Tax Incentives and Labor Market Power: Evidence from China's Value-added Tax Reform.

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Abstract

Using China's manufacturing firm-level data from 1998 to 2007, I measure labor market distortion as the ratio between a firm' s marginal revenue product of labor (MRPL) and wages. Most manufacturing firms operate in a monopsonistic environment, with an average markdown of 2.30, meaning workers earn only 43.47% of their marginal income. Using a difference-in-differences (DID) approach, this paper finds that the 2004 VAT reform increased labor market distortions, particularly in high-productivity, capital-intensive, and older firms, where workers received a smaller share of MRPL. The reform' s capital deductions favored capital over labor, weakening workers' bargaining power and deepening labor market inequalities, despite stimulating investment. **Key words:** VAT tax reform; labor market distortion; wage

1 Introduction

In recent decades, fiscal policy has increasingly focused on the use of tax incentives to stimulate economic growth and investment, particularly in developing economies (Wang et al., 2021; Liu and Lu, 2015). However, a growing research has noted the potential unintended consequences of such incentives on labor markets, particularly the distortion of labor' s share in output (Berger et al., 2022). Most research has linked declining labor shares to structural economic changes, including shifts in taxation policies, but the exact mechanisms through which tax incentives affect labor market dynamics remain unclear. This paper contributes to the ongoing debate by examining how tax incentives, specifically value-added tax (VAT) reform, impact firm-level labor market distortions through the lens of labor market power.

While previous studies have extensively explored how tax reforms influence investment, productivity, and overall economic performance (e.g., Chen et al. (2021); Dechezleprêtre et al. (2023)), fewer have examined their effects on labor market outcomes at the micro level, particularly the division of economic gains between labor and capital. However, these analyses often assume competitive labor markets, overlooking the growing evidence of imperfect competition

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and monopsony power held by firms in many labor markets. Recent advancements in labor economics have introduced models of imperfect competition, where firms exert monopsonistic or oligopsonistic control over wages (Manning, 2003; Azar and Marinescu, 2024), leading to significant wage markdowns. This paper builds on these newer models, analyzing how tax incentives affect labor market distortions by altering firms' market power, ultimately influencing the share of output received by workers.

In this paper, I apply a nonparametric production function approach to measure firm-level oligopsonistic labor-market distortions using China firm-level data from 1998 to 2007 and then examine the impacts of the VAT reform shock on my measured distortion that captures the wedge between the equilibrium marginal revenue product of labor (MRPL) and the wage. The MRPL is estimated from a nonparametric revenue production function in which identification is based on a methodology developed by Gandhi et al. (2020) ,Yeh et al. (2022) and Pham (2023).

In this paper, I find most manufacturing firms operate in a monopsonistic environment, with an average markdown of 2.30, meaning workers earn only 43.47% of their marginal income. Using a difference-in-differences (DID) approach, this paper finds that the 2004 VAT reform increased labor market distortions, particularly in high-productivity, capital-intensive, and older firms, where workers received a smaller share of MRPL. The reform' s capital deductions favored capital over labor, weakening workers' bargaining power and deepening labor market inequalities, despite stimulating investment.

This paper makes two key contributions. First, it assesses the impact of VAT reform on labor market distortions, filling a gap in the literature on tax reform and labor market dynamics. Second, it highlights the differentiated effects of VAT reform by analyzing variations in market power across firms, industries, and regions. The findings offer valuable insights for policymakers, emphasizing the need for tax policies that balance fairness, protect workers' interests, and prevent widening income inequality between labor and capital.

2 Institutional Background:The VAT reform in 2004

The VAT(value-added tax) is a widely-used type of tax. For example, more than 130 countries (including both developed and developing countries) have adopted VAT and raised about 20% or more of their tax revenues from it. A commonly used type of VAT is the consumption type, that is, the tax is levied based on the difference between firms' total sales of their products and their purchases of all inputs (including fixed assets).

Before 2004, China used the production-based VAT system. In this system, investment was not allowed to be deducted from VAT bases, resulting in double taxation on capital goods. Most of the developed countries at the time used a consumption-based VAT system, in which all purchases of capital goods are deductible from the sales of the final product while calculating a firm' s VAT liability .

The production-based tax system increased investment costs and discouraged investment,

causing inequality among firms with different capital structures. The high-tech industry and upgrading industries had to pay heavy tax due to high investment in fixed assets, which weakened the effectiveness of industrial policies and impeded industrial transformation. Although production-based VAT played an important role in preserving government tax revenue and restraining firms' investment in a then overheating economy, it was no longer the optimal tax system from the beginning of the 21st century in China.

