Does Labor Composition Impact the Transmission of Monetary Policy to Output? *

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Abstract

We ask whether the presence of contract workers influences the sensitivity of firms' output to monetary policy changes due to a relatively lower rigidity of contract workers' wages. We use a judgment of the Supreme Court of India that facilitated the hiring of contract workers as a setting that exogenously increased their presence, especially in states having stringent labor laws. Differences-in-differences and triple difference tests show that the sensitivity of output to monetary policy changes moderates due to the presence of contract workers. The relative flexibility of contract workers' wages and not the relative ease of hiring/firing is the mechanism.

Key Words: Monetary Policy Transmission; Contract Workers; Wage Rigidity

JEL Classification: J 31; J 53; L 24

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1 Introduction

The extant literature has established that wage rigidity impacts the influence of monetary policy on firm-level outcomes.[1] However, not much is known about what influences the rigidity of wages. In this context, we ask whether the nature of job contracts, distinguished as contract or regular employment, impacts wage rigidity within firms and, thereby, the transmission of monetary policy on firm output. In other words, we examine the relationship between the composition of labor and monetary policy transmission on firm-level output.

Theoretically, the likely impact is not clear. Faia and Pezone (2023), who study the impact of wage rigidity on firm-level outcomes, show that the presence of contract workers moderates the impact of monetary policy changes on a firm's stock market valuation, given a level of wage rigidity. Notice that when contract workers' wages are rigid, their presence does not alter the nominal marginal cost of labor in response to changes in demand arising from monetary policy changes. Therefore, firms with rigid wages are likely to hire/fire contract workers in response to monetary policy changes and incur a change in the overall wage bill. For example, when output shrinks in response to rising interest rates, firms with rigid wages can soften the impact on their profitability by shredding a few contract workers. Notice that under the above explanation, the responsiveness of output to monetary policy changes will not differ based on labor composition.

However, it is also possible that the wages of contract workers are less rigid due to frequent renegotiations. In that case, the presence of contract workers can reduce wage rigidity itself. Hence, the presence of contract workers could lead to a quicker adjustment of the nominal marginal cost of labor in response to monetary policy changes. A direct likely consequence of increased flexibility of wages is a reduction in the influence of monetary policy changes on output. Given the above contrasting possibilities, an empirical investigation is necessary. We find that the presence of contract workers reduces the responsiveness of output to monetary policy changes as the wages of contract workers are relatively less rigid than those of regular workers.

We use the working of the Indian labor market as an economic setting for our study. We obtain establishment-level data from the Indian Annual Survey of Industries (ASI) to test the above thesis. For a period between 1998-1999 and 2007-2008, the survey provides a panel of 18,413

[1] Faia and Pezone (2023); Björklund et al. (2019); Olivei and Tenreyro (2010); Howitt (2002); Erceg et al. (2000)

establishments with the establishment (factory) and state identifiers. It provides information about crucial operating characteristics of factories, such as the value of the output, labor person days - divided into the contract and regular person days, wage bill, operating expenses, the value of fixed assets and liabilities, and others. The ASI has dispensed with the panel structure and factory identifiers from 2008-2009. Therefore, we limit our analysis to a period between 1998-1999 and 2007-2008.

We start our analysis by examining the difference in the sensitivity of output to changes in monetary policy target rate based on the proportion of contract workers employed in a factory. We find that the presence of contract workers moderates the relationship between the policy rate and output. A one standard deviation increase in the proportion of contract workers leads up to a 1.5pp lower decline in output in response to a 100 basis points increase in the policy rates. Given the average annual growth rate in the output of 7.2%, the change in responsiveness to monetary policy is economically meaningful.

We recognize that some other endogenous factor could be at work here. Therefore, we use a shock to the proportion of contract workers provided by an unexpected judgment of the Supreme Court of India for identification. To appreciate the impact of the judgment, some background information about Indian labor law is necessary. As noted by several studies, India has stringent labor laws that make retrenching workers hard, if not impossible.[2] An interesting aspect of the labor laws in India is that both the federal and state governments have jurisdictions on them. Therefore, there is significant variation in the stringency of labor laws between Indian states.

The contract workers are out of the purview of these laws. However, the state governments have the power to declare the hiring of contract workers as "improper." In a landmark judgment delivered on August 30, 2001, the Supreme Court of India held that the governments cannot compel firms to re-hire retrenched contract workers as regular workers. As shown by Bertrand et al. (2021), the judgment significantly increased the proportion of contract workers in Indian firms.

Our use of the above judgment for identification is based on the following three considerations. First, the Supreme Court judgment disproportionately impacted the firms in "pro-worker" states. These are states where labor legislations are predominantly worker-friendly. We follow the pro-

[2]See Besley and Burgess (2004); Ahsan and Pagés (2007); Topalova and Khandelwal (2011); Mansoor and O'Neill (2021)

cedure developed by Besley and Burgess (2004) to classify the Indian states as pro-workers and others. Given the relative difficulty in retrenching regular workers, firms in such states are more likely to hire contract workers in response to the judgment.

Second, the judgment is orthogonal to other (endogenous) factors that move in parallel with monetary policy changes and impact firms in pro-worker states differently. These include both firm-level factors and past and future macroeconomic factors that influence monetary policy. Therefore, in line with Jiménez et al. (2012, 2014); Kashyap and Stein (2000); Drechsler et al. (2017); Morais et al. (2019), we use the target monetary policy rate itself as a measure of monetary policy change.

Third, the systematic differences in the factories located in the pro-worker states and other states do not influence the differential transmission of monetary policy post the Supreme Court judgment. We elaborate on these three considerations in Section 7 and provide relevant evidence.

