Assault on the Low-Wage Economy:
Federal Wage-Hour Law and Southern Industrial Development

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December 22, 2025

This paper uses newly digitized data to study the effects of the Fair Labor Standards Act (FLSA) of 1938 on the industrial development of the U.S. South. Implemented at a time of large regional wage disparities, the federal minimum wage and maximum hour regulations disproportionately affected the low-wage South. Contrary to the findings that minimum wage increments have no or small employment effects in more modern settings, we find substantial employment reductions in the manufacturing industries. This paper then builds and calibrates a general equilibrium model to formalize and quantify three arguments centering the regional development-national standards debate: the "interstate commerce" channel, the "reverse structural change" channel, and the "industrial composition channel. This is achieved by modeling multiple regions connected through trade, multiple industries connected through input-output linkages, a labor supply side characterized by a Roy model of worker selection, and a labor demand side implied by firm-level technology choices.

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1. Introduction

Efforts to impose common standards across regions at different stages of development often encounter much push back from those regions that these standards purport to protect. Opponents to including labor clauses in trade agreements or environmental standards as preconditions for market access argue that these regulations are protectionism in disguise. Inside a single nation, where there is no formal barriers to the flow of trade, the debate reappears in a different form. The political battle over the Fair Labor Standards Act (FLSA) of 1938, which enacted the first federal wage and hour law in the United States, divided the Democratic Party (Fleck, 2002) and dissenting voices emerged along geographic lines. Representative Samuel Davis McReynolds (D-TN-3rd District), for example, called such regulation "a tariff against southern goods" and argued during Congressional debates that "the northern industries are trying to stop the progress of the South":

> Who will be the losers by the passage of this bill in its present form? The southern worker, and you know it. If the goods he makes cannot compete in the northern and eastern markets he will lose his job. What good will a 25-cent or a 40-cent rate be to him then? (McReynolds, 1938, Page 7288-7289)

This paper revisits the development-versus-standards debate using newly digitized data and formalizes the arguments by building and quantifying a general equilibrium model calibrated to the early twentieth century U.S. economy. We focus on the arguments surrounding the following two themes. First, proponents of the law argued that "substandard labor conditions" in some regions gave those industries a cost advantage over other, therefore a set of minimum standards should be imposed on all regions "to eradicate from interstate commerce the evils attendant upon low wages and long hours of service and industry" (*Fleming v. Hawkeye Pearl Button Co.*, 1940). Such standards as minimum wages and maximum hours, some Southern manufacturers argued, were protectionist measures devised by their Northern competitors to curtail the South's regional comparative advantage. Second, the Act of 1938 notably excluded from coverage a wide range of sectors including agriculture, retail, domestic services, restaurants, hospitals, and many that are not directly engaging in "interstate commerce". Most notably, even though a large fraction of agricultural products were traded across state lines, the Act excluded agricultural workers from coverage by explicitly exempting the entire sector and broadening the scope of exclusion by enumerating activities related to farm work (see the next section). The issue of distributional consequences due to this incomplete coverage was raised by opponents. Representative Harold Knutson (R-MN-6th District), for example, argued that

> If this legislation will do anything, it will increase the price of commodities that the farmer must buy without making any provision for increasing the price of

> what he has to sell. In addition to that, it will make it practically prohibitive for the farmer to go into the labor market and hire farm help. Do you suppose that anyone is going to hire out to work on a farm, where the hours are long, when he can get a job in town at better pay and half the hours? (Knutson, 1938, Page 7385)

To evaluate these arguments and think through the mechanisms, this paper proceeds in three steps. First, I digitize data in the two volumes of Census of Manufactures data that cover the year before and the year after the FLSA came into effect. This data allow us to observe manufacturing employment, wages, output, and value added for each narrowly defined manufacturing industry in each state. I use this data to document stylized facts about wage distribution and employment concentration, estimate the effects of the wage and hour law on manufacturing outcomes, and calibrate the theoretical model to match the spatial distribution of industrial activities.

Next, I build a multi-region, multi-sector general equilibrium model to formalize how the various forces interact. The distribution of economic activities across regions is modeled as an equilibrium outcome that reflects regional comparative advantage and trade. The sectoral allocation of workers within regions is determined by labor supply and demand as follows. Employers choose the technologies that differ in the intensity of labor use and the degree to which the inputs are substitutable with each other, and workers (who differ in abilities) compare their prospective wage incomes in each sector and enter into the one that yields the highest earnings.

To examine how the original FLSA affect the economy, the model include three broad sectors: a manufacturing sector that produces goods that are traded across regions and is covered by the law, a non-traded sector that provides services that are consumed locally whose workers are not covered by the law, and an agricultural sector that produces tradeable goods but is exempted from coverage. The sectors are connected through input-output (IO) linkages calibrated to historical IO-tables constructed by Wassily Leontief. Modeling sectoral linkages is particularly relevant in the context of early twentieth century regional development. Influential sociologist and scholar of the South Rupert B. Vance considered the South as a "colonial economy", in the sense that it exported raw materials to the North for fabrication and then bought them back:

> Thus the South has often sold out its undeveloped resources—pine forests, Kentucky coal, Birmingham iron, Arkansas bauxite, Texas petroleum—to outside interests at rockbottom prices, all for lack of credit to finance development. The rise of textile and tobacco manufacturing and the power industries in the Southeast represents the area's first transition from an economy exploited from the outside to one more indigenous. (Vance, 1935, Page 112)

Finally, I calibrate the model using various sources of historical data and then quantify three channels through which the federal wage and hour law affect Southern industrial development. The first channel, which we label the "interstate commerce channel", postulates that one region's labor market conditions affect those in other regions due to product market competition that work through the system of relative prices. As Robert H. Jackson, the Assistant Attorney General of the Department of Justice's Antitrust Division, argues,

> by prohibiting the use of substandard labor conditions by those who compete with employers who use fair labor standards, the great majority of employers who really desire to treat labor fairly are thereby protected against the unfair methods of competition of those who utilize sweatshop methods to gain a competitive advantage. (United States Congress, Senate Committee on Education and Labor and United States Congress, House Committee on Labor, 1937, Page 3)

The second channel, which we label the "reverse structural transformation" channel, describes the sectoral reallocation away from manufacturing, which was required to pay minimum wages and premium for overtime work, to agriculture, which did not have such regulations. One source of low Southern manufacturing wages, observers at the time argued, was that the South had an abundance of low-productivity small farmers and farm workers who were lining at factory gates for industrial jobs. Given this explanation, reallocating workers toward agriculture lowers aggregate labor productivity in the South, as manufacturers face higher labor costs and the wage and hour regulations forbid the downward adjustments of wages. The third channel, which we label the "industry composition" channel, reasons that labor market interventions not only alter the relative price between labor and other inputs but also the relative returns to using labor-intensive versus labor-saving technologies. We can then quantitatively explore its implication by comparing counterfactual equilibrium outcomes by shutting down these channels one at a time.