To eliminate double taxation and encourage investment, the Chinese government started to shift from production-based VAT to consumption-based VAT. The new VAT regime applied to eight industries1 in three northeastern provinces (i.e., Liaoning, Jilin, and Heilongjiang) from July 1, 2004 onward(table 1).

Table 1: Evolution of the VAT Reform in China

Regions	**Industries Covered**
Liaoning Jilin Heilongjiang	Machine and equipment manufacturing (35, 36, 39, 40, 41, 42)
	Petroleum, chemical, and pharmaceutical manufacturing (25, 26, 27, 28, 29, 30)
	Ferrous and non-ferrous metallurgy (32, 33)
	Agricultural product processing (13, 14, 15, 17, 18, 19, 20, 21, 22)
	Shipbuilding (375)
	Automobile manufacturing (371, 372, 376, 379)
	Selected military and hi-tech products

3 Theoretical Framework

Following the methodology of Yeh et al. (2022), Berger et al. (2022), Hall (1988), and Loecker and Warzynski (2012), this paper measures firms' labor market power by the gap between labor's output elasticity and labor's income share, which reflects both output (product markup) and input (labor markdown). The estimation of labor market bargaining power can be calculated through two approaches.

This paper adopts the production function estimation method and follows the assumptions below:

Assumption 1: Firms follow the cost-minimization principle.

There exists at least one input factor k' that satisfies the following conditions:

Assumption 2: For input k', there are no adjustment costs, i.e., $\Phi_t^{k'}(\cdot,\cdot) = 0$

Assumption 3: Input factor k' is not subject to monopoly power, i.e., $V_{it}^{k'}\left(X_{it}^{k'}\right) = V_{it}^{k'}$

Assumption 4: Input factor k' is statically chosen.

Assumption 5: The function $F(\cdot;\omega_{it})$ is continuously differentiable in $X_{it}^{k'}$.

Firms minimize the cost of paying workers, and the firm's input-output must exceed the minimum production requirement to meet the firm's operational basis.

$$\min_{l_{it}\geq 0} w_{it}(l_{it})\, l_{it} \text{ s.t. } F\left(l_{it}, X_{-l,it}^{*}; \omega_{it}\right) \geq Q_{it}$$

I construct the Lagrange equation $L(l_{it}, \mathbf{X}_{-1,it}^{*}; \omega_{it}) = w_{it}(l_{it})l_{it} - \lambda_{it}\left[F\left(l_{it}, \mathbf{X}_{-1,it}^{*}; \omega_{it}\right) - Q_{it}\right]$

Taking the first-order derivative with respect to l_{it}, and get:

$$\frac{\partial L\left(l_{it}, X^*_{-l,it}; \omega_{it}\right)}{\partial l_{it}} = w'_{it}\left(l_{it}\right) l_{it} + w_{it}\left(l_{it}\right) - \lambda_{it} \frac{\partial F\left(l_{it}, \mathbf{X}^*_{-1,it}; \omega_{it}\right)}{\partial l_{it}} = 0$$

By dividing the equation by $w_{it}\left(l_{it}\right)$, obtain:

$$\left[\frac{w'_{it}\left(l_{it}\right) l_{it}}{w_{it}\left(l_{it}\right)} + 1\right] = \lambda_{it} \cdot \frac{\frac{\partial F\left(l_{it}, X^*_{-l,it}, \omega_{it}\right)}{\partial l_{it}}}{w_{it}\left(l_{it}\right)}$$

Here, $\frac{w'_{it}(l_{it}) l_{it}}{w_{it}(l_{it})}$ represents the inverse elasticity of labor supply $\varepsilon_S^{-1}\left(l_{it}\right)$, and the equation can be further written as:

$$\left[\frac{w'_{it}\left(l_{it}\right) l_{it}}{w_{it}\left(l_{it}\right)} + 1\right] = \varepsilon_S^{-1}\left(l_{it}\right) + 1$$

According to the definition of labor cost minimization and have: $\frac{\theta^l_{it}}{\alpha^l_{it}} = \nu_{it} \cdot \mu_{it}$. Based on Assumption 1, the expression for firms' labor market power can be given as $\nu_{it} = \frac{\theta^l_{it}}{\alpha^l_{it}} \cdot \left(\frac{\theta^{k'}_{it}}{\alpha^{k'}_{it}}\right)^{-1}$.

