

# Power Over Profits

Workers, Wages, and the Political Economy of International Trade

Adam Dean\*

September 3, 2013

## Abstract

This paper argues that international trade policies that benefit an industry do not automatically increase wages for that industry's workers. Instead, the degree to which such policies do increase wages depends on the domestic institutions that protect workers' rights to act collectively. Such institutions are currently an omitted variable in the international political economy literature, which accepts the distributional predictions of neoclassical models of international trade. These models use the assumption of full employment to predict that a trade policy that increases worker productivity automatically leads to an equal increase in workers' wages. In this way, the link between worker productivity and wages is a key causal mechanism of the neoclassical trade models. This paper tests this mechanism by analyzing data from 28 manufacturing industries, in 117 countries, from 1985 to 2002. The results demonstrate that the degree to which an increase in worker productivity leads to an increase in wages depends on a country's level of protection for labor rights.

---

\*PhD Candidate, Political Science Department, University of Chicago. Email: adamdean@uchicago.edu

I thank Faisal Ahmed, Gene Gerzhoy, Milena Ang Collan Granillo, Will Howell, Morgan Kaplan, Daniel Kono, Robert LaLonde, Walter Mattli, Jonathan Obert, Kevin O'Rourke, Jong Hee Park, David Rueda, Alberto Simpser, Betsy Sinclair, Dan Slater, Duncan Snidal and Felicity Vabulas for comments and suggestions. I also thank Pablo Montagnes and participants at the Workshop in Political Economy at the University of Chicago.

# 1 Introduction

Scholars have long recognized that international trade policy has important domestic distributional consequences. Free trade policies can contribute to soaring profits for export-oriented firms, just as protectionist policies can increase returns for industries shielded from the global market. However, this paper argues that the benefits of such trade policies are not automatically shared with workers in these favored industries. Instead, the degree to which workers benefit depends on the protection of basic labor rights, such as the rights to organize, collectively bargain, and strike.<sup>1</sup> The protection of labor rights permits workers to act collectively, increases their bargaining power, and enhances their ability to capture a share of increased prosperity in the form of wages. When a country does not protect such labor rights, favorable trade policy reform is more likely to translate into increased profit than into increased wages for workers.

Such distributional outcomes are hard to explain with the traditional Heckscher-Ohlin and Ricardo-Viner models of international trade, both of which predict that the benefits of trade policy are automatically shared with workers.<sup>2</sup> According to these neoclassical models, trade policy affects wages through its direct effect on product prices. For instance, a trade policy that increases the domestic price of steel increases the overall value of steel produced by the steel industry, and therefore increases the average productivity of steel workers. In turn, the models predict that this increase in worker productivity automatically leads to an equal increase in the wages paid to steel workers.<sup>3</sup> However, this predicted connection

---

<sup>1</sup> This paper uses Mosley’s definition of collective labor rights, which focuses on “the legal rights of workers to organize, associate freely, bargain collectively and strike, as well as the observation of these rights in practice.” See Mosley 2011, 1.

<sup>2</sup> The Heckscher-Ohlin and Ricardo-Viner models are the two most prominent in the literature. For examples concerning trade policy preferences, see Rogowski 1987; Hiscox 2001; Scheve and Slaughter 2001; Mansfield and Mutz 2009; Ehrlich and Maestas 2010; for examples concerning the relationship between trade liberalization and democratization, see Milner and Kubota 2005; Acemoglu and Robinson 2006; Eichengreen and Leblang 2008; for an example concerning welfare spending, see Rudra 2002.

<sup>3</sup> This example is based on the Ricardo-Viner, which uses the assumption of zero inter-industry factor mobility to predict that the distributional consequence of trade fall along industry lines. As explained below,

between an increase in worker productivity and workers' wages relies on the assumption of full employment, or what John Maynard Keynes referred to as the "strange supposition" that underlies neoclassical economics.<sup>4</sup> In contrast, this paper draws on insights from labor economics to argue that the degree to which an increase in worker productivity leads to an increase in wages depends on the protection of workers' rights.<sup>5</sup>

The relationship between worker productivity and wages is therefore a key causal relationship for the political economy of trade. In order to demonstrate that this relationship is moderated by domestic labor institutions, this paper analyzes the degree to which an increase in worker productivity is associated with an increase in wages in 28 manufacturing industries, in 117 countries, from 1985 to 2002. This relationship between productivity and wages is referred to as the "profit sharing rate" between capital and labor, as it measures the ability of workers to capture a share of increased profits in the form of higher wages.<sup>6</sup> This paper then uses a measure of protection for labor rights to demonstrate that the profit sharing rate is positively associated with the protection of workers' rights.

This paper proceeds by first reviewing the use of neoclassical models in the political economy of trade literature. Second, it presents a theory of how the domestic protection of labor rights affects the profit sharing rate. Third, it will present the results of a cross-national, quantitative analysis of the relationship between the protection of labor rights and the profit sharing rate. Last, it will discuss the implications of these findings and conclude with suggestions for future research.

---

the Heckscher-Ohlin model uses the same causal logic to link trade policy to wages, through its effects on worker productivity.

<sup>4</sup> Keynes 1936, 12.

<sup>5</sup> Levy and Temin 2009; Bentolila and Saint-Paul 2003; MaCurdy and Pencavel 1986; Olson 1984.

<sup>6</sup> Levy and Temin 2009. Productivity growth expands total output. Therefore, when productivity increases without an equal increase in wages, capital captures an ever-larger share of revenue, as profits increase at the expense of labor.

## 2 Neoclassical Trade Models and the Study of International Political Economy

The Heckscher-Ohlin and Ricardo-Viner models have dominated the study of the political economy of trade, since Rogowski and Frieden's early work on trade policy coalitions.<sup>7</sup> According to the H-O model, whether or not a trade policy increases wages depends on a country's factor endowments of land, labor, and capital.<sup>8</sup> When workers are a scarce factor of production, they automatically benefit from protectionists trade policies, whereas when workers are an abundant factor of production they automatically benefit from trade liberalization. According to the R-V model, a trade policy that benefits a specific industry automatically leads to a wage increase for that industry's workers.<sup>9</sup>

According to the literature on individual trade policy preferences, the distributional predictions of the H-O and R-V models can be used to predict the trade policy preferences of societal actors. In short, actors are predicted to hold a preference for the trade policy that benefits them economically. The H-O approach therefore predicts that scarce factors of production will favor trade protection, while abundant factors of production will favor free trade. The R-V approach predicts that actors employed in export-oriented industries will prefer free trade, while actors employed in import-competing industries prefer trade protection. According to Hiscox, the applicability of these two models depends on an economy's level of inter-industry factor mobility. When factor mobility is high, the predictions of the

---

<sup>7</sup> Rogowski 1989; Frieden 1988.

<sup>8</sup> Although the original H-O model only includes two factors of production (capital and labor), IPE scholars traditionally extend the logic of the model to three factors of production. Whereas the H-O model therefore predicts that capital and labor can never both be scarce or abundant factors at the same time, the traditional IPE use allows for factor endowments where both capital and labor are scarce or abundant at the same time.

<sup>9</sup> According to the specific factors model, which assumes that capital is specific to its industry while labor is perfectly mobile between industries, the effect of trade on real wages depends on workers' consumption patterns. However, the model predicts an automatic connection between trade and nominal wages and does not explore the moderating effect of labor market institutions. For example, see (Alt and Gilligan 1994).

H-O model are more likely to be accurate, whereas the predictions of the R-V model are more likely to be accurate when factor mobility is low.<sup>10</sup>

Although the recent literature on individual trade policy preferences challenges the applicability of these neoclassical models, scholars have not examined the causal logic that links international trade policy to workers' wages. Instead, the literature tends to accept the H-O and R-V models as accurate portrayals of how trade policy affects wages, and then identifies additional variables that influence trade policy preferences, such as home ownership,<sup>11</sup> patriotism,<sup>12</sup> education,<sup>13</sup> consumer prices,<sup>14</sup> risk tolerance,<sup>15</sup> as well as concerns for national economic performance,<sup>16</sup> fairness,<sup>17</sup> and cultural 'westernization'.<sup>18</sup> In contrast, this paper suggests that before we rule out an economic basis for trade policy preferences, we should study the domestic institutional conditions under which the predictions of the H-O and R-V are likely to hold.<sup>19</sup>

The trade policy preferences derived from the H-O model also play a central role in the literature on the relationship between trade liberalization and democratization. A large literature has developed in recent years that explores both how democratization affects a country's trade policies, as well as how changes in trade policy affect the probability of democratization. According to one argument, democratization enfranchises unskilled workers who then lobby the government for trade liberalization because of the automatic wage increases that workers receive from free trade.<sup>20</sup> According to the reverse argument, trade

---

<sup>10</sup> Hiscox 2001.

<sup>11</sup> Scheve and Slaughter 2001.

<sup>12</sup> O'Rourke et al. 2001.

<sup>13</sup> Hainmueller and Hiscox 2006; Mayda and Rodrik 2005.

<sup>14</sup> Baker 2005.

<sup>15</sup> Ehrlich and Maestas 2010.

<sup>16</sup> Mansfield and Mutz 2009.

<sup>17</sup> Ehrlich 2010.

<sup>18</sup> Margalit 2012.

<sup>19</sup> For recent work that supports an economic basis for trade policy preferences, see Murillo, Pinto and Ardanaz 2013.

<sup>20</sup> Stokes 2001; Weyland 2002; Milner and Kubota 2005; O'Rourke and Taylor 2006.

openness leads to democratization in developing countries because free trade automatically increases wages for unskilled workers who then use their increased incomes to lobby the government for democratic reform.<sup>21</sup> Central to arguments running in each direction is the H-O model and the same causal mechanism that links trade policy to workers wages through its effects on worker productivity.<sup>22</sup>

Despite recent advances in “new” new trade theory (NNTT), the trade literature still assumes that an increase in productivity automatically leads to an equal increase in wages.<sup>23</sup> NNTT argues that only a small fraction of firms in export industries are actually productive enough to export. When trade expands, less productive firms leave the market and highly productive firms increase output and expand. Overall, this leads to an increase in productivity throughout the industry, as less productive firms are replaced by more productive firms. According to NNTT, this increased productivity then leads to an increase in wages throughout the industry. Despite NNTT’s innovative approach to heterogeneous firms, it still predicts that an increase in worker productivity automatically leads to an increase in wages. In other words, NNTT is similar to the R-V and H-O models in omitting domestic labor market institutions and potentially overestimating the wage increases that workers receive from trade policy changes.

In contrast, this paper follows Schumpeter’s insight that “economic laws...work out differently under different institutional conditions.”<sup>24</sup> In this vein, comparative political economists have argued that certain labor market institutions are associated with political and economic outcomes that favor labor. Esping-Andersen’s path-breaking work linked high union density, centralized wage bargaining, and the success of left-wing political parties to

---

<sup>21</sup> Lipset 1959; López-Córdova and Meissner 2005; Giavazzi and Tabellini 2005; Rudra 2005.

<sup>22</sup> For the argument that trade liberalization increases income equality, lessens demands for redistribution, and therefore reduces elite resistance to democratization, see Acemoglu and Robinson 2006.

<sup>23</sup> Melitz 2003; Helpman, Melitz and Yeaple 2004.

<sup>24</sup> Schumpeter 1994, 32.

the development of the welfare state.<sup>25</sup> Subsequent scholarship in the tradition of power resource theory and the varieties of capitalism has argued that similar institutional configurations can promote high employment, low inflation, and economic growth,<sup>26</sup> as well as income equality.<sup>27</sup> Others have found that the structure of domestic labor market institutions can help labor unions maintain their membership despite the economic pressures of globalization.<sup>28</sup> Similarly, the protection of labor rights is expected to increase labor power and therefore increase the ability of workers' to bargain for a share of increased productivity in the form of wages.

In this way, the protection of labor rights must be distinguished from the centralization of wage bargaining, which is often associated with wage moderation. According to the Calmfors and Drifill model, the relationship between the centralization of wage bargaining and wage militancy is predicted to be hump-shaped. Both low and high levels of centralization are associated with wage moderation, while medium levels of centralization are associated with labor militancy.<sup>29</sup> Central to these outcomes is the tendency of national labor organizations to 'internalize' the macroeconomic externalities of wage militancy, such as inflation and unemployment, and to moderate wage demands.<sup>30</sup> In contrast, the protection of labor rights is not expected to lead to wage moderation because even complete protection of the 'core' labor rights to organize, collectively bargain, and strike, is insufficient for the development of national labor federations and centralized wage bargaining. That is, a country can protect these rights without workers developing the encompassing labor organizations that moderate wage demands. In fact, centralized wage bargaining is an historically contingent development largely limited to the small, open political economies of northern

---

<sup>25</sup> Esping-Andersen 1990.

<sup>26</sup> Alvarez, Garrett and Lange 1991; Hall, Soskice et al. 2001.

<sup>27</sup> Rueda and Pontusson 2000.

<sup>28</sup> Western 1997; Scruggs and Lange 2002.

<sup>29</sup> Calmfors et al. 1988. For recent work on this relationship, see Mares 2004.

<sup>30</sup> Olson 1965 For recent work that links wage moderation to centralized wage bargaining in which workers are directly involved, see Baccaro and Simoni 2010

Europe.<sup>31</sup> Therefore, although labor rights and centralized wage bargaining are both associated with labor power, the protection of labor rights should lead to wage militancy and an increase in the profit sharing rate, rather than wage moderation.

In these ways, the neoclassical trade models provide the underlying foundations for the literature on the political economy of trade. Despite new developments in trade theory, the literature has not yet explored the conditions under which a trade policy that increases productivity is translated into an increase in wages. Although comparative political economists have studied various labor market institutions, domestic labor rights remain an omitted variable in the political economy of trade.

### **3 A Theory of the Labor Market and Domestic Institutions**

This paper draws on insights from labor economics to examine how labor rights affect the connection between international trade policy and wages. Economic research on wage bargaining,<sup>32</sup> union wage effects,<sup>33</sup> and labor's share of national income,<sup>34</sup> all suggest that bargaining power is a key determinant of how productivity gains and profits are divided between capital and labor. This section argues that labor bargaining power has a positive effect on the degree to which an increase in productivity leads to an increase in wages. When wage growth lags behind productivity growth, profits increase at the expense of labor, as capital captures an ever-larger share of the pie.<sup>35</sup> For this reason, the relationship between

---

<sup>31</sup> Katzenstein 1985.

<sup>32</sup> MaCurdy and Pencavel 1986; Johnson 2008.

<sup>33</sup> Lewis 1983; Hirsch 2004; Bennett and Kaufman 2011.

<sup>34</sup> Bentolila and Saint-Paul 2003.

<sup>35</sup> Strauss and Wohar 2004.

productivity and wages is referred to as the “profit sharing rate,” as it measures the ability of workers to capture a share of increased profits in the form of higher wages.<sup>36</sup>

Therefore, the profit sharing rate is expected to increase along with increases in workers’ bargaining power.<sup>37</sup> However, since bargaining power is a latent variable that is difficult to measure independently of its observed effects, it is preferable to focus on the antecedent conditions that increase worker bargaining power.<sup>38</sup> Since workers can often increase their bargaining power through collective action, there are few factors more important than a country’s protection of workers’ rights, such as the right to organize and collectively bargain.<sup>39</sup> In this way, domestic institutions that protect labor rights increase worker bargaining power, which then increases the profit sharing rate.

Rather than consider this political struggle between capital and labor, the Heckscher-Ohlin (H-O) and Ricardo-Viner (R-V) models use the assumption of full employment to derive an automatic connection between trade policy and wages.<sup>40</sup> Although the two models differ in their assumptions concerning the degree to which the factors of production (i.e. capital, labor, land) can move between industries,<sup>41</sup> both derive an automatic connection between trade policy and wages in the following four steps:

1. A trade policy change alters the relative price of an industry’s output by either opening or closing the domestic economy.

---

<sup>36</sup> Levy and Temin 2009.

