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# Special interest groups, labor market regulations, and labor market performance in the U.S. states

*Ismail M. Cole<sup>1</sup> and Tamunopriye J. Agiobenebo<sup>2</sup>*

## Abstract

This paper uses data from the fifty US states from 2006-2015 to explore how labor market regulations and the strength of special interest groups' (SIGs) influence in the political process might affect labor market performance. A dynamic panel data model is specified and estimated using a sequential two-stage (two-step GMM) method (Kripfganz and Schwarz (2019)), which addresses endogeneity and other estimation issues, and allows direct parameter estimates for the time-constant dummies measuring SIGs influence. We find that the performance impact of alternative measures of regulation depends on the strength of SIGs' influence and that neglecting to account for such influence, as in the sizeable empirical literature, may lead to misspecification problems serious enough to undermine the validity of conclusions drawn about the nature of the relationships between the regulations and labor market performance. We also find strong support for various hypotheses relating to the independent and combined effects of labor market regulations and SIGs' influence on labor market performance. Also, in most cases, these effects are significantly stronger in the states where the SIGs' influence is dominant, such as Alabama, Florida, Hawaii, and Nevada. An apparent implication of this study is that an analysis of labor market performance that ignores the role of SIGs is, at best incomplete.

keywords: regulation, special interest groups, rent-seeking, labor market performance, multiplicative interaction models

JEL Classification Codes: D72 J64 R23

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## 1. Introduction

An interest group is an association of individuals or organizations or a public or private institution that, on the basis of one or more shared concerns, attempts to influence public policy in its favor.

Group system power is the strength of interest groups as a whole within a state in relation to other organizations or institutions, such as political parties, the legislature, the governor, and the bureaucracy.

– Thomas, Hrebienar, and Nownes (2008)

How labor market regulations (e.g., minimum wages and employment protection legislation) impact labor market performance is important in policy debates over jobs, regulatory reforms, and economic growth (Coglianese (2013) and Coglianese and Carrigan (2013)). However, the sizeable empirical literature has mirrored the theoretical ambiguity by producing mixed results showing that labor market regulations can have favorable or adverse, or even no effect on various indicators of labor market performance, including unemployment, wages, and the labor force participation rate (e.g., Blancherflower (2001), Nicoletti and Scarpetta (2003), Feldman (2012), Cebula (2013), Heller and Stephenson (2014), and Deakin, Malmberg, and Sakar (2014)). Although this literature has accounted for various factors and made valuable contributions, it has not considered the role of special interest groups (SIGs) in shaping the regulations-labor market performance relationship. Nevertheless, political economists and others have long recognized a close link between such regulations, influence, and performance, asserting that government regulatory policy is the main channel through which SIGs influence economic performance in their favor. Indeed, this issue was addressed as early as the late 18<sup>th</sup> Century by Adam Smith (1776), who argued that interest groups (e.g., mercantilists) drive laws and regulations, including those imposed on the labor market such as apprenticeships, through their rent-seeking activities, which invariably deter economic performance and harm the rest of society (Paganelli (2017)). Also, other scholars have argued that SIGs can harm economic and labor market performance through government regulation designed and implemented primarily for their benefit (e.g., Stigler (1971), Buchanan (1980), Olson (1982), and Grossman (2012)). If these arguments are valid, then an analysis of labor market performance without considering the role of SIGs is, at best

incomplete. However, such consideration is quite important from an analytical and a policy perspective by informing strategies for job creation and regulatory reform.

This paper starts to close the said gap by investigating the independent and combined impact of labor market regulations and the strength of SIGs' influence on the political process on labor-market performance. We do so in the context of the fifty U.S. states for the 2006 to 2015 period by estimating a dynamic panel data model using the sequential two-stage GMM estimation method (Kripfganz and Schwartz (2019)). This method minimizes endogeneity and other estimation issues and, unlike most other panel estimation methods, allows direct parameter estimates for the time-constant measures of SIGs' influence employed (Nownes, Thomas, and Hrebienar (2008)). Moreover, these measures are detailed in their coverage of SIGs characteristics and seem more direct, meaningful, and empirically useful than alternative measures of such influence (Shughart II, Tollison, and Yan 2003, and Young 2004).

We organized the rest of the paper as follows. Section 2 briefly reviews some related literature to develop the hypotheses we tested. Section 3 describes the data and outlines the model and the estimation method, while Section 4 presents and discusses the empirical results, and Section 5 concludes.

## **2. Developing the hypotheses**

To achieve the objectives of this paper, we focus on three basic questions. The first, which empirical studies have yet to answer conclusively, is “does labor market regulation measured here as the minimum wage have a positive, negative, or no effect on labor market performance proxied here by unemployment?”<sup>1</sup> The second and third, which previous studies have not directly answered empirically, are “does the influence of SIGs on the political process lead to higher or lower unemployment?” and “does the minimum wage have a different effect on unemployment depending on the level of such influence and vice versa?”

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<sup>1</sup> Other indicators of labor market performance include wages, the employment rate, employment-to-population ratio, and the labor force participation rate; however, this paper uses as a case study the unemployment rate, the most frequently used and best measure of such performance (Nickell and Layard (1999)). The focus on this rate enables us to restrict our attention to a distinct subset of the large and growing literature on the economic consequences of regulation. Also, although we focus on the minimum wage, we use alternative measures of regulation to test the robustness of our results.

General theories of the relationship between labor market performance (unemployment) and regulations (the minimum wage) predict a positive or a negative relationship between the two variables. Herein, we rely on two prominent and competing theoretical perspectives. The first is the efficiency and related views which predict that such wages will lower unemployment (e.g., Web (1912), Akerlof (1982), and Card and Krueger (1995)), and the other is derived from the political economy or related literature (e.g., Olson (1982), Rustici (1985), Heise (2008), Holcombe and Gwartney (2010), and Stansel Torra, and McMahon (2017)), which predict that the minimum wage raises unemployment<sup>2</sup>.

Web (1912) first proposed the efficiency theory based on his observations on the legal minimum wage in Australia and elsewhere between the 1890s and the early 1900s. Contrary to the critics of this wage at the time who argued that it was "against the laws of political economy" because it would restrict employment, drive away capital, shut down businesses, and harm the poor, Web (1912) maintained that the wage would not necessarily spell ruin for employers and workers, nor would it abolish competition for employment but, rather, would cause an employer "... to do his utmost to raise the level of efficiency of his workers, so as to get the best possible returns for the fixed conditions" (Web, 1912, p. 978). Thus, Web argued that this reaction to the minimum wage by the employer, and his other actions designed to lower production costs, would ultimately increase efficiency and productivity, raising employment and production while lowering unemployment in the industry.

This notion that the minimum wage, through the efficiency and productivity of employers and workers, lowers unemployment laid dormant for decades but was later revived in the efficiency wage theory of Akerlof (1982). His theory maintains that rising wages due to, for example, stricter labor market regulations, such as a minimum wage, can reduce quit rates and increase labor productivity because workers feel more motivated to work with higher pay. Thus, partial or all of the higher (minimum) wage costs will be regained

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<sup>2</sup> The prediction of an unemployment-increasing effect of the minimum wage by the political-economy view is in accord with standard neoclassical economic theory. However, unlike the former, the latter ignores the driving forces behind minimum wage legislation (e.g., SIGs) by assuming that it is exogenously imposed on the free labor market (Korpi (2008)). It then maintains that as a minimum wage law raises wages above their market level, employment opportunities will be reduced, especially for unskilled workers, and unemployment increased as firms move up along their downward-sloping demand for labor curves (Ehrenberg and Smith (2015)).

through increased worker retention and higher productivity. Also, the resulting increase in worker earnings will increase the demand for goods and services, increasing (lowering) employment (unemployment). This prediction of the minimum wage lowering unemployment is consistent with Card (1992), Katz and Krueger (1992), and Card and Krueger (1995), who used data on the change in the relative minimum wage in two neighboring states (New Jersey and Pennsylvania), to argue that a monopsonist firm hiring in the low-skill fast-food labor market and already repressing wages, may respond to the higher minimum wage by raising (lowering) employment (unemployment).

