). The most unionized sectors were manufacturing, construction, transportation, and retail (Gonzalez, Medwid, and Trajtemberg, 2009).

Union membership composed 25% of the non-agricultural labor force in 1995 (McGuire, 1999, Table 1). The collective contract coverage shows even more impressive union impacts. The percentage of formal sector employees covered by collective contracts circa 1995 was a striking 73% (McGuire, 1999, Table 1). Collective bargaining occurred mostly at the industry level between 1985-1995 (McGuire, 1999, Table 1). Finally, unions were politically and legally

influential, as the country ratified three out of six identified major International Labor Organization (ILO) conventions as of 1996 (McGuire, 1999, Table 1).

Economic growth or productivity followed an upward trend with a slight dip in 2002. The GDP per capita, based on purchasing power parity (PPP) and using constant 2005 international exchange rates, was encouraging compared to many other Latin American countries. The average between 1990-2005 was $14,004.24 (Public Data, 2017c). The lowest was in 1990, at $10,815.72, and the highest was in 1998, at $15,894.56 (Public Data, 2017c).

Real wages remained steady between the years 1990-1997. The average from 1990-1997 was 101.1% the rate of 1990 (Marshall, 2000, Table A). Wages as a share of GDP at factor prices were 44.7% around 1990 and 40.5% around 2000, and the average for the decade was 42.6% (Abeles, Amarante, and Vega, 2014).

Wage inequality, as proxied by the Gini coefficient, was mid-range. In terms of the Gini coefficient, an index showing how income among a population deviates from a perfectly equal distribution (0 indicating perfect equality and 100 representing perfect inequality), Argentina placed firmly in the middle in 1998 with a coefficient of 50.7 (World Bank, 2017a).

Employment was highest in the service sector, followed by the industrial sector, and then finally the agricultural sector (Public Data, 2017d, e, and f). The most relevant measure for this study is unemployment, which displayed an "M" shape over the abovementioned era, peaking in 1995 and 2002. The average for the era was 13.69% (Public Data, 2017g).

Research and development, as proxied by the number of patent applications, was reasonably high for a Latin American country in the 1990s. There were yearly fluctuations, but the average number of applications from 1990 to 2005 was 834 (World Bank, 2017b).

Social wellbeing was at respectable levels during the 1990s and early 2000s. Life expectancy levels reached 74.69 in 2005 (Public Data, 2017h). Self-reported life satisfaction in 2006, using data collected by the World Happiness Report, Argentina scored 6.31 out of 10 (Ortiz-Ospina and Roser, 2017, Responsive Table 1). This means that people answering the question "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?" averaged to the abovementioned score.

Mexico

A plurality of unions in Mexico are urban-based. Many unions are included in the Confederation of Mexican Workers (Confederacion de Trabajadores Mexicanos, or CTM), which is affiliated to the Institutional Revolutionary Party (PRI) (CountryStudies.us, n.d.). The Labor Code supposedly controlled the labor-management relations. "Corruption, paternalism, and abuse of union funds" caused this control to be circumvented (CountryStudies.us, n.d.). Unions had less political influence in the 1990s than before, as the government adopted neoliberal policies (CountryStudies.us, n.d.) The industrial sector in Mexico has generally been more heavily unionized relative to other developing countries (Grajeda, 2014). The most highly unionized sectors were "mining, electricity, water, and gas transmission," and these were followed by services, "transportation, mail, shipping and warehousing," and manufacturing (Fairris and Levine, 2004, Chart 2).

Mexico has somewhat weaker labor strength than Argentina according to McGuire (1999, Table 1). The union membership in 1995 was 31% of the non-agricultural labor force (McGuire, 1999, Table 1). There is not much information on collective contract coverage for comparable

years. The dominant level of collective bargaining took place at the firm level between 1985-1995 (McGuire, 1999, Table 1). The government ratified three out of six major ILO conventions as of 1996, showing medium involvement internationally with regards to labor (McGuire, 1999, Table 1).

Economic growth and productivity, as measured GDP per capita based on PPP in constant 2005 international exchange rates, rose slightly between 1990-2005. The mean for the 1990-2005 period was $13,950.52 (Public Data, 2017c).

Real wages rose for the first half of the 1990s. The mean level between 1990-1997 was 110.4% the rate leading into 1990 (Marshall, 2000, Table A). Wages as a share of GDP at factor prices averaged 33.3% over the decade (Abeles, Amarante, and Vega, 2014).

Mexico also placed rather mediocrely on the Gini index in 1998, with a coefficient of 49.0 (World Bank, 2017a). It did, however, have slightly less inequality than Argentina (above).

Employment was highest in the service sector between 1990-2005, followed by employment in industry and agriculture (Public Data, 2017d, e, and f). Unemployment in Mexico for the 1991-2005 period remained relatively low. The average unemployment rate for those years was 3.6% (Public Data, 2017g).

R&D was moderate between 1990 and 2005. The average number of patent applications by residents over this period was 506 (World Bank, 2017b).