<sup>37</sup> This argument is distinct from Rudra’s theory of how “potential labor power” affects welfare state spending in developing countries. Rudra’s analysis begins by adopting the H-O prediction that unskilled workers in developing countries automatically receive wage increases from trade liberalization. She then goes on to argue that collective action problems stop these workers from turning their income gains into effective political demands for increased welfare spending. In contrast, I argue that trade liberalization will not automatically increase wages for unskilled workers in developing countries unless labor rights are well protected. See Rudra 2002.

<sup>38</sup> For an example of this argument in the international relations literature, see Mearsheimer 2001.

<sup>39</sup> Olson 1965; Freeman and Medoff 1984; Borjas 2005; Levy and Temin 2009.

<sup>40</sup> Rogowski 1987; Frieden 1988; Scheve and Slaughter 2001; O’Rourke et al. 2001; Milner and Kubota 2005; Rudra 2002.

<sup>41</sup> Hiscox 2001.

2. If the relative output price increases, then the total value of goods produced by the average worker in that industry increases, thus representing an increase in average worker productivity and the marginal product of labor.<sup>42</sup>
3. Since perfectly competitive firms will hire workers until the marginal product of labor is equal to the marginal cost of an extra worker, this increase in worker productivity provides incentive for firms in the industry to hire more workers.
4. Under the assumption of full employment, hiring more workers requires these firms to offer higher wages in order to attract workers that are currently employed elsewhere.<sup>43</sup>

In these ways, a trade policy that increases an industry's relative output price leads to an increase in worker productivity, which automatically leads to an equal increase in wages.

The underlying causal logic is the same whether we use the H-O model's assumption of perfect inter-industry factor mobility, or the R-V model's assumption of zero inter-industry factor mobility. In addition, the same causal logic explains how both trade liberalization and trade protection affect wages. For example, consider the causal logic of how trade *protection* increases wages for workers. According to the R-V model, trade protection increases wages for workers in import-competing industries. This occurs because trade protection increases the relative price of such industries' output, which increases worker productivity, and therefore automatically increases wages. According to the H-O model, trade protection increases wages for workers throughout the economy in labor-scarce countries. This occurs because trade protection increases the relative price of labor-intensive industries' output, which increases worker productivity, and therefore automatically increases wages. The causal logic of how trade *liberalization* increases wages is analogous, only for workers in export-oriented industries and workers in labor-abundant countries, respectively.

---

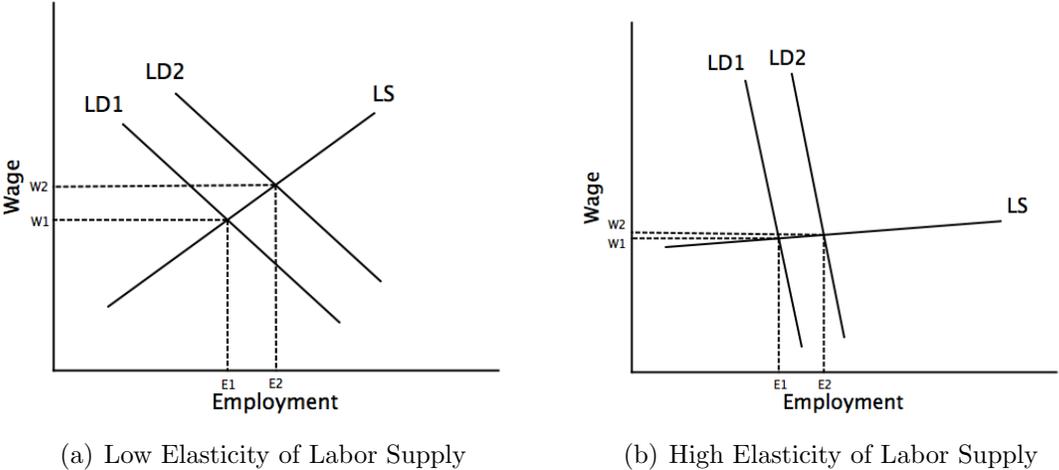
<sup>42</sup> Given that the production function is Cobb-Douglas, average worker productivity and the marginal product of labor are related to each other by a fixed ratio. Therefore, anything that increases average worker productivity must also increase the marginal product of labor.

<sup>43</sup> Where these workers come from depends on assumptions concerning inter-industry factor mobility. According to the H-O model, firms in expanding industries attract workers from contracting industries, who are assumed to be perfectly mobile between industries. According to the R-V model, firms in the expanding industry attract workers from other firms within the same industry, who are assumed to be perfectly immobile between industries. In both models, workers only move from one firm to another when they are attracted by the offer of higher wages.

However, once the assumption of full employment is relaxed we can parsimoniously display that the relationship between wages and productivity is conditional on the supply of labor. Large numbers of surplus workers, whether laid off by nearby firms or migrating from rural areas or foreign countries, create competition in the labor market that allows employers to hire additional workers without increasing wages.<sup>44</sup> That is, the fourth step of the causal logic of neoclassical trade models (above) is disrupted, as firms can increase employment without increasing wages. In more technical terms, the presence of surplus workers in the labor market results in a labor supply curve that is highly elastic.

As can be seen in Figures 1a and 1b, the elasticity of the labor supply curve conditions the degree to which an increase in productivity leads to higher wages. As mentioned above,

Figure 1: Labor Demand, Wages, and Employment



an increase in relative output price leads firms to hire more workers and thus increases the demand for labor. This is shown graphically in Figure 1a as an outward shift in the labor demand curve from LD1 to LD2. With an upward sloping labor supply curve, this increased labor demand leads to an increase in both employment and wages, as the firm’s labor market equilibrium moves from point E1 to E2. In contrast, the effect of trade policy on wages is

<sup>44</sup> Lewis 1954; Golley and Meng 2011.

very different in Figure 1b, where a labor surplus results in a highly elastic (flat) labor supply curve. As the firm's labor market equilibrium moves from E1 to E2, the firm will increase employment but only slightly increase wages. The trade policy change will lead the firm to employ more workers, but the workers previously employed by the firm will barely receive wage increases.

This gap between worker productivity and workers' wages can be attenuated through the collective action of workers in two different ways.<sup>45</sup> First, workers can restrict the supply of labor for the firm or industry. Such "closed shops" decrease the elasticity of the labor supply and assure that an increase in worker productivity is translated into an increase in wages.<sup>46</sup> Second, workers can bargain with their employers to agree upon wage and employment levels that surpass the logic of market forces, or where labor demand meets labor supply. In such bargaining scenarios, an increase in worker productivity signals an increase in the ability of employers to pay higher wages, and therefore an increase in the wages demanded by organized workers.<sup>47</sup> While there are important differences between the various bargaining models used in labor economics, all agree that wages will increase along with the bargaining power of workers.<sup>48</sup> As Mancur Olson explains, "if a union has any real bargaining strength, it can force the unusually prosperous firm to raise wages well above the market level."<sup>49</sup>

In turn, the balance of bargaining power between capital and labor depends crucially on the institutions that regulate what actions each side can employ to 'convince' the other

---

<sup>45</sup> Freeman and Medoff 1984; Rose 1987; Katz et al. 1989. For the canonical argument that even the threat of unionization increases wages for non-union workers, see Rosen 1969.

<sup>46</sup> Oswald 1982.

<sup>47</sup> For an argument on how asymmetric information concerning the ability of employers to pay higher wages can result in the break down of negotiations and costly strikes, see Hayes 1984; Ashenfelter and Johnson 1969; Hicks 1963.

<sup>48</sup> For "right-to-manage" models in which a monopoly union sets the wage and the employer decides on employment levels, see Layard, Nickell and Jackman 2005, chapter 2. For "efficient bargain" models in which a union and employer bargain over both wages and employment levels, see MaCurdy and Pencavel 1986.

<sup>49</sup> Olson 1984, 49.

party to accept its offer.<sup>50</sup> When employers are able to call in the state military to break a labor strike, the balance of bargaining power leans towards capital. When domestic institutions protect the right of workers to peacefully strike for higher wages, the balance of bargaining power tilts a little more towards labor. Although workers can potentially bargain for wages that increase along with productivity, a growing literature in labor economics has repeatedly found that wages often lag behind productivity growth.<sup>51</sup> However, these studies tend to focus on the simple question of whether or not wages increase equally along with productivity growth, rather than explaining variation in the relationship across countries or over time. Building off of these empirical studies, this paper argues that the degree to which an increase in worker productivity leads to an increase in workers' wages depends on the level of protection for labor rights. As explained above, this suggests that domestic labor market institutions moderate the relationship between trade policy and workers' wages.

## 4 Cross-National Quantitative Analysis

This section uses quantitative data to test my argument that the effect of trade policy on wages is moderated by domestic protections for labor rights. The analysis does not directly test the effect of international trade policy on wages, but rather focuses on the relationship between worker productivity and workers wages. Since international trade is theorized to affect wages through its effect on productivity, this represents a focused test of one of the trade models' key causal mechanisms. As explained earlier, the degree to which

---

<sup>50</sup> Borjas 2005.

<sup>51</sup> Hall 1986; Alexander 1993; Strauss and Wohar 2004; Wakeford 2004; Klein 2012. For a related argument that the lack of worker bargaining power decreases labor's share of national income, see Bentolila and Saint-Paul 2003. Importantly, the profit sharing rate should not be confused with this "labor share." While the labor share measures the static fraction of total income that goes to the remuneration of workers, the profit sharing rate measures the dynamic effect of productivity growth on wage growth. In this way, a low profit sharing rate may lead, over time, to a decrease in the labor share.

wages increase along with productivity is referred to as the profit sharing rate, and the profit sharing rate is expected to be positively associated with domestic protection of labor rights.

Since the R-V and H-O models make different assumptions about inter-industry factor mobility, each model makes different predictions about the level at which productivity and wages will be related. The R-V model predicts that wage growth and productivity growth will be related at the industry-level because of the assumption of zero inter-industry factor mobility. In contrast, the H-O model predicts that wage growth and productivity growth are related at the country-level because of the assumption of perfect inter-industry factor mobility.

The first hypothesis tests the relationship between the profit sharing rate and labor rights at the industry-level. Therefore this hypothesis tests the causal logic of the R-V model as well as the causal logic of IR theories that are based on the R-V model.

**Hypotheses 1.** *The protection of labor rights has a positive effect on the profit sharing rate at the industry-level. That is, the effect of productivity growth on wage growth is larger when the protection of labor rights is high.*

The second hypothesis tests the relationship between the profit sharing rate and labor rights at the country-level. Therefore this hypothesis tests the causal logic of the H-O model as well as the causal logic of IR theories that are based on the H-O model.

**Hypotheses 2.** *The protection of labor rights has a positive effect on the profit sharing rate at the country-level. That is, the effect of productivity growth on wage growth, at the country-level, is larger when the protection of labor rights is high.*

## 4.1 Data Sources

In order to test these hypotheses I use data from 28 manufacturing industries, in 117 developed and developing countries, from 1985-2002. The 28 industries cover all manufacturing sectors, and the dataset includes countries from every region of the world. Although

data is not available for the complete universe of countries, the 117 countries included in the data set accounted for approximately 96% of global GDP in 2000.<sup>52</sup> Testing these hypotheses on such a large and diverse set of countries is ideal, as the relationship between labor rights and the profit sharing rate is theorized to be generalizable across all countries.<sup>53</sup> The range of years covered by the data are recent and thus any conclusions drawn from the analysis should be applicable to contemporary political economy. This data is available from the United Nations Industrial Development Organization (UNIDO),<sup>54</sup> the World Bank, the Penn World Tables, Polity IV. The data on the protection of labor rights was collected by Layna Mosley.<sup>55</sup>

## 4.2 Dependent and Independent Variables

The main focus of this study is to examine the degree to which an increase in productivity is associated with an increase in wages, or what we have called the profit sharing

---

<sup>52</sup> The 117 countries included in the data set are: Afghanistan, Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bangladesh, Barbados, Belgium, Belize, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burundi, Cameroon, Canada, Central African Republic, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Czechoslovakia, Denmark, Ecuador, El Salvador, Eritrea, Estonia, Fiji, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Latvia, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Malta, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Nepal, Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Senegal, Seychelles, Singapore, Slovenia, South Africa, Spain, Sri Lanka, Suriname, Swaziland, Sweden, Syrian Arab Republic, Tanzania, Thailand, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Kingdom, United States, Uruguay, Venezuela, and Zimbabwe. The percent of global GDP represented by the countries included in the data set were calculated using data from the World Bank's World Development Indicators.

<sup>53</sup> The data used in this paper does not include agricultural or service sectors of the economy, and therefore may represent workers of different skill levels in different countries. For instance, manufacturing employees in developed countries may represent their country's unskilled workers, while manufacturing employees in less developed countries may represent their country's higher skilled workers. To the extent that such variation is driven by a country's level of economic development, the regression models below control for this by including GDP per capita, as well as country-level fixed-effects. However, it must be noted that the conclusions drawn from this analysis are limited to manufacturing industries, and further research is needed in order to extend the findings to agricultural and service sectors of the economy.

<sup>54</sup> The data used in this paper is available on the INDTAT-3 CD-ROM.

<sup>55</sup> Mosley 2011.

rate. Following the standard approach in the labor economics literature, this elasticity of wages with respect to productivity can be calculated by regressing the wage growth rate onto the productivity growth rate.<sup>56</sup> Thus, the dependent variable in this analysis is the real wage growth rate, measured at the industry-country-year level. This variable is calculated by taking the first difference in the natural logarithm of real average wages in the following way:<sup>57</sup>

$$Wage_{ijt}^* = \log(\text{Real Average Wage}_{ijt}) - \log(\text{Real Average Wage}_{ijt-1}) \quad (1)$$

Where *i* represents industry, *j* represents country, and *t* represents year. A similar calculation is also used to calculate the real productivity growth rate at the industry-country-year level:

$$Productivity_{ijt}^* = \log\left(\frac{\text{Real Output}_{ijt}}{\text{Number of Employees}_{ijt}}\right) - \log\left(\frac{\text{Real Output}_{ijt-1}}{\text{Number of Employees}_{ijt-1}}\right) \quad (2)$$

While the primary reason for this data transformation is to focus the analysis on the elasticity of wages with respect to productivity, it also reduces autocorrelation and the non-normal distributions that characterize wages and productivity in their level form.<sup>58</sup> Following this transformation, the coefficient on *Productivity*<sup>\*</sup> represents the degree to which an increase in average worker productivity is associated with an increase in average wages.

Unfortunately, the data available does not include worker benefits, and therefore represents less than total worker compensation. However, estimating the model on workers' wages, rather than total compensation, actually biases the results against my hypothesis by underestimating the effect of labor rights on the profit sharing rate. If workers use their

---

<sup>56</sup> For previous studies of the relationship between productivity growth and wage growth, see Klein 2012; Strauss and Wohar 2004; Wakeford 2004; Alexander 1993; Hall 1986.

<sup>57</sup> Following the standard procedure in the literature, real wages are calculated using the consumer price index, while real productivity is calculated using the producer price index. For example, see Bosworth, Perry and Shapiro 1994; Strauss and Wohar 2004; Wakeford 2004; Klein 2012.

<sup>58</sup> Harvey 1980.

bargaining power to increase benefits, and not just wages, then it will be more difficult to find a positive relationship between labor rights and the profit sharing rate, which only captures the degree to which productivity gains are translated into wage gains.<sup>59</sup>

The main independent variable of interest in this analysis is the interaction between *Productivity\** and *LaborRights*, where *LaborRights* measures the protection of labor rights at the country-year level. The coefficient on this interaction term represents the effect of a one point increase in *LaborRights* on the profit sharing rate. We therefore expect the coefficient on the interaction term to be positive because the more a country protects labor rights, the more an increase in productivity is expected to lead to an increase in wages.