The view that regulations such as the minimum wage can have a direct unemployment-reducing effect is in stark contrast to the unemployment-increasing effect predicted by the political-economy perspective. In this view, regulation is an outcome designed to serve some politically influential group (s) at the expense of others (Buchanan & Tullock, 1962; Stigler, 1971)). This view allows unemployment and its persistence over time to be explained by focusing on the role of SIGs on both the demand and supply sides of the labor market (Olson (1982) and Heise (2008)). In this role, SIGs (e.g., trade unions and employer's organizations) achieve their narrow interest through various channels that restrict other participants' economic freedom in this market, thereby harming labor market performance, such as raising unemployment. To illustrate this assertion, consider our primary measure of regulation based on the minimum wage and two alternative measures used later to test the robustness of our empirical results based on government intervention in the employment sector and labor unions. Regarding the first of these, if we measure an area's minimum wage as the minimum-wage worker's annual full-time income as a percentage of per-capita income and assume that this income proxies for the average productivity in the area, then the minimum wage would capture differences in the ability to pay wages across areas (Stansel, Torra, and McMahon 2017, p.12). Thus, rising minimum wage relative to productivity restricts low-skilled workers, new entrants, and employers to mutually beneficial employment transactions. This result amounts to limiting these workers' and employers' economic freedom, with a pronounced negative impact on labor market performance such as raising unemployment (Stansel, Torra, and McMahon 2017, p.12).

A similar outcome could result if government intervention is measured as the proportion of government employees of total area employment (GOVEMP). Specifically, when government employment exceeds the level necessary for the government's productive and protective functions (the overproduction of public goods), economic freedom is reduced, with negative consequences for labor market performance, including restrictions on the ability of workers and employers to contract freely for labor services (Stansel, Torra, and McMahon (2017))<sup>3</sup>. Finally, this outcome is also true in the case of regulation based on labor unions. Over the years, these unions have successfully used rent-seeking activities such as lobbying to affect labor laws in their favor by limiting workers' and employers' freedom to bargain for themselves concerning their employment and hiring (Holcombe and Gwartney (2010)). As a result, workers must join unions when they would rather not and be subjected to undemocratic means such as union certification without a vote by secret ballot (Stansel, Torra, and McMahon (2017)). Thus, these examples based on the political-economy view predict that regulations such as the minimum wage has a positive *ceteris paribus* effect on unemployment.

The political-economy perspective also predicts that SIGs' influence *per se* will have a direct positive impact on unemployment. The intuition behind this prediction derives from, for example, Olson's (1965 and 1982) views on the nature of SIGs and how they are formed. He argued that the formation of SIGs and the intensity of their activities increase over time in the absence of significant institutional, legal, and other changes, an environment in which only the small and relatively homogeneous groups with lower marginal costs of organization and political participation and the ability to overcome the within-group free-rider problem would win as they pursue their narrow interest at the expense of others through rent-seeking activities. In this setting, unemployment and its persistence over time may be viewed as an outcome attributable to the activities of certain interest groups. Two most likely culprits again are unions and

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<sup>3</sup> According to Viner (1932), GOVEMP only causes pecuniary externality, which the market resolves with relative price changes. However, Greenwald and Stiglitz (1986) and others have recently argued that Viner's proposition rested crucially on the assumption that the markets have complete information; thus, if this possibility holds, then GOVEMP is culpable of market distortion and restriction of economic freedom and, hence, unemployment-increasing.

business groups that have historically been at the forefront of the lobbying effort for minimum wage legislation, which they have used in their favor (see, for example, Rustici (1985)). For example, unions could support minimum wage legislation that would increase the wage rate of lower-skilled workers, who could substitute for union workers, thereby increasing the demand for union workers and their wage rates, causing unemployment to rise. Also, certain business groups may have the same motives for supporting minimum wage legislation as unions. Specifically, the self-interest of these groups "... that pay above the minimum wage dictates that they try to eliminate lower-cost rivals that pay below the minimum by forcing them to pay higher wage rates" (Rustici (1985, p. 120)). These examples indicate that SIGs' influence positively affects unemployment, *ceteris paribus*.

We turn to the possible interactive or combined effect of labor market regulation (minimum wage) and SIGs' influence on labor market performance (unemployment). At a broader level, the causes and effects of the interactions between SIGs and policymakers (e.g., regulators, lawmakers, and the legislature), have received much theoretical attention (for a landmark contribution, see Grossman and Helpman (2001)). Typically, these studies tend to frame the issues as a strategic game or interaction process in which the two groups pursue their narrow interest. For example, on the one hand, are the SIGs who use their knowledge of the issues, campaign contributions, and other means as a tool to secure access to policymakers, help their preferred candidates get elected, and influence policy decisions in their favor; and on the other hand are the policy makers who use public resources and various policy instruments to maximize their chances of winning reelections and having majority control of the state legislature (Grossman and Helpman (2001)). However, there is little specific theoretical guidance on the outcome of the strategic interactions for our special case involving unemployment, SIGs' influence, and the minimum wage<sup>4</sup>. Thus, ultimately, we rely on empirics for some insights.

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<sup>4</sup> For a recent theoretical and empirical study involving the interactions between SIGs and lawmakers in the U.S. state government spending, see Holyoke and Cummings (2019)).



Through the interaction effect, SIGs' influence may at least partially determine the relationship between unemployment and the minimum wage by perhaps strengthening or weakening the relationship. The first possibility may occur as follows. Assume an interactive and mutually beneficial relationship exists between SIGs and lawmakers/regulators, and that SIGs are distributional coalitions aimed at increasing the welfare of their members, irrespective of the effects on others (Olson (1982)), and their rent-seeking activities invariably harm economic outcomes, including labor market performance. In the context of the interest group system of power, as defined at the outset of this paper and further discussed below, SIGs in states where they are well-organized and dominant, akin to capture theory (Stigler (1971)), might use their power to capture at least part of the regulatory policy process by providing financial and other resources to political parties and candidates through lobbying and campaign contributions and, thus, can work closely with the state lawmakers/regulators to craft and implement policies (e.g., minimum wage legislation) and state lobbying laws in line with their vested interests and, ultimately, increasing unemployment. One implication of this outcome is that lawmakers/regulators in SIGs-dominant states might have a higher propensity to adopt regulatory policies and programs favorable to SIGs, thus, harming labor market performance. This implication suggests that states, where SIGs have a greater influence on the political process might have higher unemployment, all else equal.<sup>5</sup> In other words, the impact of regulation on unemployment depends on the level of interest group influence, with the interaction between the two groups strengthening the unemployment-increasing impact of regulation (unemployment-strengthening hypothesis (USH)).

Although the USH is intuitive and seems credible, it is important to heed the warnings of Ozer-Balli and Sorensen (2010) and others that an estimated interaction term may spuriously capture other features of the data and, thus, making it difficult for the researcher to establish what exactly the interaction term may imply. Since our model includes several interaction terms involving the regulation variable and the different types or categories of SIGs' influence, it is not immune from this criticism. Thus, we offer an additional USH-related scenario that our interaction terms may very well capture. Specifically, consider the case

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<sup>5</sup> This hypothesis is akin to the finding of Shughart II, Tollison, and Yan (2003) that income inequality (an important result of unemployment) is higher in states where the strength of SIGs' influence on the policymaking process is dominant.

where different kinds or categories of interest groups have different effects; that is, all groups are not created equally (e.g., there are narrow groups and encompassing groups similar to Olson (1982)). If, as one would expect, the narrow groups diminish efficiency as they seek special favors while encompassing groups enhance efficiency, then the interaction terms suggest that at low levels of interest group influence, the impact of regulation on unemployment could be positive. However, at high levels, it could be negative or vice-versa. Thus, in practice, SIGs' influence may strengthen or weaken the relationship between unemployment and the minimum wage, depending on the level of such influence.

With the above discussion as a backdrop, we derive four testable hypotheses relating to how the independent and combined or interactive effect of the regulation (the minimum wage) and SIGs' influence might affect state labor market performance (unemployment):

*Hypothesis 1 (H1A): The efficiency view: the minimum wage has a marginal unemployment-reducing effect.*

*(H1B): The political-economy view: The minimum wage has a marginal unemployment-increasing effect.*

*Hypothesis 2 (H2): The influence of SIGs on the political process has a marginal unemployment-increasing effect.*

*Hypothesis 3 (H3): The marginal unemployment-increasing effect of SIGs' influence is greater in states where their strength in the political process is dominant.*

*Hypothesis 4 (H4): The marginal unemployment effect of the minimum wage might be strengthened or weakened in states where the strength of SIGs' influence on the political process is dominant.*

## **4. Data, model, and estimation method**

### **4.1 Data**

This study uses data from 2006 to 2015 for the 50 U.S. states resulting in an initial panel dataset of five hundred observations<sup>6</sup>. Our dependent variable is the annual state-level unemployment rate ( UNRATE) (the unemployed as a percentage of the labor force) taken from the U.S. Bureau of Labor Statistics.

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<sup>6</sup> The period selected (2006-2015) was due in part to the availability of updated data on our measures of SIGs' influence.