Social wellbeing in Mexico is one of the highest in the region in the era of interest. Life expectancy was 70.8 in 1990 and followed a rising slope to 75.28 in 2005 (Public Data, 2017h). Mexico's score on self-reported life satisfaction in 2005 was 6.58 (Ortiz-Ospina and Roser, 2017).

Peru

Unions in Peru have traditionally been weak. Until the late 1960s, they were closely tied to the American Popular Revolutionary Alliance (APRA), which had near monopoly of worker mobilization, using the labor movement mainly for its own ends. The unions became more active during the following decade – the military years – with the new Industrial Reform Law, but the economic decline of the 1980s drastically weakened the movement (CountryStudies.us). The General Confederation of Peruvian Workers (Confederacion General de Trabajadores del Peru, or CGTP) persisted to become the most influential union confederation during the 1990s. Trade liberalization and new labor laws in the early 1990s diminished union bargaining power (Saavedra and Torero, 2002). Unions were present in non-trade sectors (such as banking), soft budget constraint sectors (such as public administration and state-owned enterprises), and the manufacturing sector, among others (Saavedra and Torero, 2002). More recently, other sectors impacted by unions have included electricity, water, construction, and mining (Peru Country Commercial Guide, 2017).

Labor strength was very weak in the 1990s. Only 8% of the non-agricultural labor force was unionized in 1995 (McGuire, 1999, Table 1). Unions in Peru organized collective bargaining mainly at the firm level (McGuire, 1999, Table 1). Peru only ratified two out of six major ILO conventions McGuire identifies in his 1999 study.

Economic growth and productivity exhibited a positive trend but remained relatively low. This minimal economic growth was unremarkable in fluctuations. GDP per capita based on PPP remained relatively flat for the early 1990s and only gradually sloped up. Between 1990-2005, it averaged $6,300.98 (Public Data, 2017c).

Peru experienced much positive growth in real wages between 1990-1997. The wages rose, peaked, and fell, but the overall average was 112.8% the rate of 1990 (Marshall, 2000, Table A). Wages as a share of GDP at factor prices averaged 27.9% between 1990-2000 (Abeles, Amarante, and Vega, 2014).

Unsurprisingly, the Gini coefficient for Peru was slightly higher than the regional mean, with a score of 56.1 (World Bank, 2017a). This puts Peru in its usual position, lagging behind the region in terms of development.

Employment was highest in the service sector between 1990-2005, at a rate tripling that of employment rate in the industry sector and making employment levels in agriculture seem negligible. Unemployment levels also remained relatively stable in the 1990s and early 2000s. The mean unemployment rate for the years considered was 7.59% (Public Data, 2017g).

Peru saw low levels of R&D as proxied by patent applications by residents. The data is incomplete for the years 1990-2005, but the average was only 37 patent applications per year (World Bank, 2017b). This rate of parent applications was stable over the 15-year period.

Social wellbeing was also on the lower end. Life expectancy in 1990 was 65.53, and although this trend was growing positively, life expectancy only reached 72.46 years in 2005 (Public Data, 2017h). Peru scored 4.81 on the self-reported life satisfaction in 2006, well below both Mexico and Argentina (Ortiz-Ospina and Roser, 2017).

Case Study Analysis

This section now directly applies the facts collected in the previous section to the hypotheses outlined in the theory section.

Hypotheses

Considering the information collected above, the hypotheses laid out in the theory section can now be tested. The data is shown again here in the Economic Development Index, which shows the country scores to be tested in HP7.

Table 1: Economic Development Index, scores in parentheses

	Argentina	**Mexico**	**Peru**	**Region**
R&D (patent applications, 1993)*	834 **(+3)**	506 **(+2)**	37 **(-3)**	317
GDP per Capita, PPP (1990-2005 average, using 2005 constant international $)**	$14,004.24 **(+2)**	$13,950.52 **(+2)**	$6,300.98 **(-3)**	$10,888.60
Wages (as a share of GDP 1990-2000 average)***	42.6% **(-1)**	33.3% **(-3)**	27.9% **(-3)**	47.8%
Income Inequality (Gini coefficient, 1998)******	50.7 **(+1)**	49.0 **(+2)**	56.1 **(-1)**	53.4
Unemployment (1991-2005 average)*******	13.7% **(-2)**	3.6% **(+3)**	7.6% **(+1)**	9.8%
Social Well-being (life expectancy and self-reported life satisfaction, 2005)********	74.69; 6.31 105.3% (of the regional social well-being) **(+1)**	75.28; 6.58 108.1% (of the regional social well-being) **(+2)**	65.53; 4.81 86.2% (of the regional social well-being) **(-3)**	72.91; 5.83 100% (of the regional social well-being)
Overall Country Score	**+4**	**+8**	**-12**	

* cutoff every 100 patent applications
** cutoff every $1500
*** cutoff every 5%
**** cutoff every 2 Gini points
***** cutoff every 2%
****** cutoff every 5%

HP1: *"The more centralized unions are in a country, the less R&D there is"* is visibly not supported by the cases at hand and must be rejected. In fact, the cases of Argentina, Mexico, and Peru support the notion that countries with stronger, more centralized unions also enjoy more patent applications every year.