The cross-sectional time-series data on labor rights measures the legal rights of workers to organize, associate freely, bargain collectively and strike, as well as the observation of these rights in practice.<sup>60</sup> The *LaborRights* index is based on recorded violations of thirty-seven specific labor rights in six broad categories; freedom of association and collective bargaining-related liberties; the right to establish and join worker and union organizations; other union activities; the right to bargain collectively; the right to strike; and rights in Export Processing Zones. These thirty-seven violations are based on “core” labor rights as promulgated by the International Labour Organization and encompass the *absence* of legal rights, the *limitation* of legal rights, and the *violation* of legal rights by the government or

---

<sup>59</sup> Although average wage and productivity data does not allow us to examine variation within each sector, it is likely that the profit sharing rate varies across firms and between skilled and unskilled workers. However, it is not clear that the relationship between labor rights and profit sharing, which is the focus of this paper, should vary systematically within each sector. Future research using firm or individual-level data is required to examine if labor rights is more likely to increase the profit sharing rate for workers with different skill levels or employed in different types of firms.

<sup>60</sup> Mosley 2010.

employers.<sup>61</sup> After documenting labor rights violations, the scale is reversed so that higher values now represent fewer violations of labor rights, or greater protection of labor rights.<sup>62</sup>

The dual focus on labor rights in law, as well as practice, assures that a country cannot receive a high *LaborRights* score by simply withholding legal protections for workers, and then not having any domestic labor laws to violate.<sup>63</sup> In these ways, *LaborRights* measures the degree to which domestic institutions provide the antecedent conditions for worker collective action and bargaining power. Importantly, *LaborRights* varies across time within countries, thus allowing us to estimate its effect on the profit sharing rate while also including country fixed-effects that control for omitted, time-invariant variables.<sup>64</sup> The hypothesized relationship between labor rights and profit sharing is asymmetrical, depending on whether productivity growth is positive or negative. When productivity growth is positive, the protection of labor rights is expected to increase the ability of workers to raise their wages along with productivity. In contrast, when productivity growth is negative, the protection of labor rights is expected to increase the ability of workers to decouple their wages from productivity. Such “sticky wages”, which result from workers’ ability to increase their wages during good times, but then resist wage cuts during bad times, are a well documented phenomenon.<sup>65</sup> Failure to control for this asymmetrical effect would result in sample bias that would skew the estimated effect of *LaborRights* downward.

---

<sup>61</sup> Kucera and Mosley’s methodology assigns a weighting to each violation, with more serious violations, such as general prohibitions on unions, weighted more heavily than others. However, due to a high correlation between different types of labor rights, the correlation between the weighted and unweighted indices is .89. The regression results reported below are based on the weighted index.

<sup>62</sup> In order to reduce bias, violations of these thirty-seven labor rights were drawn from three sources: the U.S. State Department annual Country Reports on Human Rights Practices; reports from the International Labor Organizations Committee of Experts on the Applications of Conventions and Recommendations and the Committee on Freedom of Association; and the International Confederation of Free Trade Unions Annual Survey of Violations of Trade Union Rights.

<sup>63</sup> This framework also allows *LaborRights* to be disaggregated into the protection of labor rights in law, on the one hand, and the protection of labor rights in practice, on the other. For regression results based on the disaggregated measures, see Table 10 in the Appendix.

<sup>64</sup> Beck 2011.

<sup>65</sup> Harris and Todaro 1970.

This asymmetry can be addressed through two methodologically equivalent techniques. First, the model can be estimated on the subset of the data for which *Productivity\** is positive.<sup>66</sup> Second, the asymmetry can be addressed by constructing a dummy variable that distinguishes between positive and negative productivity growth and interacting it to the interaction term between *Productivity\** and *LaborRights*, as well as to each control variable and the fixed-effects at the industry, country, and year-level. The coefficient on this three-way interaction term then estimates the effect of *LaborRights* on profit sharing, conditional on productivity growth being positive. Both of these approaches produce identical coefficient estimates and standard errors. For presentation purposes only, the regression results reported below are based on the former approach and the relatively easy to interpret two-way interaction term between *Productivity\** and *LaborRights*.

### 4.3 Control Variables

In addition to these independent variables of interest, I include several control variables that address alternative explanations. First, it is possible that the protection of labor rights increases with a country's level of democracy. In order to address this concern, the model includes *Polity*, which is the Polity IV measure of authoritarian and democratic regimes. Second, to control for the possibility that the protection of labor rights is driven by economic development, the model includes *GDPpc*, which measures a country's per capita GDP. Third, since wage growth and labor rights may be influenced by the tightness of the labor market, the model includes *Unemployment*, which measures economy-wide unemployment at the country-year level.<sup>67</sup>

---

<sup>66</sup> The results reported below are also robust to estimating the two-way interaction model on the full data set. Unsurprisingly, the estimated effect of *LaborRights* on profit sharing is smaller, though still statistically significant, when using data on both positive and negative productivity growth.

<sup>67</sup> High unemployment reduces the possibility for workers to find jobs elsewhere and therefore leads them to accept lower real wages in their current job, see Blanchflower and Oswald 1995.

The model also includes *Employment* which measures employment at the industry-country-year level. Not only does this variable help control for the tightness of the labor market, it also addresses the potential trade off between wages and employment levels. To the extent that an increase in wages leads to a decrease in employment, high profit sharing rates might privilege labor insiders at the expense of unemployed labor outsiders.<sup>68</sup> By controlling for employment at the industry-country-year level, the profit sharing rate can be interpreted as the effect of productivity growth on wage growth, holding employment levels constant. In this way the profit sharing rate represents the outcome of a distributional bargain between capital and labor, and not just between labor insiders and outsiders.

Fourth, wage growth and the protection of labor rights may be affected by a country's exposure to the global economy. The more open a country is to international trade the more pressure industries will face to keep production costs to an internationally competitive level.<sup>69</sup> In order to control for such a possibility, the model includes *Openness*, which measures a country's imports and exports as a percentage of GDP. Similarly, wage growth and labor rights may be influenced by FDI. While states may limit wage growth in an effort to attract FDI, scholars have also linked FDI inflows to increases in the protection of labor rights.<sup>70</sup> To control for these effects the model includes *FDI*, which measures net flows of foreign direct investment at the country-year level.

Fifth, the profit sharing rate may be influenced by the capital-intensiveness of an industry. For instance, the profit sharing rate may be lower in capital-intensive industries, where worker productivity is more heavily determined by mechanization and capital investment.<sup>71</sup> The model therefore includes *Capital/Labor*, which is a measure for the capital-labor

---

<sup>68</sup> Rueda 2005.

<sup>69</sup> For instance, while pursuing an export-oriented industrialization strategy, the Korean state repressed labor unions in order to assure that wage growth lagged behind productivity growth, see Kohli 2004.

<sup>70</sup> Mosley 2010.

<sup>71</sup> Such technological differences across industries are also controlled for by including industry-country and industry-year fixed-effects in the robustness checks presented in Table 9 in the Appendix.

ratio at the industry-country-year level.<sup>72</sup> Sixth, it is possible that the profit sharing rate is influenced by domestic political objectives. Governments may dictate higher profit sharing in militarily strategic industries, such as steel and oil, in order to quell labor militancy that could affect military capability. The inclusion of fixed-effects at the industry level allows us to control for the possibility that profit sharing is systematically higher in certain industries. Alternatively, governments may encourage higher profit sharing rates in large industries that are seen to represent the overall economy. High profit sharing rates in such industries may bolster the government’s claim to harbor economic growth and development. In order to control for this possibility, the model includes *PopEmployed*, which measures the percentage of total population employed by a given industry.

Last, the profit sharing rate may be influenced by other labor market institutions and variables associated with labor power. As robustness checks, the model includes *Union*, which measures the percentage of the labor force that belongs to a labor union, *Bargain*, which measures the level of wage bargaining centralization, and *Left*, which measures the percentage of cabinet seats held by left-wing political parties.<sup>73</sup> For descriptive statistics and Pearson correlations for all variables, please refer to Tables 3-5 in the Appendix.<sup>74</sup>

## 4.4 Model and Method

In order to address all of these alternative explanations, the full regression model includes the control variables discussed above. The baseline model can be specified in the

---

<sup>72</sup> UNIDO only collects data on changes in fixed capital each year. Therefore, this variable is created by dividing the absolute value of fixed capital accumulation at the industry-country-year level divided by the number of employees in the industry. Despite its limitations, this measure provides a good proxy for the true capital-labor ratio as we can assume that industries with more fixed capital are likely to have larger annual changes in fixed capital than industries with less fixed capital.

<sup>73</sup> The data on union density was compiled by Rama and Artecona of the World Bank. The data on wage bargaining centralization was compiled by Golden, Wallerstein, and Lange, and the data on Left-wing cabinet seats was compiled by Swank.

<sup>74</sup> For histograms of *LaborRights*, *Wage\**, and *Productivity\**, see Figure 5 in the Appendix

following way:

$$\begin{aligned}
 Wage_{ijt}^* = & \beta_1 Productivity_{ijt}^* + \beta_2 LaborRights_{jt} + \beta_3 (Productivity_{ijt}^* * LaborRights_{jt}) \\
 & + \sum_k \beta_k Controls_{jt} + \sum_n \beta_n Controls_{ijt} + \gamma_i + \eta_j + \mu_t + \epsilon_{ijt}
 \end{aligned} \tag{3}$$

Where  $i$  identifies industry,  $j$  identifies country,  $t$  identifies year. The  $\gamma_i$ ,  $\eta_j$ , and  $\mu_t$  therefore represent fixed-effects at the industry, country, and year levels, respectively.<sup>75</sup> The  $\epsilon_{ijt}$  are independent and identically distributed errors with variance  $\sigma^2$ . As described above,  $Wage^*$  and  $Productivity^*$  represent the growth rates of wages and productivity, respectively.  $Wage^*$ ,  $Productivity^*$ , and  $LaborRights$  have all been centered at their means to ease the substantive interpretation of the coefficients.<sup>76</sup>

The country fixed-effects control for all time-invariant characteristics of each country, such as colonial legacy, religion, geography, and unchanging policymaking institutions.<sup>77</sup> The inclusion of country fixed-effects also focuses the analysis on variation within each country, rather than pooling observations across countries at vastly different levels of economic development.<sup>78</sup> The industry fixed-effects control for any global economic shocks that equally affect the same industry in different countries, such as a sudden change in commodity prices. Last, the year fixed-effects control for trends that simply occur overtime. The inclusion of these fixed-effects helps to control for omitted variables that may be endogenously associated

---

<sup>75</sup>A Breusch and Pagan Lagrangian multiplier test rejects the null hypothesis of no country-specific variance and a Hausman test confirms that estimating the model with fixed effects is preferable to random effects.

<sup>76</sup> Brambor, Clark and Golder 2006.

<sup>77</sup> In addition to the theoretical reasons to include fixed-effects at the country and year levels, F-tests using ANOVA suggest that the inclusion of these variables adds significantly to the explanatory power of the model.

<sup>78</sup> As a robustness check, I estimate the effect of labor rights on the profit sharing rate for different geographical regions and income levels. Estimating the effect of labor rights using such subsets of the data obviously reduces the number of observations and the statistical power of the model. Although the positive and statistically significant effect of labor rights on the profit sharing rate cannot be replicated in each restricted subset, none of the subsets present disconfirming evidence, such as a negative and statistically significant relationship between labor rights and profit sharing. The results reported below are also robust to estimating the model while dropping one geographical region from the data at a time, thus assuring that the results are not driven by any one region.

with both the dependent and independent variables, thus leading to a spurious correlation between labor rights and the profit sharing rate.<sup>79</sup>

The inclusion of country fixed-effects along with variables that have little within-country variation could potentially lead to multicollinearity amongst the regressors. According to Plümper and Troeger, correlation between such rarely changing variables and unit fixed-effects cause the fixed-effects model to be inefficient, making unreliable point estimates with large standard errors.<sup>80</sup> As discussed above, *LaborRights* is not a time invariant or rarely changing variable. Although some political institutions, such as a democratic constitution, may be invariant variables over long periods of time, *LaborRights* measures violations of “core” labor rights, both in law and in actual practice, and varies from year to year.<sup>81</sup> For plots that display the over-time variation in *LaborRights* in each country in the data set, please refer to Figures 6 through 10 in the Appendix.<sup>82</sup>

Wages and productivity vary from year to year within each industry and therefore the industry-country-year is the basic unit of analysis. Although labor rights only vary at the country-year level, the hypotheses above suggest that such variation should be associated with variation in the profit sharing rate in each industry within the respective country. The data set in this analysis has 2,734 units (industry-countries), from 117 countries, and a maximum of 17 time periods (years). Due to missing observations for some industry-countries, the

---

<sup>79</sup> Green, Kim and Yoon 2001.

<sup>80</sup> Plümper and Troeger 2007.

<sup>81</sup> I use the Variance Inflation Factor (VIF) to test for multicollinearity between *LaborRights* and the country-fixed effects. The test yields a VIF of only 2.83 for *LaborRights*, which is well below the traditional threshold of 5. For a discussion of identifying multicollinearity using VIF, see O’Brien 2007.

<sup>82</sup> As can be seen in Figure 6 of the Appendix, there is very little within-country variation in *LaborRights* in some European countries, especially Sweden and France. Consistent with this visual diagnostic, the standard deviation of *LaborRights* in these two countries is lower than in all other countries. As a robustness check, I have estimated the model after dropping Sweden and France from the data set. Both the magnitude of the coefficient on the *LaborRights* interaction term, as well as its level of statistical significance are nearly identical to the estimates reported below.

data set is an unbalanced panel.<sup>83</sup> In order to control for the panel heteroskedasticity and contemporaneously correlated errors associated with panel data, all models are estimated using OLS with fixed-effects and panel corrected standard errors.<sup>84</sup>

## 5 Main Results

The regression results presented below provide strong evidence that the protection of labor rights is positively associated with the profit sharing rate. The findings are not only statistically significant, but also suggest that the effect is large and substantively important. When labor rights are in the top 10% of the global distribution, the profit sharing rate is predicted to be 71% higher than when labor rights are in the bottom 10%. The substantive importance of labor rights can be seen clearly in Figure 2, where the slope of each line represents the profit sharing rate at different levels of *LaborRights*.<sup>85</sup>

Table 1 presents the results of four regression models that establish the paper’s baseline results. Model 1 establishes that *LaborRights* is positively associated with the profit sharing rate. This positive association can be seen in the positive coefficient of the interaction term between *Productivity\** and *LaborRights*. The positive (.009) and statistically significant ( $p < .01$ ) interaction term means that an increase in productivity is associated with a larger increase in wages when *LaborRights* is high, compared to when *LaborRights* is low. Specifically, the coefficient on the interaction term represents the effect of a one point increase in *LaborRights* on the profit sharing rate, holding *Productivity\** constant at its

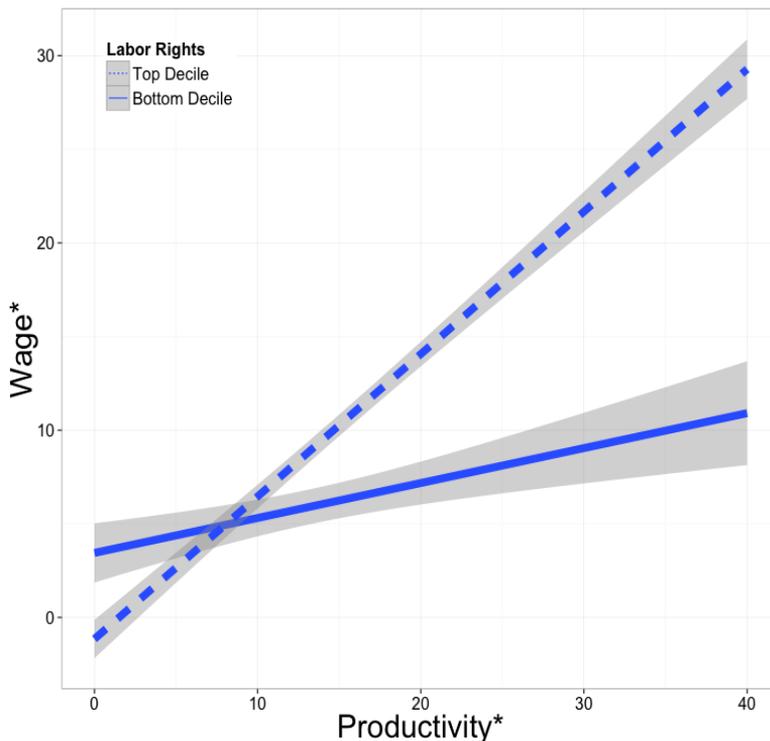
---

<sup>83</sup> Due to missing data on some variables, the full regression model in Model 4 of Table 2 is estimated on only 1,559 industry-countries from 71 countries. However, these 71 countries still represented 89% of global GDP in 2000.