Our main explanatory variables are the state SIGs' influence types or categories and several alternative state and local labor market regulation indicators. The data measuring SIGs' influence in U.S. states are due to the collaborative work of Clive Thomas and Ronald Hrebenar going back several decades. For this paper, we use the 2006-2007 updated version of the data found in Nownes, Thomas, and Hrebenar (2008) (henceforth NTH). These data, as already noted, are detailed in their coverage of SIGs characteristics, and seem more direct, meaningful, and empirically useful than alternative measures of such influence (Shughart II, Tollison, and Yan, 2003; Young, 2004)<sup>7</sup>. The NTH data collection is based on a well-established survey methodology and involves some political practitioners and scientists in each state. NTH classifies these data into five categories reflecting the relative strength of SIGs on the state political process. Specifically, a set of five binary dummies represent these categories:

- (i) "Dominant" groups (SIGD5): these groups "...as a whole are the overwhelming and consistent influence on policymaking."<sup>8</sup>
- (ii) "Dominant/complementary" groups (SIGD4): these groups alternate or move between the two situations: dominant and complementary.<sup>9</sup>
- (iii) "Complementary" groups (SIGD3): these groups work in conjunction with or are limited by other forces (e.g., political parties, legislature, the governor, and bureaucracy) in the political process.<sup>10</sup>
- (iv) "Complementary/subordinate" groups (SIGD2): these groups alternate or move between the two situations of complementary and subordinate.<sup>11</sup>
- (v) "Subordinate" groups (SIGD1): these groups are consistently subservient to other forces of the political process.<sup>12</sup>

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<sup>7</sup> For a fuller discussion of the categories of SIGs' influence, see, for example, Nownes, Thomas, and Hrebenar (2008) (NTH). Although the NTH data on such influence is quite useful and improve previous data, they also have drawn some criticism. For example, single individuals in each state decided on SIGs influence, and that needs to be more information on the criteria these individuals used in assessing such influence (Ness, Tanberg, and McLendon 2015).

<sup>8</sup> The dominant group includes Alabama, Florida, Hawaii, and Nevada

<sup>9</sup> The dominant/complementary is the largest group and includes Alaska, Arizona, Arkansas, California, Delaware, Georgia, Idaho, Illinois, Iowa, Kansas, Louisiana, Maryland, Mississippi, Missouri, Nebraska, New Mexico, Ohio, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Virginia, West Virginia, and Wyoming.

<sup>10</sup> The complementary group includes Colorado, Connecticut, Indiana, Maine, Massachusetts, Montana, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Pennsylvania, Rhode Island, Washington, and Wisconsin.

<sup>11</sup> The complementary/subordinate group includes Kentucky, Michigan, Minnesota, South Dakota, and Vermont.

<sup>12</sup> None of the states fall under this category.

The above NTH classification suggests that the direction of influence between SIGs and political and other actors can be unilateral, bilateral, or both.

The data for our three measures (indexes) of labor-market regulation at the subnational (state and local) level are from the thirteenth edition of the Fraser Institute's annual report on the *Economic Freedom of North America (EFNA) project* (Stansel, Torra, and McMahon 2017).<sup>13</sup> These indexes are constructed on a scale of zero to 10, with relatively low values indicating relatively very low levels of economic freedom (i.e., relatively high levels of regulation) and relatively higher values indicating greater economic freedom (i.e., relatively lower levels of regulation). The indexes are based on certain mechanisms through which labor market regulation may affect labor market freedom and, hence, labor market performance. They include our main measure of regulation (the minimum wage), and two alternative measures, labor market institutions (unions), and government intervention in the employment sector used later to test the robustness of our initial results<sup>14</sup>. The first index, MINWAGE, found in Area 3Ai of the EFNA database, is defined as the annual full-time income of the minimum-wage worker as a percentage of per-capita income. As explained earlier, this measure is intended to capture the average productivity in the area and the differences in the ability to pay wages across areas (Stansel, Torra, and McMahon (2017)). For ease of interpretation of our empirical results, MINWAGE and the other regulation indexes were inverted so that higher values on the scale for the index are associated with more government regulation.

The second component of sub-national labor market regulation, GOVEMP, found in Area 3Aii of the EFNA database, is measured as state government employment as a percentage of total state employment. It is intended to capture what happens when government employment exceeds the level

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<sup>13</sup> This widely used database employs third-party data from sources such as the U.S. Census Bureau, Statistics Canada, and Instituto Nacional de Estadística Geografía to construct several indexes (measures) of the extent to which governments restrict economic freedom (free-market activity) across all 50 U.S. states, the Canadian provinces, and the Mexican states.

<sup>14</sup> Despite the wide use of these indexes of regulation, they have recently drawn some criticism. Specifically, Murphy (2020) has pointed out that the government employment index is more a measure of the size of the government and tenuously related to the concept of labor market regulation. Also, some authors (Kleiner and Kreuger (2013) and Soltas (2014) have noted that the decline of private unions has been accompanied by the rise in occupational licensure in the U.S. states; thus, a measure of labor market regulation should include both factors rather than only the former. Unfortunately, data accounting for the criticism are not available for our period under study.

necessary for the government's productive and protective functions; that is, labor-market freedom is reduced as in the restriction of the ability of individuals and organizations to contract freely for labor services (Stansel, Torra, and McMahon (2017)).

The third index of the sub-national labor market regulation, UNION, found in Area 3Aii of the EFNA database, measures union density, and it is intended to capture the role of unions in limiting workers' and employers' freedom to bargain for themselves concerning their employment and hiring (Holcombe and Gwartney (2010) and Stansel, Torra, and McMahon (2017

To better assess the unemployment effects of regulation and SIGs' influence, we control for the variables often used to explain area unemployment and related differentials (Holzer, 1991; Partridge & Rickman, 1995; McGranahan, 1999; Shughart II, Tollison, and Yan 2003; Elhorst, 2003; Garrett & Rhine, 2011; Heller & Stephensen, 2014; Bennett, 2016). These include educational attainment, measured as the percent of state population over 25 years with a college degree (EDU), and are from the U.S. Census Bureau; structure and composition of industry, measured as the state nonfarm employment share of manufacturing (MANUSHR) and the state nonfarm employment share of retail and wholesale trade (RWTRADESHR), both taken from the U.S. Bureau of Labor Statistics; the density of Population (POPDEN), defined in terms of per square mile area, to reflect the existence of agglomeration economies, the time and effort needed to gather necessary information about job opportunities, as well as the extent to which interest groups flourish because the cost of organizing collective action is lower as they can more easily identify potential members and more effectively monitor their group participation; geographic mobility of firms and individuals, proxied by area amenities (AMENITY) (e.g., landscape, weather, historical sites, and amusement parks) and dis-amenities (CRIME) (e.g., robbery and violent crime rates), taken from Peters and Johnson (2000) and the U.S. Department of Justice, FBI, respectively<sup>15</sup>; and the percent of the state's black population (BLACKPOP). Although researchers commonly use these control

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<sup>15</sup> Peters and Johnson (2000) reported the Amenity scale for only the 48 contiguous U.S. states. So, for our regressions, we assign Alaska the North Dakota score, the second coldest state in the U.S. behind Alaska. In addition, we assign Hawaii the score for the state of California. However, excluding the states of Alaska and Hawaii did not cause any meaningful changes in our results.

variables, it is not easy to place sign expectations on them (Elhorst, 2003). Thus, we let the data determine the specific roles of the control variables in affecting unemployment.

## 4.2 The model

Given our interest in testing the hypotheses relating to the independent and combined effects of labor market regulation (minimum wage) and SIGs' influence on labor market performance (unemployment), we proposed and estimated a multiplicative interaction model ( e.g., Braumoeller (2004) and Brambor, Clark, and Golder (2006)), specified as follows<sup>16</sup>:

$$\begin{aligned} \ln UNRATE_{it} = & \alpha_0 + \alpha_1 \ln UNRATE_{it-1} + \alpha_2 MINWAGE_{it-1} + \alpha_3 SIGD5 + \alpha_4 SIGD4 + \alpha_5 SIGD3 + \\ & \alpha_6 (MINWAGE_{it-1} \times SIGD5) + \alpha_7 (MINWAGE_{it-1} \times SIGD4) + \\ & \alpha_8 (MINWAGE_{it-1} \times SIGD3) + \theta X'_{it-1} + v_t + n_i + \varepsilon_i \end{aligned} \quad (1)$$

where  $i$  and  $t$  represent U.S. states and time, respectively, and all variables are as previously defined. The dependent variable is the natural log of the unemployment rate; we lag the regulation variable one year ( $MINWAGE_{it-1}$ ) as it takes time to initiate, craft, and implement regulation<sup>17</sup>.  $X'_{it-1}$  is a vector of the already discussed control variables lagged one year to help minimize endogeneity concerns;  $v_t$  and  $n_i$  represent a set of time and state fixed effects that allow us to control for common shocks or business cycle effects across the states, and time-invariant characteristics specific to each state, respectively.  $\varepsilon_{it}$  is the stochastic error term. Also, we include the lagged dependent variable ( $\ln UNRATE_{it-1}$ ) to capture the time persistence of unemployment, allowing for annual partial adjustment towards the steady-state equilibrium<sup>18</sup>.

