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DEPARTMENT OF CORRECTIONS

Key Findings

Based on a survey of Alabama auto plant workers and related sources, we study the incidence of incarcerated labor in Hyundai's U.S. supply chain.

- In the survey, those working in the Hyundai supply chain in Alabama report earning 10-15% less than other auto supply chain workers in the state, even after accounting for education, race, gender, and age.

- Workers in Hyundai's supply chain also report more safety hazards and more frequent negative experiences such as wage theft, forced overtime, harassment, and lack of breaks, compared to other auto supply chain workers in Alabama.

- In the Montgomery area, where Hyundai suppliers are concentrated, auto supplier wages are 7-9% lower than expected compared to similar jobs elsewhere in Alabama and nearby states. One contributor to these disparities appears to be Hyundai's use of prison labor. Multiple Hyundai-linked suppliers employ workers from Alabama's prison work release program, with prison labor especially concentrated in auto parts manufacturing in Montgomery.

- We find that a 10% increase in the share of incarcerated workers in a plant is associated with a 10-14% drop in wages for free workers. We find evidence that this is explained by the fact that incarcerated workers are far less likely to quit over low pay due to coercive prison conditions, which gives employers leverage to lower wages and working conditions for all their employees.

01. Introduction

In this report, we first document the wages and working conditions of those working in the Hyundai supply chain in Alabama. We estimate that Hyundai supply chain workers are paid between 7% and 15% less than their counterparts elsewhere in the state. We also find that Hyundai supply chain workers are more exposed to occupational hazards and bad employment practices, such as wage theft.

We then draw on our complementary academic research in Helper et al. (2025) to explore one contributing factor to the lower wages facing Hyundai supply-chain workers: Hyundai suppliers' use of coerced labor. In particular, we study the incidence of Hyundai's use of prisoners in the Alabama Department of Corrections (ADOC) work release program. In our academic paper, we find that a 10% increase in the share of incarcerated workers in a plant is associated with a 10-14% drop in wages for free workers. This may be explained by the fact that incarcerated workers are far less likely to quit over low pay due to coercive prison conditions, which gives employers leverage to lower wages and working conditions for all workers. We present largely graphical evidence drawn from that paper here, and refer readers interested in the econometric and structural modeling details to Helper et al. (2025).

Hyundai's use of coerced labor extends beyond the prison as well. We conclude with evidence that Hyundai suppliers in Alabama have made use of child workers and migrant workers, for whom similarly coercive dynamics likely apply, and which similarly drive down wages and working conditions for all.

02. Background

Hyundai Motor America, a subsidiary of Hyundai Motor Company of Korea, began operations in Montgomery, Alabama, in 2005 with the opening of Hyundai Motor Manufacturing Alabama (HMMA).[3] Today, Hyundai is the largest manufacturing employer in Montgomery, producing approximately 360,000 vehicles and 500,000 engines every year. HMMA directly employs about 4,200 workers,[4] and another 6,000 work in the Hyundai supply chain nearby.[5]

Hyundai's Alabama operations are in many ways emblematic of larger changes to the U.S. auto industry. Historically, auto assembly workers were the highest paid manufacturing workers in the U.S., due to high unionization rates and the

highly choreographed nature of production, which means that an auto assembly plant line stoppage can cost an automaker more than $10,000 per minute in lost profits.

Automakers have sought to reduce their dependence on such highly paid workers, both by contracting with outside suppliers and by moving to regions where workers tend to be paid less. The industry once concentrated along the Great Lakes, especially in Michigan and Ohio. Since the mid-1990s, however, it has moved South. The South attracted auto companies like Hyundai because of relatively low wages prevailing in the region; a lack of regulation; and state "right-to-work" laws, which mean a worker can opt out of paying union dues even while benefiting from a collective bargaining agreement.[6]

Southern states also provided large financial incentives to foreign auto companies to attract investment. In 2002, Alabama offered $234.6 million (more than $425 million in 2025 dollars) in state and local incentives to attract Hyundai to Montgomery. All told, since 1993, Alabama has provided more than $2 billion (in 2025 dollars) to the four major automobile companies manufacturing in the state.[7] Based on estimates of direct job creation at these plants, such incentives amount to approximately $300,000 in tax breaks for every job created.

What kinds of jobs has Hyundai created in Alabama? In South Korea, where Hyundai is headquartered, the company's workforce is represented by the Hyundai Motor Union, a strong and active labor organization that has long been considered integral to the country's democratic life.[8] In the Southern United States, however, union avoidance is key to its business model. Indeed, one advantage that the company saw in Alabama was the absence of a similar history of labor activism, a "flexible labor market and the lack of adversarial labor relations," according to two scholars of the company, which "enabled HMMA to more efficiently operate its work organization than at the original plants in South Korea" (Jo and You, 2011, p. 43).

Such flexibility has come with a high cost for workers. As Peter Waldman of Bloomberg reported in 2017, occupational injury rates across Southern automobile suppliers are far higher than among their Northern counterparts. In 2015, "the chances of losing a finger or limb in an Alabama parts factory was double the amputation risk nationally for the industry."[9] Between 2012 and 2016, he reports, Korean-owned suppliers – those providing parts to Hyundai and Kia – had the highest rate of safety violations in the state.[10]

03. Data

In April 2024, Jobs to Move America (JMA) contacted our research team about its intention to survey auto manufacturing production workers in Alabama. We provided advice to JMA staff about how to structure survey questions that would allow for the estimation of wages and working conditions in the industry, as well as the estimation of firm-specific labor supply elasticities for incarcerated and non-incarcerated workers. We also provided advice about how to recruit a representative sample of respondents, and answered questions that arose for them as they fielded the survey.

Between August and December of 2024, JMA collected survey data using three primary channels of sample recruitment: in-person visits to auto manufacturing plants; online recruitment via Facebook and Instagram ads targeting Alabama auto workers; and a paper mailing to individuals incarcerated in work release centers. JMA staff collected the survey data primarily via in-person visits to dozens of Alabama auto manufacturing plants, concentrating their efforts in Southern Alabama. They approached workers outside plants on breaks and near shift changes, asking them to fill out the survey on a JMA tablet or their phone by following a QR code on a flyer. They also invited respondents to take a few flyers with them back into the plants to encourage co-workers to respond. Respondents at plants included both free and incarcerated workers. JMA also recruited respondents online via Meta's targeted ads, targeting Alabama auto manufacturing workers in recruitment and then screening respondents based on whether they named a real auto manufacturing plant as their place of work. Finally, using a public list of ADOC work release facility residents, JMA mailed a paper survey, along with a return envelope, to a sample of inmates. Some reported working outside the auto manufacturing industry and they were excluded from the sample when we analyze auto suppliers below (although they are kept for the within-worker survey experiment analysis). For each completed and validated survey, JMA sent a $25 gift card to the email address of each respondent's choice.

The research team obtained de-identified, secondary survey data collected by Jobs to Move America (JMA) and independently analyzed it. The research team checked representativeness by comparing the data to publicly available data from the U.S. Current Population Survey, described below, and verified that the survey collection protocols were adequate to obtain a reliable sample of auto plant workers in the area. While the survey is not a random sample, it lines up on many dimensions with a representative sample, and is a valuable lens into working conditions in a difficult-to-study context.

The survey measured key variables for each worker. First, it asked, “How much does your employer pay for each **hour** of your work, before taxes and deductions (gross pay)? Please enter a number below.” This *gross hourly wage* (w) question was followed immediately by one asking net pay, after taxes and deductions, in order to distinguish gross from net in the respondent's mind. The model and the subsequent hypothetical wage cut questions all focus on w.