Firstly, based on the assumption that firms maximize profits, the profit maximization equation can be expressed as a function related to labor (l). $MRPL(l)$ is the revenue function of the firm, and $w(l)$ is the wage function for labor.

$$v = \frac{MRPL(l)}{w(l)} = \frac{1}{\varepsilon_s} + 1$$

At this point, calculating the wage markdown v requires computing $MRPL(l)$ and $w(l)$. The latter can be estimated using the firm's reported wage and benefits expenses and employment figures. Specifically, the industry wage index equals the total industry wage and benefits divided by the total number of employees in the industry. These values are aggregated from firms' reported wage expenditures and employee counts, categorized by four-digit industries.

Secondly, based on the cost-minimization assumption of firms, following Yeh et al. (2022), the firm's labor bargaining power v is calculated using three indicators: the product markup μ, labor's output elasticity θ, and labor's income share α.

4 Data Source and Identification strategy

4.1 Data

The firm-level data used in this paper come from the Annual Survey of Industrial Enterprises in China (ASIF) from 1998 to 2007. This dataset covers all private industrial enterprises and all state-owned enterprises (SOEs) with sales of more than RMB 5 million, representing more than 90% of the total output of China's industrial activities during the same period (according to official data from the National Bureau of Statistics (NBS)).

Following Brandt et al. (2014),the data cleaning process involves the following steps. First,

I only use manufacturing firms, although the original sample also includes firms in the mining industry and public utility industry, because they depend on natural resource or population distribution other than the factors considered in this paper.Second, I drop firms with missing values for all key variables. Third, I drop the outside data of 0.1 and 99.9 percentile ranges. Last, a new classification system for industry codes (GB/T 4754 - 2002) was adopted in 2003 to replace the old classification system (GB/T 4754 - 1994), to ensure the comparability of industry codes throughout the period, the industry codes for all years were standardized according to the National Economic Industry Classification Standard (GB/T 4754 - 2002).

4.2 Measuring labor market distortion

Table 2 reports the measurment results for the revenue elasticity and labor market distortion across two-digit Chinese manufacturing industries. Across all industries, my estimation procedure's performance is remarkably stable and produces an average capital elasticity of 0.06, an average labor elasticity of 0.10, and an average material elasticity of 0.74. The average revenue return to scale (RTS), is 0.90,which is similar to Pham (2023).

The labor market distortion of the whole manufacturing sector is 2.30, implying a worker earning only 43.47% on the marginal income generated.The distortion's mean and median are consistently greater than one. This empirical fact suggests that Chinese manufacturing firms face distortion in the labor market during the 1998–2007 period.

Table 2: Revenue Elasticities and Labor Market Distortion by Industry

	Capital	Labor	Material	Scale	Mean	Median
13.Processing of Foods	0.04	0.09	0.74	0.87	3.95	3.26
14.Foods	0.06	0.09	0.72	0.88	2.36	1.74
15.Beverages	0.07	0.12	0.69	0.88	3.27	2.54
16.Tobacco	0.11	0.17	0.64	0.91	3.74	2.57
17.Textile	0.05	0.10	0.76	0.90	2.08	1.65
18.Apparel Foot ware	0.07	0.13	0.73	0.93	1.62	1.23
19.Leather Fur	0.04	0.13	0.75	0.92	1.99	1.38
20.Timbers Wood	0.05	0.12	0.73	0.90	2.82	2.20
21.Furniture	0.04	0.12	0.74	0.90	2.25	1.71
22.Paper Products	0.04	0.11	0.75	0.91	2.73	2.27
23.Printing	0.09	0.11	0.71	0.90	1.71	1.41
24.Culture Education	0.07	0.11	0.74	0.93	1.47	1.13
25.Processing Petroleum Nuclear Fuel	0.05	0.11	0.73	0.90	3.48	2.60
26.Raw Chemicals	0.06	0.10	0.74	0.90	2.90	2.23
27.Medicines	0.11	0.11	0.68	0.89	3.01	2.18
28.Chemical Fibers	0.05	0.08	0.78	0.91	2.61	2.01
29.Rubber	0.06	0.09	0.73	0.89	1.96	1.40
30.Plastics	0.06	0.09	0.75	0.90	2.04	1.56
31.Non-metallic Mineral	0.06	0.09	0.72	0.87	1.85	1.36
32.Processing of Ferrous Metals	0.05	0.13	0.75	0.93	4.28	3.58
33.Processing of Non-ferrous Metals	0.06	0.10	0.76	0.92	3.45	2.76
34.Metal Products	0.06	0.08	0.75	0.89	1.66	1.26
35.General Purpose Machinery	0.06	0.09	0.73	0.89	1.86	1.36
36.Special Purpose Machinery	0.07	0.09	0.72	0.88	1.97	1.37
37.Transport Equipment	0.08	0.10	0.73	0.92	2.11	1.58
39.Electrical Machinery	0.08	0.08	0.75	0.92	1.94	1.43
40.Computers Electronics	0.11	0.12	0.72	0.95	2.07	1.57
41.Measuring Instruments	0.11	0.09	0.71	0.91	1.42	1.07
42.Artwork	0.05	0.10	0.73	0.89	1.49	1.08
All Industry	0.06	0.10	0.74	0.90	2.30	1.65