We recognize that with the presence of interaction terms in our model, it is not appropriate, except in quite unusual situations (one of the interactive variables equals zero) to interpret the coefficient of the variable of interest (e.g.,  $MINWAGE$ ) as its unconditional marginal effect on our dependent variable

<sup>16</sup> As outlined in the cited studies, we follow the best practice guidelines for using multiplicative interaction models.

<sup>17</sup> The minimum wage variable is replaced later by two alternative measures of regulation when we test the robustness of the empirical results. Also, note that  $SIGD2$  is our excluded or referenced group.

<sup>18</sup> We note that the inclusion of the lagged dependent variable has implications for the interpretation of the independent variables' coefficient estimates. Specifically, these estimates depict short-run effects. However, we can determine the long-run effects by dividing each of the coefficients by one minus the coefficient of the lagged dependent variable (e.g., Baltagi, Demetriades, and Law (2009)).

because its true marginal effect is also a function of various levels of the moderating variable (e.g., SIGs influence type) (Braumoeller (2004), Brambor et al. (2006), and Kingsley et al. (2017)). Accordingly, we rely on the conditional marginal effects of our variables of interest in testing our hypotheses. For the minimum wage variable, we calculate its marginal effect by taking the partial derivatives of unemployment for MINWAGE for equation (1):

$$\frac{\partial UNRATE_{it}}{\partial MINWAGE_{it-1}} = \alpha_2 + \alpha_6 SIGD5 + \alpha_7 SIGD4 + \alpha_8 SIGD3 \quad (2)$$

Our first hypothesis states that the minimum wage has a marginal unemployment-reducing effect (**H1A**) (the efficiency view) or a marginal unemployment-increasing effect (**H1B**) (the political-economy view). This prediction is true if the partial derivative in equation (2) is negative (**H1A**) or positive (**H1B**) and statistically significant<sup>19</sup>.

The second hypothesis, H2, maintains that each of the SIGs' influence types on the political process has a marginal unemployment-increasing effect. This hypothesis is satisfied if the partial derivatives of unemployment for SIGD5, SIGD4, and SIGD3 from equation (1) are positive and statistically significant. Thus, for SIGD5, SIGD4, and SIGD3, respectively, we have:

$$\alpha_3 + \alpha_6 MINWAGE_{it-1} > 0; \alpha_4 + \alpha_7 MINWAGE_{it-1} > 0; \text{ and } \alpha_5 + \alpha_8 MINWAGE_{it-1} > 0. \quad (3)$$

The third hypothesis, **H3**, states that the marginal unemployment-increasing effect of the SIGs influence types may be greater in states where their strength in the political process is dominant. This hypothesis is satisfied if the partial derivatives of SIGD5, SIGD4, and SIGD3 from equations (1) are greater in descending order. Thus, for SIGD5, SIGD4, and SIGD3, respectively, we have:

$$\alpha_3 + \alpha_6 MINWAGE_{it-1} > \alpha_4 + \alpha_7 MINWAGE_{it-1} > \alpha_5 + \alpha_8 MINWAGE_{it-1}$$

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<sup>19</sup> It is important to provide the test of statistical significance for the conditional marginal effects for at least two reasons. First, the coefficients of our variables of interest may be statistically insignificant and yet combine to yield statistically significant conditional effects. Second, since our focus is on the coefficient of the variable of interest and that of the interactive term, it is important to account for the covariance between them to correctly calculate the standard error of the marginal effect (Brambor et al. (2006)). Accordingly, we implement the test based on standard errors estimated using the delta method (e.g., Kam and Franzese (2005) and Brambor et al. (2006)).

The fourth hypothesis maintains that the increasing dominance of SIGs' influence on the political process might be strengthened or weaken the unemployment-increasing effect of SIGs. Here we are interested in the relative magnitude of the coefficients of the interaction terms. Thus, for example, the unemployment-increasing effect of regulation is strengthened if  $\alpha_6 > \alpha_7 > \alpha_8$ ; and weakened if  $(\alpha_6 < \alpha_7 < \alpha_8 < 0)$ .

### 4.3. Estimation method

A major challenge in the estimation of our model (equation (1)) is dealing with potential endogeneity problems related to omitted-variable bias, reverse causality (simultaneity bias) and the presence of unobserved fixed effects, and the dynamic panel bias (Nickell (1981))<sup>20</sup>. The customary way empirical studies of this nature address these potential problems is by using fixed effects, instrumental variables, or Generalized Method of Moments estimators (Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998)). However, these methods may not adequately and simultaneously address statistical problems due to certain model features. For example, using mean- or first differencing required by some of these estimators to remove the state-specific effects would also remove our SIGs' influence time-constant regressors of interest while also biasing the results in the dynamic panel data setting (Nickell (1981)). The Hausman and Taylor (1981) model can address our endogeneity concerns and the time-constant regressors issue; however, it cannot accommodate the dynamic aspects of our model. Recently, however, Kripfganz and Schwarz (2019) (K&S) proposed a generalized method of moments sequential linear panel dynamic model (GMMSLPDM) based on a two-stage estimation method that can consistently identify the effects of time-constant regressors in the presence of unobserved unit-specific

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<sup>20</sup> For example, regulation (minimum wage) is expected to impact labor market performance (unemployment); however, the reverse is also possible. Ideally, one would use an appropriate external exogenous instrument to control for the endogeneity of the time-varying minimum wage. The same would apply to time-constant variables where one would need some exogenous time-varying variables or others that are not included in the model. However, it is not easy to obtain such instruments. For instance, in their landmark study on the employment effects of the minimum wage across the U.S. states, Neumark and Wascher (1992) attempted such an instrument for state minimum wage levels; however, it performed poorly as their coefficient estimates were not statistically different from those of studies that ignored endogeneity. This outcome prompted these authors to ignore the endogeneity of the minimum wage in the rest of their study. In this study, our first attempt to mitigate the endogeneity issue is, as already stated, by lagging the explanatory variables to one lag so that they are not likely to have a contemporaneous effect on unemployment.



effects within a dynamic version of the Hausman and Taylor (1981) model, and uses internal instruments obtained from the dataset. Thus, the K&S method is well suited for this study.<sup>21</sup> We apply this method based on a two-step difference-GMM estimator with collapsed GMM-type instruments in both stages (Roodman (2009)), using the K&S Stata command, XTREQREG. In the first stage, we only run a regression of our dependent variable on the time-varying regressors. We consider these regressors endogenous in the first stage since the time-invariant regressors are part of the state-specific effects. In the second stage, we regress the first-stage residuals on the time-constant regressors, identifying the coefficients of the latter. The instrument lag for the endogenous variables is set at one lag. Since the usual standard errors are invalid in the second stage, potentially leading to incorrect inference, we corrected these errors using the XTREQREG, which provides the Windmeijer-corrected robust standard errors. Finally, to verify that our instruments are exogenous and assess the validity of the estimates with the GMM system, we use the XTREQREG post-estimation commands to perform the Hansen's J-tests of overidentifying restrictions and the Arellano-Bond autocorrelation (AR2) tests, respectively (Hansen (1982), Arellano and Bond (1991) and Roodman (2009))<sup>22</sup>. The null of the Hansen-J tests is that the instruments as a group are exogenous and that for the AR2 test is that there is no second-order serial correlation. For reliable and stable results, the null hypothesis of both tests should not be rejected.

#### **4. Empirical Results:**

Table 1 shows the summary statistics and correlation matrix for our U.S. states' panel data over the 2006 to 2015 period. Behind these data were wide variations across the states of our variables of utmost interest (unemployment, regulations, and SIGs' influence), making them well-suited for this study. For example, in the Great Recession in 2009, the highest unemployment rate (13.7% in Michigan) exceeded the lowest rate (3.1% in Wyoming) by almost four and a half, with an average value of 8.5%. In 2015, the

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<sup>21</sup> For a detailed discussion of the GMMSLPDM, including its other advantages over other methods, see Kripfganz and Schwarz (2019).