Next, the survey asked a set of questions about each subject's likelihood of quitting their job in response to different hypothetical wage cuts. These questions had two types and two variants of each type. Percent-cut type questions were asked only on the web survey because they used dynamic adjustment to fill in values specific to the person's reported w. A 10% cut question asked, “First, if your gross pay decreased from \$$w$ to \$(0.9 x w) an hour, how likely would you be to stop working at your current job or actively look for another job? (Gross pay means pay before fees or deductions).” The four response options were Very likely, Likely, Not very likely, and Not at all likely. A second percent-cut type question followed the same structure but asked about a 20% cut. Some surveys were administered on paper, preventing use of dynamic adjustment and percent-cut type questions. These surveys used dollar-cut type questions, “If your gross pay decreased by \$2 an hour, ...” for \$2 and \$4 cuts. The web survey also included these two variants of the dollar-cut type questions after the percent-cut type questions.

Next, each worker reported their own incarceration status, responding Yes or No to, “Are you currently on a work release program?” The survey asked the name and address of the plant as a free response. JMA harmonized these to a plant name and street address. Finally, respondents reported race, ethnicity, gender, educational attainment, whether they were ever previously incarcerated, and other information about working conditions. The analytic sample of 635 auto workers includes respondents with complete wage, incarceration status, plant, and hypothetical wage-cut response data. Of these, 567 respondents were recruited at a plant, 51 online, and 17 filled out a paper survey, which JMA then inputted to the web survey.

Table 1 displays summary statistics for the analytic sample by incarceration status (Columns 1 and 2). Of the analytic sample, 87% report not being on work release (free-world) and 13% reported being on work release (incarcerated). Gross hourly wages averaged \$18.61 in the overall sample with a standard deviation of \$7.47. Incarcerated respondents' wages averaged less than free respondents'. While Alabama's comparable-pay law forbids within-plant wage differences between similar free and incarcerated workers, across-plant wage differences are unrestricted. The Appendix in Helper et al. (2025) presents evidence that within-plant differences between free and incarcerated workers are small and insignificant. Incarcerated auto workers were more likely to be white (26%) than not-incarcerated workers (14%) and much more likely to be male (87%) than non-incarcerated workers (51%). Incarcerated workers were much more likely not to have a high school degree (27%) than non-incarcerated workers (11%).

Table 1: Summary Statistics by Incarceration Status with CPS Comparison

	Incarcerated	Non-Incarcerated	2024 CPS
N	86	590	37
Hourly Wage	14.32 (5.49)	19.24 (7.51)	18.84 (6.27)
White	0.26 (0.44)	0.14 (0.35)	0.30 (0.47)
Female	0.13 (0.34)	0.49 (0.50)	0.46 (0.50)
Age	40.97 (13.75)	35.64 (11.84)	39.32 (13.83)
Educ.			
Less than HS	23 (26.7%)	66 (11.3%)	2 (6.5%)
HS	34 (39.5%)	334 (57.0%)	18 (48.9%)
Some college	26 (30.2%)	151 (25.8%)	9 (24.4%)
BA+	3 (3.5%)	35 (6.0%)	7 (20.1%)

Standard deviations or percentages in parentheses.

For evidence on the survey's validity, we compare it against an analogous sample from a nationally-representative, official workforce survey, the U.S. Bureau of Labor Statistics Current Population Survey (CPS). For comparability, we restrict the CPS sample to employees in Alabama's auto manufacturing industry, in production occupations, in 2024.[11] In the CPS, 37 cases meet these filters. The CPS sample is statewide while the JMA survey draws mostly (though not entirely) from Southern Alabama. Column 3 displays summary statistics for the CPS sample. The CPS excludes institutionalized people, so is comparable to the not-incarcerated survey sample (Column 2). Average wages, share female, and age are quite similar. Averages on the other variables differ a bit. ADOC publishes online the race of each incarcerated resident of its work release facilities but without differentiating by work site. Our analysis of ADOC data found that 40% were white, higher than the 26% in the JMA survey, suggesting there may be racial differences among work release workers in their tendency to work in auto plants.

04. Hyundai Suppliers

Each car contains about 30,000 parts. The final assembly plants belonging to the branded automakers, like Hyundai, take in parts produced and aggregated by different “tiers” of suppliers. Overall, approximately 1 million workers are employed in auto manufacturing in the United States, and over half of these are employed in the parts manufacturing, or suppliers, sector.[12]

HYUNDAI

We identified a firm as a Hyundai supplier if it was identified as such on at least one of the following three sources: the firm's own website (as of June 25, 2025); a list maintained by the Economic Development Partnership of Alabama; a nonprofit that supports business recruitment,[13] and/or in articles on the website of the Alabama Department of Commerce.[14]

We begin by comparing the wages of (non-incarcerated) workers in Hyundai's supply chain to other (non-incarcerated) auto supply chain workers in Alabama. We use two separate approaches. First, we use JMA survey data to directly compare the wages of those who report working in plants that supply Hyundai against those working in plants that supply other automakers in Alabama. Second, we make use of the fact that those working in the Hyundai supply chain are concentrated in the Montgomery area, while those working in the supply chain for other automakers in Alabama are concentrated elsewhere. We use Quarterly Workforce Indicators data to compare wages across these different regions, using a difference-in-differences strategy that adjusts for potential differences in costs-of-living.

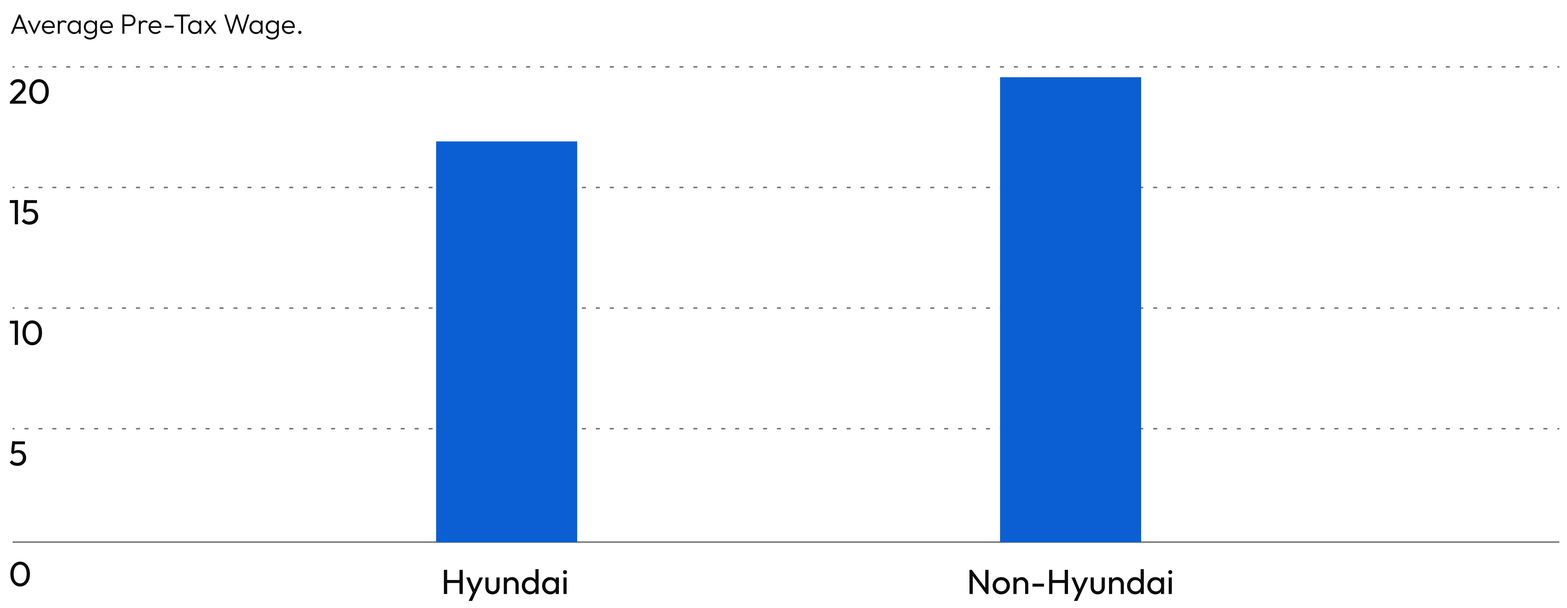
04.01 The Hyundai Supplier Wage Penalty

Based on data from the JMA survey, Figure 1 shows that workers in the Hyundai supply chain report wages that are approximately 15 percent lower than other auto supply chain workers in Alabama. After adjusting for race, education, gender, and age, wages among Hyundai supply chain workers remain approximately 10 percent lower than other auto supply chain workers.