<sup>84</sup> As shown in Table 8 of the Appendix, the results are also robust to the estimation of standard errors clustered by country. PCSE are reported in the main results tables in accordance with Beck and Katz 1995, 1996.

<sup>85</sup> This plot represents the bivariate relationship between *Wage\** and *Productivity\** for two different subsets of the data, and includes 95% confidence intervals. The estimates do not include controls or fixed-effects, as do the regression results and marginal effects plots presented below.

Figure 2: The Effect of Labor Rights on Profit Sharing. With  $Wage^*$  on the Y-axis and  $Productivity^*$  on the X-axis, the *slope* of these two regression lines represent the profit sharing rate when *LaborRights* is in the top and bottom deciles, respectively.



mean. In order to increase the robustness of the analysis, Models 2 through 4 successively add fixed-effects at the country, year, and industry levels.

The regression models reported in Table 2 further increase the robustness of the analysis by including additional control variables. Model 1 replicates the baseline model (Model 4 of Table 1) by only including the  $Productivity^*:LaborRights$  interaction term, its main effects, and fixed-effects at the country, year, and industry levels. Model 2 starts with the baseline model and adds control variables that vary at the industry-country-year level. These include *Employment*, which measures total employment in the industry; *Capital/Labor*, which measures the relative capital or labor-intensiveness of the industry; and *PopEmployed*, which measures the percentage of the total population employed in the industry. The coefficient

on the interaction between *Productivity\** and *LaborRights* increases slightly (.009) and remains statistically significant ( $p < .05$ ). Model 3 starts with the baseline model and adds control variables that vary at the country-year level. These include *FDI*, which measures a country's net flow of foreign direct investment; *Polity*, which measures a country's level of democracy; *Openness*, which measures a country's openness to international trade; *GDPpc*, which measures a country's GDP per capita; and *Unemployment*, which measures a country's economy-wide unemployment rate. The coefficient on the interaction between *Productivity\** and *LaborRights* does not change and remains statistically significant ( $p < .05$ ).

Model 4 starts with the baseline model and then adds both sets of control variables - the controls that vary at the industry-country-year, as well as the controls that vary at the country-year level. When all control variables, as well as the fixed-effects at the country, industry, and year levels are included, the coefficient on the interaction between *Productivity\** and *LaborRights* does not change and remains statistically significant ( $p < .05$ ). Due to relatively limited data for many of the controls, the inclusion of these variables decreases the number of observations from 14,136 to 7,755.<sup>86</sup>

To substantively interpret this interaction coefficient, consider the difference in the protection of labor rights between the Sweden and Columbia in the year 2000, a year in which Sweden received a perfect *LaborRights* score of 37, and Columbia received a score of 7.25. By holding all other variables at their mean, we can estimate how the profit sharing rate would vary in an average country that changed its level of protection for labor rights.

---

<sup>86</sup> Including these variables reduces the number of countries from 117 to 71. The 46 countries missing data on these variables are: Afghanistan, Albania, Argentina, Armenia, Bahamas, Barbados, Belize, Bosnia and Herzegovina, Burundi, Central African Republic, China, Costa Rica, Cuba, Czechoslovakia, Eritrea, Estonia, Ghana, Honduras, Iceland, Iraq, Jamaica, Kazakhstan, Luxembourg, Macedonia, Madagascar, Malawi, Malta, Mauritius, Moldova, Mongolia, Mozambique, Myanmar, Nepal, Nigeria, Oman, Papua New Guinea, Qatar, Russia, Rwanda, Senegal, Seychelles, South Africa, Suriname, Syrian Arab Republic, Tonga, and Trinidad and Tobago. In order to check for bias introduced by this missing data, I estimated the baseline model, with no controls, using the subset of countries that have data on all control variables (71 countries) and compared the results to those reported in Table 1, Model 4 (117 countries). The coefficient estimate for the interaction between *Productivity\** and *LaborRights* is nearly identical in both models, which suggests that the restricted sample is unbiased.

According to the interaction coefficient estimate of .009, an increase in labor rights from Columbia's to Sweden's *LaborRights* score would be associated with a 152% increase in the profit sharing rate. That is, given the same increase in worker productivity, workers with the high level of protection for labor rights would receive approximately 2.5 times the wage increase of workers with the low level of labor rights. Although workers' wages do still increase along with productivity, even when the protection of labor rights is very low, it is clear that domestic protection for labor rights moderates the profit sharing rate in a substantively important way.

The average relationship between productivity growth and wage growth is estimated by the coefficient on *Productivity\**. Substantively speaking, the .355 coefficient on *Productivity\** in Model 4 of Table 2 means that a 10% increase in productivity is associated with a 3.55% increase in wages when *LaborRights* and all other variables are at their mean values.<sup>87</sup> Figure 3 in the Appendix graphs the marginal effect of productivity growth on wage growth, or the profit sharing rate, as a function of the protection of labor rights.<sup>88</sup> At low levels of labor rights, productivity growth has a very weak effect on wage growth. At increasingly high levels of labor rights, productivity growth has an *increasingly positive* effect on wage growth. Although productivity growth is still associated with a small wage increase when labor rights are poorly protected, this finding suggests that the neoclassical trade models tend to overestimate the wage increases that workers' receive from trade policy reforms. In

---

<sup>87</sup> According to economic theory, the elasticity of wages with respect to productivity should be 1, or unit elastic. Part of the discrepancy between this prediction and the .355 elasticity estimated in this paper is due to data availability and the paper's focus on average wages. If data on benefits and total worker compensation were included, the elasticity of total compensation with respect to productivity would be higher. However, as explained above, the lack of data on total compensation actually biases the results against finding a positive association between labor rights and the profit sharing rate. For other studies that also find that wage growth lags behind worker productivity growth, see Strauss and Wohar 2004; Wakeford 2004; Klein 2012. For a review of the statistical obstacles to obtaining a unit elasticity between wages and productivity, see, Bosworth, Perry and Shapiro 1994. The estimated elasticities reported below are nearly identical whether worker productivity is deflated using the consumer price index or the producer price index.

<sup>88</sup> The x-axis represents *LaborRights* after it has been centered at its mean. Therefore, when the x-axis is equal to zero, *LaborRights* is at its global mean. The dotted lines represent 90% confidence intervals.

this way, the paper does not reject the predictions of the neoclassical models, but rather seeks to demonstrate how a previously omitted variable can further our understanding of the distributional consequences of international trade.

Caution is needed in interpreting the coefficient on *LaborRights*, which represents the effect of an increase in labor rights on wage growth when productivity growth is held constant at its mean. Although the coefficient for *LaborRights* is statistically insignificant in the models reported below, this is only a remnant of centering *Productivity\** at its mean. Figure 4 of the Appendix shows that the marginal effect of *LaborRights* on *Wage\** is statistically significant at higher values of productivity growth.<sup>89</sup> The figure demonstrates that the association between labor rights and wage growth is *increasingly positive* as productivity growth increases. While the effect of labor rights on wage growth is an important question, this paper is focused on testing the causal logic of the neoclassical trade model and therefore on how labor rights affects the profit sharing rate. Therefore, the most important estimate is of the coefficient of the interaction term between *Productivity\** and *LaborRights*, which remains positive and statistically significant in all regression models.

As mentioned above, testing the profit sharing implications of the H-O model and Hypothesis 2 requires us to examine the relationship between worker productivity and wages at the country-level. Therefore, Model 5 in Table 2 examines the effect of average productivity growth on average wage growth throughout the manufacturing sector. Estimating the model on such average values changes the unit of analysis from the industry-country-year to the country-year and decreases the number of observations from 7,755 to only 303. Despite this much reduced sample size, the coefficient on the interaction between *Productivity\** and *LaborRights* is still positive and statistically significant ( $p > .05$ ). The magnitude of the coefficient (.041) is larger than the estimates from previous models, but the overall interpre-

---

<sup>89</sup> The x-axis represents productivity growth after it has been centered. Therefore, when the x-axis is equal to zero, *Productivity\** is at its mean.

tation is substantively similar. According to this estimate, starting with the protection of labor rights at its mean, a one standard deviation increase in labor rights is associated with a 100% increase in the profit sharing rate. Alternatively, according to the previous estimate in Model 4, the same one standard deviation increase in the protection of labor rights is associated with a 20% increase in the profit sharing rate. This finding provides support for Hypothesis 2 and is robust to the same controls and fixed-effects used in the previous models.

The regression results also contain two additional statistically significant findings. First, holding productivity growth and all other variables constant, *Unemployment* is negatively associated with wage growth. This finding is consistent with the theoretical discussion above, which argued that unemployment and labor surpluses dampen wage growth. Second, *Polity* is positively associated with wage growth, which is consistent with a large body of literature that finds a positive correlation between democracy and economic growth.<sup>90</sup>

In summary, the fixed-effects regression results demonstrate that the protection of labor rights is positively associated with the profit sharing rate, and therefore support both Hypothesis 1 and Hypothesis 2. These findings are robust to the inclusion of controls for economic development, globalization, democratization, various industry characteristics, fixed-effects at the industry, country, and year-level, and panel corrected standard errors. These controls should give us confidence that the results are not due to an omitted variable that causes both labor rights and profit sharing. Any time-invariant, idiosyncratic characteristic of countries that might be associated with labor rights and profit sharing is controlled for by the inclusion of country-level fixed-effects.

---

<sup>90</sup> Gerring et al. 2005; Papaioannou and Siourounis 2008; Haggard and Tiede 2011. However, neither variable appears to directly moderate the relationship between productivity growth and wage growth. This is tested by including additional interaction terms between *Productivity\** and *Polity* and *Unemployment*, respectively. Although neither interaction term is statistically significant, the association between *Labor-Rights* and the profit sharing rate is robust to the inclusion of these additional interaction terms. For further discussion and regression results, see section 6.6 and Table 11 in the Appendix.

## 5.1 Note on Endogenous Labor Rights

Does the protection of labor rights increase profit sharing, or does profit sharing increase the protection of labor rights? Although the empirical analysis presented above is unable to identify the direction of causality, there are reasons to believe that an increase in labor rights causes an increase in the profit sharing rate. First, this paper presents a direct causal mechanism through which we expect the protection of labor rights to increase the bargaining power of workers and thereby increase the profit sharing rate. As discussed above, a basic tenant of labor economics holds that an increase in labor rights and worker bargaining power directly increases wages.<sup>91</sup> Second, the *sign* of the reverse causal mechanism is not clear, *a priori*. On one hand, an increase in profit sharing increases the resources available to workers and may facilitate their ability to organize and lobby the government for better legal protections for workers. If this were the case, the estimated effect of labor rights on profit sharing would be biased upwards. On the other hand, a decrease in profit sharing may frustrate workers, thus leading to increased organization and demands for legal protections. If this were the case, the estimated effect of labor rights on profit sharing would be biased downwards. In these ways, the biases introduced by the possibility of reverse causality may partially cancel each other out.

However, even without solving the complicated relationship between labor rights and the profit sharing rate, this paper has important implications for the political economy of trade. Regardless of the direction of causality, attention to labor rights helps identify countries in which the distributional predictions of the neoclassical trade models may be less accurate. In countries with low protection for labor rights and low profit sharing rates, these models appear to overstate the benefits that workers receive from trade policy reforms. Although future research should focus on identifying the direction of causality, this paper

---

<sup>91</sup> MaCurdy and Pencavel 1986; Bentolila and Saint-Paul 2003; Layard, Nickell and Jackman 2005; Borjas 2005.

nonetheless identifies domestic labor market institutions as an important omitted variable in the political economy of trade.

## 6 Robustness Checks

This section presents additional robustness checks of the main finding that the protection of labor rights is positively associated with the profit sharing rate.

### 6.1 Labor Rights and Labor Power

How does the protection of labor rights compare to other variables associated with labor bargaining power? In order to examine the independent effect of labor rights on the profit sharing rate, I introduce variables often used to measure labor power: union density, the electoral strength of left-wing political parties, and the level of wage bargaining. Unfortunately, data on these variables is relatively limited, and their inclusion greatly reduces, and biases, the data. While data on union density, *Union*, is available for 54 developed and developing countries, data on wage bargaining centralization is only available for 20 OECD countries, and data on wage bargaining centralization is only available for 15 OECD countries. Due to correlation between *LaborRights* and these various measures of labor power, only one new control can be added to the model at a time.<sup>92</sup> However, as can be seen in Table 6 of the Appendix, the association between *LaborRights* and the profit sharing rate is robust to the inclusion of each of these different measures of labor power. Although not displayed below, the results are also robust to the inclusion of interaction terms between *Productivity\** and each of the labor power variables, respectively.

---

<sup>92</sup> For correlations between *LaborRights*, *Union*, *Left*, and *Bargain*, see Tables 4 and 5 in the Appendix.

## 6.2 Fixed-Effects and Rarely Changing Variables

Next, I check to make sure that the results are not driven by the inclusion of country-level fixed effects and variables that are rarely changing at the country-level.<sup>93</sup> The full model includes *Openness* and *GDPpc*, both of which do not vary much within countries from year to year, and therefore may be collinear with the country-level fixed-effects. The variance inflator factor (VIF) suggests that *GDPpc* contains little information not contained by the other independent variables (VIF of 12.4).<sup>94</sup> This high VIF value means that GDP per capita is being controlled for in the model even without the inclusion of the variable. Similarly, *Openness* has a VIF of 6.3 and therefore is also likely collinear with the country-level fixed-effects. However, as can be seen in Table 7 of the Appendix, the coefficient on the interaction term between *Productivity\** and *LaborRights* is of a nearly identical magnitude and statistical significance whether or not these variables are included. Model 1 replicates the full model, while Model 2 and Model 3 alternatively drop *GDPpc* and *Openness* from the model. Last, Model 4 drops both *GDPpc* and *Openness*. We should therefore have high confidence that the main results reported earlier are not due to multicollinearity among the regressors.

## 6.3 Standard Errors: PCSE vs. Cluster-Robust Standard Errors

I also re-estimate the main findings using cluster-robust standard errors instead of the panel-correct standard errors reported previously. Table 8 of the Appendix replicates the full model tests of Hypotheses 1 and 2 (Model 4 and Model 5 in Table 2, respectively) using robust standard errors, clustered at the country-level. The coefficient on the interaction between *Productivity\** and *LaborRights* remains statistically significant in both Model 1 and Model 2. The cluster-robust standard errors are slightly larger than the panel corrected

---

<sup>93</sup> Plümper and Troeger 2007.

<sup>94</sup> O'Brien 2007.

standard errors reported above, but do not undermine the paper’s main finding that the protection of labor rights is positively associated with the profit sharing rate.<sup>95</sup>

## 6.4 Technological Change and Fixed-Effects

Might the results be driven by technological change that alters the profit sharing rate in different industries or countries? To address this concern, I re-estimate the model with additional fixed-effects at the industry-year and industry-country levels. Including these extra fixed-effects helps to control for additional omitted variables that may be related to technological changes. For instance, if a new technology suddenly diffused through a specific industry in every country, the effect would be control for by the inclusion of industry-year fixed effects. Similarly, if a new industry-specific technology was developed in one country, and then not allowed to diffuse to other countries, the effect of such innovation would be controlled for by the inclusion of industry-country fixed effects. As can be seen in Table 9 of the Appendix, including these fixed-effects barely alters the coefficient on the interaction terms between *Productivity\** and *LaborRights*, and the coefficient remains highly statistically significant ( $p < .001$ ). Model 1 adds industry-year fixed effects only, while Model 2 adds industry-country fixed-effects only. Finally, Model 3 adds both industry-year and industry-country fixed effects. By including these two extra types of fixed effects, in addition to the full model specification with control variables and fixed effects at the country, year, and industry level, we are able to further assure the robustness of this paper’s findings.