<sup>22</sup> As Roodman (2009) points out, the credibility of Hansen's J tests cannot be relied upon if there are too many instruments relative to the number of observations; thus, we follow his collapsed GMM-type instruments approach and his recommendation that the number of instruments be fewer than the number of units under study.

last year for the period of this study, the variation had narrowed but was still significant as the highest unemployment rate (6.8% for Nevada) exceeded the lowest (2.8% for North Dakota) by almost two and a half, with an average of 5%. Accompanying these variations were large differences in state and local level labor market regulations. The regulation indexes, as previously described, are constructed on a scale of zero to 10 with higher values associated with stricter state and local government regulations (Stansel, Torra, and McMahon, 2017). These indexes show that for 2015, for example, the level of regulation based on the minimum wage, the relative size of government employment, and union density varied from 6.71, 1.86, and 3.67 (West Virginia, Wyoming, and New York, respectively) to 9.60, 10, and 9.71 (Connecticut, Nevada, and Mississippi, respectively). The state averages were at 8.2, 6.9, and 7, respectively.

Along with the variations in state unemployment and regulation levels, were also variations in the scope and power of interest group activity across the states (Ness et al. (2015)). For example, during the period under study (2006 to 2015), SIGs' influence based on the average raw counts of these groups (absolute power) ranged from New York with 3,291 to Wyoming with 250, with an average across the states of 1029. Also, these counts as a percentage of state RGDP (relative power) and state civilian population (relative power), varied from 0.39 in Wyoming and 0.01 in states such as Tennessee, Indiana, and California, respectively, to 8.22 and 0.08 in Florida and Vermont, respectively, with the averages across the states at 2.2 and 0.03, respectively<sup>23</sup>. Furthermore, SIGs' influence (group system power) based on several categories reflecting the relative strength of SIGs on the political process discussed earlier also shows wide variation across the states in the 2006 – 2015 period. This variation ranged from states where SIGs have a dominant role in political policymaking (Alabama, Florida, Hawaii, and Nevada) to states where SIGs play a complementary/subordinate role by working in conjunction with or limited by other forces such as political parties, legislature, the governor, and the bureaucracy (e.g., Kentucky, Michigan, Minnesota, and Vermont).

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<sup>23</sup> The data for the raw count of SIGs are from Holyoke (2019).

Table 2 shows the regression results using the two-stage (two-step GMM) method of Kripfganz and Schwartz (2019). Column 1 of the table reports the results based on our main measure of labor market regulation, the minimum wage (MINWAGE), while columns 2 and 3, report the results based on two alternative measures of such regulation (GOVEMP and UNION), highlighted later as part of our robustness test of the empirical results in column 1. Each of the three regressions considers the given regulation measure, the SIGs' influence types or categories, and the interaction between these two sets of variables while accounting for the controls and time dummies. The diagnostics for each regression are satisfactory and shown at the bottom of Table 2. For example, for the MINWAGE regression, the Arellano-Bond test for autocorrelation (AR1) rejects a null hypothesis of no correlation (p-value = 0.001), but the p-value (0.523) for the test of AR(2) indicates no serial correlation. Also, the two Hansen J-test statistics reported for the MINWAGE regression do not reject the null hypothesis of joint validity of the overidentifying restrictions in each case. These results are similar to those for our alternative regulation measures, as shown at the bottom of Table 2. These results suggest that our model estimation involving all three regulation measures provides reliable and stable results.

Recall that we capture the impact of previous unemployment and the underlying dynamics of our model by including the lagged dependent variable ( $\ln UNRATE_{it-1}$ ). This variable enters the regressions in Table 2 with a relatively high positive and statistically significant coefficient indicating strong unemployment persistence.

Since the control variables are not of primary interest herein, and to save space, their estimated results are not included in the tables but are available upon request. However, we do provide a brief descriptive summary of their results. As noted earlier, placing sign expectations on these variables is not easy. As it turns out, the coefficients of these variables are not consistently significant across our three regressions. However, in cases when they are significant, POPDEN, MANUSHR, RWTRADESHR and CRIME tend to have a positive sign.

We now turn to our results of primary interest, focusing first on the results of our main measure of the regulation (MINWAGE) shown in column 1 of Table 2. As discussed earlier, rather than use the

customary way of determining the main effect of a variable of interest based solely on its estimated coefficient, we adopt instead the theoretically preferred and more accurate conditional marginal effects approach, which considers the estimated coefficient as well as the variation in the levels of the moderating variable in determining the main effect of the variable of interest. Thus, for example, we calculated the marginal unemployment effect of the SIGs' influence variables (SIGD5, SIGD4, and SIGD3) in the presence of MINWAGE using the related estimated parameters from equation (1) shown in column (1) of Table 2, as:

$8.25 - [0.397 \times \text{MINWAGE}_{it-1}]$ ,  $4.35 - [0.133 \times \text{MINWAGE}_{it-1}]$ , and  $-0.018 + [0.095 \times \text{MINWAGE}_{it-1}]$ , respectively. Given that these marginal effects vary with the level of MINWAGE, we assess this variation by evaluating each of these conditional marginal effects at the mean, minimum, and maximum levels of MINWAGE. In the case where the independent variable of interest is the regulation variable (e.g., MINWAGE) in the presence of the moderating dummy SIGs' influence variables, we calculate the conditional marginal effects when the SIGs' influence is absent (dummies set equal to zero) or present (dummies set equal to one).

Using the above methods, we calculated the conditional marginal effects (CMEs) on state unemployment for MINWAGE, and the results are reported in Part A of Table 3. As seen from this table, when the CME of MINWAGE is evaluated in the absence of the SIGs' influence variables, that is, each SIGs variable set equal to zero, the CME is positive and highly statistically significant (0.402). These results are consistent with the political-economy view and other strands of literature that have consistently reported that stricter labor market regulations due to the minimum wage may discourage job creation and adversely affect labor market flexibility by raising the unemployment rate in various countries (e.g., Nickel (1997 and 1998), Nunziata (2002), and Bernal-Verdugo et al. (2012)), and also for the US states (e.g., Garrett and Rhine (2011), Heller and Stephensen (2013), and Bennett (2016)). However, it is quite a different outcome when we account for the role of the strength of SIGs' influence on the political process. Specifically, we see in Part A of Table 3 that the CME of MINWAGE changes sign and is statistically insignificant (-0.033) compared to its positive and statistically significant effect in the absence of SIGs' influence. This finding

suggests that the answers to the important question of whether stricter labor market regulations due to the minimum wage contribute to higher or lower unemployment depend in part on whether the strength of SIGs' influence in the political process is incorporated in the empirical analysis. In other words, as previous studies have done, the omission of such influence in the analysis may lead to misspecification problems serious enough to influence our conclusion about the true nature of the relationship between the minimum wage and labor market performance (unemployment).

Still focusing on MINWAGE, we see from Part B of Table 3 the results used for assessing the validity of Hypothesis 2 (**H2**), which maintains that each of the SIGs influence variables (SIGD5, SIGD4, and SIGD3) has a marginal unemployment-increasing effect. As seen in columns 1, 2, and 3 of Part B of this table, there is strong support for **H2** when the influence variables (except SIGD3) interact with MINWAGE. More concretely, the CMEs for the SIGD5 and SIGD4 are positive and statistically significant at various levels (mean, minimum, maximum) of MINWAGE; however, these effects are strongest when the minimum wage is at its lowest and decline in magnitude when it is at its highest level. These results support the political-economy view that the influence of SIGs on the political process raises unemployment.

Hypothesis 3 (**H3**) predicts that the marginal unemployment-increasing effect of the SIGs may be larger in states where their strength on the political process is dominant. As explained earlier, this means that the CMEs of the SIGs influence variables will be greater than each other hierarchically, that is, in descending order. These CMEs, evaluated at the mean, minimum, and maximum levels of the minimum wage, are reported in Part C of Table 3. These results strongly support **H3** in the context of the minimum wage. Specifically, they suggest that states where SIGs' influence is dominant (SIGD5) have the highest unemployment-increasing effect, which in the case of MINWAGE is 7.5% higher than our reference complementary/subordinate states. Overall, the CMEs are greater than each other in descending order such that dominant (SIGD5), dominant/complementary (SIGD4), and complementary (SIGD3), have higher unemployment rates compared to our reference states where such influence is complementary/subordinate (SIGD2). Another aspect of this finding is revealed when we group the unemployment rates based on the different state SIGs' influence categories for the period under study (2006 – 2015). This grouping indicates

that the mean unemployment rates for SIGD5 (7.085%), SIGD4 (6.41%), and SIGD3 (6.34%) states were higher than the reference SIGD2 (6.092%) complementary/subordinate states. However, the empirical support for **H3** is hardly surprising if, as suggested earlier, SIGs in states where their influence is dominant are likely to play a more important role in initiating, crafting, and implementing government regulations to reflect their narrow interests, accomplished through various channels, including lobbying and political campaign contributions.