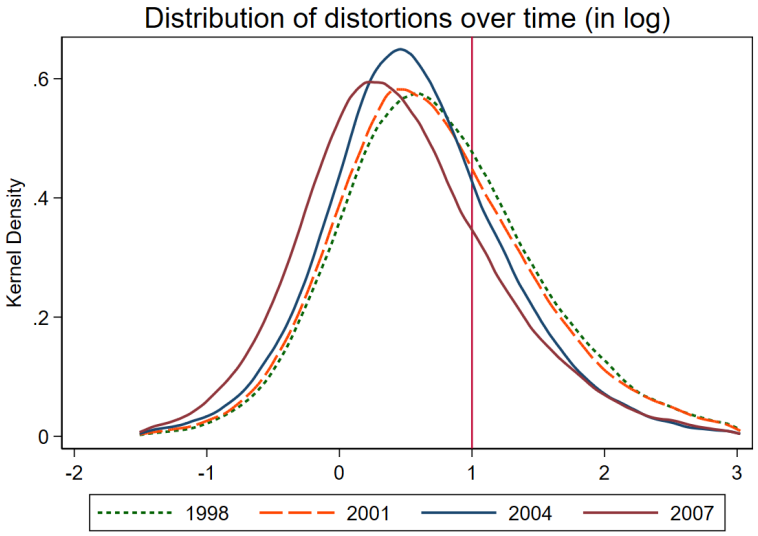


Figure 1: Distribution of distortion over time (in log)

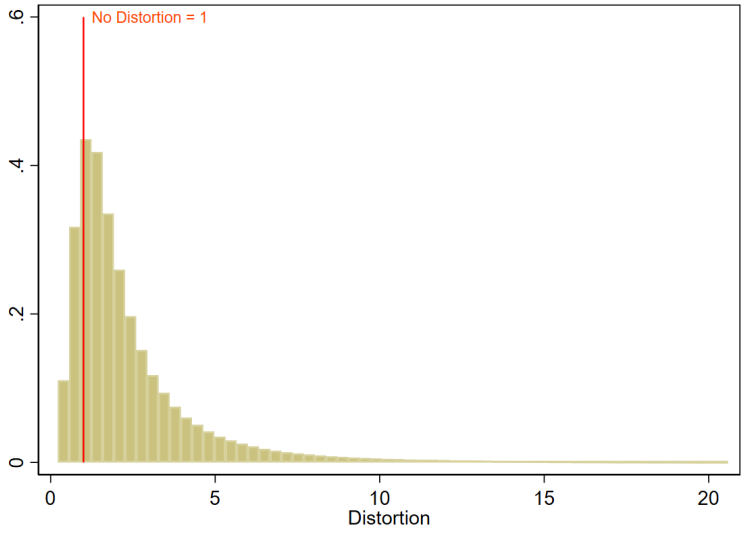


Figure 2: Distribution of distortion(in log)

Figure 1 representing the years 1998, 2001, 2004, and 2007 exhibit fluctuating trends, indicating that the degree of distortion varied across different years. In certain years, the curve rises, suggesting an increase in the degree of distortion, reflecting a worsening of imperfect competition in the labor market or a greater deviation from an ideal economic state. In other years, the curve declines, indicating a relief in distortion, possibly due to changes in the economic environment, policy adjustments, or shifts in market structure.

The histogram 2 illustrates the distribution of distortion (log scale), with the majority of values exceeding 1, indicating prevalent market distortions. The red vertical line at "No Distortion = 1" highlights that most observations show significant deviations from ideal market conditions, while only a small fraction of values are at or below 1, reflecting minimal or no distortion.