## 6.5 Disaggregating Labor Rights

Which is more important for the profit sharing rate, the legal protection of labor rights or the actual protection of labor rights in practice? In order to answer this question,

---

<sup>95</sup> Although not presented below, the findings are also robust to clustering the standard errors at the industry-country level.

I disaggregate *LaborRights* into its two component parts based on the protection of labor rights in law and the protection of labor rights in practice. By estimating the model with each of these two labor rights measures we can see if the results are driven by variation in only one part of the *LaborRights* index. As can be seen in Table 10 of the Appendix, the results are robust to estimating the model with both *LRLaw* and *LRPractice*, the two disaggregated measures of *LaborRights*. Model 1 estimates the model using the measure based on labor rights in law and therefore includes an interaction term between *Productivity\** and *LRLaw*. The coefficient on this interaction term is positive, and of a similar magnitude (.011) as the interaction term when estimated with *LaborRights* in Model 4 of Table 2, but is only statistically significant at the  $p < .1$  level. Model 2 estimates the model using the measure based on labor rights in practice and therefore includes an interaction term between *Productivity\** and *LRPractice*. The coefficient on this interaction term is positive (.017) and statistically significant ( $p < .05$ ). Since the coefficients on the labor rights interaction terms in both models are of similar signs, magnitudes, and levels of statistical significance, this robustness check suggests that the findings are not being driven overwhelmingly by only one type of labor rights violation.

## 6.6 Determinants of the Profit Sharing Rate

The regression results presented above include many variables that are expected to influence wage growth or to be associated with the protection of labor rights. While this approach controls for alternative explanations, it does not directly estimate the relationship between the control variables and the profit sharing rate. In order to do so, the model presented in Table 11 of the Appendix adds additional interaction terms between *Productivity\** and each independent variable.<sup>96</sup> These additional interaction coefficients estimate whether

---

<sup>96</sup> All variables have been centered at their mean in order to reduce multicollinearity and ease the interpretation of the interaction terms. See Aiken and West 1991; Robinson and Schumacker 2009.

or not the relationship between productivity growth and wage growth is moderated by any of the control variables.<sup>97</sup> As can be seen in Table 11, the only additional variable that has a statistically significant association with the profit sharing rate is *FDI*.<sup>98</sup> According to these results, an increase in FDI is associated with wages that lag behind productivity growth. Most importantly, the main findings are robust to the inclusion of these additional interaction terms. The coefficient on the interaction term between *Productivity\** and *LaborRights* is statistically significant and nearly identical to the estimates in other models.

These robustness checks, as well as the inclusion of various control variables and fixed-effects at the country, year, and industry-level, should increase our confidence that labor rights is positively associated with the profit sharing rate. The results are robust to adding alternative measures of labor power, dropping rarely changing variables, cluster-robust standard errors, fixed-effects at the industry-year and industry-country level, as well as disaggregated measures of labor rights and a two-year rolling average. In all of these alternative specifications, the interaction term between *Productivity\** and *LaborRights* remains positive and statistically significant. This means that when labor rights are not well protected, an increase in productivity does not automatically lead to the equal wage increase predicted by the neoclassical trade models.

## 7 Conclusion

This paper argued that when the protection of labor rights is low, the neoclassical trade models overestimate the benefits that workers receive from trade policy reforms. These neoclassical models use the assumption of full employment to predict that a trade policy that increases worker productivity automatically leads to an equal increase in workers' wages.

---

<sup>97</sup> Model 1 does not include *GDPpc* or *Openness*. As explained above, the inclusion of these rarely changing variables leads to multicollinearity with the country-level fixed effects.

<sup>98</sup> The relationship between *Employment* and the profit sharing rate just misses the traditional threshold for statistical significance.

This paper identified the relationship between worker productivity and wages as a key causal mechanism of the neoclassical trade models and provided both a theoretical and empirical critique of the models' causal logic. Using data from 28 manufacturing industries, in 117 countries, from 1985 to 2002, this paper demonstrated that the degree to which an increase in worker productivity is associated with an increase in wages, or the "profit sharing rate," depends on the degree to which a country protects labor rights.

When labor rights are not well protected, favorable trade policy reforms lead to lower wage increases than predicted by the H-O and R-V models. Although the regression results show that an increase in productivity still leads to a wage increase even when protection for labor rights are low, variation in the profit sharing rate is likely to have important consequences for workers' trade policy preferences. After all, the more a trade policy increases workers' wages, the more likely they are to support it. In this way, this paper does not reject the predictions of the neoclassical models, but rather seeks to demonstrate how a previously omitted variable can further our understanding of the political economy of trade.

This insight may be especially important in developing countries, where labor rights tend to be less protected. Although trade liberalization is likely to increase productivity in labor-intensive industries,<sup>99</sup> potential wage increases are likely to be competed away by labor surpluses associated with unemployment and migration from rural areas.<sup>100</sup> If workers in developing countries are less likely to support free trade than predicted by the H-O model, then attention to labor rights may also contribute to the literature on the relationship between trade liberalization and democratization. As Milner and Mukherjee, explain the lack of attention to theory is particularly problematic in the study of democratization, where scholars have repeatedly established statistical correlations between democratization and

---

<sup>99</sup> Krishna and Mitra 1998.

<sup>100</sup> Lewis 1954.

trade liberalization without developing our theoretical understanding of *how* one variable affects the other.<sup>101</sup>

Last, variation in the profit sharing rate has implications beyond the study of international trade policy, as the profit sharing rate also has an effect on income equality. When the profit sharing rate is low it means that the returns to capital are increasing relative to the returns to labor and that income inequality will worsen.<sup>102</sup> In this way, the profit sharing rate has consequences for various issues studied by political scientists. For instance, scholars have argued that income inequality poses a risk for foreign investors and therefore lowers levels of inward FDI.<sup>103</sup> Others have argued that income inequality decreases economic growth by creating an unstable environment for investment, as well as by lowering the purchasing power of workers.<sup>104</sup> Finally, still others have linked income equality to democratization by arguing that a society's elite are less likely to resist democratization when an equal distribution of income lessens demands for redistribution.<sup>105</sup> Such broad implications present many avenues for future research concerning how domestic institutions determine the distributional consequences of economic policy, and in turn, how such distributional consequences affect various political outcomes.

---

<sup>101</sup> Milner and Mukherjee 2009.

<sup>102</sup> Jensen and Rosas 2007.

<sup>103</sup> Jensen 2003, 2006.

<sup>104</sup> Alesina and Perotti 1996; Keynes 1936; Schlesinger 1957.

<sup>105</sup> Boix 2003.

Table 1: Baseline OLS Regression Results. Dependent Variable = *Wage\**.

	Model 1	Model 2	Model 3	Model 4
(Intercept)	2.324*** (0.677)	-1.988 (1.940)	1.445 (1.962)	2.253 (1.994)
Productivity*	0.409*** (0.038)	0.402*** (0.030)	0.371*** (0.023)	0.377*** (0.023)
LaborRights	-0.021 (0.070)	0.019 (0.089)	-0.112 (0.096)	-0.110 (0.096)
Productivity*:LaborRights	0.009** (0.003)	0.009** (0.003)	0.007** (0.003)	0.007** (0.003)
Country Fixed-Effects	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>
<i>N</i>	14136	14136	14136	14136
<i>R</i> <sup>2</sup>	0.105	0.175	0.195	0.197
adj. <i>R</i> <sup>2</sup>	0.105	0.168	0.187	0.188
Resid. sd	15.231	14.691	14.519	14.512

Panel corrected standard errors in parentheses

† significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Table 2: OLS Regression Results with Controls. Dependent Variable = *Wage\**.

	Model 1	Model 2	Model 3	Model 4	Model 5
Productivity*	0.377*** (0.023)	0.366*** (0.030)	0.357*** (0.030)	0.355*** (0.030)	0.316 (0.195)
LaborRights	-0.110 (0.096)	-0.140 (0.122)	-0.076 (0.145)	-0.074 (0.160)	0.090 (0.225)
Productivity*:LaborRights	0.007** (0.003)	0.009* (0.004)	0.009* (0.004)	0.009* (0.004)	0.041* (0.018)
Employment		0.453 <sup>†</sup> (0.275)		0.361 (0.300)	
Capital/Labor		-0.237 (0.184)		-0.116 (0.251)	-2.332 (1.828)
PopEmployed		-0.630 (0.592)		-1.221 (0.759)	
FDI			0.408 (1.310)	-0.594 (1.963)	-0.458 (3.409)
Polity			0.769*** (0.197)	0.852*** (0.234)	1.270* (0.593)
Openness			-1.935 (5.527)	1.360 (4.859)	2.274 (8.037)
GDPpc			0.165 (5.494)	-0.262 (6.257)	-8.136 (10.331)
Unemployment			-0.640* (0.258)	-0.866** (0.273)	-0.825 (0.502)
Country Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>no</i>
<i>N</i>	14136	10406	9853	7755	303
<i>R</i> <sup>2</sup>	0.197	0.208	0.248	0.266	0.439
adj. <i>R</i> <sup>2</sup>	0.188	0.198	0.238	0.254	0.237
Resid. sd	14.512	13.913	13.385	12.942	10.934

Panel corrected standard errors in parentheses

<sup>†</sup> significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

## References

- Acemoglu, D. and J.A. Robinson. 2006. *Economic Origins of Dictatorship and Democracy*. Cambridge University Press.
- Aiken, Leona S and Stephen G West. 1991. *Multiple regression: Testing and interpreting interactions*. Sage.
- Alesina, A. and R. Perotti. 1996. "Income Distribution, Political Instability, and Investment." *European Economic Review* 40(6):1203–1228.
- Alexander, Carol O. 1993. "The Changing Relationship Between Productivity, Wages and Unemployment in the UK." *Oxford Bulletin of Economics and Statistics* 55(1):87–102.
- Alt, J.E. and M. Gilligan. 1994. "The political economy of trading states: Factor specificity, collective action problems and domestic political institutions." *Journal of Political Philosophy* 2(2):165–192.
- Alvarez, R Michael, Geoffrey Garrett and Peter Lange. 1991. "Government partisanship, labor organization, and macroeconomic performance." *The American Political Science Review* pp. 539–556.
- Ashenfelter, Orley and George E Johnson. 1969. "Bargaining Theory, Trade Unions, and Industrial Strike Activity." *The American Economic Review* 59(1):35–49.
- Baccaro, Lucio and Marco Simoni. 2010. "Organizational determinants of wage moderation." *World politics* 62(4):594–635.
- Baker, A. 2005. "Who Wants to Globalize? Consumer Tastes and Labor Markets in a Theory of Trade Policy Beliefs." *American Journal of Political Science* 49(4):924–938.
- Beck, Nathaniel. 2011. "Of Fixed-Effects and Time-Invariant Variables." *Political Analysis* 19(2):119–122.
- Beck, Nathaniel and Jonathan N Katz. 1995. "What to Do (and Not to Do) with Time-Series Cross-Section Data." *American Political Science Review* pp. 634–647.
- Beck, Nathaniel and Jonathan N Katz. 1996. "Nuisance vs. Substance: Specifying and Estimating Time-Series-Cross-Section Models." *Political Analysis* 6(1):1–36.
- Bennett, James T and Bruce E Kaufman. 2011. *What do unions do?: a twenty-year perspective*. Transaction Books.
- Bentolila, Samuel and Gilles Saint-Paul. 2003. "Explaining movements in the labor share." *Contributions to Macroeconomics* 3(1):9.
- Blanchflower, David G and Andrew J Oswald. 1995. "An Introduction to the Wage Curve." *The Journal of Economic Perspectives* 9(3):153–167.
- Boix, C. 2003. *Democracy and Redistribution*. Cambridge University Press.
- Borjas, George. 2005. *Labor Economics*. Third ed. McGraw-Hill Irwin.
- Bosworth, Barry, George L Perry and Matthew D Shapiro. 1994. "Productivity and Real Wages: Is There a Puzzle?" *Brookings Papers on Economic Activity* 1994(1):317–344.
- Brambor, T., W.R. Clark and M. Golder. 2006. "Understanding Interaction Models: Improving Empirical Analyses." *Political analysis* 14(1):63–82.
- Calmfors, Lars, John Driffill, Seppo Honkapohja and Francesco Giavazzi. 1988. "Bargaining structure, corporatism and macroeconomic performance." *Economic policy* pp. 14–61.

- Ehrlich, S. and C. Maestas. 2010. "Risk Orientation, Risk Exposure, and Policy Opinions: The Case of Free Trade." *Political Psychology* 31(5):657–684.
- Ehrlich, S.D. 2010. "The Fair Trade Challenge to Embedded Liberalism." *International Studies Quarterly* 54(4):1013–1033.
- Eichengreen, B. and D. Leblang. 2008. "Democracy and Globalization." *Economics & Politics* 20(3):289–334.
- Esping-Andersen, Gøsta. 1990. *The Three Worlds of Welfare Capitalism*. Princeton University Press.
- Freeman, Richard B and James L Medoff. 1984. "What Do Unions Do?" *Industrial & Labor Relations Review* 38:244.
- Frieden, J. 1988. "Sectoral Conflict and Foreign Economic Policy, 1914-1940." *International Organization* pp. 59–90.
- Gerring, John, Philip Bond, William T Barndt and Carola Moreno. 2005. "Democracy and economic growth." *World Politics* 57(3):323–364.
- Giavazzi, F. and G. Tabellini. 2005. "Economic and Political Liberalizations." *Journal of Monetary Economics* 52(7):1297–1330.
- Golley, J. and X. Meng. 2011. "Has China Run Out of Surplus Labour?" *China Economic Review* 22(4):555–572.
- Green, Donald P, Soo Yeon H Kim and David Yoon. 2001. "Dirty Pool." *International Organization* 55(02):441–468.
- Haggard, Stephan and Lydia Tiede. 2011. "The rule of law and economic growth: where are we?" *World Development* 39(5):673–685.
- Hainmueller, J. and M.J. Hiscox. 2006. "Learning to Love Globalization: Education and Individual Attitudes Toward International Trade." *International Organization* 60(02):469–498.
- Hall, Peter A, David W Soskice et al. 2001. *Varieties of capitalism: The institutional foundations of comparative advantage*. Vol. 8 Wiley Online Library.
- Hall, Stephen G. 1986. "An Application of the Granger & Engle Two-Step Estimation Procedure to United Kingdom Aggregate Wage Data." *Oxford Bulletin of Economics and Statistics* 48(3):229–239.
- Harris, John R and Michael P Todaro. 1970. "Migration, Unemployment and Development: a Two-Sector Analysis." *The American Economic Review* pp. 126–142.
- Harvey, Andrew C. 1980. "On Comparing Regression Models in Levels and First Differences." *International Economic Review* 21(3):707–720.
- Hayes, Beth. 1984. "Unions and Strikes with Asymmetric Information." *Journal of Labor Economics* pp. 57–83.
- Helpman, Elhanan, Marc J Melitz and Stephen R Yeaple. 2004. "Export versus FDI with Heterogeneous Firms." *The American Economic Review* 94(1):300–316.
- Hicks, John Richard. 1963. *The Theory of Wages*. Macmillan London.
- Hirsch, Barry T. 2004. "What do unions do for economic performance?" *Journal of Labor Research* 25(3):415–455.