Finally, the fourth hypothesis maintains that the increasing dominance of SIGs' influence on the political process might strengthen or weaken the minimum wage's unemployment-increasing effect. As explained earlier, it is not the sign of the interaction terms but their relative magnitude that matters. Thus, for example, if  $\alpha_6 < \alpha_7 < \alpha_8$  (from equation (1)), then the effect of the minimum wage becomes weaker with the increasing dominance of the SIGs. Indeed, the results from Part D of Table 3 support this scenario as they show that in the case of the minimum wage,  $-0.397 < -0.133 < 0.095$ . It is not apparent why the unemployment effect of regulations such as the minimum wage becomes weaker with the increasing dominance of SIGs. It is possible though that this might reflect a case where SIGs are not created equally, that is, there are narrow groups and encompassing groups similar to Olson (1982). In this case, the narrow groups might diminish efficiency as they pursue their narrow interests through rent-seeking, while the encompassing groups, subject to, for example, the "radius of trust" emphasized in the social capital literature (e.g., Fukuyama (1999) and Heise (2008)) would enhance efficiency as their actions create a positive spillover effect into the larger society. Thus, if the radius of trust effect dominates, the SIGs' influence types may weaken the positive unemployment effect of regulation. This scenario is also reminiscent of Adam Smith's (1776) concept of the "invisible hand," according to which individuals and interest groups in a market economy pursuing their self-interests create beneficial social and economic outcomes unintentionally (the harmony of interests hypothesis).

#### **4.1 Sensitivity test**

The above findings are important; however, they may be sensitive to certain aspects of our model specification, such as defining key variables. Thus, we perform further tests to check their robustness.

Specifically, we replaced our main measure of labor market regulation (the minimum wage) in equation (1) with two alternative measures of such regulation discussed earlier, namely, government intervention as measured by the proportion of government employees of total area employment (GOVEMP), and the role of labor unions (UNION) as measured by union density. The estimation method, control variables and all other aspects of our initial model remain the same. As indicated before, the results obtained for GOVEMP and UNION are reported in columns 2 and 3 of Table 2. Like in the case of the MINWAGE regression, the diagnostics for the GOVEMP and UNION regressions are satisfactory both in terms of the Hansen J-tests and the AR1 and AR2 tests (the bottom of Table 2). Also, the lagged dependent variables in these regressions are positive and statistically significant, affirming the persistence of unemployment across the states reported in our initial estimation results.

We used the methods described earlier along with related estimated coefficients from Table 2 to calculate the conditional marginal effects and then compare how the regressions containing the two alternative measures of regulation perform in terms of the predictions of our hypotheses vis a vis the initial minimum wage regression. The detailed results are reported in Tables 4 and 5, which also show the results based on the initial MINWAGE regression for convenience; however, we provide only a summary discussion. First, our initial finding for **H1** based on the minimum wage is that such wage has a positive and statistically significant (0.402) effect on unemployment in the absence of SIGs but a negative (-0.033) though insignificant effect when they are present. We found very similar results (Part A of Table 4) when regulation is based on GOVEMP; however, when UNION is employed, we found a positive and statistically significant (0.181) effect on unemployment in the absence of SIGs, as well as for when SIGs are present (0.631). Thus, the political-economy view that regulation raises unemployment receives strong support when UNION measures regulation.

Second, our initial finding for **H2** based on the minimum wage indicates that the SIGs' influence types have a statistically significant marginal unemployment-increasing effect that varies with the mean, minimum, and maximum levels of the minimum wage in the dominant (SIGD5) and dominant/complementary (SIGD4) states. From Part B of Table 4, we see that quite similar results are found

when the regulation variable is GOVEMP; however, the results based on UNION are mixed, with the unemployment effects of SIGs being positive and statistically significant at the mean and minimum levels of the union variable in complementary (SIGD3) states and the maximum level of dominant/complementary (SIGD4) states, but negative and statistically significant at the mean and minimum levels of dominant (SIGD5) states (Part B of Table 4).

Third, the results from the initial minimum wage regression support **H3** by indicating that the marginal unemployment-increasing effect of the SIGs may be larger in states where their strength on the political process is dominant at various (mean, minimum, and maximum) levels of the minimum wage (Part A of Table 5). These results are confirmed when regulation is measured as GOVEMP and at the mean and minimum levels of the minimum wage. However, with UNION proxying for regulation, the indication is that the unemployment-increasing effect of SIGs' influence is smaller in states where this influence is dominant.

Fourth, the results from the initial minimum wage regression, based on the relative size of the interactive term coefficients, suggest that the unemployment effect of the minimum wage is weakened by SIGs' influence ( $-0.397 < -0.133 < 0.095$ ) (Part B of Table 5). However, in the case of GOVEMP ( $-0.298 > -0.387 < -0.406$ ), and UNION ( $0.347 > 0.169 > 0.66$ ) the opposite result indicating that the effect of these regulations on unemployment is strengthened is suggested. In other words, each of the SIGs' variables and these regulation variables are more potent in raising unemployment when the other is present and rising. Thus, the GOVEMP and UNION measures of regulation results are more in line with the political economy view.

Finally, we also tested the robustness of our initial results based on the minimum wage by considering two additional state characteristics controls often used in the unemployment literature, namely, the percentage of the population that is young (between 16 and 24 years old) and elderly (65 years old and over), drawn from the US Census Bureau. However, these variables did not change any of the conclusions arrived at based on the initial minimum wage regression. A summary of the hypotheses test results is reported in Table 6.



## 5. Summary and Conclusions:

A longstanding and persistent theme in the political economy literature is that government regulatory policy is the main channel through which SIGs could influence economic performance in their favor (e.g., Adam Smith (1776), Stigler (1971), Olson (1982)). However, curiously, the sizeable empirical literature investigating the effects of regulations on economic performance has yet to incorporate the role of SIGs' influence in the political and regulatory process. Using data from the fifty US states over the 2006-2015 period, this paper explored how labor market regulations and the strength of SIGs' influence on the political process independently and interactively impact labor-market performance as measured by unemployment. It addresses the issue by estimating a dynamic panel data model using the sequential two-stage GMM estimating method (Kripfganz and Schwarz (2019)), which provides various advantages, including mitigating the endogeneity and other estimation issues and allowing direct parameter estimates for our time-constant measures of SIGs influence in a panel data context.

To summarize, when we considered the special case where SIGs' influence is absent by setting our measures of this influence to zero, we found that our measures of the regulation (MINWAGE, GOVEMP, UNION) each have a significant marginal unemployment-increasing effect, consistent with the strand of the literature reporting that stricter labor market regulations may discourage job creation and adversely affect labor market flexibility by raising the unemployment rate in various countries (e.g., Nickel (1997 and 1998), Nunziata (2002), and Bernal-Verdugo et al. (2012)), and also in the US states (e.g., Garrett and Rhine (2011), Heller and Stephensen (2013), and Bennett (2016)). However, in the more realistic case where SIGs' influence is present, MINWAGE and GOVEMP have a negative but no statistically significant effect on unemployment. However, when the role of SIGs is accounted for, only UNION shows that regulation significantly increases unemployment and, thus, more in line with the political-economy view ((Part A of Table 4).

Second, in line with the political-economy view (**H2**), the results indicate that in states where SIGs are dominant (SIGD5) and dominant/complementary (SIGD4), their influence has a statistically significant

marginal unemployment-increasing effect at various levels (mean, minimum, maximum) of the moderating regulation variable of MINWAGE and, alternatively, GOVEMP, with the effect being strongest when these two variables are at their lowest and decline in magnitude as the two variables increase (Part B, Table 4). However, SIGD5 and SIGD4 have a statistically significant unemployment-decreasing effect when the regulation variable is UNION and is at its mean and minimum levels. This finding of a marginal unemployment-decreasing effect of SIGs is consistent with the “radius of trust” concept and the harmony of interests hypothesis alluded to earlier.

Third, we found some strong support for **H3**, which predicts that the marginal unemployment-increasing effect of SIGs’ influence is larger in states where the strength of their influence on the political process is dominant (Part A of Table 5). This finding is consistent with the fact that the states where such influence is dominant (SIGD5), dominant/complementary (SIGD4), and complementary (SIGD3), had higher unemployment rates (7.08%, 6.41%, and 6.34%, respectively), compared to our reference SIGD2 (6.09%) states where such influence is complementary/subordinate.