4.3 Identification strategy

A key objective of this paper is to understand how the VAT reform affected the labor market distortions in China's manufacturing industries. We begin this section by estimating a baseline difference-in-difference (DID) model as follow:

$$Y_{it} = \beta_1 VAT_i \times Post_t + (X_{i,2003} \times f(t))' \eta + \alpha_i + \mu_t + \varepsilon_{it} \tag{1}$$

Where Y_{it} measured labor market distortion of firm i in year t. The main explanatory variable, VAT_i ,is a dummy variable indicating whether it is a pilot industry in a pilot region, which equals to 1 if firm i belongs to the pilot industry in the Northeastern region, and 0 otherwise. $Post_t$ is a time dummy variable, taking a value of 1 for years 2004 and onwards, and 0 otherwise. α_i and μ_t represent the fixed effects for firm and year, respectively. ε_{it} is the error term.

This paper adopts the approach of Lu et al. (2019), utilizing the interaction term $X_{i,2003} \times f(t)$, where $X_{i,2003}$ denotes firm characteristics in the pre-reform year of 2003, such as productivity (tfp), ownership structure, capital-labor ratio, wage levels, and input share. $f(t)$ represents the time trend, allowing the model to control for temporal changes in these firm-specific characteristics.

Parallel trends assumption. The major challenge of the DID identification design is that the time trends of labor market distortion may be different between the treated and the control groups. To test the parallel trends assumption, I will estimate the VAT reform' s dynamic effects on labor market distortion by using the event-study specification. The event study model is as follows:

$$Y_{it} = \beta_0 + \sum_{t=1998}^{2007} \beta_k VAT_i \times Year_t + (X_{i,2003} \times f(t))' \eta + \alpha_i + \mu_t + \varepsilon_{it} \tag{2}$$

The core of this event study framework lies in using the coefficient β_k for each year to detect the dynamic effects of the policy. If the differences between the treatment and control groups before the policy implementation (e.g., from 1998 to 2003) show insignificant β_k, this indicates that the parallel trends assumption holds, meaning that the treatment and control groups had similar trends before the policy. After the policy implementation (e.g., from 2004 onwards), significant β_t reveals how the VAT reform's impact on labor market distortions evolves over time.

5 Empirical results

This section presents estimates of the policy impact of the VAT reform on firms' labor market distortion. base on the specification (1), and the following two subsections test the two most crucial assumptions of the DID setting.

5.1 Baseline results

Table 3 lists the treatment and control group means for a variety of firm characteristics in the pre-policy year (2003), including firms' productivity (TFP), ownership structure, capital-labor ratio, wage levels, and input share.

Table 3: The impact of VAT reform on labor market distortion: baseline results.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
$VAT_i \times Post_t$	0.075**	0.060*	0.063*	0.050	0.081**	0.080**
	(0.035)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
$TFP_{i,2003} \times f(t)$		0.001***	0.001***	0.001***	0.001***	0.001***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Foreign_{i,2003} \times f(t)$			-0.014***	-0.025***	-0.041***	-0.042***
			(0.004)	(0.004)	(0.005)	(0.005)
$Caplaborratio_{i,2003} \times f(t)$				0.000***	0.000***	0.000***
				(0.000)	(0.000)	(0.000)
$Lnwage_{i,2003} \times f(t)$					0.041***	0.041***
					(0.003)	(0.003)
$Inputshare_{i,2003} \times f(t)$						-0.013
						(0.012)
Observations	1,135,312	717,495	717,495	717,495	717,495	717,495
R-squared	0.657	0.608	0.608	0.608	0.609	0.609
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Column (1) through Column (6) in table 3 show different model specifications examining the impact of the VAT reform on labor market distortion. We begin with an OLS specification with firm and year fixed effects in Column (1), which indicates that the VAT reform has a significant positive impact on labor market distortion. In Column (2), we add time-varying controls, such as productivity (TFP) trends, showing that the reform's effect remains significant. In Column (3), we further control for firm ownership structure, and the negative coefficient of foreign ownership interaction term highlights a differential effect. Column (4) and subsequent columns introduce additional firm characteristics, including the capital-labor ratio, wage levels, and input share. Quantitatively, the VAT reform increases labor market distortion by 0.08, significant at the 5% level, with the effect being robust across all specifications.

5.2 Dynamic policy effects

It is widely known that common trend is the basic requirement for a qualified DID setting. Although we control for rich variables and firm and year fixed effects, it is still possible to omit some time-varying unobservable variables. For instance, local governments might adopt tax

incentives or financial supports to encourage the development of specific industries. Similarly, development stages and developing trends vary across geographic locations; thus, firms located in different regions appear to have heterogeneous time trends. These issues display salient contradictions with the common trend hypothesis in the DID setting. To address the concern that my estimation results are driven by the heterogeneous trends before the reform, we conduct an event study analysis by estimating equation (2).