We conduct a first-stage test to verify the cross-sectional differences in the impact of the judgment. Bertrand et al. (2021) find that the judgment led to a significantly higher increase in the hiring of contract workers in pro-worker states than in other states. We find similar results: the growth in the number of contract workers in response to the judgment is approximately 51pp higher in the worker-friendly states relative to the growth in regular workers. The year-on-year analysis rules out the possibility of the existence of a pre-trend mechanically causing the above result. The fact that the increase in the proportion of contract workers is exogenous – in response to the unexpected Supreme Court judgment – makes the setting reasonable for identifying the impact of contract workers on monetary policy transmission.

Our headline result is that the impact of monetary policy changes on output gets muted for firms operating in pro-worker states after the exogenous entry of contract workers. After the judgment, a 100 basis points increase (decrease) in key policy rate leads up to a 5.1pp lower decrease (increase) in output in pro-worker states. The differential impact is economically meaningful given the average annual growth rate of 7.2% in output during our study timeline. There is no difference between the firms in the two types of states before the event regarding the effects of monetary policy changes on output.

We next explore the likely mechanisms behind both the above results. We find that the wage rate (wages per day) of contract workers is more responsive to monetary policy changes when compared to that of regular workers. Within a factory year, a 100 basis points change in the key monetary policy rate leads to a 1.9% higher change in the per day wage of contract workers compared to the per day wage of regular workers. The results imply that the wages of contract workers are less rigid when compared to those of regular workers. Therefore, the presence of contract workers moderates the transmission of monetary policy to output by reducing wage rigidity. Note that, as discussed above, mere ease of hiring/firing cannot change the sensitivity of output to monetary policy changes, as it does not alter the nominal marginal cost of labor in response to changes in demand.

In the second part of the paper, we address concerns and conduct robustness tests. We first take up the concern relating to endogeneity. Note that our results are based on a triple interaction between variables representing states more impacted by the judgment, post-judgment period, and monetary policy changes. Therefore, the endogenous factor should vary with the judgment in the same cross-section that we use for identification and work precisely in line with the changes in monetary policy rates.

Although we cannot think of any such factor, we conduct a test to rule out any residual concerns. We estimate our main test using a sample of firms to which labor laws are not applicable as they are below the threshold number of workers required for the application of labor laws. We do not find any differential change in the sensitivity of output and wages to changes in monetary policy in this sample. Endogenous factors, including macroeconomic variables that influence monetary policy decisions, if they existed, should have influenced the outcome here as well. It is highly improbable that there are endogenous factors that move through the triple interaction described above and also influence only those firms for which labor laws are applicable.

Next, there could be concerns about the low frequency of data we use. As described above, we use annual data and study the impact of monetary policy changes with a one year lag. Many studies on monetary policy transmission use high-frequency data (Hanson and Stein (2015), Albagli et al. (2019)). However, it is important to distinguish the nature of the outcome we are after from those examined in those studies. Our focus is on the sensitivity of output to monetary policy changes. The extant research shows that monetary policy changes impact output with a lag (Friedman (1961); Scott Jr (1955); Bekaert et al. (2013)). Therefore, it is reasonable to use low-frequency annual data given the context of our study.

Further, we also find that the transmission of monetary policy to output is no different between the two types of states before the Supreme Court judgment. A question may arise as to why did the additional flexibility in hiring and firing that the other states had even before the judgment not make a difference. However, as noted earlier, hiring/firing can only impact profitability but not output sensitivity when the nominal marginal cost of labor does not change. Unfortunately, we cannot test the impact on profitability due to the likely endogenous nature of firms' response to sticky wages before the shock; the firms located in the pro-worker states are likely to smoothen wages (Elsby (2009)).

Finally, we conduct several tests to establish the robustness of our results. We find that our results become stronger when we limit the sample to labor-intensive firms. Finally, our results go through, even if we omit states considered as neutral states in terms of the tilt of labor laws.

The paper contributes to the literature that examines wage rigidity and its impact. Faia and Pezone (2023) show that the rigidity of wages increases the impact of monetary policy changes on stock market valuations and profitability of firms. Kaur (2019) show that the wages of casual laborers in India are downward rigid and lead to higher unemployment in some situations. Schmitt-Grohé and Uribe (2016) also document that wages are downward rigid in emerging economies. Goette et al. (2007) document the existence of nominal wage rigidity in Germany, Italy, and Great Britain. Barattieri et al. (2014) examine the Survey of Income and Program Participation in the US and find that the nominal wages are rigid. Kim and Ruge-Murcia (2009) also find wage rigidity in the US. To the best of our knowledge, previous studies do not relate wage rigidity to the form of employment. Using an exogenous increase in the hiring of contract workers by some firms, we show that the wages of contract workers are relatively less rigid than the wages of regular workers.

Some studies in this literature examine the reasons that lead to wage rigidity. Campbell III and Kamlani (1997) examine the possible causes for wage rigidity by conducting a survey of firms. They find that, among other explanations, the likely adverse selection in quits and the impact of wage changes on efforts are the most prominent reasons for wage rigidity. Fehr and Goette (2005) show that nominal wage rigidity exists in a low inflation environment and impacts employment. Fehr and Falk (1999) show that wage cutting is costly for employers if workers have discretion over their effort level. Thus, the incompleteness of labor markets is one possible explanation for wage rigidity. Bewley (1998) argue that employers are reluctant to cut pay because they believe doing so would hurt employee morale, leading to lower productivity and current or future difficulties with hiring and retention. Stiglitz (1984) show that the efficiency wage models explain wage rigidity. We contribute to the above literature by showing that the composition of labor – in terms of contract and regular workers – influences wage rigidity.