It is possible that Hyundai's wage differential is explained by other characteristics of the jobs. For example, a job that has fewer health and safety issues or better working conditions can recruit and retain workers despite paying lower wages, owing to these offsetting non-pecuniary differences (compensating differentials). We explore this possibility, but find no support for it.

First, the Bloomberg article cited in the Introduction finds very high rates of injury among Hyundai supply chain workers. Second, the JMA survey asked about a large number of workplace characteristics beyond the wage. It asked about 11 occupational safety and health measures, and 13 types of negative workplace experiences. Figures 2 and 3 show the raw average differences between workers at Hyundai and non-Hyundai suppliers on counts of these two indexed outcomes, with regression-adjusted results presented in the

Figure 1: Wage Difference Between Hyundai and Non-Hyundai Auto Suppliers



Restricted to non-incarcerated workers in non-assembly plants in sample. Simple difference = -2.66(1.00). Difference adjusting for education, age, gender and race = -1.82(0.98), N= 422.

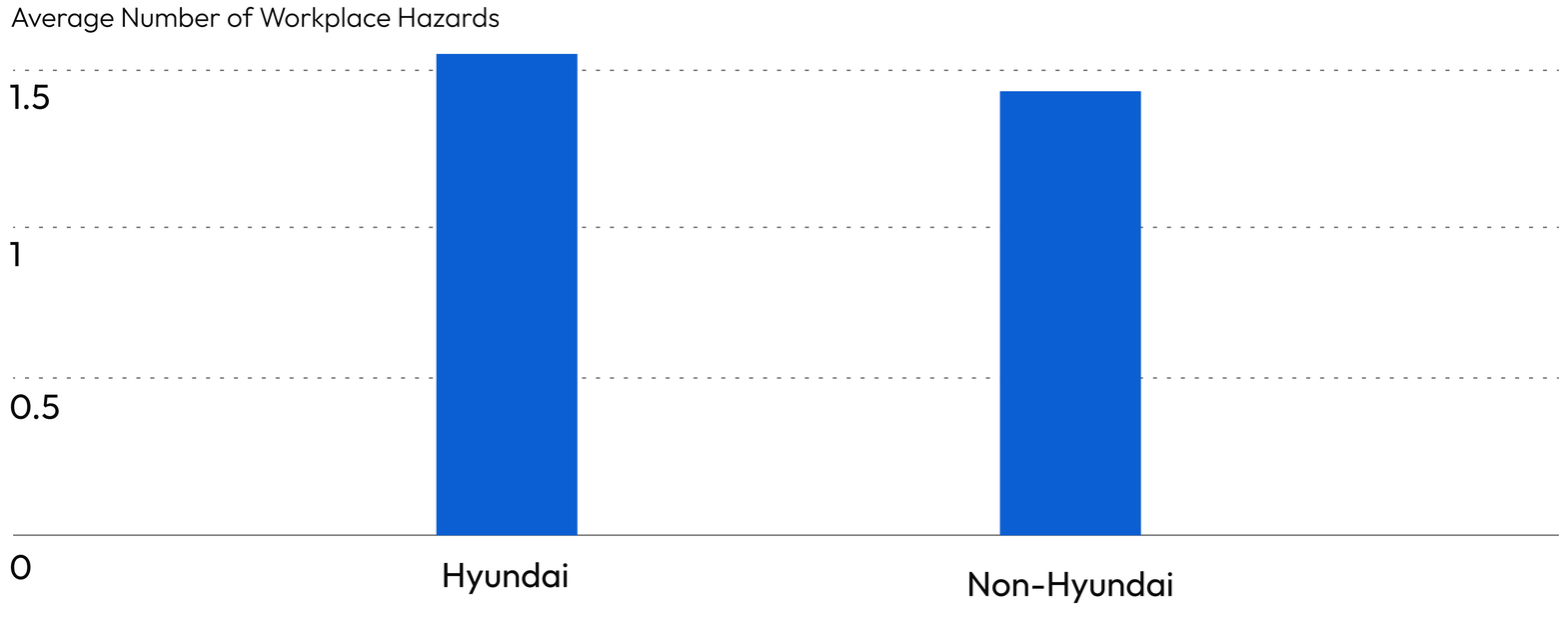
notes. In both cases, Hyundai suppliers are worse, with higher counts of occupational health and safety problems and higher counts of negative workplace experiences. In the case of occupational health and safety problems, these differences are insignificant when unadjusted, but become significant when controlling for worker demographics. In the case of negative workplace experiences, the differences are statistically significant whether or not demographics are controlled for. This suggests that Hyundai's wage penalty is not explained by better workplace conditions. Indeed, the non-pecuniary workplace characteristics seem to be worse at Hyundai as well.[15]

04.02 Auto Supplier Wages in Montgomery

The JMA survey allows us to compare workers in the Hyundai supply chain with other auto supply chain workers, mostly within the same region of Alabama. As a complementary piece of evidence, we use administrative data to test whether average wages in the auto supply chain in the Montgomery area – where Hyundai suppliers are concentrated – are lower than expected compared to elsewhere in the state, using a difference-in-differences approach. Specifically, we compare the log wage gap between workers in the auto supply chain (Motor Vehicle Parts Manufacturing = NAICS 3363 and adding Motor Vehicle Body and Trailer Manufacturing = NAICS 3362 in some models for a robustness check) and those in a comparison industry that does not use incarcerated labor in the Montgomery area, to the wage gap between the same industries elsewhere in Alabama and in the neighboring states: Georgia, Mississippi, and Tennessee. We use QWI data on multi-county workforce investment regions as the geographic area of analysis. Workforce investment region avoids data censoring from disclosure

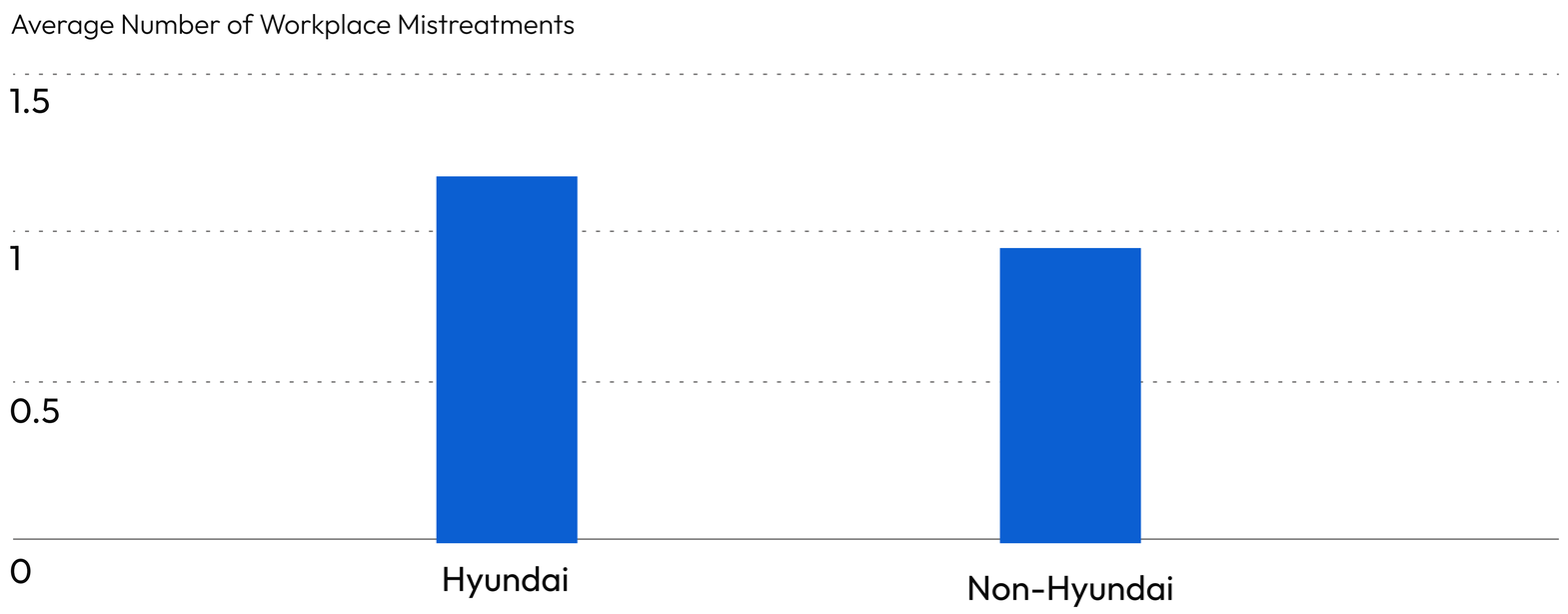
limits in small counties while still enabling separate measurement of the Montgomery area versus the rest of Alabama.[16]