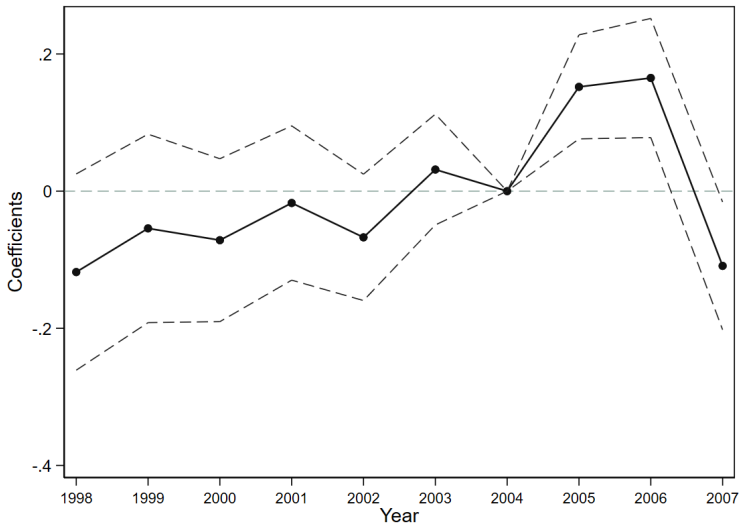


Figure 3: Parallel trend

The presumption of difference-in-difference estimation is common trend between control groups and treated groups, so we expect The coefficients β_k in equation (2) are approximately close to zero. If this is the case, the increase in labor market distortion is likely caused by the VAT reform. Figure 3 explicitly plot the dynamic effects before and after the VAT reform and show their 95% confidence intervals. labor market distortion display parallel trends before the VAT reform, and start to diverge between treated and control groups after implementing VAT deduction.

5.3 Possible mechanism

5.3.1 Reduction in VAT Payable

The results indicate a significant reduction in VAT payable following the reform (-0.085, $p<0.01$). This reduction suggests that the VAT reform alleviated firms' tax burdens, thereby increasing their liquidity and allowing more resources for wages or capital investments. The decreased tax burden might reduce firms' incentives to suppress wages, thus influencing wage markdown.

5.3.2 Increase in capital-labor ratio

The VAT reform positively impacted the capital-labor ratio (0.105, p<0.01), indicating that the reform likely encouraged firms to increase capital investments, especially given that capital expenditures could now be deducted from taxable bases. A higher capital intensity leads to greater reliance on technology substituting labor, which reduces labor's bargaining power relative to capital. This shift potentially exacerbates labor market distortions, as workers' share of their marginal revenue product diminishes.

5.3.3 Decrease the productivity (TFP)

Although the reform had a slightly negative effect on total factor productivity (-0.006, p<0.05), the small magnitude of the change suggests limited adjustment in firms' production efficiency during the reform period. The modest impact on productivity may restrict firms' ability to offer higher wages, thereby failing to significantly improve wage markdown.

5.3.4 Reduction on the average of wage

The VAT reform negatively affected the average wage (-0.028, p<0.01), indicating that despite the reduction in tax burdens, firms did not significantly pass these savings on to employees in the form of higher wages. Instead, the wage markdown increased, possibly due to firms shifting toward more capital-intensive production, which reduced the demand for labor and further weakened labor's bargaining power, thereby reducing the share of wages relative to workers' marginal revenue product.

Table 4: Mechanism Impact of VAT Reform

	(1)	(2)	(3)	(4)
VARIABLES	vat-added tax payable	capital-labor ratio	productivity(TFP)	lnwage
$VAT_i \times Post_t$	-0.085***	0.105***	-0.006**	-0.028***
	(0.018)	(0.014)	(0.002)	(0.007)
Observations	643,316	717,495	717,495	717,495
R-squared	0.614	0.783	1.000	0.689
$X_{i,2003} \times f(t)$	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6 Heterogeneity Analysis

Table 5 examines the heterogeneous effects of China's VAT reform on labor market distortion, where distortion is defined as the inverse of the share of wages received by workers from their marginal revenue product of labor (MRPL). In this heterogeneity analysis, firms grouped

by the 50th percentile according to productivity, capital-labor ratio and firm's age, to examine the differential impact of the reform.

A larger distortion indicates weaker labor market power for workers. The results, stratified by total factor productivity (TFP), firm size, and firm age, reveal that the VAT reform's impact on labor market distortion varies across these groups. High-TFP firms experience a significant increase in labor market distortion (0.165), while the effect on low-TFP firms is smaller (0.058), indicating that workers in more productive firms capture a lower share of their MRPL.