We also contribute to the literature that examines the need for and the role of contract labor in firms. Bertrand et al. (2021) and Chaurey (2015) find that firms hire contract workers to escape restrictive labor laws in India. Several other papers document the rise of contract work arrangements and different non-standard ways of employment and the impact of such work arrangements on several firm-level and macroeconomic outcomes (Katz and Krueger (2019); Goldschmidt and Schmieder (2017); Dube and Kaplan (2010); Boeri et al. (2020); Drenik et al. (2020)). We contribute to this literature by showing that the presence of contract workers smoothens the firms' response to monetary policy changes.

2 Institutional Setting

2.1 Industrial Disputes Act

Under the Indian constitution, labor is a part of the concurrent list. Federal and state governments are competent to enact legislation on the topic. The only restriction on the powers of the state government is that a law passed by a state government on a matter relating to the concurrent list cannot be repugnant to an existing law passed by Parliament. However, relaxing or tightening the law or rules is not considered repugnancy. The state governments can modify the rules, change procedures, impose new restrictions, etc. Not surprisingly, due to the regular amendments legislated by the state governments, there is significant variation between states in terms of the working of labor laws.

The Industrial Disputes Act (IDA), 1947, makes the provision for the investigation and settlement of industrial disputes. It is one of the most important labor laws in India. Two sections of the act are relevant to our study. First, the Section V-A of the act, dealing with layoff and retrenchment, provides the right to compensation upon layoff.[3] It is applicable to industrial establishments employing more than 50 workers. Second, the Section V-B of the act makes an even more stringent provision – an employee can be laid off only after obtaining the relevant state government's

[3]https://www.indiacode.nic.in/bitstream/123456789/11102/1/industrial-disputes-act-1947.pdf

permission. This provision is applicable to establishments employing more than 100 workers.

The workers hired on a contract basis are out of the purview of the IDA. However, the federal government enacted the Contract Labor (Regulation and Abolition) Act, 1970 (CLRA), which empowered the state governments to examine whether firms were hiring contract workers for jobs that were "regular" in nature. The state governments could forbid firms from hiring contract workers in such cases. Disputes arose as to what would happen to existing contract workers when a state government declared the hiring of contract workers null and void.

The dispute was triggered by a case involving the Steel Authority of India (SAIL) (Steel Authority of India Ltd. vs. National Union Water Front, 2001). The Government of West Bengal issued a notification dated July 15, 1989, under Section 10(1) of the CLRA Act prohibiting the employment of contract labor in four specified stockyards of the appellants. The workers insisted that in such cases, the existing contract workers should be absorbed into the regular workforce. The Calcutta High Court upheld the workers' plea. The matter then went to the Supreme Court of India. In a landmark judgment delivered on August 30, 2001, the Supreme Court held that an employer is not bound to absorb contract workers into the regular workforce when state governments prohibit contract employment.

Note that any judgment pronounced by the Supreme Court takes the shape of law. It applies to all entities, not just those involved in the dispute. Only a law passed by the legislature can overturn such a judgment. Therefore, in this particular instance, the Supreme Court judgment on contract workers is applicable to all firms and not just to the Steel Authority of India. Further, the fact that Supreme Court overturned the earlier High Court judgment supports our view that the Supreme Court judgment was unexpected.

The judgment resolved a significant uncertainty relating to contract labor. Firms could hire contract workers without worrying about absorbing them into the regular workforce should the state government prohibit hiring contract workers. Bertrand et al. (2021) note that the hiring of contract workers blossomed after the judgment.

2.2 Monetary Policy in India

The Reserve Bank of India (RBI), the Indian central bank, pursues the twin goals of maintaining price stability and employment. Repo rate, Reverse Repo Rate, and the Cash Reserve Ratio (CRR) were three important tools of monetary policy used by the RBI during our sample period. Repo (Reverse) rate refers to the rate at which the RBI lent (borrowed) short-term funds to (from) banks. The Cash Reserve Ratio is the proportion of bank deposits to be maintained in cash.

The operating principle of monetary policy in India is to keep the interbank lending rate, known as the call rate, within a narrow band of the repo rate. This narrow band is known as the policy corridor. Our analysis relies on the Weighted Average Call Rate (WACR), which is computed using the amounts traded at different rates as the weights. The RBI buys and sells government securities to keep the WACR within the policy corridor. Figure 1 plots the evolution of the monthly WACR during our study timeline. The WACR was significantly higher before the Supreme Court judgment. It drifted down initially in the post judgment period and then recovered gradually. The sudden decline, in the end, corresponds to the period of the global financial crisis.

3 Data

Our primary source of data is the Annual Survey of Industries (ASI) released by the Ministry of Statistics and Programme Implementation. ASI is the main source of industrial statistics in India. Its geographical coverage extends to the entire country. The survey is conducted at an annual frequency and the data correspond to the activity during 1^{st} April to 31^{st} March of the following year.[4] For example, the ASI 1999-2000 survey provides the information corresponding to the period, 1^{st} April 1999 to 31^{st} March 2000. When we mention the year in our study, we refer to the financial year ending in March.

As per the survey's website, the primary unit of enumeration is a factory in the case of manufacturing industries, a workshop in the case of repair services, an undertaking or a licensee in the case of electricity, gas, and water utilities, and an establishment in the case of tobacco-based industries.[5] We refer to all these units as factories in our analysis. Further, the survey sample consists of two schemes – census and sample.[6] All the units are surveyed under the census scheme. In the case of sample scheme, only a subset of units is surveyed. The survey also provides the status of the

[4]The survey timeline is in line with the Indian financial year, which is from 1^{st} April to 31^{st} March of the following year

[5]http://microdata.gov.in/nada43/index.php/catalog/12/study-description

[6]The criteria for the identification of a census scheme varies across states. For example, all units belonging to the less industrially developed states are included in the census scheme. In other states, units having at least a certain number of employees are included. Note that this threshold is also prone to variation across states.

unit – an open status indicates the factories with fixed assets and working staff having non-zero production. We consider the census factories with an open status in our analysis.