Figure 2: Health and Safety Differences Between Workers at Hyundai and Non-Hyundai Auto Suppliers



Restricted to non-incarcerated workers in non-assembly plants in sample. Simple difference = 0.12(0.18).
Difference adjusting for education, age, gender and race = 0.33(0.20), N= 422.

Figure 3: Negative Workplace Experience Differences Between Workers at Hyundai and Non-Hyundai Auto Suppliers



Restricted to non-incarcerated workers in non-assembly plants in sample. Simple difference = .023(.018).
Difference adjusting for education, age, gender and race = 0.32(0.18), N = 422.

In choosing a comparison industry, we selected a variety of industries that do not use incarcerated labor in the Montgomery area. Otherwise, its wage level would potentially also reflect wage suppression from employer access to incarcerated labor. First, we compare against only auto assembly plants (Motor Vehicle Manufacturing = NAICS 3361). Car brands operate these plants directly, taking in supplied parts and producing finished vehicles. Auto assembly plants are a good comparison because they are in the same auto manufacturing sector as auto parts manufacturing but tend to avoid the use of incarcerated labor due to heightened brand reputation risk. However, auto assembly plants usually pay more than do parts plants, due to factors such as their greater capital intensity and higher degree of unionization. Our analysis examines whether usage of prison labor affects the size of this pay differential. We also probed robustness to a wider set of comparison industries.

In Helper et al. (2025) we analyze region-industry-quarter data on average monthly earnings for stable employees in the private-sector with observations weighted by such employment from 2020 Q1 to 2024 Q3. We find that average wages are estimated as being 7% to 9% lower in the Montgomery area auto supply chain industry than would be expected based on wages in Montgomery area's auto assembly industry and the supply versus assembly wage gap in nearby regions, though this estimated difference is only marginally statistically significant. A 7% reduction is about -$390 a month in 2024 dollars.[17] Adding a wider set of comparison industries unlikely to employ incarcerated labor in order to define the wage gap yields substantively similar estimates that are highly significant statistically.

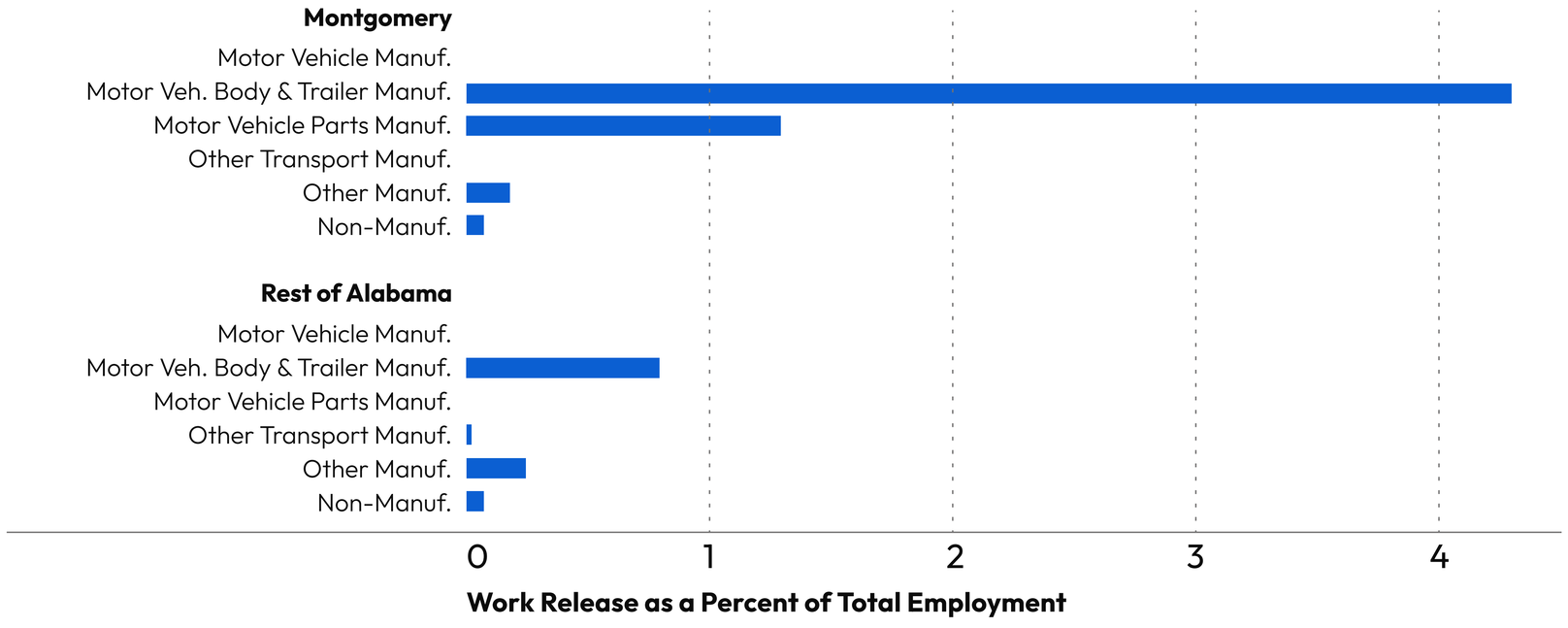
05. How Prison Labor May Lower Wages

The lower wages and poor working conditions in Hyundai's supply chain may partly be explained by suppliers' use of incarcerated labor. While the focus of this report is incarcerated workers, in the conclusion we discuss anecdotal reports that Hyundai is using other types of limited mobility workers, such as migrant workers and children, where a similar analysis may apply.

Previous reporting has documented significant use of prison labor in the Hyundai supply chain, through suppliers' contracts with Alabama's work release program.[18] We find evidence that supports this reporting. Work release participants in Alabama are assigned to a wide range of private employers, at the discretion of each facility's job placement manager. Data collected from Freedom of Information Act requests filed by Jobs to Move America (JMA) report the employer for which each work release participant works. To connect these employers to industries, we link employers to Dun & Bradstreet establishment records from Data Axle.

Figure 4 illustrates the use of work release participants as a share of total employment across different Alabama industries, divided by those within and outside of the Montgomery area. While many non-manufacturing employers make use of work release participants, work release participants are overrepresented among auto-suppliers, particularly in the Montgomery area. Moreover, all of the auto suppliers that made use of work release participants during the years covered by the FOIA request (2021-2023) have had a significant supply relationship with Hyundai (Ju-Young, SL, and HS Automotive Alabama).

Figure 4: Share of Alabama Workers on Work Release by Sector and Region



In the following sections, we demonstrate how Hyundai suppliers' use of work release participants may reduce wages for non-incarcerated workers.

05.01 Prison Labor in Alabama History

While the current work release system is a far cry from the 19th century, coerced labor has been integral to Alabama's economy since the state's admission to the Union in 1819, when security for slaveowner property was written into the state's first constitution. Such forced labor was initially independent of the state's criminal justice system. The state did not develop its prison system until the 1840s, as most criminals were held in county jails.