- Hiscox, M.J. 2001. "Class Versus Industry Cleavages: Inter-Industry Factor Mobility and the Politics of Trade." *International Organization* 55(01):1–46.
- Jensen, N.M. 2003. "Democratic Governance and Multinational Corporations: Political Regimes and Inflows of Foreign Direct Investment." *International Organization* 57(3):587–616.
- Jensen, N.M. 2006. *Nation-States and the Multinational Corporation: A Political Economy of Foreign Direct Investment*. Princeton University Press.
- Jensen, N.M. and G. Rosas. 2007. "Foreign Direct Investment and Income Inequality in Mexico, 1990–2000." *International Organization* pp. 467–487.
- Johnson, George E. 2008. "Work rules, featherbedding, and Pareto-optimal union-management bargaining." *Journal of Labor Economics* 8(1):S237–59.
- Katz, Lawrence F, Lawrence H Summers, Robert E Hall, Charles L Schultze and Robert H Topel. 1989. "Industry rents: Evidence and implications." *Brookings Papers on Economic Activity. Microeconomics* 1989:209–290.
- Katzenstein, Peter J. 1985. *Small states in world markets: Industrial policy in Europe*. Cornell University Press.
- Keynes, J.M. 1936. *The General Theory of Employment, Interest and Money*. Palgrave Macmillan.
- Klein, Nir. 2012. "Real Wage, Labor Productivity, and Employment Trends in South Africa: A Closer Look." *International Monetary Fund*.
- Kohli, Atul. 2004. *State-Directed Development: Political Power and Industrialization in the Global Periphery*. Cambridge University Press.
- Krishna, Pravin and Devashish Mitra. 1998. "Trade Liberalization, Market Discipline and Productivity Growth: New Evidence from India." *Journal of Development Economics* 56(2):447–462.
- Layard, Richard, Stephen Nickell and Richard Jackman. 2005. *Unemployment: Macroeconomic Performance and the Labour Market*. Oxford University Press, USA.
- Levy, F. and P. Temin. 2009. "Institutions and Wages in Post-World War II America." *Labor in the Era of Globalization* pp. 15–49.
- Lewis, H Gregg. 1983. "Union Relative Wage Effects: A Survey of Macro Estimates." *Journal of Labor Economics* pp. 1–27.
- Lewis, W.A. 1954. "Economic Development with Unlimited Supplies of Labour." *The Manchester School*.
- Lipset, S.M. 1959. "Some Social Requisites of Democracy: Economic Development and Political Legitimacy." *The American Political Science Review* pp. 69–105.
- López-Córdova, J.E. and C.M. Meissner. 2005. The Globalization of Trade and Democracy, 1870–2000. Technical report National Bureau of Economic Research.
- MaCurdy, Thomas E and John H Pencavel. 1986. "Testing Between Competing Models of Wage and Employment Determination in Unionized Markets." *The Journal of Political Economy* pp. 3–39.
- Mansfield, E.D. and D.C. Mutz. 2009. "Support for free trade: Self-interest, sociotropic politics, and out-group anxiety." *International Organization* 63(3):425–457.

- Mares, Isabela. 2004. "Wage bargaining in the presence of social services and transfers." *World Politics* 57(1):99.
- Margalit, Yotam. 2012. "Lost in Globalization: International Economic Integration and the Sources of Popular Discontent." *International Studies Quarterly* 56(3):484–500.
- Mayda, A.M. and D. Rodrik. 2005. "Why are Some People (and Countries) More Protectionist than Others?" *European Economic Review* 49(6):1393–1430.
- Mearsheimer, John J. 2001. *The Tragedy of Great Power Politics*. WW Norton & Company.
- Melitz, Marc J. 2003. "The impact of trade on intra-industry reallocations and aggregate industry productivity." *Econometrica* 71(6):1695–1725.
- Milner, H.V. and B. Mukherjee. 2009. "Democratization and Economic Globalization." *Annual Review of Political Science* 12:163–181.
- Milner, H.V. and K. Kubota. 2005. "Why the Move to Free Trade? Democracy and Trade Policy in the Developing Countries." *International Organization* 59(01):107–143.
- Mosley, Layna. 2010. *Labor Rights and Multinational Production*. Cambridge University Press.
- Mosley, Layna. 2011. Replication data for: Collective Labor Rights Dataset. Technical report <http://hdl.handle.net/1902.1/15590> Layna Mosley [Distributor] V1 [Version].
- Murillo, María Victoria, Pablo Pinto and Martin Ardanaz. 2013. "Sensitivity to Issue Framing on Trade Policy Preferences: Evidence from a Survey Experiment." *International Organization, Forthcoming*.
- O'Brien, Robert M. 2007. "A Caution Regarding Rules of Thumb for Variance Inflation Factors." *Quality & Quantity* 41(5):673–690.
- Olson, M. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Vol. 124 Harvard University Press.
- Olson, Mancur. 1984. *Rise and Decline of Nations*. Yale University Press.
- O'Rourke, Kevin H, Richard Sinnott, J David Richardson and Dani Rodrik. 2001. The Determinants of Individual Trade Policy Preferences: International Survey Evidence [with comments and discussion]. In *Brookings trade forum*. JSTOR pp. 157–206.
- O'Rourke, K.H. and A.M. Taylor. 2006. "Democracy and Protectionism." *Working Paper, Department of Economic, University of California David*.
- Oswald, Andrew J. 1982. "The Microeconomic Theory of the Trade Union." *The Economic Journal* 92(367):576–595.
- Papaioannou, Elias and Gregorios Siourounis. 2008. "Democratisation and Growth\*." *The Economic Journal* 118(532):1520–1551.
- Plümper, Thomas and Vera E Troeger. 2007. "Efficient Estimation of Time-Invariant and Rarely Changing Variables in finite sample panel analyses with unit fixed effects." *Political Analysis* 15(2):124–139.
- Robinson, Cecil and Randall E Schumacker. 2009. "Interaction effects: centering, variance inflation factor, and interpretation issues." *Multiple Linear Regression Viewpoints* 35(1):6–11.
- Rogowski, R. 1987. "Political Cleavages and Changing Exposure to Trade." *The American Political Science Review* pp. 1121–1137.

- Rogowski, Ronald. 1989. *Commerce and Coalitions: How Trade Affects Domestic Political Alignments*. Princeton University Press.
- Rose, Nancy L. 1987. "Labor Rent Sharing and Regulation: Evidence from the Trucking Industry." *The Journal of Political Economy* 95(6):1146–1178.
- Rosen, Sherwin. 1969. "Trade Union Power, Threat Effects and the Extent of Organization." *The Review of Economic Studies* 36(2):185–196.
- Rudra, N. 2002. "Globalization and the Decline of the Welfare State in Less-Developed Countries." *International Organization* 56(2):411–445.
- Rudra, N. 2005. "Globalization and the Strengthening of Democracy in the Developing World." *American Journal of Political Science* 49(4):704–730.
- Rueda, David. 2005. "Insider-Outsider Politics in Industrialized Democracies: the Challenge to Social Democratic Parties." *American Political Science Review* 99(1):61–74.
- Rueda, David and Jonas Pontusson. 2000. "Wage inequality and varieties of capitalism." *World Politics* 52(3):350–383.
- Scheve, K.F. and M.J. Slaughter. 2001. "What Determines Individual Trade-Policy Preferences?" *Journal of International Economics* 54(2):267–292.
- Schlesinger, A.M. 1957. *The Age of Roosevelt*. Vol. 1 Houghton Mifflin 3 vols. Boston.
- Schumpeter, Joseph A. 1994. *History of economic analysis*. Routledge.
- Scruggs, Lyle and Peter Lange. 2002. "Where have all the members gone? Globalization, institutions, and union density." *Journal of Politics* 64(1):126–153.
- Stokes, S.C. 2001. *Mandates and Democracy: Neoliberalism by Surprise in Latin America*. Cambridge University Press.
- Strauss, Jack and Mark E Wohar. 2004. "The Linkage between Prices, Wages, and Labor Productivity: A Panel Study of Manufacturing Industries." *Southern Economic Journal* pp. 920–941.
- Wakeford, Jeremy. 2004. "The Productivity-Wage Relationship in South Africa: an Empirical Investigation." *Development Southern Africa* 21(1):109–132.
- Western, Bruce. 1997. *Between class and market: Postwar unionization in the capitalist democracies*. Cambridge Univ Press.
- Weyland, K. 2002. *The Politics of Market Reform in Fragile Democracies: Argentina, Brazil, Peru, and Venezuela*. Princeton University Press.

# Appendix

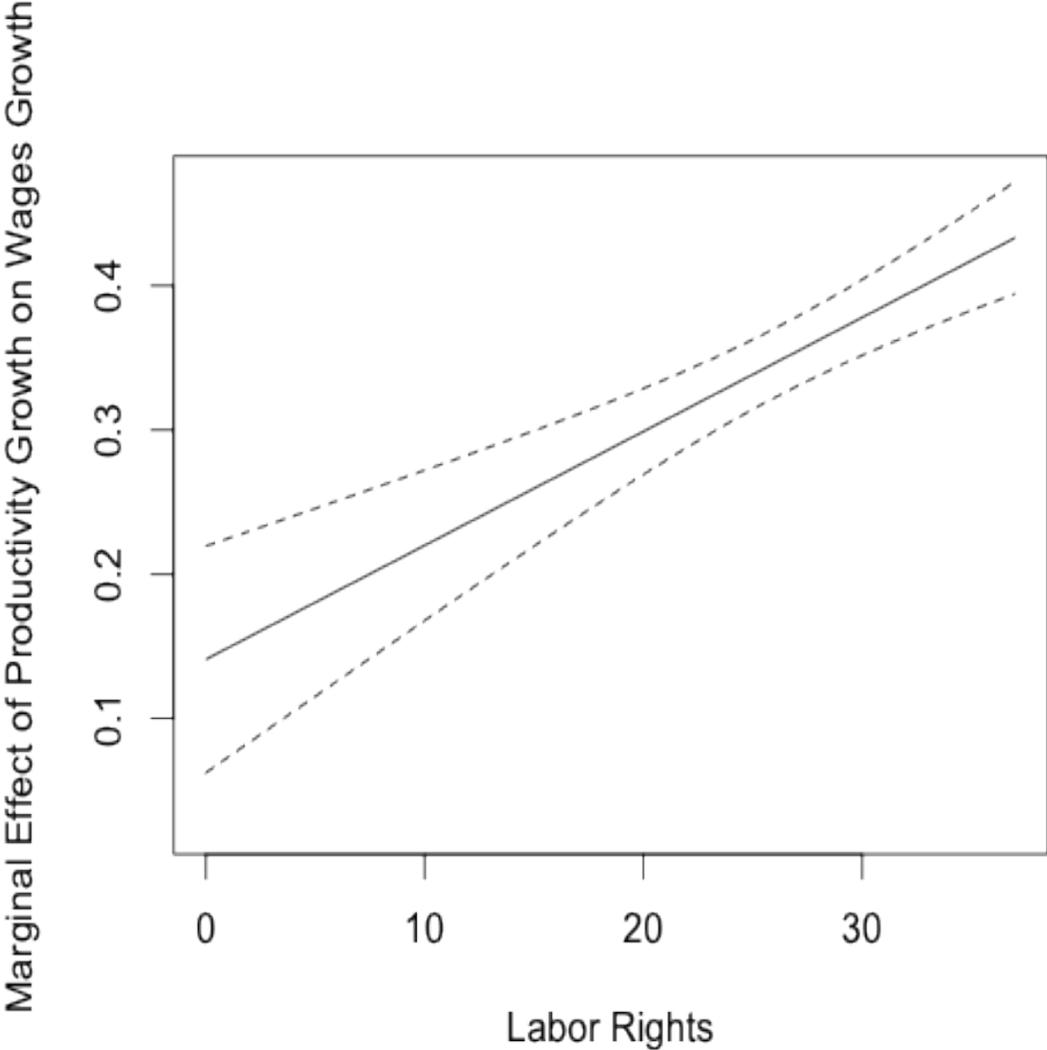


Figure 3: Marginal Effect of Productivity Growth on Wage Growth.

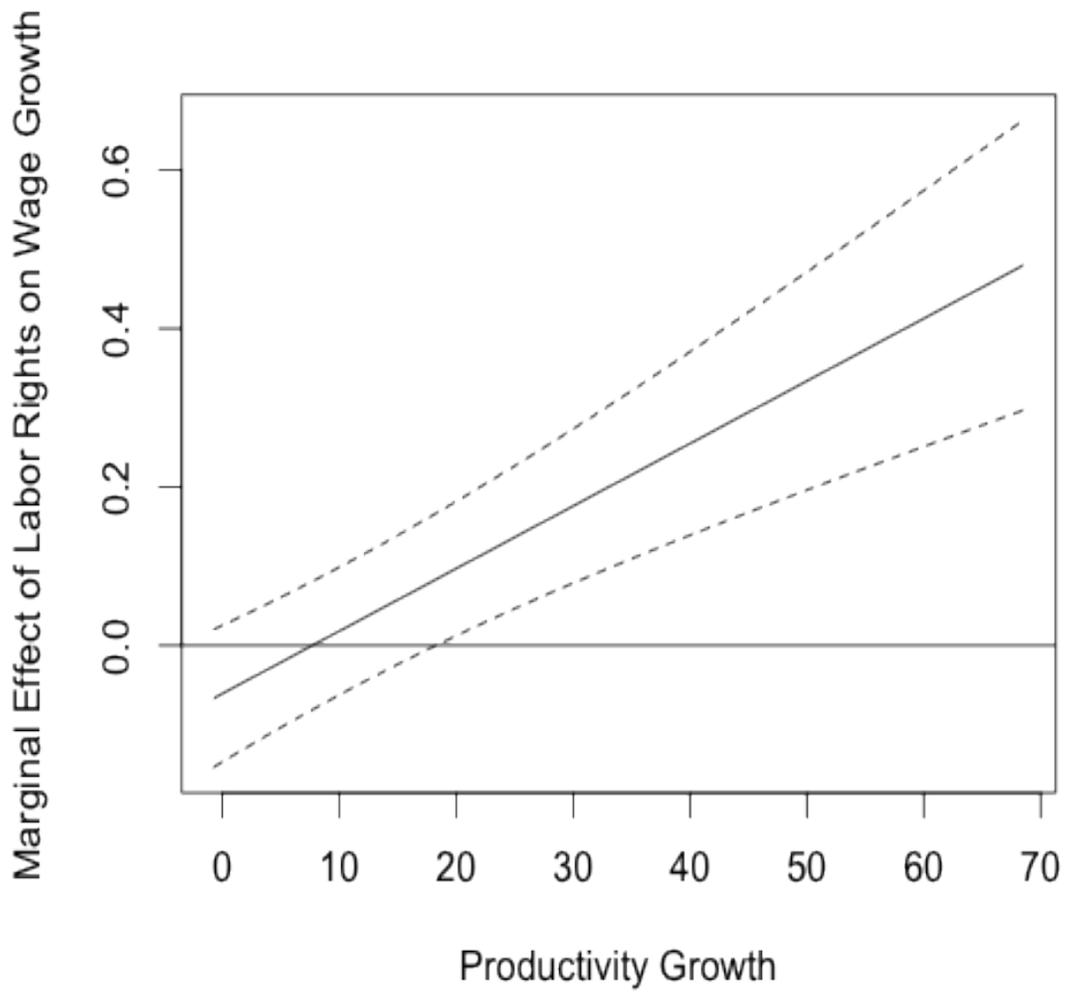


Figure 4: Marginal Effect of Labor Rights on Wage Growth.