Finally, we also tested **H4**, which maintains that the marginal unemployment effect of regulation may be strengthened (**H4A**) or weakened (**H4B**) by SIGs’ influence on the political process. There is strong support for **H4A** when the regulation variable is measured as GOVEMP or UNION, and supportive of the political-economy view. This finding suggests a complementary interdependency between regulation and SIGs’ influence. However, strong support for H4B was found when regulation was measured as MINWAGE.

Some obvious and important implications can be drawn from our results. First, our results indicate that the performance or unemployment impact of the labor market regulations depends strongly on the strength of SIGs’ influence. Thus, efforts to analyze the performance impact of such regulations without considering the importance of SIGs’ influence may lead to serious bias in the sign, size, and significance of the estimated marginal effects of interest and, thereby, cloud our understanding of the true nature of the relations between such performance and the regulations. Also, policymakers interested in job creation,

regulatory reforms, and economic growth must pay attention to the possible impact of SIGs in influencing the desired policy outcomes.

Further research is needed to test the robustness of the results of this study. For example, one may also control for a set of political variables, recognizing that those in power seek to influence unemployment in a certain way based on whether they have a right (conservative) (Republican) or left (liberal) (Democratic) ideology. Specifically, the right implements policies to control inflation and raise the unemployment rate, while the left pursues policies that lower the unemployment rate (Roubini & Sachs, 1989; McCracken & Baldwin, 2016). To account for this influence, one may use state-level political variables (dummies) for the presence of Democratic or Republican legislature and partisan divided legislature (McCracken and Baldwin (2016)).

### **Compliance with Ethical Standards**

**Ethics Approval:** This study used publicly available data, and no ethical approval was required.

**Conflict of Interest:** The authors declare no conflict of interest.

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**Table 1: Summary statistics and correlation matrix (Based on 2006 to 2015 data for the 50 states)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Mean	6.43	1.91	3.69	3.06	2.89	0.08	0.52	0.3	0.1	27.63	9.21	15.42	151.61	14.49	.005	0.61
Std. Dev.	2.2	0.86	1.7	1.47	0.6	0.27	0.5	0.46	0.3	4.81	3.55	1.13	205.4	12.6	.002	2.37
Minimum	2.6	0.01	0	0.16	1.34	0	0	0	0	16.5	2.23	12.53	0.74	0.54	.001	-3.56
Maximum	13.7	3.95	8.67	6.61	4.43	1	1	1	1	40.5	19.09	19.69	964.28	50.35	0.03	7.35

**Variables:**

(1) UNRATE	1.000															
(2) MINWAGE	0.517*	1.000														
(3) GOVEMP	-0.005	0.220*	1.000													
(4) UNION	0.173*	-0.184*	-0.543*	1.000												
(5) AVGREG	0.384*	0.536*	0.604*	0.215*	1.000											
(6) SIGD5	0.088*	0.095*	-0.209*	0.172*	-0.011	1.000										
(7) SIGD4	-0.009	0.183*	0.392*	-0.481*	0.066	-0.307*	1.000									
(8) SIGD3	-0.010	-0.298*	-0.258*	0.365*	-0.088*	-0.193*	-0.681*	1.000								
(9) SIGD2	-0.051	0.064	-0.070	0.087	0.036	-0.098*	-0.347*	-0.218*	1.000							
(10) EDU	-0.092*	-0.500*	-0.437*	0.425*	-0.305*	-0.153*	-0.291*	0.407*	0.001	1.000						
(11) MANUSHR	0.030	0.191*	-0.046	-0.066	-0.005	-0.269*	-0.028	0.040	0.230*	-0.279*	1.000					
(12) RWTRADESHR	-0.143*	0.052	-0.229*	-0.120*	-0.288*	-0.012	-0.172*	0.129*	0.099*	-0.048	0.245*	1.000				
(13) POPDEN	0.171*	-0.376*	-0.410*	0.426*	-0.219*	-0.050	-0.270*	0.413*	-0.136*	0.514*	-0.099*	-0.088*	1.000			
(14) POPBLACK	0.262*	0.037	0.028	-0.262*	-0.169*	0.076	0.230*	-0.188*	-0.164*	-0.150*	0.149*	-0.039	0.230*	1.000		
(15) CRIME	0.188*	0.013	-0.094*	0.045	-0.046	0.277*	0.217*	-0.264*	-0.209*	-0.206*	-0.151*	-0.191*	0.084	0.435*	1.000	
(16) AMENITY	0.114*	0.156*	-0.158*	0.083	-0.006	0.399*	-0.027	-0.025	-0.276*	0.149*	-0.446*	-0.089*	0.012	-0.192*	0.089*	1.000

\* Shows significance at the .05 level

UNRATE: The unemployed as a percentage of the labor force; MINWAGE: Subnational minimum wage legislation index; GOVEMP: Subnational government employment as a percentage of total employment index; UNION: Union density index; AVGREG: Overall subnational (state and local) labor market regulation index; SIGD5: Dominant interest groups (4 states); SIGD4: Dominant/complementary interest groups (26 states); SIGD3: Complementary interest groups (15 states); SIGD2: Complementary/subordinate (5 states); EDU: The percentage of population with a college degree; MANUSHR: Nonfarm employment share of manufacturing; RWTRADESHR: Nonfarm employment share of retail and wholesale trade; POPDEN: Population per square mile area; POPBLACK: Percent of the population that is black; CRIME: Sum of robbery and violent crimes per one hundred thousand people of population; AMENITY scale.

**Table 2:** Two-stage dynamic model GMM estimates of the effects of labor market regulations and interest groups' influence on US states' unemployment rate (2006-2015)

	Main Model	Robustness test	Robustness test
	(1)	(2)	(3)
	MINWAGE	GOVEMP	UNION
First-stage Method:	Dependent variable is log(UNRATE)		
UNRATE <sub>it-1</sub>	0.701*** (0.091)	0.459*** (0.108)	0.828*** (0.070)
MINWAGE <sub>it-1</sub>	0.402*** (0.044)		
SIGD5xMINWAGE <sub>it-1</sub>	-0.397*** (0.121)		
SIGD4xMINWAGE <sub>it-1</sub>	-0.133** (0.064)		
SIGD3xMINWAGE <sub>it-1</sub>	0.095 (0.105)		
GOVEMP <sub>it-1</sub>		0.684*** (0.050)	
SIGD5xGOVEMP <sub>it-1</sub>		-0.298** (0.139)	
SIGD4xGOVEMP <sub>it-1</sub>		-0.387*** (0.090)	
SIGD3xGOVEMP <sub>it-1</sub>		-0.406*** (0.118)	
UNION <sub>it-1</sub>			0.181*** (0.058)
SIGD5xUNION <sub>it-1</sub>			0.347*** (0.116)
SIGD4xUNION <sub>it-1</sub>			0.169** (0.069)
SIGD3xUNION <sub>it-1</sub>			-0.066 (0.081)
Second-stage Method:	Dependent variable is residual from the first stage		
_AMENITY	-0.821 (0.862)	-0.437 (0.512)	0.726 (0.458)
_SIGD5	8.250* (4.610)	6.093** (2.984)	-3.405 (2.532)
SIGD4	4.349** (1.871)	3.917** (1.615)	-0.739 (0.982)
SIGD3	-0.018 (1.561)	1.435 (1.376)	0.841 (1.023)
Number of states(id)	50	50	50
Number of instruments	45	45	41
AR(1)	0.001	0.003	0.003
AR(2)	0.523	0.397	0.615
Hansen test(1)	0.336	0.192	0.192
Hansen test(2)	0.341	0.331	0.600
Control variables	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes

Windmeijer-corrected robust standard errors are in parenthesis; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Table 3: Testing the hypotheses with labor market regulation measured as the minimum wage:**