I find that, using both county level and state-industry level data, higher exposure to the labor market regulations is associated with larger employment and wage bill reduction. With industry-level data, we are able to control for industry fixed effects and thus the myriad of industry-specific exemptions (for example, some manufacturing industries engaging in the handling and processing of agricultural products were given a complete overtime exemption but no minimum-wage exemption, some were exempted from paying overtime for the first fourteen weeks of work in a given year, and so on) and isolate the effects due to the fact that having more below-minimum-wage workers prior to the increase means a bigger strain on the part of the employer to maintain the same work force. In the county level data, we see that many low-wage Southern counties showed a sudden rise in average manufacturing wages after the FLSA came into effect, but this was

due to reductions in both employment and wage bills while the former dropped by more.

How does the employment effect impact the development of Southern economy? Workers separated from their previous manufacturing jobs either find employment in another manufacturing firm, become reemployed in a different sector, remain unemployed, or leave the labor force. On the one hand Acemoglu (2003) and Acemoglu (2010) has shown that under certain conditions labor market interventions can cause technological advances. Through the lens of the model developed in this paper, this is a quantifiable question that asks whether regional aggregate labor productivity increases due to firms adopt different sets of technologies in response to the intervention. On the other hand, reallocating workers out of the manufacturing sector into the agricultural sector could reduce aggregate productivity if marginal agricultural labor productivity was lower compared to the industrial sector.

This paper contributes to the literature that uses general equilibrium models to study spatial development. In the context of the development of the American South, Caselli and Coleman Ii (2001) explains the convergence of southern to northern average wages from 1880 to 1980 using a model of structural transformation: the South initially has a comparative advantage in agricultural production. Over time, as barriers to sectoral mobility is reduced, workers move out of the agricultural sector and into the nonagricultural sector, benefiting the South disproportionately, as it has more agricultural workers. In our model, the distribution of production is determined by regional comparative advantage and technology choices are endogenized. Relatedly, Hornbeck and Naidu (2014) shows that in reaction to the out-migration of black workforce caused by the Great Mississippi Flood of 1927, landowners in the Mississippi Delta modernized agricultural production, increased capital intensity, and moved toward larger-scale farm operations. This paper is also related to Jaworski (2017) and Jaworski and Yang (2025) that study the implications of aggregate shocks on regional development.

This paper complements the vast literature on minimum wages (see, for example, Neumark and Wascher (2010),Neumark and Shirley (2022),Manning (2021) for an overview) by shedding new lights on the original FLSA. Additionally, by separately evaluating the dynamic effects of the Act on the manufacturing hours, this paper also speaks to the literature on working time regulations (Germain, 2025; Osuna, 2003; Crépon and Kramarz, 2002). Previous works that study the original FLSA have long recognized its disproportionate effects on the South. Seltzer (1997) finds that binding minimum wages lead to increased mechanization and reduced employment in the Southern seamless hosiery industry. By comparing the wholesale industry, which was covered by the original FLSA, with the retail industry, which was not, Costa (2000) finds larger reductions in the proportion of workers working over 40 hours per week in the South. The precursor to the 1938 Act's minimum wage and maximum hour regulations was those established in the National Industrial

Recovery Act (NIRA) but nullified in 1935 by the Supreme Court. Fishback, Vickers, and Ziebarth (2024) studies the workweek restrictions of 1933 and finds that limiting workweek increased employment but lowered total hours worked.

This paper is related to the literature on the effects of labor market institutions on technology adoption. Acemoglu (2003) shows that wage push due to binding minimum wages, union bargaining, or other wage-setting institutions can lead to less skill-biased technical changes—firms become more willing to adopt technologies that are complementary to unskilled workers. Acemoglu (2010) characterizes the conditions under which labor scarcity induces technological adoption and when technology is strongly labor saving, setting the minimum wage above the market-clearing level induces technological advances.

The empirical evidence on the firm growth effects due to labor cost increases is mixed. Mayneris, Poncet, and Zhang (2018) finds that the survival probability of Chinese firms fell after a minimum-wage reform, but the surviving firms saw significant productivity improvements that reflect better inventory management and capital investments. Acemoglu and Finkelstein (2008) shows that hospitals adopted new medical technologies after the Medicare Prospective Payment System reform effectively increased the price of labor relative to their capital costs. Kong, Qin, and Xiang (2021) finds that higher minimum wages reduce the number of new firm registrations in China and the effects are stronger in industries that are more labor-intensive and in areas where labor costs are higher or access to finance is lower.

2. Historical Background

2.1. Fair Labor Standards Act of 1938

The Fair Labor Standards Act set the minimum wage at 25 cents per hour for the first year, starting October 24, 1938. This rate was set to increase to 30 cents an hour after one year and to eventually reach 40 cents an hour in 1945.

The Act also established the 40-hour, 5-day workweek as we know it today by setting maximum hours and requiring overtime pay at one-and-a-half times the regular hourly rate for any hours worked beyond these caps. The cap was set at 44 hours a week (a workweek is considered to be 7 consecutive 24-hour days) during the first year (from October 24, 1938, to October 24, 1939), 42 hours during the second year, and 40 hours starting October 1940.

The Act required employers covered by the law to keep records of the wages and hours of their employees. It created the Wage and Hour Division under the Department of Labor, and authorized it to inspect workplaces and investigate whether there has been any violation of the Act. During the first year of the Act, the Division received 32,802

complaints charging violations of the Act but its staff numbered only 109 inspectors to cover about 250,000 establishments in the country (U.S. Department of Labor, Wage and Hour Division, 1939). Though the Act included provisions for a maximum fine of $10,000 and maximum imprisonment of six months for willful offenders, these penalties were rarely imposed (Richter, 1943). From the beginning, enforcement had been mostly relying on voluntary restitutions of back-pay where violations were discovered by the inspectors (Livengood and Association, 1952).

Coverage. Agricultural laborers were excluded from the wage and hour regulations since the bill was first proposed in 1937, and later modifications through the legislative process only worked to strengthen and broaden the scope of the exclusion of the agricultural sector from the coverage of FLSA (Wason and of Congress. Legislative Reference Service, 1966). When the law was passed in 1938, the exemption applied to not only "any employee employed in agriculture" but also "any individual employed within the area of production" and those who "engaged in handling, packing, storing, ginning, compressing, pasteurizing, drying, preparing in their raw or natural state, or canning of agricultural or horticultural commodities for market, or in making cheese or butter or other dairy products" (*Fair Labor Standards Act of 1938* 1938).

3. Data and Stylized Facts

I digitized both the industry-state- and county-level data in the Census of Manufactures for the 1937 and 1939 volume, and combine the county-level panel with the ones from 1927 to 1937 digitized by Janas (2024). Additionally, the Census Bureau published special reports for a subset of industries along side the Biennual Census of Manufactures. I digitized the region-by-month data on work hours for the 1937 and 1939 volumes. The data allow us to describe the spatial distribution of manufacturing activities across regions and to address the challenge that both the minimum wage and maximum hour regulations were introduced at the same time.