The impact of VAT reform on enterprises may vary depending on their capital intensity. Capital-intensive firms rely heavily on capital inputs in the production process. Therefore, the post-reform capital deduction policy may provide a greater incentive for these firms to increase capital expenditures. In contrast, labor-intensive firms rely more on labor, and the reform's impact on them may manifest primarily through changes in labor costs. In this analysis, the capital intensity of firms is measured by the Capital-Labor Ratio, and firms are grouped based on the median of this ratio. It is expected that capital-intensive firms have a notable increase in distortion (0.090), whereas labor- intensive firms show no significant change.

Finally, the reform substantially reduces labor market distortion in older firms (>=50 years) (0.122), while younger firms are less affected. Overall, the VAT reform decrease workers' labor market power in more productive, larger, and older firms by increasing labor market distortions.

Table 5: The VAT reform impact on Labor market distortion:heterogeneous effects

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	<tfp_50	>=tfp_50	small_ratio	big_ratio	<age50	>=age50
$VAT_i \times Post_t$	0.058*	0.165**	-0.013	0.090*	0.127	0.122***
	(0.031)	(0.076)	(0.052)	(0.052)	(0.079)	(0.043)
Observations	343,198	374,297	346,616	370,879	279,997	437,498
R-squared	0.598	0.653	0.659	0.661	0.662	0.651
$X_{i,2003} \times f(t)$	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7 Conclusion

This paper has explored the impact of China's 2004 VAT reform on labor market distortions, with a particular focus on wage markdown and labor market power. Our empirical analysis, using firm-level data from China's manufacturing sector, reveals that the VAT reform exacerbated labor market distortions in several key dimensions. Specifically, firms with higher productivity, larger capital intensity, and older firms saw a significant increase in wage

markdown, suggesting that the reform disproportionately benefitted capital over labor, thus weakening workers' bargaining power. The reform's capital deduction incentives encouraged firms to shift toward more capital-intensive production, further marginalizing labor in the process.

In my heterogeneity analysis, we found that the impact of VAT reform varied across different groups. High-productivity firms experienced a notable rise in labor market distortion, as their workers received a smaller share of their marginal revenue product. Additionally, larger and older firms, which could more effectively capitalize on the reform's tax deductions, saw increased labor market power relative to labor-intensive or younger firms. These results suggest that while the VAT reform successfully reduced tax burdens and encouraged capital investment, it also intensified labor market imbalances, particularly in firms that were better positioned to leverage the new tax structure.

Overall, my findings highlight a critical trade-off in VAT reforms: while they may stimulate investment and economic growth, they can also exacerbate labor market inequalities if not carefully designed. Policymakers should be mindful of these distributional consequences when considering tax reforms, particularly in emerging economies where labor markets are often less competitive. Future research could extend this analysis by examining the long-term effects of VAT reform on labor market dynamics and exploring potential policy interventions that could mitigate the adverse effects on labor.

References

Azar, J. and Marinescu, I. (2024). Monopsony power in the labor market: From theory to policy. *Annual Review of Economics*, 16(1):491–518.

Berger, D., Herkenhoff, K., and Mongey, S. (2022). Labor market power. *American Economic Review*, 112(4):1147–1193.

Brandt, L., Van Biesebroeck, J., and Zhang, Y. (2014). Challenges of working with the chinese nbs firm-level data. *China Economic Review*, 30:339–352.

Chen, Z., Liu, Z., Suárez Serrato, J. C., and Xu, D. Y. (2021). Notching r&d investment with corporate income tax cuts in china. *American Economic Review*, 111(7):2065–2100.

Dechezleprêtre, A., Einiö, E., Martin, R., Nguyen, K.-T., and Van Reenen, J. (2023). Do tax incentives increase firm innovation? an rd design for r&d, patents, and spillovers. *American Economic Journal: Economic Policy*, 15(4):486–521.

Gandhi, A., Navarro, S., and Rivers, D. A. (2020). On the identification of gross output production functions. *Journal of Political Economy*, 128(8):2973–3016.

Hall, R. E. (1988). The relation between price and marginal cost in us industry. *Journal of political Economy*, 96(5):921–947.

Liu, Q. and Lu, Y. (2015). Firm investment and exporting: Evidence from china's value-added tax reform. *Journal of International Economics*, 97(2):392–403.

Loecker, J. D. and Warzynski, F. (2012). Markups and firm-level export status. *American economic review*, 102(6):2437–2471.