The second hypothesis, "*As a country's union strength increases on the Union Strength Index, economic growth and productivity initially increase before reaching diminishing returns"* is supported in this study. The expected finding was that Peru, with its weak unions, would have little productivity; that Mexico, with moderate unions, would have high productivity; and that Argentina, with strong unions, would have diminishing returns exemplified by lower productivity. The returns have not yet become negative in Argentina *at this time,* but the productivity outputs in Argentina and Mexico are so similar as to suggest that the rate of return has diminished and is nearly flat.

The notion of diminishing returns is central to HP3. The three cases seem to lend little support for the hypothesis "*As a country's union strength increases on the Union Strength Index, wages initially increase before reaching diminishing returns.*" In terms of wage growth rate, Argentina and Mexico fall perfectly in line with the expected finding that moderate union strength would heed a high wage growth rate while great union strength would experience diminishing

returns. However, Peru, with its weak unions, has greater real wage growth than either of the other two countries, making the relationship appear linear and negative. In terms of real wages and labor productivity, used in the Economic Development Index, it appears that union strength has a linear positive correlation with wages as a share of GDP. In Argentina, wages in 2000 constituted a 6% higher share of GDP than in Mexico and a 13.5% higher share than in Peru. In either case, HP3 must be rejected, as wages comprise a greater share of GDP as union strength increases.

The cases of Argentina, Mexico, and Peru appear to support HP4: "*As a country's union strength increases on the Union Strength Index, income inequality initially diminishes before increasing again*" depending on the measure used. Using wage dispersion coefficients for the manufacturing sector, again, as similarly to the case for HP2, this relationship appears linear and negative. The argument regarding the concave effect unionization has on wage inequality does not hold true in this case. However, because no data is available for wage dispersion coefficients for a regional average, it would not have been possible to insert "Income Inequality" into the Economic Development Index. I, therefore, also observed the relationship between union strength and the Gini coefficient for inequality, which actually supports HP4.

This case study seems to moderately support hypothesis 5. HP5, "*As a country's union strength increases on the Union Strength Index, employment initially increases before reaching diminishing returns*" appears validated in the sense that Peru and Argentina, with weak and strong unions respectively, have higher levels of unemployment than Mexico, with moderate unions.

The sixth hypothesis, "*As a country's union strength increases on the Union Strength Index, social well-being initially increases before reaching diminishing returns,*" is also supported by this case study. Weakly unionized Peru performs poorly in both indicators of social well-being.

Argentina and Mexico have a narrow difference, which indicates that diminishing returns may be occurring.

The final hypothesis is *HP7: As a country's union strength increases on the Union Strength Index, overall economic development, as measured in my Economic Development Index, initially increases before reaching diminishing returns.* The Index does show an overall inverted U shape representation of the diminishing returns effect of union strength on economic development. Argentina (+4), with its strong unions, scores worse than Mexico (+8), with its medium strength unions, but better than Peru (-12), with its weak unions, on the Index. Using the Economic Development Scale to interpret the Economic Development Index, I find that Argentina has "Medium-High" economic development, Mexico has "High" economic development, and Peru has "Low" economic development. This supports the diminishing returns relationship between union strength and economic development.

Conclusion

This study observed the effect of union strength on economic development in Argentina, Mexico, and Peru. Through my analysis, I hope to have shed light on a topic that had formerly received restricted scrutiny. Economic development in this paper has been operationalized comprehensively, using various indicators. The theory tested is whether union strength has a diminishing returns effect on the various economic development indicators.

Using the most similar system designs, the findings are that with some indicators, union strength seems to have a positive linear correlation, but overall, there is a diminishing returns relationship at play. As union strength rises, economic development rises, levels off, and

eventually diminishes in a sort of inverted U shape. This may be because of the data used in the operationalization of indicators, so more research is necessary to draw more confident conclusions.

Some shortcomings of this research include the lack of data on collective contract coverage rates in Mexico or Peru for the 1990s; the fact that the calculation of union strength did not include union dues as a factor, as data pertaining to dues is often not available to common libraries; the limited data for measuring educational achievement, which only included comparable data on literacy rates for the period; the fact that trade openness was not included as a confounding variable, and aggregate savings and foreign direct investment were not included as indicators of economic development. Shortcomings of the Economic Development Index are the same as above: lacking data. Comparable data to calculate regional averages is scarce, so one indicator may be calculated for a different year than another indicator.

Further research is necessary to fine-tune the operationalization of the variables, provided better data is available for such a feat, so that findings may be stated with more confidence. It would also be necessary to take aggregate savings and foreign direct investment into account as controlled variables, as both greatly support economic development. Furthermore, it would be useful to clarify whether the differences in results across cases are substantively significant. I would encourage further research on the reasons causing the diminishing returns effect of union strength. However, as a preliminary survey of the comprehensive effects of union strength on economic development in Latin America, it can confidently be stated that this essay has made reasonable headway.

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