3.1. Regional Wage Disparity

Figure 1 shows that, one year before the geographically-uniform wage floor came into effect, firms in the South were paying less than half in wages than their northern counterparts.

In 1937, an average manufacturing worker worked 1933.13 hours per year. After the introduction of the 25-cent minimum wage, this worker could not be paid less than an annual labor income of $483.28. Figure 2 plots the county-level average wages after the passing of FLSA against the ones a year before. The vertical line shows the minimum

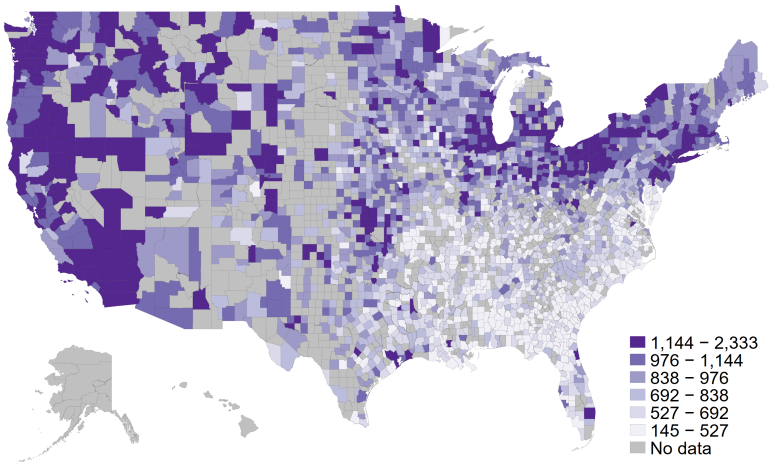


FIGURE 1. Average Manufacturing Wages for U.S. Counties in 1937

labor income for an average manufacturing worker. The fitted line is estimated using a kink regression model. This suggests a wage threshold under which increases in wages disproportionately occurred. Counties that had the lowest manufacturing wages in 1937 saw the largest wage increases on average, while high-wage counties experienced little such changes. The figure also shows a clear regional pattern of this change.

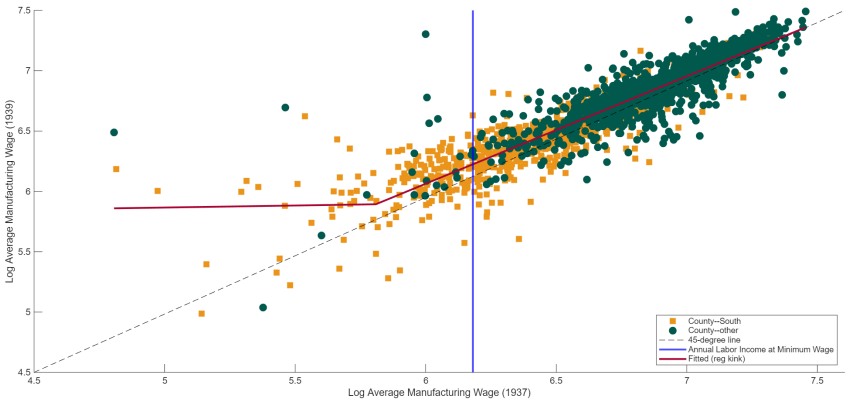


FIGURE 2. Average Manufacturing Wages for U.S. Counties Before and After FLSA

3.2. Distribution of Manufacturing Activities

Table 1 summarizes the shares of the South's manufacturing activity relative to the entire country before the passing of FLSA. Although the South had 28% of the country's population, it employed only 16% of the manufacturing labor, contributed to 12% of total value added and paid 10% of the wages. The table further shows the largest 25 industries in 1937 based on the value of sales (each industry's size, expressed as the fraction of its value of production of all manufacturing industries, is shown in the second column). The largest

industry by the value of products was "Steel works and rolling-mill products". Of the 12 states that were recorded to engage in these activities, none of them were in the South. In the related "Nonferrous-metal alloys; nonferrous-metal products, except aluminum, not elsewhere classified" and "Blast-furnace products" industries, the Southern states accounted for 0.74% and 6.63% of total sales in the two industries, respectively.

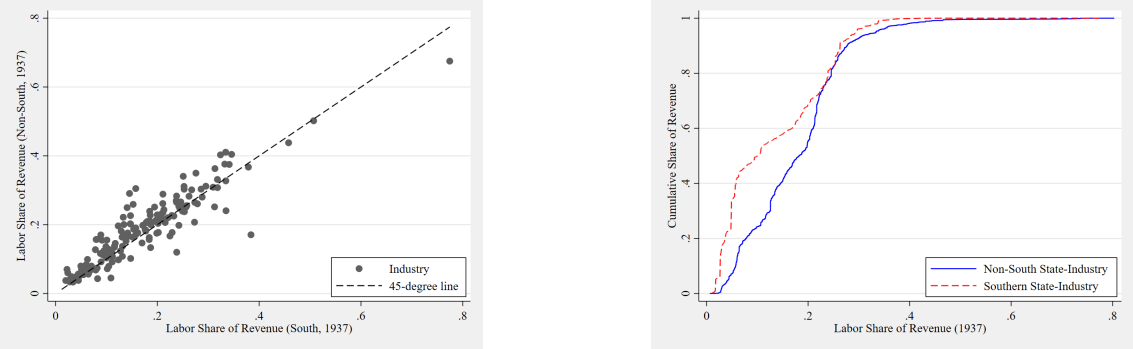
TABLE 1. Share of Southern Manufacturing Activities

Industry (# states)	Workers	Wages	Output	Value added
Steel Products (12)	0.00	0.00	0.00	0.00
Meat Packing (36)	11.27	8.70	8.77	10.07
Petroleum (18)	39.81	37.37	40.42	37.14
Motor Vehicles (5)	0.00	0.00	0.00	0.00
Auto Parts (24)	0.41	0.24	0.25	0.31
Electrical Equipment (29)	0.58	0.45	0.75	0.55
Bakery Products (48)	12.81	10.09	11.52	11.29
Newspapers (48)	13.56	11.21	9.71	10.43
Machinery (38)	10.52	9.30	10.50	10.81
Cotton Goods (19)	76.72	73.26	76.67	74.34
Paper (24)	5.21	5.06	7.59	7.38
Chemicals (23)	11.10	8.72	10.96	11.72
Lumber (43)	49.24	31.56	36.91	35.84
Grain Milling (40)	25.00	19.05	20.44	20.87
Cigarettes (3)	99.69	99.63	99.85	99.71
Book Printing (46)	8.19	6.90	6.64	6.48
Canned Goods (37)	14.01	7.32	8.24	7.41
Footwear (22)	3.59	3.11	3.98	4.13
Furniture (38)	23.65	17.80	18.97	17.54
Machine Shops (43)	4.97	4.30	4.04	4.42
Nonferrous Metals (26)	0.89	0.68	0.74	0.71
Blast Furnaces (6)	8.98	7.51	6.63	9.83
Butter (39)	10.90	8.80	8.56	10.51
Men's Clothing (20)	9.32	6.23	4.89	5.96
Paints (28)	5.37	4.23	4.76	4.95
Beer (27)	8.23	6.50	5.67	5.87
Farm Equipment (14)	1.83	0.92	0.91	1.10