However, with the abolition of slavery, and the exception clause in the 13th Amendment, which permitted slavery and involuntary servitude “as a punishment for crime whereof the party shall have been duly convicted,” the state prison system expanded enormously, and its racial composition transformed from White to Black.

By the early 20th century, the state of Alabama operated the most profitable convict leasing system in the country. Convict leasing was an important source of revenue for the state, and for this reason the state was loathe to abandon it. Alabama would be the last state in the United States to formally do so, in 1928, nine years after the previous state (Florida) and twenty years after Georgia.

In many ways, prison work in Alabama has changed quite a lot since the convict leasing days. The vast majority of those working within Alabama's prisons are engaged in the kind of “prison housework” jobs that are common in prisons around the country: mopping, working the kitchen, mowing the lawn, doing the laundry. Relevant for this report, Alabama also manages eleven “Community-Based Facilities” and “Community Work Centers” around the state, which during the survey period (between August and December of 2024) detained an average of approximately 3,200 people (out of approximately 21,000 total prisoners in the state prison system). These minimum-security facilities house prisoners who work outside of prison walls, either working for the state or for private employers.[20]

In order to participate in work release, an incarcerated person must be classified as being on “Minimum-Community” status, the lowest level of custody in the state correctional system. The “Minimum-Community” status is intended for those incarcerated people

...who have demonstrated the ability to adjust to [a] semi-structured environment and/or those inmates who are nearing the end of their incarceration in order to transition and reintegrate back into the community. Inmates in this custody are allowed gainful employment in the community on a full-time basis and will be supervised in community based [sic] facilities when not working.[21]

Some inmates may benefit post-release from the work experience and reputation they gain via work release employment, but this report focuses on experiences and impacts during work release.

05.02 Violence and Abuse in the Prison

Unlike other forms of coerced labor, like Alabama's historical slave economy and convict leasing system, incarcerated workers are not forced to work for private industry. However, incarcerated workers are often eager to enter the work release system owing to the extreme violence, and general despair, inside the general prison.

The violence is well-documented. In 2019, the Department of Justice initiated its first lawsuit against an entire state prison system under the 1980 Civil Rights of Institutionalized Persons Act (CRIPA), finding reasonable cause that Alabama prisons constituted unconstitutionally cruel and unusual punishment.[22] As it reported, in 2017, the rate of homicide within Alabama's prisons was eight times higher than the average within prisons nationwide[23] – and this was likely an understatement, since investigators discovered several homicides over the course of their investigation that the system had not disclosed. Prisons were bursting at the seams, with an average occupancy rate of 182% across the 13 main facilities, and as high as 320% at Kirby, one maximum-security facility. Meanwhile, staffing rates were dangerously low – facilities were staffed at less than a third of authorized positions[25] – and incarcerated people seemed to feel they had to be responsible for their own protection. Prison staff estimated "that between 50 and 75 percent of incarcerated people were armed with some sort of weapon,"[26] and incarcerated people interviewed at one facility "said that 'everyone' has knives, and prisoners need a weapon to stay alive."[27] In the disciplinary unit of this same facility, incarcerated people reported that "rapes and physical assaults [would] occur in the back of the dormitory, where there are blind spots preventing the line of sight for correctional staff to view activities through the windows." Correctional officers would avoid the disciplinary unit altogether, seemingly out of fear for their own safety, "unless someone is killed and they have to clean up the aftermath."[28] Financial and sexual extortion was rampant, and the drug trade mostly unchecked.

The dangerousness of the state's prison system implies that eligibility for work release, and the assignment to Community Work Centers or Community-Based Facilities, is highly desirable. Work release facilities are much safer than other correctional facilities, with both the absolute number of deaths and the mortality rate an order of magnitude lower than the overall prison system.

The contractual relationship between the private employer and work release participant is somewhat ambiguous. In some ways, work release participants are considered similar to non-incarcerated workers. They work at the employer's establishment alongside non-incarcerated workers, unsupervised by correctional staff, and wearing civilian clothing. Moreover, regulations state that the "[e]mployer must pay for inmate labor in the same manner as for any employee and must comply with applicable requirements established by the Fair Labor Standards Act," and wages must be "equal to that of comparable workers and no less than federal minimum wage."[29]

On the other hand, this employment is entirely mediated by the correctional facility. First, participants do not choose their jobs. They are assigned by a job placement officer to work for particular employers. Employers enter into contracts with the Alabama Department of Corrections rather than with individual work release participants. Second, employers are prohibited from paying prisoners directly. Checks must be payable to both “the inmate and ADOC,” and “[t]he inmate must not be allowed to handle the check.” Work release prisoners are not allowed to be used as strikebreakers, but neither are they permitted to join labor unions.[30]

Third, work release participants see only a fraction of the pay that employers provide, so their net wages are far below non-incarcerated workers'. Of gross salaries paid by employers, normal government deductions take 20%, and ADOC takes another 40%. After miscellaneous fees are deducted (like transportation costs), about 20% of gross wage is disbursed into inmate accounts. The 40% of a work release participant’s pay is fixed by state law and “deducted by the ADOC to assist in defraying the cost of his/her incarceration.” Several other fees apply. For example, participants are required to pay five dollars each day for transportation to a worksite, fifteen dollars a week for laundry, and are compelled to pay a portion of their own medical costs. Prisoners may also be responsible for paying restitution, court costs, attorney fees, or child support.[31]

05.03 Why Alabama Prison Labor Reduces Free-World Wages

We study the effects of employer access to incarcerated labor through the lens of monopsonistic labor markets. The reason that prison labor reduces wages for non-incarcerated workers has to do with the interaction between the monopsonistic nature of the non-incarcerated labor market and the wage-parity constraint, which means that employers must pay incarcerated and non-incarcerated workers comparable wages.

Monopsony is the economics term for an employer who has wage-setting power in the labor market. Just as a monopolist can keep prices high by keeping the supply of a product lower than it would be in a competitive product market, a monopsonist can keep wages low by keeping employment lower than it would be in a competitive labor market. While the term was once reserved for literally a single employer (like a company town), it is now recognized as a term indicating wage-setting power more broadly.

The last 15 years of labor economics has generated a wealth of evidence showing that monopsony is pervasive in the labor market, appearing in all sorts of labor markets, from gig work to manufacturing. We use the term here as used in the economics literature, denoting wage-setting power.

A key measure of monopsony is the labor supply elasticity facing the firm. This measure captures how much employment falls or rises when a firm changes its wage; a higher wage reduces quits and turnover and allows a firm to employ more workers, a lower wage increases those same metrics and decreases a company's employment level. Recent U.S. studies estimate labor supply elasticity between 3 and 6. When the labor supply elasticity is, for example, 4, it implies that a firm can cut wages by 1% and only lose 4% of their employment, giving them significant latitude and incentives to keep wages down. The lower the labor supply elasticity, the more labor market power the employer has to push wages down below the competitive level. The gap between the wage and productivity is called the *markdown*, equal to the inverse of the labor-supply.[32] The labor-supply elasticity is often proxied by (2 times the negative of) the quit elasticity, which directly measures the chance that a worker quits in response to a wage cut.[33]

The Alabama work release system has a job-specific wage parity regulation, requiring that incarcerated workers be paid at the same level as their non-incarcerated counterparts. This *job-level* restriction on wages, together with a degree of monopsony in the non-incarcerated labor market, is what allows employers to make use of coerced labor in ways that drive non-incarcerated wages down. In Helper et al. (2025) we provide direct evidence on wage-parity, showing that the level of wages between incarcerated and non-incarcerated workers are not statistically different from each other within specific plants.

We find, unsurprisingly, that incarcerated workers are less elastic to wages than non-incarcerated workers (they feel less free to quit jobs in response to a reduction in the wage). The wage parity constraint thus induces employers with access to inelastic incarcerated workers to lower wages for more elastic, non-incarcerated workers doing the same job. Because employers cannot pay the two different types of labor different wages, the incarcerated work force just lowers the overall elasticity of labor supply facing the firm, giving the employer more labor market power, and allowing them to push down the wage for free-workers, knowing that there are incarcerated workers who will stay employed at that wage. For our full economic model, see Helper et al. (2025).