Table 3: Descriptive Statistics

	Observations	Mean	Standard Deviation	Minimum	Maximum
Productivity*	16,047	14.41	12.75	0.00	69.24
Wage*	16,047	8.25	16.08	-69.28	69.11
LaborRights	14,136	27.37	7.98	0.00	37.00
Employment (thousands)	16,047	58.20	165.00	1.00	2,620.00
Capital/Labor	11,799	5.46	166.43	0.00	11,900.00
PopEmployed	14,703	0.19	0.34	0.00	7.47
FDI (billions)	14,352	4.96	18.70	-4.55	321.00
Polity	13,894	4.96	6.39	-10.00	10.00
Openness	14,686	73.83	52.64	0.62	371.82
GDPpc (thousands)	14,703	13.30	11.00	0.19	72.70
Unemployment	10,842	8.36	4.82	0.50	36.40
Union	9,336	27.85	22.05	0.00	95.50
Left	4,157	39.82	41.36	0.00	100.00
Bargain	3,124	2.81	1.30	1.00	5.00

Table 4: Correlation Table - Country-Year Variables

	LaborRights	GDPpc	Openness	Polity	Unemployment	FDI	Union	Left	Bargain
LaborRights	1.00	0.36	0.07	0.32	0.12	0.09	0.52	0.38	0.55
GDPpc	0.36	1.00	0.15	0.34	-0.26	0.34	0.41	-0.08	0.03
Openness	0.07	0.15	1.00	-0.13	-0.07	-0.07	0.09	0.01	0.25
Polity	0.32	0.34	-0.13	1.00	0.02	0.18	0.39	-0.15	0.15
Unemployment	0.12	-0.26	-0.07	0.02	1.00	-0.07	-0.01	0.03	-0.19
FDI	0.09	0.34	-0.07	0.18	-0.07	1.00	-0.04	-0.06	-0.38
Union	0.52	0.41	0.09	0.39	-0.01	-0.04	1.00	0.04	0.63
Left	0.38	-0.08	0.01	-0.15	0.03	-0.06	0.04	1.00	0.30
Bargain	0.55	0.03	0.25	0.15	-0.19	-0.38	0.63	0.30	1.00

Table 5: Correlation Table - Industry-Country-Year Variables

	Wage*	Productivity*	Capital/Labor	Population Employed	Employment
Wage*	1.00	0.52	-0.00	0.02	0.01
Productivity*	0.52	1.00	-0.02	0.01	0.01
Capital/Labor	-0.00	-0.02	1.00	-0.01	-0.01
Population Employed	0.02	0.01	-0.01	1.00	0.41
Employment	0.01	0.01	-0.01	0.41	1.00

Table 6: OLS Regression Results. Dependent Variable = *Wage\**.

Robustness Check: Labor Rights and Labor Power Variables				
	Model 1	Model 2	Model 3	Model 4
Productivity*	0.355*** (0.030)	0.333*** (0.036)	0.152 <sup>†</sup> (0.084)	0.261* (0.120)
LaborRights	-0.074 (0.160)	0.236 (0.220)	-0.413 (0.277)	-0.465 (0.284)
Productivity*:LaborRights	0.009* (0.004)	0.011* (0.005)	0.039*** (0.011)	0.028 <sup>†</sup> (0.015)
Employment	0.361 (0.300)	0.383 (0.365)	-0.457 (0.326)	-0.930 <sup>†</sup> (0.562)
FDI	-0.594 (1.963)	2.410 (2.212)	2.812 (2.292)	2.813 (3.043)
Capital/Labor	-0.116 (0.251)	-0.084 (0.320)	-0.660 (0.477)	-1.542* (0.649)
PopEmployed	-1.221 (0.759)	-1.179 (0.798)	-1.112 (1.092)	1.228 (1.488)
Polity	0.852*** (0.234)	0.847* (0.371)		
Openness	1.360 (4.859)	6.759 (7.463)	0.080 (10.611)	-5.146 (13.670)
GDPpc	-0.262 (6.257)	3.022 (8.450)	-21.366 (18.716)	-28.955 (31.410)
Unemployment	-0.866** (0.273)	-1.145** (0.367)	-0.219 (0.550)	-0.131 (0.640)
Union		0.360*** (0.089)		
Left			0.022 (0.021)	
Bargain				-0.922 (1.453)
Country Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
<i>N</i>	7755	5599	3227	2372
<i>R</i> <sup>2</sup>	0.266	0.344	0.514	0.520
adj. <i>R</i> <sup>2</sup>	0.254	0.332	0.503	0.507
Resid. sd	12.942	12.084	8.658	8.957

Panel corrected standard errors in parentheses

<sup>†</sup> significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Table 7: OLS Regression Results. Dependent Variable = *Wage\**.

Robustness Check: Fixed-Effects and Rarely Changing Variables				
	Model 1	Model 2	Model 3	Model 4
Productivity*	0.355*** (0.031)	0.355*** (0.030)	0.355*** (0.031)	0.355*** (0.030)
LaborRights	-0.074 (0.161)	-0.074 (0.160)	-0.081 (0.152)	-0.081 (0.152)
Productivity*:LaborRights	0.009* (0.004)	0.009* (0.004)	0.009* (0.004)	0.009* (0.004)
Employment	0.359 (0.297)	0.359 (0.295)	0.367 (0.292)	0.367 (0.289)
FDI	-0.609 (1.952)	-0.611 (1.938)	-0.559 (1.951)	-0.567 (1.934)
Capital/Labor	-0.377 (0.796)	-0.376 (0.801)	-0.374 (0.793)	-0.373 (0.798)
PopEmployed	-1.197 (0.748)	-1.197 (0.738)	-1.184 (0.760)	-1.186 (0.749)
Polity	0.852*** (0.235)	0.851*** (0.235)	0.858*** (0.232)	0.856*** (0.232)
Openness	1.377 (4.862)	1.380 (4.894)		
GDPpc	-0.045 (6.193)		-0.213 (6.233)	
Unemployment	-0.867** (0.273)	-0.866*** (0.235)	-0.879** (0.275)	-0.876*** (0.236)
Country Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
<i>N</i>	7755	7755	7755	7755
<i>R</i> <sup>2</sup>	0.266	0.266	0.266	0.266
adj. <i>R</i> <sup>2</sup>	0.254	0.254	0.254	0.254
Resid. sd	12.943	12.942	12.942	12.942

Panel corrected standard errors in parentheses

† significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Table 8: OLS Regression Results. Dependent Variable =  $Wage^*$ .

Robustness Check: Standard Errors Clustered by Country		
	Model 1	Model 2
Productivity*	0.355*** (0.040)	0.325 (0.285)
LaborRights	-0.074 (0.151)	0.136 (0.306)
Productivity*:LaborRights	0.009* (0.004)	0.040† (0.024)
Employment	0.359 (0.323)	
FDI	-0.609 (1.830)	-1.215 (3.500)
Capital/Labor	-0.377 (0.510)	-135.287 (70.986)
PopEmployed	-1.197 (0.640)	
Polity	0.852** (0.284)	1.242* (0.482)
Openness	1.377 (5.711)	2.411 (9.831)
GDPpc	-0.045 (7.740)	-3.587 (9.762)
Unemployment	-0.867* (0.341)	-0.812 (0.736)
Country Fixed-Effects	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>	<i>no</i>
$N$	7755	303
$R^2$	0.266	0.437
adj. $R^2$	0.254	0.234
Resid. sd	12.943	10.956

Cluster robust standard errors in parentheses

† significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Table 9: OLS Regression Results. Dependent Variable = *Wage*\*

Robustness Check: Technology, Industry-Country and Industry-Year Fixed-Effects

	Model 1	Model 2	Model 3
Productivity*	0.381*** (0.043)	0.384*** (0.057)	0.414*** (0.062)
LaborRights	-0.066 (0.152)	-0.065 (0.170)	-0.058 (0.171)
Productivity*:LaborRights	0.010* (0.004)	0.012** (0.004)	0.013** (0.005)
Employment	0.450 (0.325)	1.280 (1.273)	1.224 (1.302)
FDI	-0.829 (1.868)	-0.359 (2.099)	-0.450 (2.093)
Capital/Labor	-0.670 <sup>†</sup> (0.386)	0.352 (0.724)	0.152 (0.802)
PopEmployed	-1.261* (0.622)	-3.180 (3.463)	-3.997 (3.373)
Polity	0.815** (0.279)	0.811** (0.311)	0.782** (0.299)
Openness	1.590 (5.77)	1.123 (6.68)	1.836 (6.660)
GDPpc	-0.066 (7.591)	-0.091 (8.705)	0.011 (8.449)
Unemployment	-0.872** (0.340)	-0.836* (0.405)	-0.859* (0.399)
Country Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>	<i>yes</i>	<i>yes</i>
Industry-Year Fixed-Effects	<i>yes</i>	<i>no</i>	<i>yes</i>
Industry-Country Fixed-Effects	<i>no</i>	<i>yes</i>	<i>yes</i>
<i>N</i>	7755	7755	7755
<i>R</i> <sup>2</sup>	0.307	0.385	0.430
adj. <i>R</i> <sup>2</sup>	0.254	0.228	0.230
Resid. sd	12.943	13.171	13.153

Cluster robust standard errors in parentheses

<sup>†</sup> significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Table 10: OLS Regression Results. Dependent Variable = *Wage\**.

Robustness Check: Disaggregate *LaborRights* into Law and Practice

	Model 1	Model 2
Productivity*	0.350*** (0.031)	0.358*** (0.031)
LRLaw	-0.245 (0.255)	
LRPractice		-0.075 (0.255)
Productivity*:LRLaw	0.011 <sup>†</sup> (0.007)	
Productivity*:LRPractice		0.017* (0.007)
Employment	0.352 (0.291)	0.380 (0.291)
FDI	-0.538 (1.955)	-0.733 (1.955)
Capital/Labor	-0.382 (0.792)	-0.311 (0.792)
PopEmployed	-1.215 (0.740)	-1.265 <sup>†</sup> (0.740)
Polity	0.863*** (0.233)	0.869*** (0.233)
Openness	0.985 (4.668)	1.647 (4.668)
GDPpc	-0.027 (6.276)	-0.226 (6.276)
Unemployment	-0.873** (0.270)	-0.866** (0.270)
Country Fixed-Effects	<i>yes</i>	<i>yes</i>
Year Fixed-Effects	<i>yes</i>	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>	<i>yes</i>
<i>N</i>	7755	7755
<i>R</i> <sup>2</sup>	0.265	0.267
adj. <i>R</i> <sup>2</sup>	0.253	0.255
Resid. sd	12.953	12.937

Panel corrected standard errors in parentheses

<sup>†</sup> significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

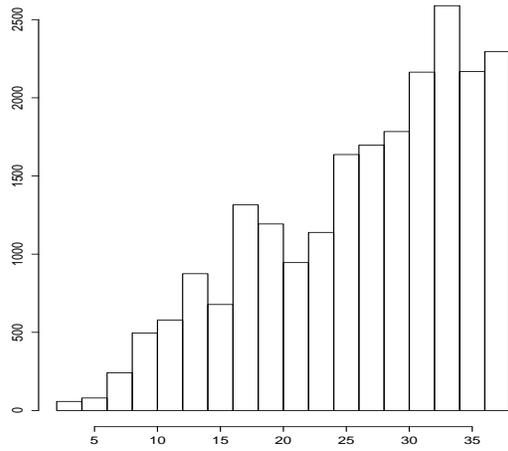
Table 11: OLS Regression Results. Dependent Variable =  $Wage^*$ .

Robustness Check: Determinants of the Profit Sharing Rate	
Model 1	
Productivity*	0.347*** (0.026)
Productivity*:LaborRights	0.010* (0.004)
Productivity*:Employment	0.033 <sup>†</sup> (0.018)
Productivity*:FDI	-0.086* (0.039)
Productivity*:Capital/Labor	-0.036 (0.090)
Productivity*:PopEmployed	-0.044 (0.105)
Productivity*:Polity	-0.001 (0.006)
Productivity*:Unemployment	-0.003 (0.006)
Country Fixed-Effects	<i>yes</i>
Year Fixed-Effects	<i>yes</i>
Industry Fixed-Effects	<i>yes</i>
$N$	7755
$R^2$	0.268
adj. $R^2$	0.256
Resid. sd	12.927

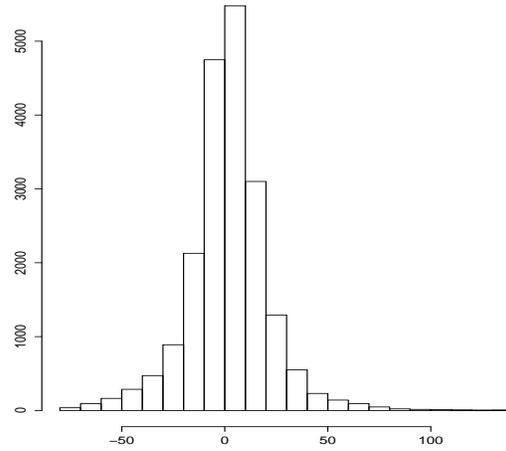
Panel corrected standard errors in parentheses

The model includes the constituent terms of each interaction, but for presentation purposes only the interaction coefficients are presented.

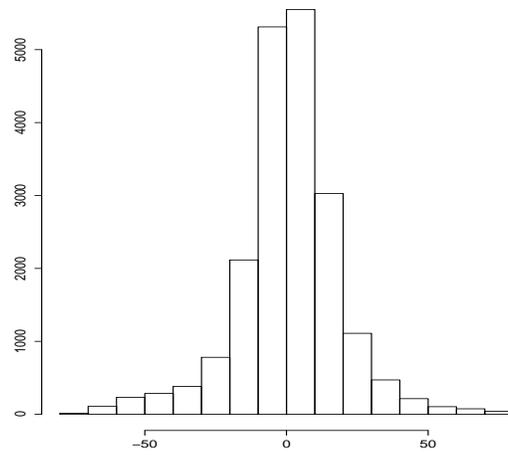
<sup>†</sup> significant at  $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$