3.2.1. Southern labor income share and the composition of manufacturing industries

Although the South had 28% of the country's population, it employed only 16% of the manufacturing labor and paid less than 11% of the wages. Why was Southern manufacturing workers receiving a disproportionately low labor income relative to the size of its

manufacturing workforce? The following figures display two potential explanations by disaggregating labor income shares, defined as the share of wage bill in total revenue, by industry and region. The left panel plots average Southern labor shares for each industry against that in the rest of the country. We do see that within a given industry, labor shares are in general lower in the South, but the observations align rather closely around the 45-degree line. The right panel shows the distribution of labor income shares within each region. 20% of firms (in terms of their share of the region's total revenue) in the South had labor shares less than 4%, while no more than 4.5% of firms in non-Southern states had labor shares less than 4%; 50% of firms in the South had labor shares slightly above 10%, while no more than 24% of firms in non-Southern states had labor shares less than 10%. Low Southern average labor income share is due to the composition of its manufacturing industries.



A. Within-industry variation

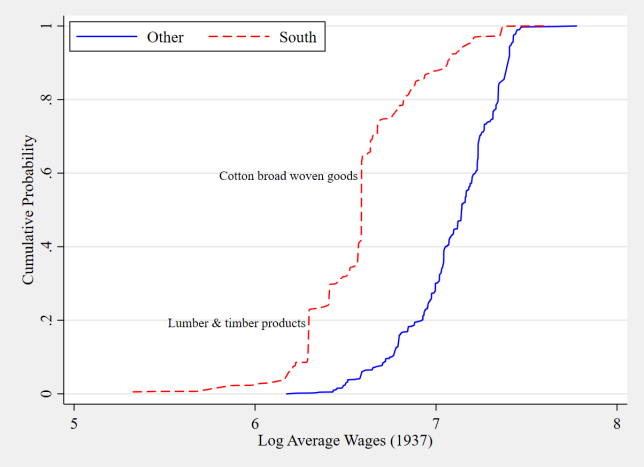
B. Within-region distribution

FIGURE 3. Low Southern average labor income share is due to manufacturing composition

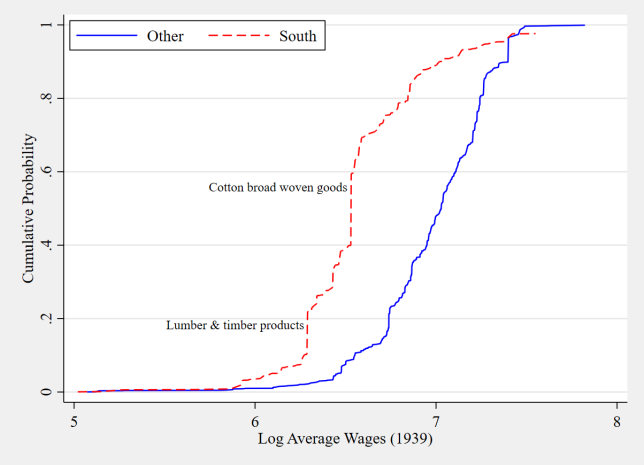
3.3. Disentangling Effects from Minimum Wage and Maximum Hours

3.3.1. Exposure to Binding Wage Floor

To estimate the impact of the federal wage and hour law on the manufacturing sector, the empirical strategy is to compare changes in outcomes in areas where more workers were earning hourly wage rates lower than the statutory minimum to areas where the wage floor were not binding for most workers. Table 2 indicates that the South had both a larger share of the country's low-wage workers and a larger exposure in the manufacturing sector to the wage and hour regulation. Column 3 shows that more than 63% of the country's manufacturing workers receiving less than 30 cents an hour were located in the Southeastern region alone (United States et al., 1939). Column 4 shows that the fraction of manufacturing workers receiving less than 30 cents an hour ranged from 15.5% to 27.9%



A. Manufacturing Wage Distribution in 1937



B. Manufacturing Wage Distribution in 1939

FIGURE 4. Empirical cdf (state-industry)

in the four largest Southern manufacturing states. The basic estimating equation is

$$\begin{aligned}\text{Outcome}_{ist} = &\ IndustryFE_i + TimeFE_t \\ &+ \delta\left(\text{Exposure}_s \times \text{Employment}_{is} \times \mathbb{1}\{t \geq 1938\}\right) + \varepsilon_{ist},\end{aligned}$$

where Outcome_{ist} is the (logarithm of) outcome for industry i-state s in year t, Exposure_{is} is (logarithm of) the measure of exposure to the minium wage increase, constructed using the survey conducted by the Bureau of Labor Statistics in 1939 before the minimum wage was to increase to 30 cents an hour (United States et al., 1939), and $\mathbb{1}\{t \geq 1938\}$ is an indicator equal to one for years 1938 and later. The industry fixed effects $IndustryFE_i$ control for time-invariant industry characteristics and $TimeFE_t$ is the time fixed effect. The coefficient of interest is δ, which measures the differential effect of exposure to the

TABLE 2. Share of Manufacturing Workers Receiving Less Than 30 Cents an Hour

Region	State	Relative to national total	Relative to regional manufacturing
Far west (CA, WA, OR, NV)		0.55%	0.66%
Northwest (KS, CO, NE, MT, ID, UT, SD, ND, WY)		0.73%	2.88%
Middle states (IL, OH, MI, IN, WI, MO, MN, IA)		8.80%	1.55%
Northeast (NY, PA, MA, NJ, CT, MD, RI, WV, ME, NH, VT, DE)		21.49%	2.88%
Southwest (TX, OK, AZ, NM)		5.08%	14.26%
	Arizona	0.03%	2.70%
	Oklahoma	0.18%	3.26%
	Texas	4.83%	16.87%
Southeast (NC, GA, SC, TN, VA, AL, LA, KY, MS, FL, AR)		63.36%	23.09%
	South Carolina	6.79%	21.57%
	North Carolina	9.83%	15.50%
	Georgia	10.15%	27.92%

The regional classification corresponds to Odum (1936)'s Six Major Regions Basic to the Southern Regional Study. Column 3 represents region *i*'s share of manufacturing workers receiving less than 30 cents per hour, $\frac{x_i}{\sum_i x_i}$. Column 4 represents the ratio x_i/y_i of region *i*'s manufacturing workers receiving less than 30 cents per hour, x_i, to the region's manufacturing workers subject to the Fair Labor Standards Act, y_i. Data are from voluntary responses to a mailed questionnaire sent out by the Bureau of Labor Statistics in 1939.

wage and hour regulation on the outcome variable in the post-1938 period relative to the year 1937. Standard errors are clustered at the state level. Table 3 shows the estimation results.