ASI provides a granular factory-level information that facilitates our study. It provides detailed information about the workers directly employed by the factory (hereafter, regular workers) and those employed through contractors (hereafter, contract workers). The data fields include the average number of workers, number of person-days worked, number of person-days paid, and wages.[7] We also have the factory-level variables such as the ex-factory value of output, total investment in fixed assets, and the number of months of operation during a year. We identify industries using the 3-digit National Industry Classification (NIC) codes.

We obtain the information about the key macro-economic variables from the Reserve Bank of India's website.[8] Our set of macro-variables include GDP growth, credit growth, US Dollar/Indian Rupee (INR) exchange rate change, market return, and foreign investor flows. Further, we obtain the Whole Price Index (WPI) information from the Office of Chief Economic Adviser (CEA).[9] Table 1 elucidates the definition of factory-level and macro-economic variables used in our study.

Our classification of the states into worker-friendly and business-friendly is based on the methodology developed by Besley and Burgess (2004). They classify each state-level amendment to the Industrial Disputes Act (IDA) as pro-worker, neutral, or pro-employer based on their reading of the state-level amendments. The amendment-level scores are cumulated to obtain a labor-regulation score for each state. States which made no amendment to the IDA are classified as neutral. Several studies have used this method of classification (Chaurey (2015), Adhvaryu et al. (2013)).

Subsequent studies have scrutinized Besley and Burgess (2004)'s method. As a result, we deviate from Besley and Burgess (2004)'s classification in the case of two states – Andhra Pradesh and Gujarat. First, Andhra Pradesh was coded as pro-employer based on three amendments passed in 1968 (tagged as pro-employer), 1982 (tagged as pro-employer), and 1987 (tagged as pro-worker); and we deviate from this classification based on Bhattacharjea (2006)'s critique. The 1968 amendment limiting strikes was merely applicable to hospitals and dispensaries; hence we treat the same as neutral for the manufacturing industry. Further, the 1982 amendment merely granted the

[7]Our ASI-panel data reports missing observations as zeroes. We treat these zeroes as missing observations and conduct our analysis. Further, we impute the contract workers' information from total workers and regular workers' information.

[8]https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home

[9]https://eaindustry.nic.in/download_data_9394.asp

powers of a civil court to labor tribunals to enforce their awards (Bhattacharjea (2006)); hence we treat the same as neutral. After re-classifying these two amendments, we treat Andhra Pradesh as a pro-worker state based on the 1987 amendment.

Second, Gujarat was classified as a pro-worker state based on a single amendment passed in 1973; however, the amendment merely imposed a penalty on employers for not nominating representatives to firm-level joint management councils (Bhattacharjea (2006)). Hence, we treat Gujarat as a neutral state until 2004 and thereafter as pro-employer as the state passed the SEZ Act and provided exemptions from Section V-B of the IDA (Chaurey (2015)). Our list of pro-worker, pro-employer, and neutral states is mentioned in Table A1 of the Online Appendix. For our study, we club states into two categories – worker-friendly and neutral/employer-friendly.

Finally, our measure of monetary policy is the key inter-bank rate – weighted average call rate (WACR) – targeted by the Reserve Bank of India, as mentioned in Section 2.2. We define monetary policy change as the difference in annual WACR from that of the previous year.

Table 2 illustrates the waterfall of our sample construction. After restricting the data to the census scheme, our ASI panel data contains 166,296 observations. Further restricting the observations to open status leaves us with 138,248 observations. Moreover, we exclude the states for which we do not have Besley and Burgess (2004) classification. We then exclude factory-year observations for which we do not have the number of regular workers and those observations where reporting is not a financial year.

For our main results, we restrict the sample to factory-year observations which report more than 50 regular workers, i.e., when the Section V-A of the Industrial Disputes Act is binding, as discussed in Section 2.1. Our final sample contains 77,351 observations involving 18,413 unique factories from 80 industries. We have 17,525 observations in the pre-period and 59,826 observations in the post-period.

We present the descriptive statistics in Table 3. Panel-A summarizes the key factory-level variables used in our study. The average share of contract workers during the entire sample period is 12.5%. Further, note that the average output growth during our sample period is 7.2%. In Panel-B, we report the descriptive statistics of the macroeconomic variables. The average change in monetary policy is -0.06%. Moreover, we have six (four) instances of monetary tightening (loosening) during this period.

In Panel-C, we summarize how the share of contract workers changed across states, post the Supreme Court judgment. Note that the average share increased by 4.1pp, from 9.3% to 13.4%, across all the states. However, the pro-worker states witnessed a greater increase of 7pp, from 11.4% to 18.4%.