06. Survey Analysis

In Helper et al. (2025), we conduct two levels of analysis to provide complementary evidence on the ways in which the use of incarcerated labor reduces the wages of non-incarcerated workers, looking at variation across both Hyundai and non-Hyundai plants.

First, we study variation across plants, exploring how the average reported wages of non-incarcerated workers is associated with the share of workers from a plant who are incarcerated. Second, we use the hypothetical quit questions on the JMA survey to estimate the labor supply elasticity separately for incarcerated workers and non-incarcerated workers, then interpret these estimates and other information through the lens of a theoretical model to estimate the impact of employer access to incarcerated labor on the worker surplus of non-incarcerated workers.

06.01 Effects of Coerced Workers on Free Workers

We first test whether non-incarcerated workers in plants with a higher share of incarcerated workers have lower wages. To estimate this relationship empirically, we draw on the JMA survey. For each of the 91 auto plants represented in the survey, we observe a share incarcerated and an average gross wage among the non-incarcerated. Nineteen plants have at least one worker who reports being incarcerated.[34] Across plants, the mean incarcerated share is 0.06, with a standard deviation 0.14, and the average non-incarcerated worker wage is $19.13, with a standard deviation of $6.58. Figure 5 illustrates this relationship. Plants are partitioned into equally-sized bins based on the share of workers incarcerated. Each dot's position communicates its bin's average on the two axes' variables, showing that wages tend to be lower where the share of incarcerated workers is higher. The best fit line is displayed. A simple regression based on these 91 observations yields a coefficient of -8.11 (p-value = 0.094). Transforming the variables so that the coefficient in a simple regression yields the elasticity of non-incarcerated average wages with respect to incarcerated worker share produces an elasticity estimate of -0.023 (p-value = 0.086).[35]

Figure 5: Plant Average Non-Incarcerated Worker Gross Wage by Share of Workers Incarcerated in Auto Supplier Plants

Measure of plant, incarceration status, and wage comes from survey.
Dots show non-parametric relationship grouping plants in bins with similar incarcerated-worker shares.
Line shows linear relationship.

We address concerns about omitted variable bias contaminating these regressions. We use a plant's distance to the nearest work release facility as an instrumental variable. An instrumental variable is a variable that is correlated with the independent variable of interest (here, the share of workers in a plant who are incarcerated) but uncorrelated with the error term, so that it affects the dependent variable (here, the average wages of non-incarcerated workers) only through the independent variable. Using an indicator for a plant being less than 5 miles from a facility gives us a strong first-stage (i.e. correlation with share incarcerated).

Using this instrumental variable to address potential confounds yields qualitatively similar, if somewhat larger, estimated coefficients in each model. In the full sample without controls, a 10 percentage point higher plant share of workers incarcerated causes an estimated 0.1556 log point (16%) lower average wage for free workers. The estimated effect is similar when restricting to the subsample of plants with a positive incarcerated share. Adding controls in the full sample yields a similar estimate, a -12% wage effect. All in all, our estimates suggest that a 1 percentage point increase in a plant's share of incarcerated labor decreases hourly wages by between 22 and 30 cents an hour. While our instrumental variable approach reduces some concerns about omitted variables, we acknowledge there could be failures of the required exclusion restriction, as plants closer to work release facilities may have lower wages for other reasons we are unable to measure, such as low productivity.

06. Quit Elasticities of Incarcerated Workers

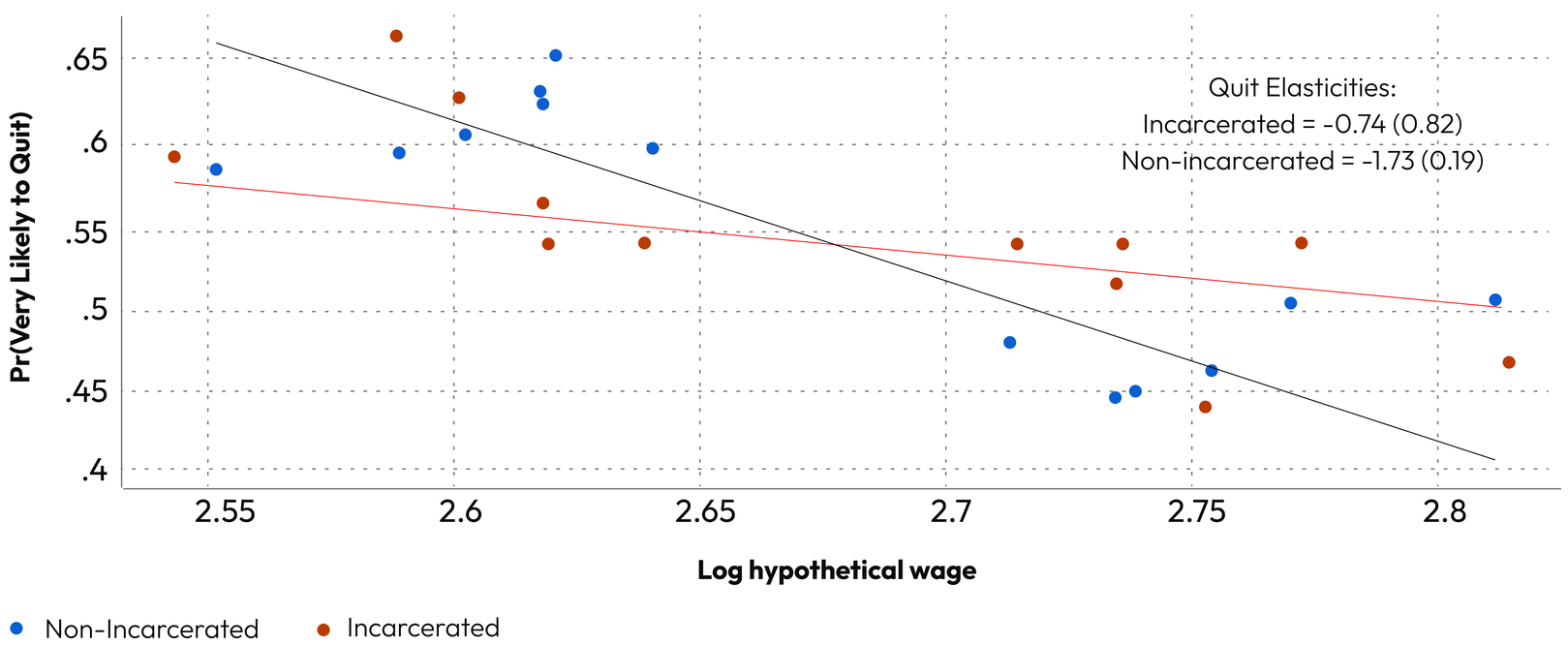
The JMA survey experiment enables us to estimate the elasticity of labor supply for non-incarcerated and incarcerated workers. In a steady state, firm labor supply elasticity is -2 times firm quit elasticity (Manning, 2013). The survey data is informative about the quit elasticity in each employee subsample. The survey asks workers their probability of quitting in response to a set of hypothetical outside options. We interpret a response of “Very likely” as a proxy for quit and other responses as a proxy for no-quit.

Figure 6 illustrates how random variation in the log of the hypothetical wage offer affects the share of respondents in each incarceration status group who say they would quit, and how the sensitivity of quits to the wage differs across groups. First, we flexibly describe the relationships. After adjusting responses to focus only on variation across question within person and question type, each group's observations (178 for incarcerated and 2,318 for non-incarcerated) are partitioned into multiple, evenly-sized bins based on the hypothetical wage offer (in natural logs to facilitate interpretation as a percent change). A dot displays each bin's mean log hypothetical wage against its quit share. Each group's best fit line is also displayed.