3.3.2. Average Hours Worked

One year after the Act came into effect, the threshold above which an overtime premium should be paid was lowered from 44 hours to 42 hours per week. The 42-hour week regulation became effective on October 24, 1939. At the same time, the minimum wage was raised by 20% from 25 cents to 30 cents per hour. Both mandates can affect employment as well as hours worked, but neither the causes or effects nor the interaction between the two mandates is unambiguous.

I address this challenge by leveraging the separate wage orders that set differential industry-specific minimum wage rates at different points of time. The 1938 Act set up industry committees that should "from time to time recommend the minimum rate or rates of wages to be paid". In 1939, two such wage orders were issued. The textile industry minimum wage rate of 32.5 cents per hour came into effect in October, and the hosiery industry rate of 32.5 for the seamless branch and 40 for the full-fashion branch in September. Both industries' wage mandates were higher than the 30-cent rate that was generally applicable. Controlling for the industry characteristics, the only variation

TABLE 3. Effects of the Minimum Wage Increase on Manufacturing Outcomes

	(1) Employment	(2) Wage Bill	(3) Establishment Size	(4) Value Added per Worker	(5) Output per Worker
δ	-0.037***	-0.038***	-0.017***	-0.008***	-0.009***
	(0.012)	(0.013)	(0.004)	(0.003)	(0.003)
Observations	6752	6752	6752	6752	6752
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
R-squared	0.687	0.628	0.790	0.717	0.806

Note: Robust standard errors clustered at the state level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

therefore came from the differing intensities of minimum wage increases between these industries and the rest of the manufacturing sectors.

I digitized the 1937 and 1939 volumes of the Man-Hour Statistics that were compiled as special reports for the Census of Manufactures. The industry-by-region tables include information on monthly average work hours for 105 and 171 industries in 1937 and 1939, respectively. Figure 5 shows the event-study plot for the effects of the industry-specific minimum wage increases on average hours worked, with the event times defined as months before and after the wage orders' effective date. The estimation controls for industry monthly average hours in 1937, when the FLSA was still debated in congress. The figure shows that work hours were higher at the beginning of 1939, when the 44-hour week was the law. Months before the wage orders came into effect, however, average hours began to drop substantially. Unfortunately, we are not able to further trace the evolution of manufacturing outcomes with this data beyond the December of 1939 as the World War II disrupted the data collection process and the Census of Manufactures did not resume until 1947.

4. Theoretical Model

There are N regions and S sectors. Each region-industry is populated by a continuum of firms. Each firm is endowed with one unit of managerial capital. Markets are perfectly competitive. The structure of the model is similar to abc Farrokhi, Lashkaripour, and Pellegrina (2025), Farrokhi and Pellegrina (2023), and Galle, Rodríguez-Clare, and Yi (2023)

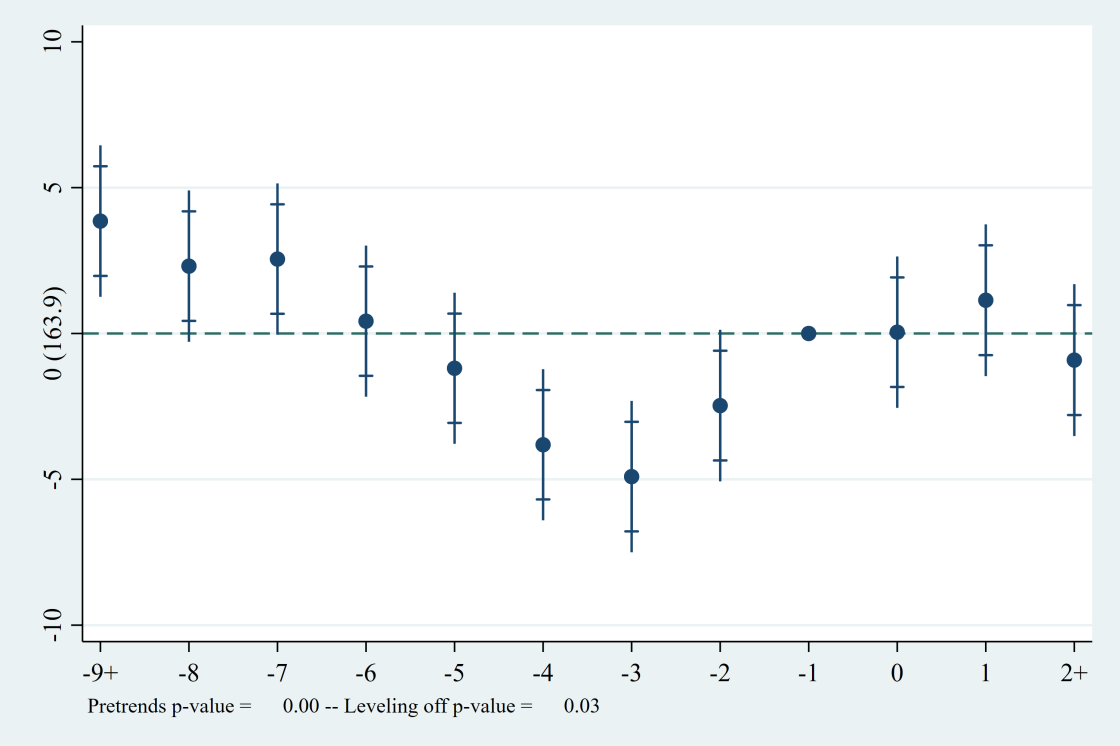


FIGURE 5. Effects of Industry-Specific Minimum Wage Increases on Work Hours

4.1. Firms and Technology

Production function. Each firm $\omega \in \Omega_{i,s}$ has access to a menu of constant-returns-to-scale production functions, indexed by $t \in \mathbb{T}_{i,s}$, given by

$$Q_{i,st}(\omega) = A_{i,st}\left[Z_{i,st}(\omega)\frac{\mathscr{K}_{i,st}(\omega)}{\gamma^{Z}_{i,st}}\right]^{\gamma^{Z}_{i,st}}\left[\frac{\mathcal{L}_{i,st}(\omega)}{\gamma^{L}_{i,st}}\right]^{\gamma^{L}_{i,st}}\left[\frac{M_{i,st}(\omega)}{\gamma^{M}_{i,st}}\right]^{\gamma^{M}_{i,st}} \tag{1}$$

where $A_{i,st}$ is total factor productivity under technology t, $Z_{i,st}(\omega)$ is idiosyncratic managerial productivity specific to firm ω, and $\mathscr{K}_{i,st}(\omega)$, $\mathcal{L}_{i,st}(\omega)$, and $M_{i,st}(\omega)$ are managerial capital, labor (in efficiency units), and intermediate input uses, respectively. The intermediate input is a bundle of intermediate goods aggregated as follows. For each firm ω operating technology t in region i, sector g,

$$M_{i,gt}(\omega) = \prod_{h=1}^{S} M_{i,hgt}(\omega)^{\phi_{hg}}, \quad \sum_{h=1}^{S}\phi_{hg} = 1,$$

where $M_{i,hgt}$ is the quantity of good h used for production of good g and the exponent $\phi_{hg} \geq 0$ is the input-output parameter associated with h. Production technologies differ in their input intensity parameters $\gamma_{i,st} \equiv \left(\gamma^{L}_{i,st}, \gamma^{M}_{i,st}, \gamma^{Z}_{i,st}\right)$, where $\gamma^{L}_{i,st} \in [0,1]$, $\gamma^{M}_{i,st} \in [0,1]$,

and $\gamma^Z_{i,st} = 1 - \gamma^L_{i,st} - \gamma^M_{i,st}$ are intensity parameters of labor, intermediate inputs, and managerial capital.