4 Impact of Labor Composition on Policy Transmission

As a first step, we test whether the labor composition affects the sensitivity of output to monetary policy changes. Our definition of labor composition is the share of contract workers in total workers employed by a factory. We define sensitivity as the decline (increase) in output in response to a tightening (loosening) monetary policy. We estimate the following regression equation.

$$Y_{it} = \beta_0 + \beta_1 \times ContractShare_{it} \times \Delta WACR_t + \beta_2 \times ContractShare_{it} + \gamma_i + \delta_{ind} t + M_t(\theta_t) + \epsilon_{it} \quad (1)$$

Our data are organized at the factory i and year t level. The dependent variable is the logarithm of the value of the output produced by the factory i in year t. $ContractShare$ is the share of contract workers in the total workers at the end of the previous year. $\Delta WACR$ is the change in weighted average call rate during the previous year ($\Delta WACR = WACR_{t-1} - WACR_{t-2}$). A positive (negative) value denotes monetary contraction (expansion). δ_{ind} is an indicator variable that is set to 1 for factory i's industry, and t denotes a time trend (Besley and Burgess (2004)). In other words, we include industry-specific time trends. M_t represents a vector of macroeconomic control variables – summarized in Panel B of Table 3. In an alternate specification, we include year fixed effects denoted by θ_t. Note that the inclusion of year fixed effects absorbs the direct effect of the policy rates and those of the macroeconomic control variables. γ_i denotes the factory fixed effects. Following Besley and Burgess (2004), the standard errors are clustered at the state and industry levels to account for the serial correlation among observations belonging to the same industry within a state.

We present the results in Table 4. The dependent variable is the logarithm of the value of output across the four columns. All four specifications contain factory-fixed effects. We include industry-specific time trends in columns (1) and (3). Column (1) also includes the macroeconomic control variables summarized in Panel B of Table 3. We include year fixed effects in columns (2) and (3) and industry $\times$ year fixed effects in column(4). We are interested in the coefficient of $ContractShare \times \Delta WACR$.

Consider column (1) of Table 4. The coefficient of $\Delta WACR$ is -0.032. When the WACR increases (decreases) by one percentage point, the value of output reduces (increases) by approximately 3.2%, which is consistent with a contractionary policy shrinking the output produced. The result shows that monetary policy actions have the expected directional impact.

The coefficient of $ContractShare \times \Delta WACR$ is 0.037. Note the standard deviation of contract share is 22.4%, as reported in Table 3. Hence, for a one standard deviation change in the share of contract workers, the output sensitivity reduces by 0.83pp (i.e., 0.224$\times$0.037) for a one percentage point increase in WACR. Given that the average output growth rate during our sample period was 7.2%, the moderation translates to an economically meaningful magnitude of 11% (i.e., 0.8/7.2). We obtain similar economic significance when we consider the coefficients in columns (2), (3), and (4).

5 Supreme Court judgment as an Exogenous Shock

A straightforward approach of comparing the sensitivities of output to monetary policy changes based on the proportion of contract workers could be subject to endogeneity concerns. It is possible that some observable or unobservable differences between factories employing different proportions of contract workers also lead to a differential response to monetary policy changes. Given that the concerns are related to time-varying factors, the use of factory fixed effects is not sufficient to alleviate the concerns relating to endogeneity.

Therefore, we use the unexpected judgment of the Supreme Court of India as a shock to the hiring of contract workers. The use of the Supreme Court order to test our thesis is valid if (i) it leads to an exogenous cross-sectional variation in the additional hiring of contract workers due to the stringency of labor laws and not because of any other differences, (ii) it is orthogonal to the monetary policy setting process, and (iii) systematic differences between those factories hiring additional contract workers and others do not lead to a differential transmission of monetary policy after the judgment. We discuss the evidence relating to the above assumptions in detail in Section

7.

5.1 Exogenous Increase in Contract Workers

The Supreme Court judgment resolved the uncertainty surrounding the absorption of contract workers into the regular workforce. Factories could now hire contract workers without the fear of automatic absorption, as described in Section 2.1. Bertrand et al. (2021) find that in response to the judgment, firms increasingly relied on contract workers, and the increase is more concentrated in pro-worker states. This is expected as it is relatively more difficult to adjust the size of the regular workforce based on the demand situation in pro-worker states. Such factories are more likely to use the contract workers route to ease the above constraint. As a first step, we verify their finding using the factory-level data.

$$Y_{iwt} = \beta_0 + \beta_1 \times Post_t \times Labor_{it} \times Contract_w + \beta_2 \times Post_t \times Contract_w +$$
$$\beta_3 \times Post_t \times Labor_{it} + \beta_4 \times Labor_{it} \times Contract_w + \beta_5 \times Contract_w + \gamma_i + \delta_{ind} t + M_t(\theta_t) + \epsilon_{it} \tag{2}$$

Our data are organized at the factory i, worker type w, and year t level. The dependent variable is the logarithm of one plus the number of employees under the respective worker category (i.e., regular or contract) in factory i and year t. Following the standard practice in literature, we add one to the number of employees before taking the logarithm so that factories with zero workers of a particular type are not omitted.[10] However, recent literature highlights the potential problems associated with the 'log of one plus' measure (Cohn et al. (2022)). We return to this potential problem in Section 5.1.2.

Post is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* and *Contract* are indicator variables identifying pro-worker states and contract worker type, respectively. γ_i and θ_t denote the factory and year fixed effects, respectively. δ_{ind} is an indicator variable that is set to 1 for factory i's industry, and t denotes a time trend (Besley and Burgess (2004)). M_t represents a vector of macroeconomic control variables – summarized in Table 3. The standard errors are clustered at the state and industry (3-digit NIC code) level.

[10] Ouimet and Zarutskie (2014); Lerner and Wulf (2007); Barrios et al. (2022)

The coefficient of $Post \times Contract$ captures the increase in contract workers compared to regular workers in all states post the Supreme Court judgment. However, as noted by Bertrand et al. (2021), contract workers increased more in the pro-worker states. Hence, we also include the triple-interaction term, $Post \times Labor \times Contract$, to capture the differential increase in pro-worker states.