(a) Histogram of Labor Rights



(b) Histogram of Productivity\*



(c) Histogram of Wage\*

Figure 5: Distribution of Variables

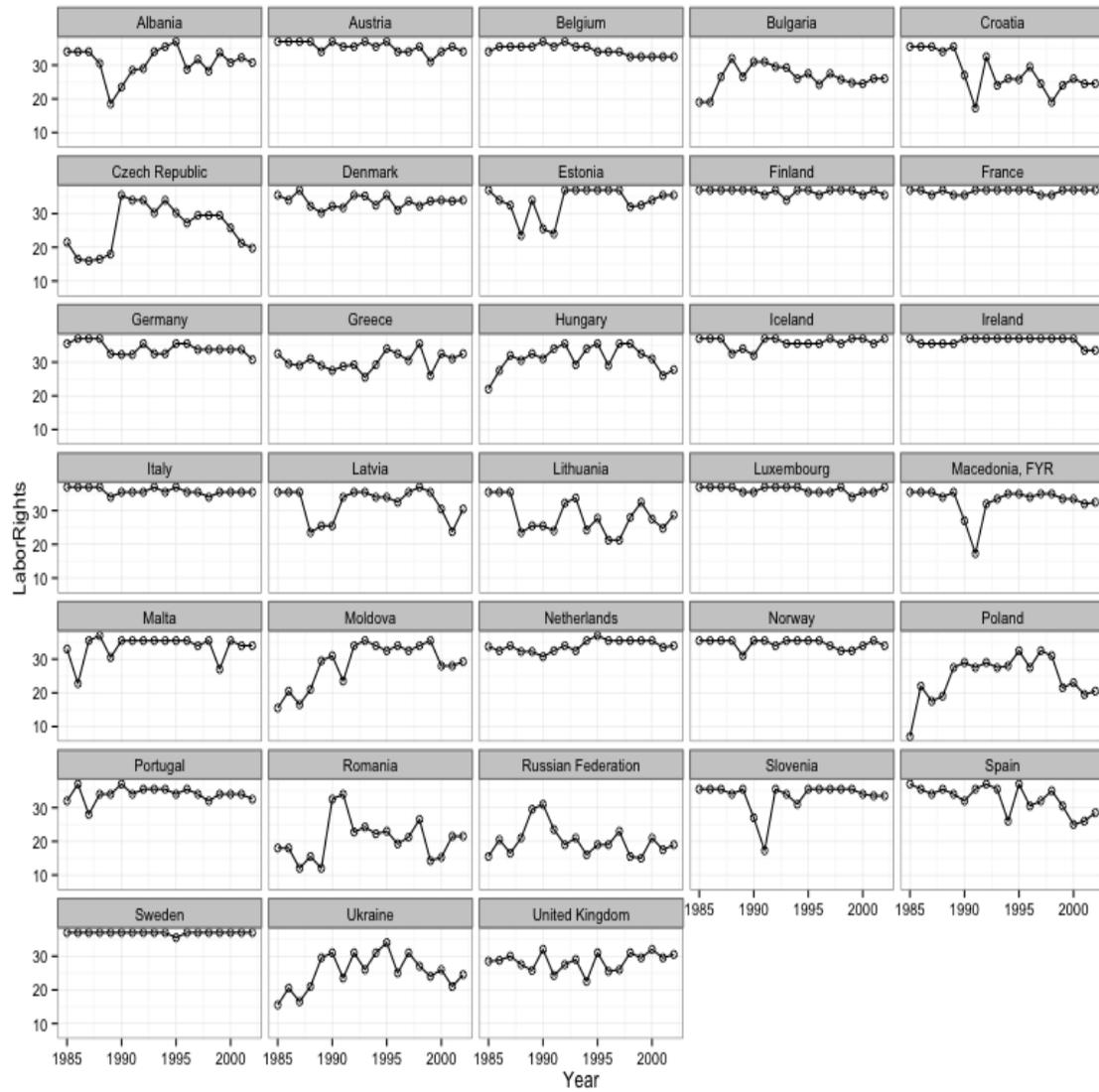


Figure 6: Labor Rights Over Time in Europe

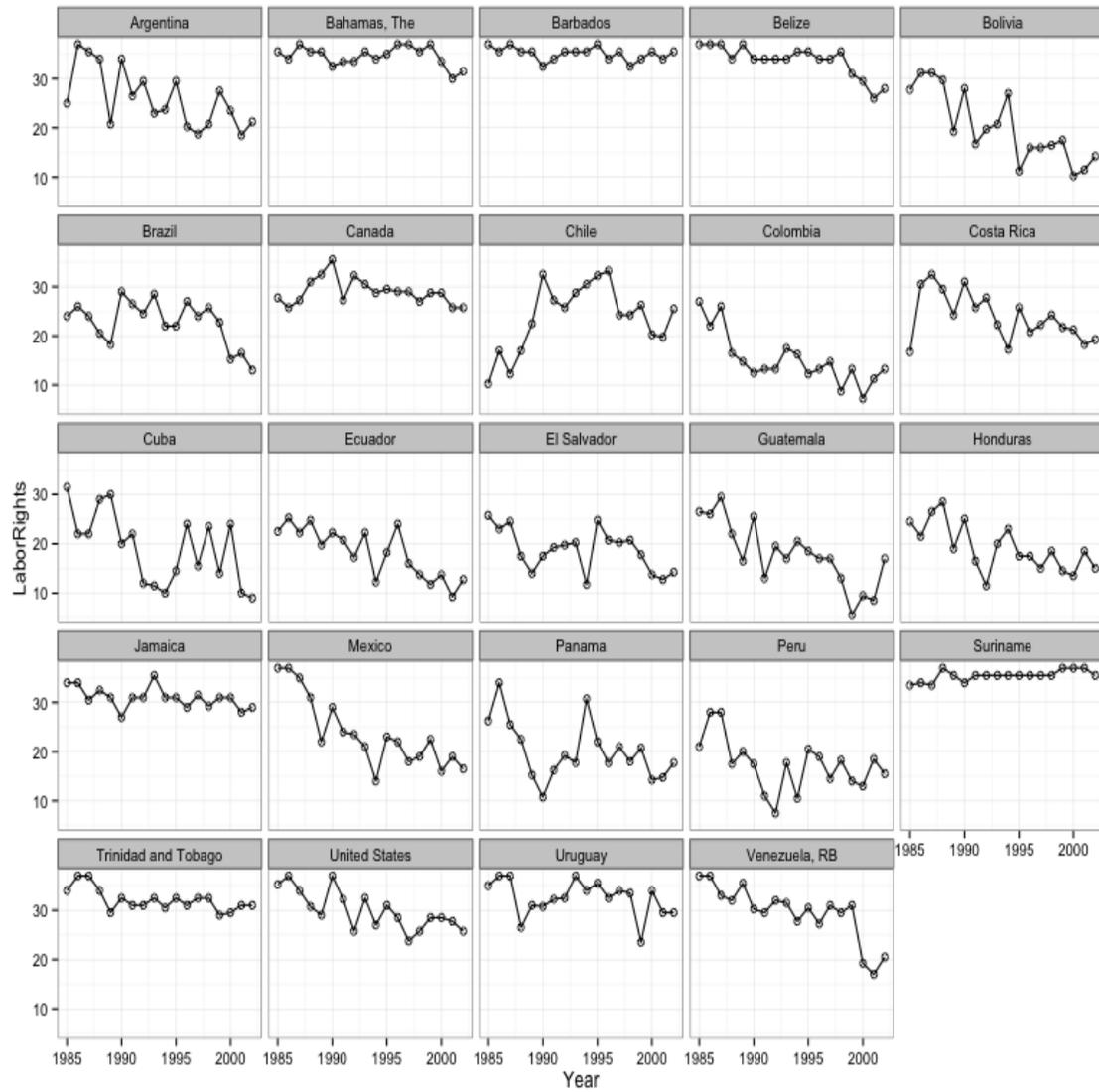


Figure 7: Labor Rights Over Time in the Americas

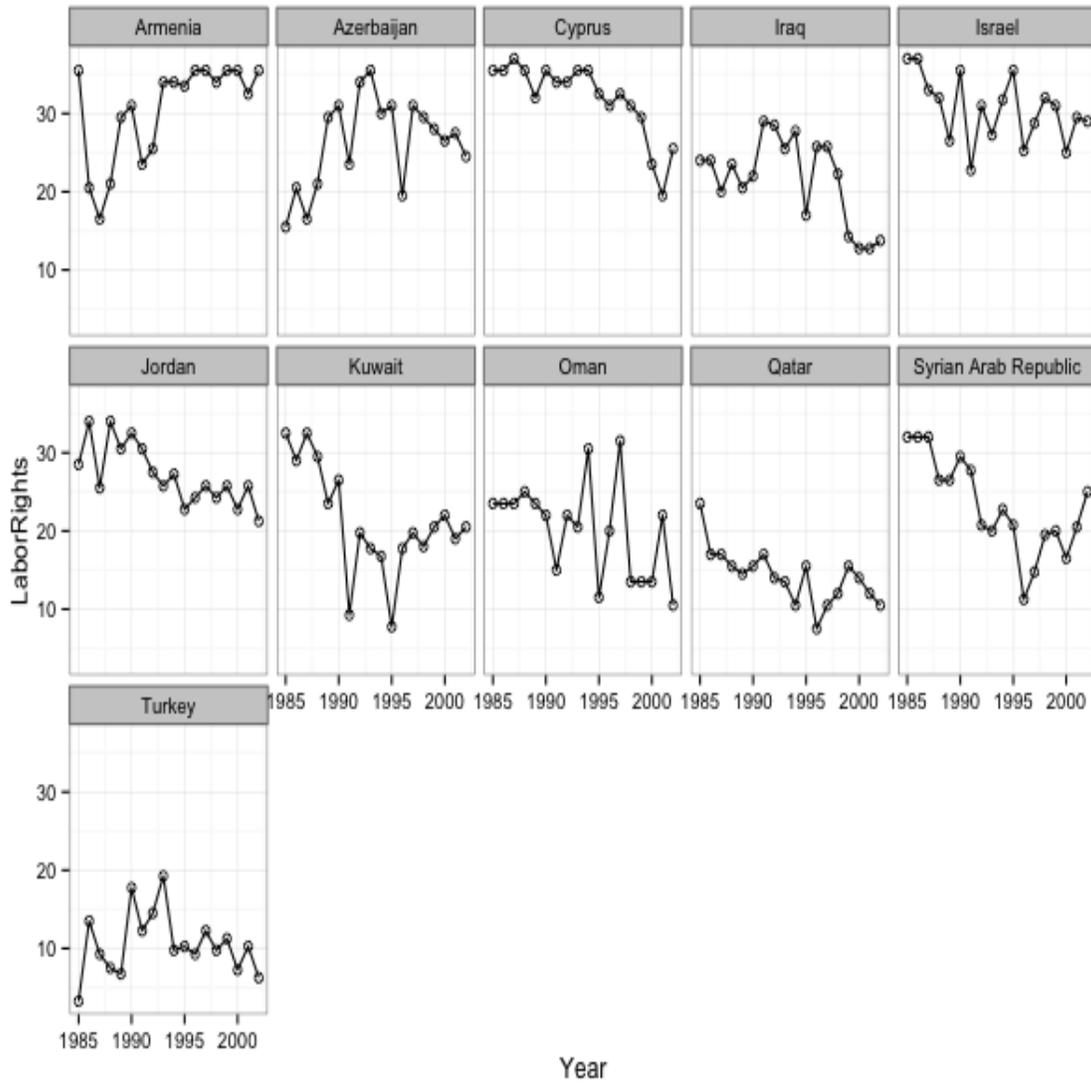


Figure 8: Labor Rights Over Time in the Middle East

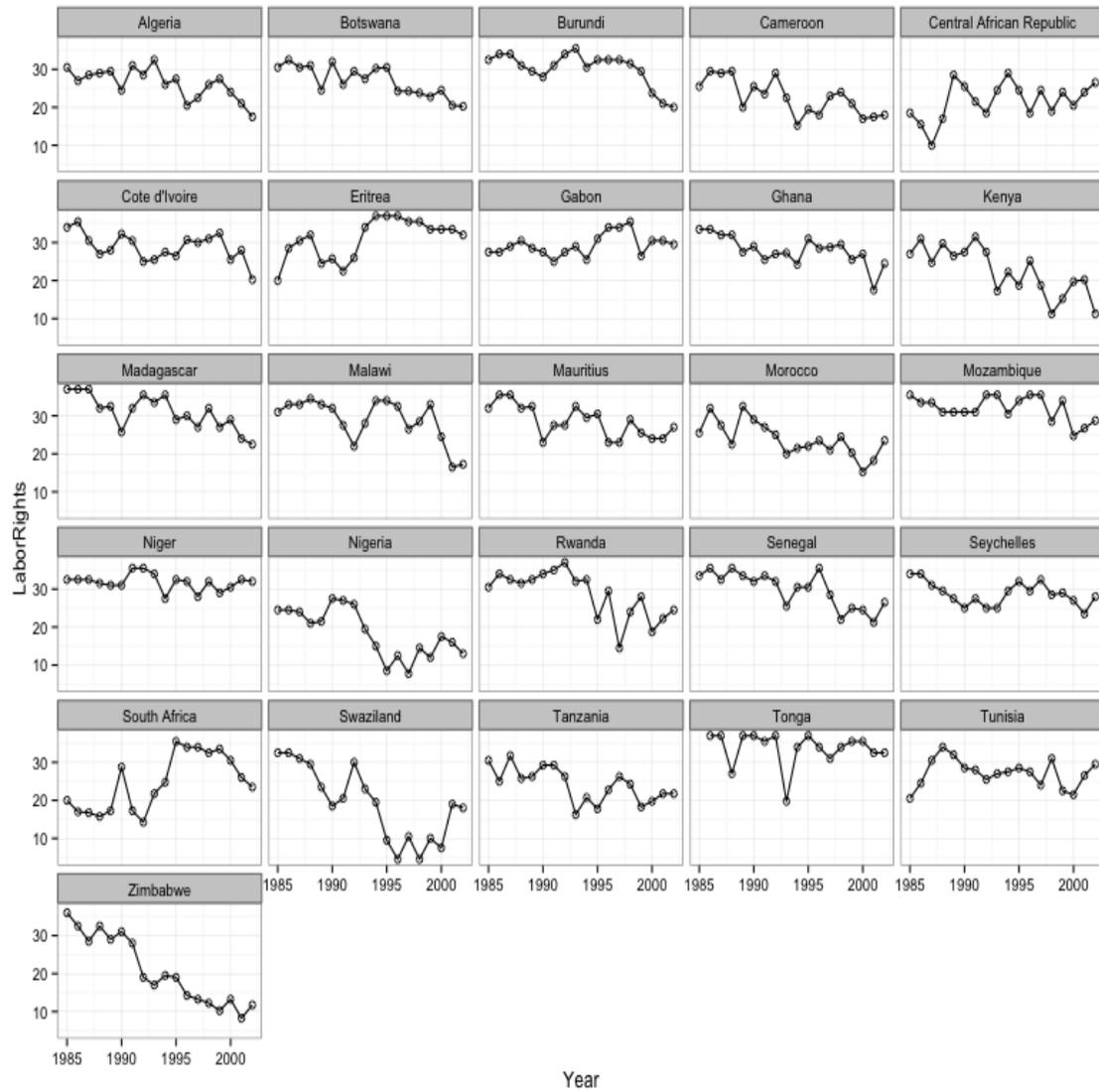


Figure 9: Labor Rights Over Time in Africa

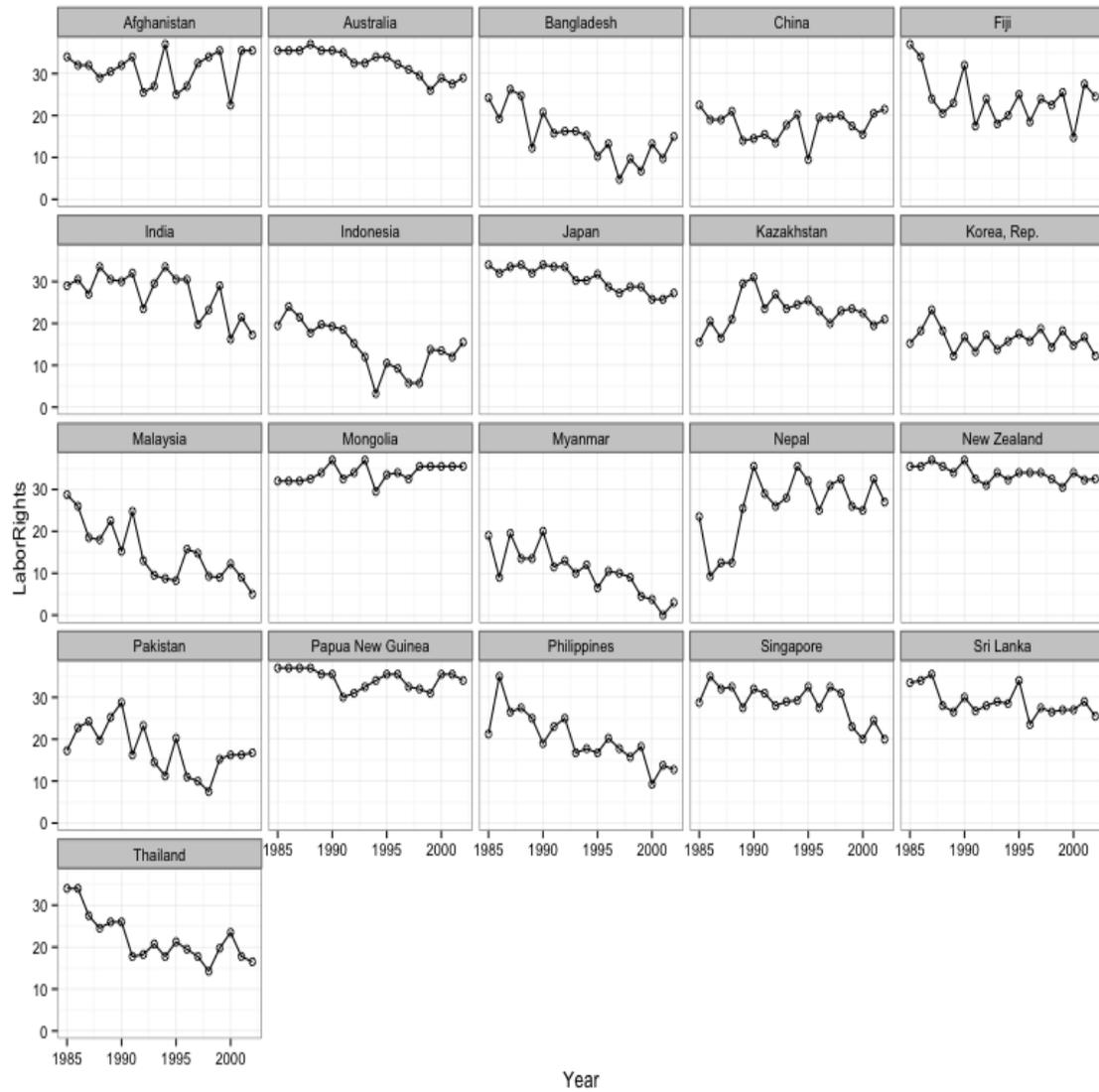


Figure 10: Labor Rights Over Time in Asia and Oceania