Labor market regulations alter the price of labor relative to the costs of other factors of production. This is modeled as a multiplicative factor $\tau^L_{i,st}$ that drives a wedge between the wage rates (per efficiency unit), $w_{i,s}$, and the effective labor costs faced by the firms, $\tau^L_{i,st} w_{i,s}$. The specification implies the following marginal cost of production for a firm $\omega \in \Omega_{i,s}$ using technology t:

$$c_{i,st}(\omega) \equiv \frac{1}{A_{i,st}} \left[\frac{r_{i,st}(\omega)}{Z_{i,st}(\omega)} \right]^{\gamma^Z_{i,st}} \left(\tau^L_{i,st} w_{i,s} \right)^{\gamma^L_{i,st}} m_{i,s}^{\gamma^M_{i,st}},$$

where $r_{i,st}(\omega)$ is the return to the firm's managerial capital and $m_{i,s} = \prod_{h=1}^{S} P_{i,h}^{\phi_{hs}}$ is the price index of the bundle of intermediate inputs.

Technology choice. Each firm $\omega \in \Omega_{i,s}$ is endowed with one unit of managerial capital and chooses a technology t from the set of alternatives $t \in \mathbb{T}_{i,s}$ that maximizes the return $r_{i,st}(\omega)$ to its managerial capital. Given that the markets are perfectly competitive and that the technologies feature constant returns to scale, the returns are proportional to the firm's own managerial productivity operating each technology t, $Z_{i,st}(\omega)$, taking as given output prices $p_{i,s}$ and input costs $w_{i,s}$ and $m_{i,s}$:

$$r_{i,st}(\omega) = Z_{i,st}(\omega) \frac{a_{i,st}}{\grave{\tau}^L_{i,st}} p_{i,s} h_{i,st} \tag{2}$$

where $a_{i,st} \equiv A_{i,st}^{1/\gamma^Z_{i,st}}$, $\grave{\tau}^L_{i,st} \equiv \left(\tau^L_{i,st} \right)^{\gamma^L_{i,st}/\gamma^Z_{i,st}}$, and

$$h_{i,st} \equiv \left(\frac{w_{i,s}}{p_{i,s}} \right)^{-\gamma^L_{i,st}/\gamma^Z_{i,st}} \left(\frac{m_{i,s}}{p_{i,s}} \right)^{-\gamma^M_{i,st}/\gamma^Z_{i,st}}.$$

Assume that firm ω's idiosyncratic managerial productivities are realizations of a random vector $Z_{i,s}(\omega)$, each of whose component $Z_{i,st}(\omega)$ drawn independently from a Fréchet distribution, so that $\text{Prob}\left\{ Z_{i,st}(\omega) \leq Z_t : t \in \mathbb{T}_{i,s} \right\}$ is given by the cumulative probability function

$$F(Z_1, \cdots, Z_T) = \exp\left\{ -\overline{\phi} \sum_{t=1}^{T} Z_t^{-\theta} \right\},$$

where $\theta > 1$ and $\overline{\phi} \equiv [\Gamma(1-1/\theta)]^{-\theta}$. The technological composition of firms in each region i-sector s is therefore characterized by the share $\alpha_{i,st}$ of firms that select technology t:

$$\alpha_{i,st} = \frac{\left(a_{i,st} h_{i,st} / \tilde{\tau}^L_{i,st}\right)^{\theta}}{\sum_{t' \in \mathbb{T}} \left(a_{i,st'} h_{i,st'} / \tilde{\tau}^L_{i,st'}\right)^{\theta}}. \tag{3}$$

4.2. Labor Supply

A worker in region i has a vector of individual productivities $(z_{i1}, \ldots, z_{iS})$, where each element z_{is} represents the worker's efficiency units in sector s and is modeled as a random draw from a Fréchet distribution with shape parameter $\kappa_i > 1$ and scale parameter $\mathcal{A}_{i,s}$. Workers take the prices for efficiency units, $\left\{w_{i,s}\right\}$, as given, and chooses to work in the sector with the highest labor income. Labor income distribution is driven by both the distribution of worker productivity as well as the relative returns $\tilde{w}_{i,s}$ to each unit of labor input z_s. The ratio $\tilde{w}_{i,s}/\tilde{w}_{i,k}$ can potentially differ from $w_{i,s}/w_{i,k}$ if sector s faces a binding constraint under the wage and hour law while sector k is exempted from coverage. Let $\Omega_{is} \equiv \left\{(z_1, \ldots, z_S) | \, \tilde{w}_{i,s} z_s \geq \tilde{w}_{i,k} z_k \text{ for all } k\right\}$ denote the set of workers choosing to work in sector s, and let $F_i(z)$ be the joint probability distribution of $z = (z_1, \ldots, z_S)$ for workers in region i. The share of workers that apply to sector s is then

$$\pi_{i,s} \equiv \int_{\Omega_{i,s}} \mathrm{d}F_i(z) = \frac{\mathcal{A}_{i,s} \tilde{w}_{i,s}^{\kappa_i}}{\sum_k \mathcal{A}_{i,k} \tilde{w}_{i,k}^{\kappa_i}}. \tag{4}$$

Each worker inelastically supplies one unit of labor. The total labor input supplied to sector s in region i is therefore

$$\mathcal{L}_{i,s} \equiv L_i \int_{\Omega_{is}} z_s \mathrm{d}F_i(z) = \xi_i \frac{\Phi_i}{\tilde{w}_{i,s}} \pi_{i,s} L_i, \tag{5}$$

where L_i is the fixed population size in region i, $\xi_i \equiv \Gamma(1 - 1/\kappa_i)$, and $\Phi_i^{\kappa_i} \equiv \sum_k \mathcal{A}_{i,k} \tilde{w}_{i,k}^{\kappa_i}$.

Sectoral Average Labor Productivity. Following Young, 2014, define the expected efficacy of a worker in region i-sector s as

$$\overline{z}_{i,s} \equiv \mathbb{E}\left(z_s | \, z \in \Omega_{i,s}\right) = \frac{\int_{\Omega_{is}} z_s \mathrm{d}F_i(z)}{\int_{\Omega_{i,s}} \mathrm{d}F_i(z)} = \xi_i \left(\frac{\mathcal{A}_{i,s}}{\pi_{i,s}}\right)^{\frac{1}{\kappa_i}}.$$

The labor productivity gap between sector s and sector k is then

$$\frac{\overline{z}_{i,s}}{\overline{z}_{i,k}} = \left(\frac{\mathcal{A}_{i,s}}{\mathcal{A}_{i,k}} \div \frac{\pi_{i,s}}{\pi_{i,k}} \right)^{\frac{1}{\kappa_i}}. \tag{6}$$

We can then distinguish between two sources of sectoral productivity differences: a fundamental productivity component given by the ratio $\mathcal{A}_{i,s}/\mathcal{A}_{i,k}$, and a compositional component given by the ratio $\pi_{i,s}/\pi_{i,k}$. In the quantitative experimentation, we explore the effects of labor market regulations that changes the compositions but not the fundamental productivities on the agricultural labor productivity gap.