We present the results in columns (1) to (3) of Table 5. We include factory fixed effects and industry-specific time trends in the first two columns. Columns (1) and (2) include macroeconomic control variables and year fixed effects, respectively. Column (3) is our strongest specification, where we include factory $\times$ year fixed effects, which controls for any factory-level heterogeneity. We are interested in the coefficient of the triple-interaction term ($Post \times Labor \times Contract$).

Consider column (2) of Table 5. The coefficient of $Post \times Labor$ is -0.23, which implies that the labor-friendly states experienced approximately 23pp lower growth in regular workers compared to other states. Further, the coefficient of $Post \times Contract$ is 0.348, implying that the increase in contract workers is approximately 35pp more than that of regular workers in other states, post the Supreme Court judgment. Finally, the coefficient of $Post \times Labor \times Contract$ is 0.51, implying that the differential growth of contract and regular workers is approximately 51pp more in the pro-worker states after the Supreme Court Judgment. These findings suggest that the number of contract workers increased in all the states post the Supreme Court judgment; however, the increase was more concentrated in the pro-worker states. The results are in line with Bertrand et al. (2021).

For robustness, we examine whether there has been any change in the total wages paid to regular (contract) workers. Since factories in pro-worker states exhibited greater reliance on contract workers, the total wages paid to regular (contract) workers should have decreased (increased) compared to the factories in the other states. We estimate the regression equation 2 with the logarithm of wages as the dependent variable. Columns (4) to (6) of Table 5 present the results. Our coefficient of interest, i.e., the triple-interaction term, is 0.297 and significant across the three specifications. Therefore, the differential growth of contract and regular wages is approximately 29.7pp more in the pro-worker states after the Supreme Court Judgment.

5.1.1 Test of Pre-Trends

There could be concern about a pre-existing trend in the growth of contract workers in the pro-worker states and continuation of the same into the post period. We formally test for pre-existing trends by including separate year dummies in the equation (2). We estimate the regression equation after the inclusion of industry-specific time trends, factory and year fixed effects. We plot the triple-interaction coefficients in equation (2). Between any two years, the difference in coefficients is to be interpreted as the differential growth of contract workers vis-à-vis regular workers in pro-worker states and other states. Figure 2 plots the triple-interaction coefficients. Note that there is no marked trend before the judgment. However, after the judgment, we find a secular growth of contract workers in the pro-worker states.

5.1.2 Alternative Dependent Variables

Cohn et al. (2022) demonstrate that the usage of the logarithm of one plus the outcome variable could lead to biased estimates. They suggest to use Poisson, negative binomial model, or rate regressions, as appropriate. Note that a Poisson model imposes a restriction that the conditional mean and variance of the outcome variable to be equal. Since the dependent variable is overdispersed in our study, we choose a negative binomial model instead.[11]

Column (1) of Table A2 of the online appendix presents the results. The dependent variable is the number of employees. Note that the sign of interested coefficients does not flip and we obtain directionally similar results. As a robustness check, we scale the number of employees (wages) with the total fixed assets and use the same as the dependent variable in a linear regression. Columns (2) and (3) of Table A2 of the online appendix present the results. Our results continue to hold.

5.2 Sensitivity of Output to Monetary Policy

Having demonstrated the higher growth of contract workers in the pro-worker states, we now evaluate our main hypothesis about the sensitivity of output to monetary policy. Our identification strategy relies on the exogenous growth of contract workers post the Supreme Court judgment. We continue to use the overnight rate as a measure of monetary policy. Though the monetary policy is

[11] The degree of overdispersion in our study is 4.16 and statistically significant (Begley and Weagley (2023))

endogenous to future output or expected macroeconomic conditions, we are less concerned about the same owing to our triple-difference framework. We discuss this issue in detail in Section 7. We estimate the following regression equation to test the hypothesis.

$$Y_{it} = \beta_0 + \beta_1 Post_t \times Labor_{it} \times \Delta WACR_t + \beta_2 Post_t \times \Delta WACR_t +$$
$$\beta_3 Post_t \times Labor_{it} + \beta_4 Labor_{it} \times \Delta WACR_t + \delta_{ind} t + M_t(\theta_t) + \gamma_i + \epsilon_{it} \quad (3)$$

Our data are organized at the factory i and year t level. The dependent variable is the logarithm of the output produced by the factory i in year t. *Post* is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* is an indicator variable that takes the value of one for pro-worker states and zero otherwise. $\Delta WACR$ is the change in weighted average call rate during the previous year ($\Delta WACR = WACR_{t-1} - WACR_{t-2}$). A positive (negative) value denotes monetary contraction (expansion). δ_{ind} is an indicator variable that is set to 1 for factory i's industry, and t denotes a time trend (Besley and Burgess (2004)). M_t represents a vector of macroeconomic control variables – summarized in Panel B of Table 3. γ_i denotes the factory fixed effects. The standard errors are clustered at the state and industry (3-digit NIC code) level.

As noted in Section 5.1, contract workers increased in all the states post the Supreme Court judgment; however, there was a greater increase in the pro-worker states. If our hypothesis of contract workers moderating the sensitivity of output to monetary policy holds true, we should find a lower sensitivity in all the states post the judgment, indicated by a positive coefficient of $Post \times \Delta WACR$. Further, factories located in the pro-worker states should experience a greater decline in sensitivity, indicated by a positive coefficient of $Post \times Labor \times \Delta WACR$.

We present the results in Table 6. The dependent variable is the logarithm of the value of output across the four columns. We include factory fixed effects in all four columns. Further, columns (1) and (3) contain industry-specific time trends. Additionally, column (1) also contains our macroeconomic control variables. Finally, we include year fixed effects in columns (2) and (3), industry × year fixed effects in Column (4).