Lu, Y., Wang, J., and Zhu, L. (2019). Place-based policies, creation, and agglomeration economies: Evidence from china' s economic zone program. *American Economic Journal: Economic Policy*, 11(3):325–360.

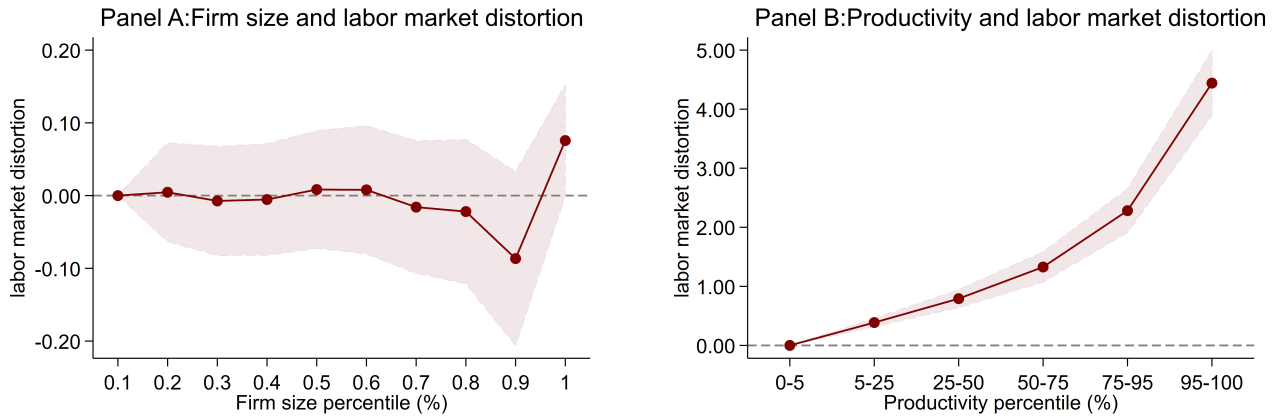
Manning, A. (2003). The real thin theory: monopsony in modern labour markets. *Labour economics*, 10(2):105–131.

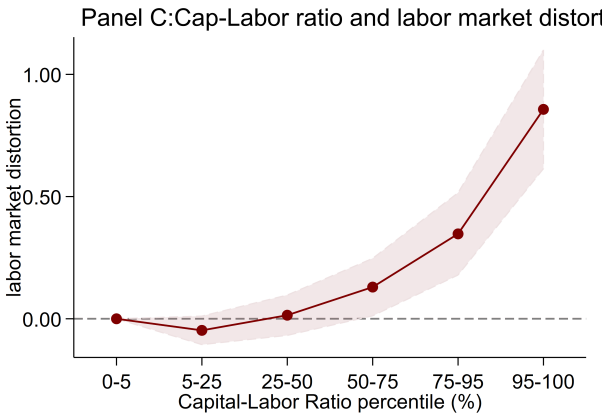
Pham, H. (2023). Trade reform, oligopsony, and labor market distortion: Theory and evidence. *Journal of International Economics*, 144:103787.

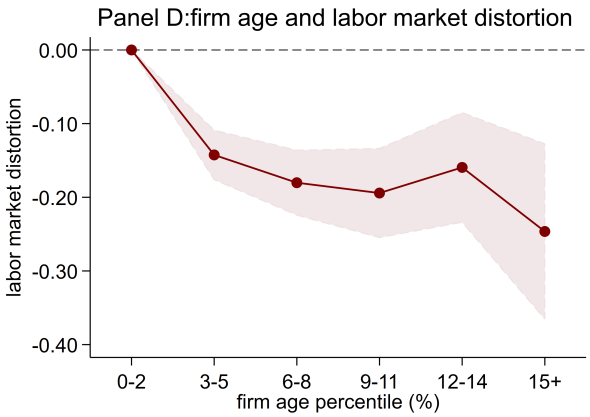
Wang, J., Shen, G., and Tang, D. (2021). Does tax deduction relax financing constraints? evidence from china's value-added tax reform. *China Economic Review*, 67:101619.

Yeh, C., Macaluso, C., and Hershbein, B. (2022). Monopsony in the us labor market. *American Economic Review*, 112(7):2099–2138.

A Appendix




Panel C:Cap-Labor ratio and labor market distorl
labor market distortion
1.00
0.50
0.00
0-5
5-25
25-50
50-75
75-95
95-100
Capital-Labor Ratio percentile (%)


Panel D:firm age and labor market distortion
labor market distortion
0.00
-0.10
-0.20
-0.30
-0.40
0-2
3-5
6-8
9-11
12-14
15+
firm age percentile (%)