4.3. Trade and Consumption

The representative consumer in each region j has the utility function

$$U_j = \prod_{s=1}^{S} \left[\sum_{i=1}^{N} \left(b_{ij,s}^{\frac{1}{\sigma_s}} C_{ij,s}^{\frac{\sigma_s - 1}{\sigma_s}} \right)^{\frac{\sigma_s}{\sigma_s - 1}} \right]^{\beta_s},$$

with expenditure shares β_s and elasticity of subsitution σ_s. The demand system can be expressed in terms of the trade shares

$$\lambda_{ij,s} = \frac{b_{ij,s} \left(d_{ij,s} p_{i,s} \right)^{1-\sigma_s}}{P_{j,s}^{1-\sigma_s}}, \tag{7}$$

where $P_{j,s}$ are the CES price indexes for industry s in region j

$$P_{j,s} = \left[\sum_{i=1}^{N} b_{ij,s} \left(d_{ij,s} p_{i,s} \right)^{1-\sigma_s} \right]^{\frac{1}{1-\sigma_s}}.$$

4.4. General Equilibrium

The equilibrium prices and quantities satisfy the following conditions.

Goods market clears.

$$R_{i,h} = \sum_{j=1}^{N} \lambda_{ij,h} E_{j,h}, \tag{8}$$

where the expenditures in region j, sector h is given by the sum of final consumption expenditures and intermediate input uses:

$$E_{j,h} = \beta_h \left(Y_j + D_j \right) + \sum_{g=1}^{S} \sum_{t \in \mathbb{T}_{j,g}} \phi_{hg} \gamma^M_{j,gt} R_{j,gt},$$

$Y_j = \sum_{s=1}^{S} \sum_{t \in \mathbb{T}_{j,s}} \left(1 - \gamma^M_{j,st}\right) R_{j,st}$ is the value added in region j, and D_j are exogenous trade imbalances that satisfy $\sum_{j=1}^{N} D_j = 0$.

Labor market clears.

$$w_{i,s} \mathcal{L}_{i,s} = \sum_{t \in \mathbb{T}_{i,s}} \frac{\gamma^L_{i,st}}{\tau^L_{i,st}} R_{i,st} \tag{9}$$

5. Quantitative Analysis

5.1. Calibration

A key input to the quantification of a large class of spatial equilibrium models is data on regional trade flows. The commonly used Commodity Flow Survey only began in 1993, and the Census of Transportation data digitized by researchers only goes back until 1963. To fill this gap, I digitize the inter-regional commodity flow data in the Freight Traffic Report published by the Office of Federal Coordinator of Transportation in 1935 (Transportation, 1935). The data include bilateral flows between nine regions for each commodity group.

Figure 6 shows the Balassa Index of revealed comparative advantage for the South (aggregating the Pocahontas Territory, the Southern Freight Territory, and the Southwestern Territory) constructed by taking the ratio of export shares in the South relative to that in the rest of the country for each commodity category. In our context, exports are measured by the number of cars that originates in the South and terminate outside the South. We see that raw materials account for a disproportionately large share of Southern exports.

To quantify the interconnectedness of sectors, I digitize various versions of I-O tables for the years 1919, 1929, and 1939 by Wassily Leontief. To calibrate the economy before 1938, I use the consolidated 1929 table in Leontief, 1941 as a baseline. I further explore alternative definitions of sectors using the 43 industry table of 1929 and 1939.

5.2. Structural Transformation and Regional Convergence

We next analyze whether structural transformation leads to regional convergence. By structural transformation, we refer to the reallocation of workers away from agriculture and into manufacturing; by regional convergence, we refer to the relative change in

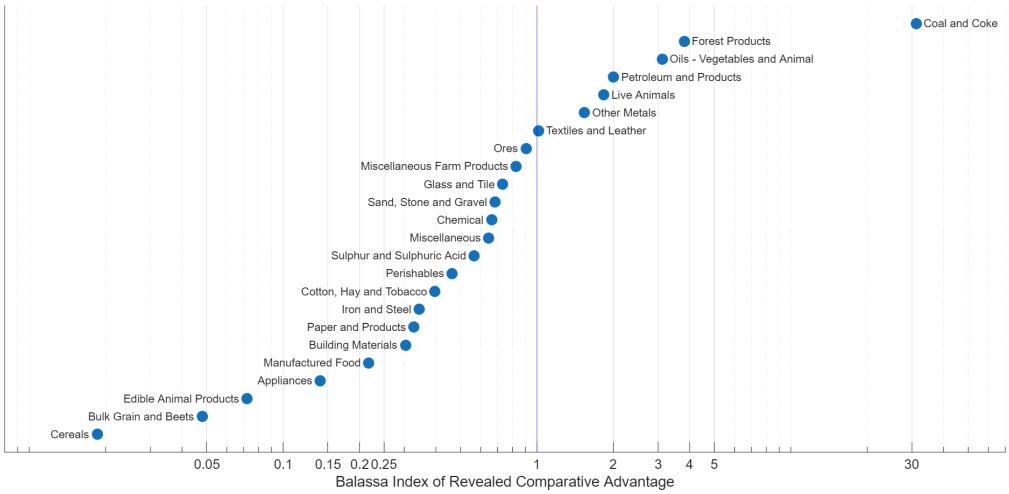


FIGURE 6. Freight Traffic Report by Commodity Group

the average product of labor across regions. The framework allows us to examine the quantitative implications of the following two aspects. The first aspect concerns the macroeconomic implications of Roy-type worker selection along the lines of Lagakos and Waugh (2013) and Young (2014). The second aspect involves sectoral reallocation of worker due to changes in the composition of firms. The latter mechanism explains labor productivity changes in terms of firms' adoption of technologies that have different factor intensities in reaction of changes in the relative costs of inputs, while the former postulates that a sector's average labor productivity decreases with its employment share as long as workers' comparative advantage aligns with their absolute advantage.

5.2.1. Labor Market Distortion

One argument for establishing an uniform minimum standard applicable to all regions in the economy is that labor market distortions in one region creates a pecuniary externality on employers in other regions through product market competition. If low wages in the South are due to such distortions that workers are paid less than their marginal value products, then these industries are employing an inefficiently high amount of labor and producing too much relative to an efficient benchmark, driving down output prices, and thus reducing demand for products supplied by other regions. In the data, the Southern states together employed 16% of the country's manufacturing labor but accounted for only 10% of the aggregate wage bill. We therefore start by considering the counterfactual in which such wedges are eliminated in the South and that Southern manufacturers conform to the national standard that wages are set equal to workers' value of marginal product.