Consider column (1) of Table 6. The coefficient of $\Delta WACR$ is -0.195. When the WACR increases by one percentage point, the value of output declines by approximately 20%, which is consistent with a contractionary policy shrinking the output produced. Interestingly, the coefficient of $Labor \times \Delta WACR$ is insignificant, i.e., we do not find any difference in sensitivities among factories in labor-friendly states and other states before the Supreme Court judgment. We are not surprised by this result as the additional flexibility that the other states have in terms of hiring/firing workers does not manifest in lower sensitivity of output; it can only shield the factories from a decline in profitability.

Furthermore, the coefficient of $Post \times \Delta WACR$ is 0.073, implying that the sensitivity of output to monetary policy is lower in all the states post the Supreme Court judgment. This is consistent with our hypothesis as contract workers increased in all states post the Supreme Court judgment, as observed in Section 5.1.

Our coefficient of interest is that of the triple interaction term ($Post \times Labor \times \Delta WACR$). The coefficient ranges from 0.044 to 0.051 and is statistically significant across the four columns. Therefore, for a one percentage point increase in WACR, the factories located in the pro-worker states experience up to 5.1pp lower sensitivity than those located in the other states. Given the average annual growth rate of 7.2% in output during our study timeline, the reduction in output sensitivity is economically meaningful.

6 The Mechanism

Having demonstrated the lower sensitivity of output to monetary policy in states experiencing an exogenous increase in contract workers, we proceed to investigate the mechanism driving this result. Note that, as discussed in Section 1, the relative ease of hiring/firing of contract workers cannot influence the sensitivity of output to monetary policy changes: it can only mitigate the impact on firm profitability by adjusting the total wage burden quickly (Faia and Pezone (2023)). If the wages of contract workers are as rigid as those of regular workers, the sensitivity of output will not change with an increase in the proportion of contract workers.

In other words, when demand shifts due to a change in monetary policy stance, to maintain the same level of output, the marginal cost of labor and not just the total labor cost needs to adjust. The ease of hiring/firing changes the total labor cost and not necessarily marginal costs. Marginal costs can change in response to the entry of contract workers if their wages are relatively more flexible than those of regular workers. In such a case, a firm facing a demand shock can lower its per-unit prices due to reduced marginal cost. Thus, a plausible explanation for our result is that the wages of contract workers are relatively less rigid than those of regular workers.

We test the proposed mechanism by estimating the following regression equation.

$$Y_{iwt} = \beta_0 + \beta_1 Contract_w \times \Delta WACR_t + \beta_2 Contract_w + \gamma_i \times \theta_t + \epsilon_{it} \tag{4}$$

Our data are organized at the factory i, worker type w, and year t level. We consider factory-year observations with some presence of both regular contract workers, i.e., those with a share of contract workers in total workers between 5% and 95%. Since our focus is on the wage flexibility of contract workers in general, we do not distinguish between pre and post Supreme Court judgment periods.

The dependent variable is the per-day wage in Rupees paid to the regular (contract) worker.[12] Our ASI data presents information about wages, the number of person-days paid, and the number of person-days worked. This information allows us to compute wage per person-day paid and wage per person-day worked, and we consider both these variables in different specifications. *Contract* is an indicator variable identifying the contract worker type. $\Delta WACR$ is the change in the weighted average call rate during the previous year ($\Delta WACR = WACR_{t-1} - WACR_{t-2}$). γ_i and θ_t denote the factory and year fixed effects, respectively. We include factory $\times$ year fixed effects in our final specification, which enables us to control for any factory-level heterogeneity and examine within-factory change in wages paid to contract workers. The standard errors are clustered at the state and industry (3-digit NIC code) level.

We present the results in columns (1)-(4) of Table 7. The dependent variable is the wage per person-day paid to the regular (contract) worker in columns (1), (2), and the wage per person-day worked in columns (3), (4). Columns (1) and (3) include the factory fixed effects, year fixed effects, and industry-specific time trends (Besley and Burgess (2004)), and columns (2) and (4) include the factory $\times$ year fixed effects.

Consider column (2) of Table 7. The coefficient of *Contract* is -90.65, implying that the per-day wage of contract workers is INR 90.57 lower than that of regular workers, on average. Our coefficient of interest is that of $Contract \times \Delta WACR$, which is -2.73. Therefore, when the WACR

[12] We winsorize the dependent variable at the 1% and 99% level

increases by 100 basis points, the decline in the per-day wage of contract workers is INR 2.75 more than that of regular workers. As noted in Table 3, the per-day average wage of contract workers is INR 141 during our sample period; hence, a decline of INR 2.64 in a difference-in-difference sense translates to an economically meaningful decline of 1.9% (i.e., 2.75/141). We obtain directionally similar results when we consider wage per person-day worked in columns (3) and (4).

We consider 5% and 95% thresholds for the share of contract workers so that we examine observations with the presence of both regular and contract workers. There could be a concern about our choice of thresholds. As a robustness check, we strengthen these thresholds significantly and restrict the sample to observations with a share of contract workers between 20% and 80%. We present the results in columns (5)-(8) of Table 7. Our results continue to hold.

The results are in line with the thesis that the wages of contract workers are relatively more flexible than those of regular workers, leading to a change in marginal costs in response to a shift in demand caused by monetary policy changes. A change in marginal cost reduces the responsiveness of output to monetary policy changes.

7 Discussion & Robustness

As noted in Section 5, our use of the Supreme Court judgment as an exogenous shock is based on three identification assumptions. In this section, we elaborate on these three assumptions.