As displayed here, incarcerated workers are much less responsive to wage changes than non-incarcerated workers, meaning that they have a much lower quit elasticity. In other words, incarcerated workers report being far less able to quit in response to lower pay. In Helper et al. (2025) we subject these estimates to a battery of robustness checks; the difference in quit elasticities between incarcerated and non-incarcerated workers remains positive and significant.

Recall that labor supply elasticities are roughly -2 times the quit elasticities, so the quit elasticities translate in labor-supply elasticities of 3.44 for non-incarcerated and 0.66 for incarcerated workers. The estimate for non-incarcerated workers is consistent with estimates from the literature. For example, in a meta-analysis, Sokolova and Sorensen (2021) report a preferred labor-supply elasticity of 4. An estimate for incarcerated workers is novel, and consistent with other estimates of monopsony in coercive contexts. For instance, Naidu, Nyarko and Wang (2016), looking at migrant workers in the UAE, find virtually no separations outside of contract expirations, and a labor-supply elasticity to the firm of 1 at contract expiration (prior to a mobility-increasing reform).

Figure 6: Sensitivity of Worker Quit Likelihood to Hypothetical Wage by Worker Incarceration Status



Residual relationship conditional on worker by question type fixed effects.

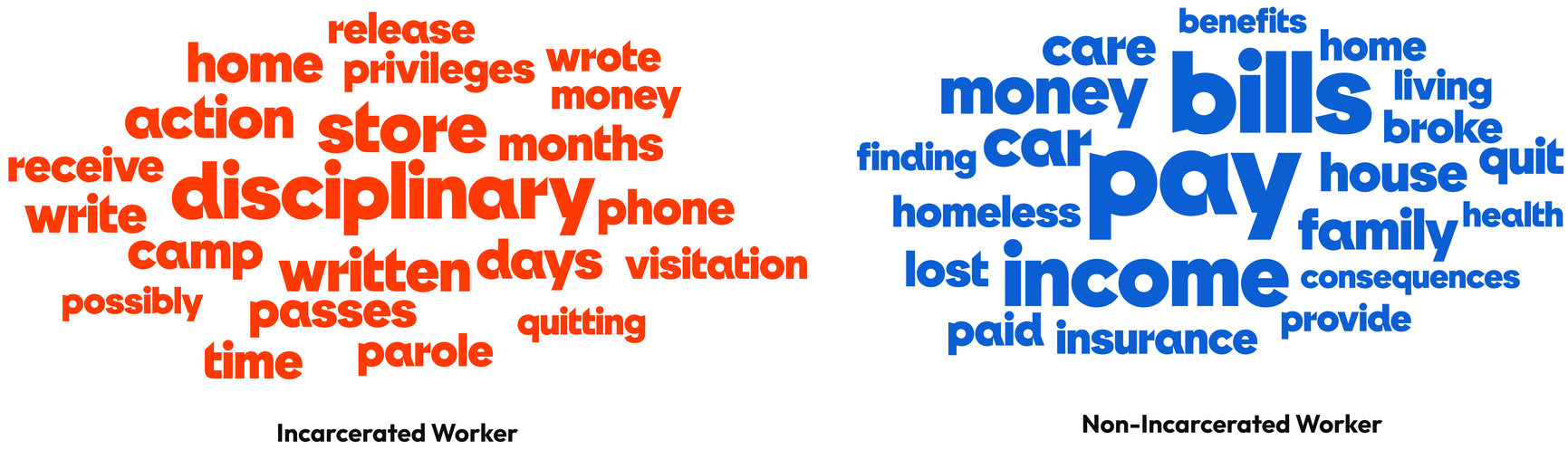
We find additional, descriptive evidence that while non-incarcerated workers feel more free to leave their jobs than incarcerated workers, non-incarcerated workers also feel constrained about their quit decisions.

The JMA survey included two questions about respondents' perceptions of their freedom to leave their jobs. First, as discussed above, it included a measure of subjective freedom to leave. Second, the survey asked the open-ended question, “If you decided to stop working at this job, what would the consequences be?”

Among both incarcerated workers and non-incarcerated workers, the modal response to how free workers felt to leave their jobs was “Not free at all.” However, while the mean response among incarcerated workers (on a scale from 1 to 4, with 1 being “Not free at all” and 4 being “Very free”) was 1.92, the mean response among non-incarcerated workers was 2.26, a difference of 0.34, or 0.3 of a standard deviation.

Figure 7 displays the words used most frequently in respondents' open-ended answers about the consequences of leaving their jobs, divided by incarcerated and non-incarcerated status. As seen in this figure, incarcerated workers tend to worry about the disciplinary consequences of leaving their jobs – being written up, losing privileges (such as weekend visitation), and possibly being sent back to a more restrictive prison environment. Non-incarcerated workers, on the other hand, tend to discus the financial implications of leaving their jobs – how they would risk being unable to pay their bills and feed their families. While the hypothetical quit elasticities do suggest the free-world workers are more readily able to leave their jobs in response to better opportunities, the difference is not quantitatively overwhelming, and the obstacles to job mobility for free-world workers remain substantial. Both free and incarcerated workers face significant monopsony power in the labor market.

Figure 7: Common Words for Incarcerated and Non-Incarcerated Workers, "If you left job"



Quantitative Counterfactual: In Helper et al. (2025) we build and estimate a quantitative economic model of employment in imperfectly competitive labor markets. The model has employers using both incarcerated and free-world workers. Incarcerated workers bear both a payroll tax (40% of their wages are garnished by ADOC) as well as the threat of physical harm if unemployed, and these forces translate, in the model, to a much lower elasticity of labor supply than free-world workers. The wage-parity constraint then implies that incarcerated workers lower the wages of free workers. We estimate how reforms would affect the well-being of both free and incarcerated workers, looking at both limited and system-wide reforms, and find that eliminating incarcerated workers' payroll tax would generate the largest welfare gain to both.

07. Conclusion

Those who work in the Hyundai supply chain report lower wages and poorer working conditions than their counterparts elsewhere in the state. We have offered one potential explanation for this pattern: the use of prison labor in Hyundai's supply chain. Alabama auto exporters in the Montgomery area – most of whom supply parts to Hyundai – make extensive use of incarcerated work release workers, and the wage-parity regulation gives employers an incentive to lower all workers wages, knowing that incarcerated workers are much less likely to quit.

While prison labor is the focus of this report, the Hyundai supply chain uses other forms of captive labor that likely also drive down wages and working conditions in Alabama. For instance, Reuters has reported on the Hyundai supply chain's extensive use of child labor in the state.[36] At least four major Hyundai suppliers in the state had violated child labor laws, Reuters reported, and an additional six suppliers were under investigation by state and federal agencies. Children as young as 12 had been employed in parts manufacturing plants.

There are also allegations that Hyundai suppliers make fraudulent use of Trade NAFTA (TN) visas to hire Mexican workers in auto assembly plants. Under this scheme, staffing agencies working for Hyundai suppliers would hire Mexican engineers and technicians with the promise of professional jobs in the United States, for which the TN visas were designed.[37] Once in the United States, these workers allegedly would be assigned to the auto parts production line and paid wages lower than their U.S. citizen counterparts.[38]

Amid the bipartisan policy discussion around raising the share of U.S. employment in manufacturing, the analysis shows that whether manufacturing jobs are “good” depends crucially on the institutional context in which it takes place. Previous work has shown the use of coercion in manufacturing jobs iin the 19th century, its historical use in agriculture and mining, and its prevalence under conflict-ridden and authoritarian regimes. The analysis suggests that the high-tech supply chains of American automotives will use coercive labor market institutions if available, with negative impacts both on those who are coerced and on the broader labor market within which the coercion takes place.