Part A	1	2	3	
Hypothesis 1: Labor market regulation (minimum wage) has a marginal unemployment-increasing (political economy view) or decreasing (the efficiency view) effect	Evaluated in the absence of SIGs (SIGs dummies equal zero)	Evaluated in the presence of SIGs (SIGs dummies equal to one)		
Marginal effect of MINWAGE <sub>it-1</sub>	0.402*** ((0.044)	-0.033 (0.214)		
	Regular standard errors in parenthesis	Delta standard errors in parenthesis		
Part B	Marginal effect for:			
Hypothesis 2: Each of the SIGs' influence types has a marginal unemployment-increasing effect	SIGD5 Interacted with MINWAGE	SIGD4 Interacted with MINWAGE	SIGD3 Interacted with MINWAGE	
MINWAGE <sub>Mean</sub>	7.54*** (0.458)	4.10*** (0.022)	0.163 (0.738)	
MINWAGE <sub>Min</sub>	8.29*** (0.241)	4.30*** (0.404)	-0.002 (0.396)	
MINWAGE <sub>Max</sub>	6.73*** (0.738)	3.82*** (0.434)	0.357 (0.648)	
Part C	Evaluated at:			
Hypothesis 3: The marginal unemployment-increasing effect of SIGs' influence may be larger in states where their strength on the political process is dominant.	MINWAGE <sub>Mean</sub>	MINWAGE <sub>Minimum</sub>	MINWAGE <sub>Maximum</sub>	Support for hypothesis
$\alpha_3 + \alpha_6 MINWAGE_{it-1} > \alpha_4 + \alpha_7 MINWAGE_{it-1} > \alpha_5 + \alpha_8 MINWAGE_{it-1}$	7.54 > 4.1 > 0.163	8.29 > 4.30 > -0.002	6.7 > 3.8 > 0.36	YES
Part D				
Hypothesis 4A: the unemployment effect of regulation (minimum wage) is strengthened by SIGs' influence if $\alpha_6 > \alpha_7 > \alpha_8$ ; or Hypothesis 4B: weakened if $\alpha_6 < \alpha_7 < \alpha_8$		Hypothesis supported		
From estimates (Table 2), $\alpha_6 < \alpha_7 < \alpha_8$	-0.397 < -0.133 < 0.095	4B		

**Table 4:** Conditional marginal effects of the regulation variables: Evaluating hypotheses 1 and 2 based on the three alternative measures of regulation:

Part A	1	2	3
<b>Hypothesis 1:</b> Each of the labor market regulations has a marginal unemployment-increasing (private interest view) or decreasing (public interest view) effect	Evaluated at the SIGs dummies equal zero	Evaluated at the SIGs dummies equal to one	
Marginal effect of MINWAGE	0.402*** ((0.044)	-0.033 (0.214)	
Marginal effect of GOVEMP	0.684*** (0.050)	-0.0407 (0.404)	
Marginal effect of UNION	0.181*** (0.058)	0.631*** (0.312)	
	Regular standard errors in parenthesis	Delta standard errors in parenthesis	
<b>Part B</b>	Marginal effect for <sup>a</sup> :		
Hypothesis 2: Each of the SIGs' influence types has a marginal unemployment-increasing effect	SIGD5 interacted with MINWAGE	SIGD4 interacted with MINWAGE	SIGD3 interacted with MINWAGE
MINWAGE <sub>Mean</sub>	7.54*** (0.458)	4.10*** (0.022)	0.163 (0.738)
MINWAGE <sub>Min</sub>	8.29*** (0.241)	4.30*** (0.404)	-0.002 (0.396)
MINWAGE <sub>Max</sub>	6.73*** (0.738)	3.82*** (0.434)	0.357 (0.648)
	Marginal effect for:		
	SIGD5 interacted with GOVEMP	SIGD4 interacted with GOVEMP	SIGD3 interacted with GOVEMP
GOVEMP <sub>Mean</sub>	4.99*** (1.119)	2.49*** (0.621)	0.075 (0.723)
GOVEMP <sub>Min</sub>	6.093*** (0.219)	3.92*** (0.243)	1.44*** (0.138)
GOVEMP <sub>Max</sub>	3.51*** (1.439)	0.57 (1.077)	-1.768 (1.159)
	Marginal effect for:		
	SIGD5 interacted with UNION	SIGD4 interacted with UNION	SIGD3 interacted with UNION
UNION <sub>Mean</sub>	-2.33*** (0.665)	-0.220 (0.197)	0.636* (0.350)
UNION <sub>Min</sub>	-3.34*** (0.164)	-0.710*** (0.114)	0.830*** (0.079))
UNION <sub>Max</sub>	-1.11 (1.021)	0.320*** (0.440)	0.405 (0.581)

<sup>a</sup>Delta standard errors are in parenthesis; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

;

**Table 5:** Evaluating Hypotheses 3 and 4 based on the three alternative measures of regulation

PART A				
Hypothesis 3: The marginal unemployment-increasing effect of SIGs’ influence may be larger in states where their strength on the political process is dominant.	Evaluated at:			
	MINWAGE <sub>Mean</sub>	MINWAGE <sub>Minimum</sub>	MINWAGE <sub>Maximum</sub>	Support for hypothesis
$\alpha_3 + \alpha_6 MINWAGE_{it-1} > \alpha_4 + \alpha_7 MINWAGE_{it-1} > \alpha_5 + \alpha_8 MINWAGE_{it-1}$	7.54>4.1>0.163	8.29>4.30>-0.002	6.7>3.8>0.36	YES
	GOVEMP <sub>Mean</sub>	GOVEMP <sub>Minimum</sub>	GOVEMP <sub>Maximum</sub>	YES
$\beta_3 + \beta_6 GOVEMP_{it-1} > \beta_4 + \beta_7 GOVEMP_{it-1} > \beta_5 + \beta_8 GOVEMP_{it-1}$	4.99>2.49>0.08	6.1>3.92>1.44	3.5>0.56<-1.77	
	UNION <sub>Mean</sub>	UNION <sub>Minimum</sub>	UNION <sub>Maximum</sub>	
$\delta_3 + \delta_6 UNION_{it-1} > \delta_4 + \delta_7 UNION_{it-1} > \delta_5 + \delta_8 UNION_{it-1}$	-2.3<-0.22<0.64	-3.34<-0.71<0.83	-1.11<0.32<0.41	NO
PART B				
Hypothesis 4: SIGs’ influence strengthens the marginal unemployment effect of:				
MINWAGE	-0.397 < -0.133 < 0.095			
GOVEMP	-0.298 > -0.387 > -0.406			
UNION	0.347 > 0.169 > 0.066			

\*The conditional marginal effects estimates are taken from Table 3

**Table 6: Summary of the four hypotheses test results\***

<b>Part A</b>	1	2	3
<b>Hypothesis 1:</b> The measure of labor market regulation has a significant marginal unemployment-increasing effect	Evaluated at the SIGs dummies equal zero	Evaluated at the SIGs dummies equal to one	
Marginal effect of MINWAGE	YES	?	
Marginal effect of GOVEMP	YES	?	
Marginal effect of UNION	YES	YES	
<b>Part B</b>	Marginal effect for <sup>a</sup> :		
<b>Hypothesis 2:</b> Each of the SIGs' influence types has a marginal unemployment-increasing effect	SIGD5 interacted with MINWAGE	SIGD4 interacted with MINWAGE	SIGD3 interacted with MINWAGE
MINWAGE <sub>Mean</sub>	YES	YES	?
MINWAGE <sub>Min</sub>	YES	YES	?
MINWAGE <sub>Max</sub>	YES	YES	?
	Marginal effect for:		
	SIGD5 interacted with GOVEMP	SIGD4 interacted with GOVEMP	SIGD3 interacted with GOVEMP
GOVEMP <sub>Mean</sub>	YES	YES	?
GOVEMP <sub>Min</sub>	YES	YES	YES
GOVEMP <sub>Max</sub>	YES	?	?
	Marginal effect for:		
	SIGD5 interacted with UNION	SIGD4 interacted with UNION	SIGD3 interacted with UNION
UNION <sub>Mean</sub>	NO	?	YES
UNION <sub>Min</sub>	NO	NO	YES
UNION <sub>Max</sub>	?	YES	?
<b>Part C</b>			
Hypothesis 3: The marginal unemployment-increasing effect of SIGs' influence is larger in states where their strength on the political process is dominant with regard to: MINWAGE	MINWAGE <sub>Mean</sub>	MINWAGE <sub>Minimum</sub>	MINWAGE <sub>Maximum</sub>
	YES	YES	YES
	GOVEMP <sub>Mean</sub>	GOVEMP <sub>Minimum</sub>	GOVEMP <sub>Maximum</sub>
GOVEMP	YES	YES	NO
	UNION <sub>Mean</sub>	UNION <sub>Minimum</sub>	UNION <sub>Maximum</sub>
UNION	NO	NO	NO
<b>Part D</b>			
Hypothesis 4: SIGs' influence strengthens the marginal unemployment effect of:			
MINWAGE	NO		
GOVEMP	YES		
UNION	YES		

\* YES=hypothesis supported; NO = opposite hypothesis supported; ? = results are not statistically significant