Table 4 shows the counterfactual changes in equilibrium outcomes for the Southern region if labor market distortions were altogether eliminated. The second and third

TABLE 4. Changes in Welfare and Income

		Roy only	Roy + Tech. Adoption
Panel A. Welfare			
	Southeast	1.05	0.99
	Southwest	0.89	1.01
Panel B. GDP			
	Southeast	1.07	0.95
	Southwest	0.96	0.98

columns compares the equilibrium changes in a scenario in which the technology adoption channel is shut down and a scenario in which firm technology choices are accounted for. Figure 7 shows how industrial composition, represented by the shares of revenue, adjust in response to the improvement in allocative efficiency.

5.2.2. Employment Reallocation

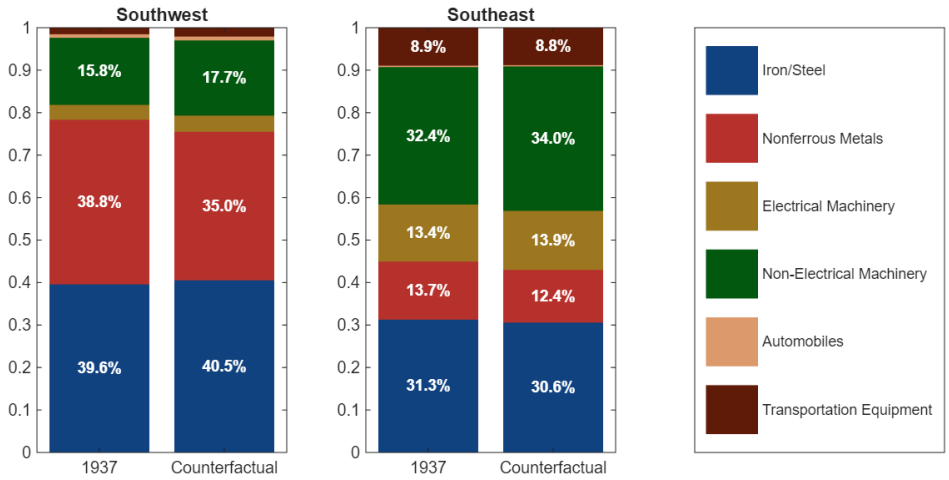
Regulating wages and hours in some sectors while excluding from coverage other sectors effectively changes the relative price of labor in different sectors. Through the lens of the Roy model, raising the relative payoffs in the covered sectors increases the relative labor supply these regulated sectors. From equation (6), controlling for fundamental productivity differences $\mathcal{A}_{i,s}/\mathcal{A}_{i,k}$, changes in the relative payoffs $\hat{\tilde{w}}_{i,s}/\hat{\tilde{w}}_{i,k}$ affect the relative productivity gap through changes in the compositions $\hat{\tilde{\pi}}_{i,s}/\hat{\tilde{\pi}}_{i,k}$ as follows:

$$\log \frac{\hat{\tilde{z}}_{i,s}}{\hat{\tilde{z}}_{i,k}} = \frac{1}{\kappa_i} \times \log \frac{\hat{\tilde{\pi}}_{i,s}}{\hat{\tilde{\pi}}_{i,k}}$$

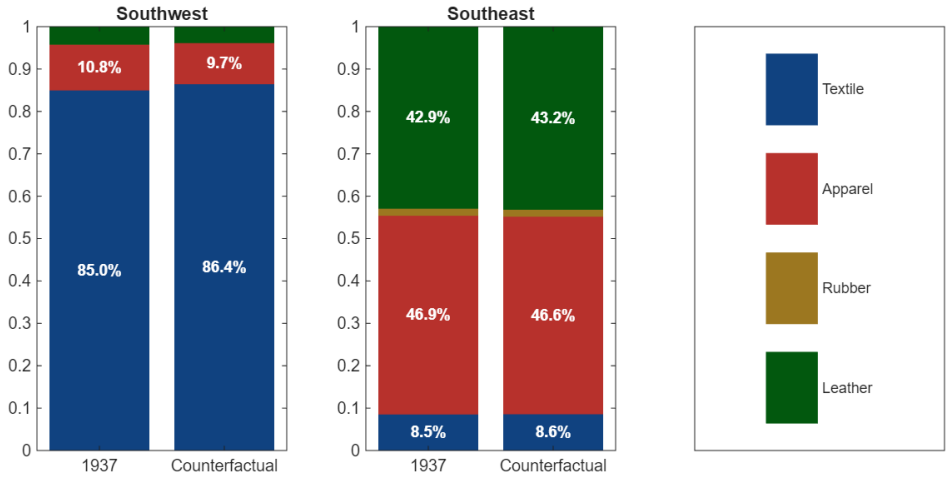
We can then apply the model to quantify the general equilibrium effects due to this labor reallocation channel. Since the firms in this counterfactual experiment effectively face a labor supply shock, we can further quantify the intensive and extensive margins of the firms' employment responses by comparing an equilibrium in which the technology adoption channel is shut down with an equilibrium in which firms can also adjust by choosing a different production function.

6. Conclusion

The inherent tension between common labor standards and regional differences has led to numerous policy proposals and debates for more than a century. This paper complements discussions on international trade and labor standards by showing the parallel in the context of sub-national industrial development. Understanding the impact of the federal



A. Manufacturing (Heavy)



B. Manufacturing (Light)

FIGURE 7. Changes in Industrial Composition

wage and hour law on the low-wage South in the United States provides useful lessons for modern policy makers. For example, in today's globalized world, one is concerned whether anti-sweatshop activism reduces employment in developing countries (Grier, Mahmood, and Powell, 2023; Harrison and Scorse, 2010) or if international competition leads to a race to the bottom of labor standards (Brown, 2001). We saw these points being made in the congressional hearing for the proposed bill in 1937. For example, Lucy Randolph Mason, General Secretary of the National Consumers' League, argued that "Substandard labor conditions prevailing to any great extent in one area tend to drag down standards in other sections" (United States Congress, Senate Committee on Education and Labor and United States Congress, House Committee on Labor, 1937, Page 405).

This paper revisits this influential legislation by bringing in newly digitized data and developing a general equilibrium model that captures the key features of the debate. By

TABLE 5. Changes in Employment Shares in Covered Sectors

		Roy only	Roy + Tech. Adoption
Southeast			
	Manufacturing (heavy)	0.79	0.88
	Manufacturing (light)	0.81	0.88
Southwest			
	Manufacturing (heavy)	0.85	0.94
	Manufacturing (light)	0.83	0.93

documenting stylized facts about the "regional unbalance" ((U.S.), 1938) and calibrating the model around these features, we are able to disentangle the competing forces that are important in shaping aggregate outcomes. Future work that extends the scope of this paper to explore the impact of the wage and hour law on individual mobility or estimate the differential impacts on workers of different ethnicity is highly valuable.

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