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Endnotes

[3] https://www.hmmausa.com/hyundai-motor-manufacturing-alabama-celebrates-20-year-production-anniversary/

[4] Alabama's auto industry keeps rolling, although potholes might be forming — https:/businessalabama.com/spotlight-on-montgomery-county-economic-engines-2/; https://www.madeinalabama.com/2025/05/hyundai-workers-celebrate-20th-anniversity-milestone-of-alabama-manufactuirng-facility/; https://www.hyundainews.com/assets/documents/original/57081-EconomicContributionStudyofHyundaiMotorAmericasUSOperations.pdf

[5] See page 40 of https://www.hyundainews.com/assets/documents/original/57081-EconomicContributionStudyofHyundaiMotorAmericasUSOperations.pdf. The 6,000 employees = 6,950 "intermediate employment" minus 900 employed at Hyundai dealerships.

[6] https://www.nytimes.com/2005/06/22/automobiles/foreign-makers-settled-in-southpace-car-industry.html; See also Helper and Henderson (2014) and Alder, Lagakos and Ohanian (2023).

[7] https://assets-businessalabama-com.s3.amazonaws.com/uploads/2018/08/Incentives.pdf; https://www.wsj.com/articles/toyota-mazda-offered-at-least-700-million-incentive-package-for-alabama-plant-1515725918?gaa_at=eafs&gaa_n=ASWzDAgOE-IzyD-YZdSwRihY1A6iVfGux0_r-jOW2IJDnzFYv7yM_jbElmtH&gaa_sig=70UJw1vhrd5Cj1N2PKb7lFbbSla6TMyyGW9wwfvVF2bvSw4s72R1T304oqE7-5lWFwitvghR0InTOmT4vCL8Cw%3D%3D&gaa_ts=687d8b8f

[8] https://www.nytimes.com/2006/07/27/business/worldbusiness/27won.html

[9] www.bloomberg.com/news/features/2017-03-23/inside-alabama-s-auto-jobs-boom-cheap-wages-little-training-crushed-limbs

[10] Ibid.

[11] CPS data from IPUMS with ind1990 = 351 (Motor vehicles and motor vehicle equipment) and occ 1990 in 703-799 using earner weights (Flood et al., 2023).

[12] Automotive Industry: Employment, Earnings, and Hours: US Bureau of Labor Statistics.

[13] https://edpa.org/wp-content/uploads/2022/04/Hyunda-Suppliers-Alabama.pdf

[14] https://www.madeinalabama.com

[15] The 13 negative workplace experiences asked about with respect to the prior 12 months were: "My pay was too low," "I was not paid for all the hours I worked," "I was forced to work off the clock," "I was not paid for overtime," "I was forced to work overtime without enough notice," "I was not paid on time," "Improper deductions were made from my paycheck," "I worked in dangerous conditions," "I was discriminated against," "I was abused or harassed by a supervisor," "I was abused or harassed by a coworker," "I was denied breaks, or not given sufficient break time," and "I was not given enough notice for a shift or schedule change" presented along with the option of "None of the above." The 11 health and safety conditions asked about with respect to the prior 12 months were: "I've interacted with hazardous chemicals," "I've been exposed to electrical hazards," "I've used outdated or faulty equipment," "I've operated heavy machinery," "I've lifted heavy objects by myself or without enough support," "I've been exposed to uncomfortably high temperatures," "I've done repetitive movements such as packing, sorting, assembling, cleaning, pulling, pushing, etc.," "I've used obstructed or unsafe walkways," "I've worked at heights over two feet above the ground," "I've worked in a bent, twisted, awkward, or otherwise uncomfortable position," and "I've been exposed to noises so loud I had to raise my voice to be heard."

[16] Alabama Workforce Investment Regions 5 and 6 are used to measure the Montgomery area. Only those two regions have a majority of their counties in the Montgomery area. All Georgia, Mississippi, and Tennessee regions and Alabama regions with no counties in the Montgomery area are considered untreated, as are Alabama workforce investment regions with only a minority of their counties in the Montgomery area. This is conservative. The partial treatment of Alabama regions 3, 4, and 7 in control diminishes the treatment-control contrast.

[17] QWI has only data from the first two quarters of 2024 available. Average monthly earnings among full-quarter employees in 2024H1 in the Montgomery area auto supply industry (NAICS 3363) are $5,554. Using the average wage in the survey as representing the 7% reduction implies a loss of $1.42 per hour.

[18] Alabama Prison Labor Program Faces Legal Challenges - The New York Times https://www.nytimes.com/2024/10/26/business/economy/prison-labor-alabama-hyundai.html

[19] Beginning in the 1880s, the state entered into a long-term contract with the Tennessee Coal and Iron Company (TCI), later known as U.S. Steel, to build and operate prisons that doubled as work camps for the company's mines (McCarthy and McCarthy Jr, 1984, p. 190). In 1887, Commissioner of Labor Carroll Wright – generally a critic of convict leasing – had seemed to make an exception for Alabama's system. In Alabama, he argued that most of those incarcerated people involved in the system were "negroes of low class. . . [who] benefited by regular work," and pointed out that mine owners could not be profitable without convict labor helping to lower the wage. This was not only because convict labor drove down the wage directly, but also because it served as a potent threat against labor organization. As one executive of Tennessee Coal and Iron put it in 1892, "For some years after we began the convict labor system. . . we found that we were right in calculating that free laborers would be loath to enter upon strikes when they saw that the company was amply provided with convict labor" (Woodward, 1971, p. 233).

[20] Technically, those working for the state are housed in “Community Work Centers,” while those working for private employers are housed in “Community-Based Facilities,” though, in practice, these are nearly always located at the same address. Only those working for private employers are considered as “work release” prisoners. During the survey period, an average of approximately 1,400 prisoners were listed as being housed in “Community-Based Facilities.” See https://doc.alabama.gov/docs/MonthlyRpts/January%202025.pdf

[21] https://doc.alabama.gov/Definitions.aspx

[22] U.S. Department of Justice, Civil Rights Division. 2019. “Investigation of Alabama’s State Prisons for Men.”

[23] Ibid, p. 6.

[24] Ibid, p. 15.

[25] Ibid, p. 9.

[26] Ibid, p. 25.

[27] Ibid, p. 25.

[28] Ibid, p. 27.

[29] https://doc.alabama.gov/docs/AdminRegs/AR410.pdf

[30] Ibid.

[31] Ibid.

[32] A very competitive labor market, with an elasticity of 10, would imply that workers got over 90% of their marginal product, while a more realistic labor market, with an elasticity of 4, would imply that workers got 80% of their marginal product

[33] See Naidu and Carr (2022) for an accessible introduction to monopsony in the labor market, and Azar and Marinescu (2024) for an overview of the recent economics literature, and Naidu, Posner and Weyl (2018) for antitrust remedies.

[34.] This number is much higher than the number of such plants represented in ADOC administrative data accessed byJMA via FOIA and shared with researchers. A possible explanation is that individuals in post-incarceration programs run by state contractors might report they are incarcerated. Many of these programs require participants to reside in their own facilities and restrict participants’ movements during certain off-work hours.

[35].The outcome is the natural log of average plant free-worker wage and the predictor is plant share of workers incarcerated over the mean share across plants. Correcting measurement error from small samples in some plants strengthens the results.

[36] https://www.reuters.com/world/us/exclusive-hyundai-subsidiary-has-used-child-labor-alabama-factory-2022-07-22/; https://www.reuters.com/investigates/special-report/usa-immigration-hyundai/

[37] see Martinez-Lopez v. Glovis, LLC, No. 1:24-cv-02676-JPB-CCB (N.D. Ga. filed June 20, 2024); Heredia, et al. v. Sewon Am. Inc., No. 24-cv-00050-TCB-RGV (N.D. Ga. filed Mar. 15, 2024); Martinez-Lopez, et al. v. GFA Alabama, et al., No. 3:22-cv-00145-TCB-RGV (N.D. Ga. filed Mar. 20, 2023)

[38] Ibid. On September 4, 2025, ICE conducted a highly publicized raid on Hyundai’s ‘”megasite” in Georgia, which led to the arrest and deportation of hundreds of Korean workers, some but not all of whom were alleged to be employed in violation of their visas. https://www.nytimes.com/2025/09/24/world/asia/south-korea-georgia-hyundai-ice-raid.html

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