First, the increase in hiring of contract workers is based on the stringency of labor laws and not due to other differences across states. For instance, if the time-varying state-level differences in the supply of contract labor led to a higher increase in contract labor in pro-worker states, then this assumption would be invalid. We test this assumption by examining factory-year observations with less than 50 regular workers, i.e., when the Section V-A of the IDA does not bind, as discussed in Section 2.1. For the rest of the paper, we label such factories as exempted. We repeat our analysis performed in Section 5.1, but with factory-year observations having less than 50 regular workers. Table A3 of the online appendix presents the results. The coefficient of the triple interaction term ($Post \times Labor \times Contract$) is insignificant across the six columns, implying that there is no evidence of disproportionate growth in contract workers in pro-worker states among exempted factories. This result is in line with our first assumption.

Second, we assume that the Supreme Court judgment is orthogonal to the monetary policy setting process. Before proceeding further, we acknowledge the endogenous nature of the monetary policy. For instance, the central bank sets policy with a desired level of future output in mind. The standard practice in literature is to identify a component of monetary policy that is plausibly exogenous to future output or expected macroeconomic conditions (Nakamura and Steinsson (2018)). There are two major approaches – using high frequency data around policy announcements (Hanson and Stein (2015)) and historical macroeconomic data to estimate the model coefficients (Galí (2015)). Unfortunately, we cannot adopt the former approach due to the unavailability of high-frequency data during our study timeline. We are unable to adopt the latter approach either, as India shifted from targeting money supply to targeting interest rates in 1998, and we do not have a reasonably long timeline to estimate the model coefficients.[13]

Due to the above reasons, we directly use the target policy rate, and we cautiously mention monetary policy changes rather than monetary policy shocks.[14] Nevertheless, we are confident that the direct use of the policy rate does not invalidate our results, owing to our triple difference framework. For our results to be invalid, the endogenous component of the monetary policy process should not only change with the Supreme Court judgment but also depend more on the pro-worker states, i.e., the endogenous component of monetary policy should be associated with $Labor \times Post$. We do not see why that should be the case.

Nevertheless, we test our second identification assumption using the exempted factories. We examine whether the exempted factories (i.e., those with less than 50 regular workers) exhibit any differential sensitivity of output to monetary policy changes from the year 2002 onwards. We estimate regression equation (3), but with factory-year observations having less than 50 regular workers. Table A4 of the online appendix presents the results. We do not find a significant coefficient on the triple interaction term ($Post \times Labor \times \Delta WACR$) across four specifications, implying that there is no evidence of differential change in sensitivity among exempted factories located in the pro-worker states. Interestingly, the coefficient of $\Delta WACR$ is similar to the set of factories for which labor laws are applicable; therefore, the exempted factories experience similar impact on

[13] https://www.bis.org/review/r200130f.htm

[14] Note that the use of policy rates directly to represent changes in monetary policy is not atypical. Many studies that exploit exogenously created cross-sectional differences for identification use monetary policy rates (Jiménez et al. (2012, 2014); Drechsler et al. (2017); Morais et al. (2019); Kashyap and Stein (2000)).

output due to response to monetary policy changes. Note that if the endogenous component of monetary policy moved in line with our cross-section of states and the Supreme Court judgment, the effect of lower sensitivity should have manifested in exempted factories as well; however, that is not the case. It is highly improbable that the endogenous factor moves through the triple-interaction term and influences only those firms for which the labor laws are binding.

Third, the systematic differences in the factories located in the pro-worker states and other states do not influence the differential transmission of monetary policy post the Supreme Court judgment. To rule out systematic differences as an explanation, we first assess whether there are any observable differences between factories located in the two types of states. Panel A of Table A5 of the online appendix presents the comparison of key factory-level variables before the judgment (i.e., during 1999-2001). Note that, ex-ante, we expect significant differences between the factories if the labor laws are binding (Agrawal and Matsa (2013)). We find that the factories located in the two states are different along several dimensions, indicated by a significant t-statistic in Panel A of Table A5 of the online appendix. On average, we observe that the factories located in the pro-worker states are larger in size and more mature.

To rule out these time-varying factory-level differences as an explanation for our results, we include the factory level variables identified in Panel A and their interaction with *Post* as control variables in the regression equation (3). We present the coefficient estimates in Panel B of Table A5 of the online appendix. Our main result continues to hold.

As a further robustness check, we match factories located in pro-worker states and other states based on several observable characteristics – identified in Panel A of Table A5 – as of 2001, i.e., the year before the Supreme Court judgment.[15] Table A6 of the online appendix presents the results and we reach the same conclusion of lower sensitivity in pro-worker states. Therefore, our results are not driven by differences in observable characteristics of factories located in pro-worker and other states.

[15]Note that we perform entropy matching on the factories located in the two types of states based on the logarithm of production cost, investment in plant & machinery, current assets, current liabilities, total wages paid to the employees, number of employees, investment in fixed assets; the age of the factory since initial production year and number of months the factory was active in a financial year

7.1 Other Robustness Tests

We now conduct two robustness tests. Faia and Pezone (2023) document that the effects of wage rigidity is stronger for firms with high labor intensity. We examine if the sensitivity of output is a function of labor intensity, conditional on the share of contract workers. Our definition of labor intensity is the ratio of total wages to fixed assets. We divide factories into terciles, by industry and year, based on the labor intensity in the previous year. We estimate regression equation (1) for each of the three groups separately. Table A7 of the online appendix presents the results. We find that the decline in sensitivity manifests in factories with medium and high labor intensities.

Finally, Besley and Burgess (2004) classify states into pro-worker, neutral, and pro-employer, but we club neutral and pro-employer into a single category. We verify whether the results change if we exclude neutral states. Table A8 of the online appendix presents the results. Our main results continue to hold.

8 Conclusion

We examine whether the presence of contract workers impacts the sensitivity of firms' output to monetary policy changes. We use a surprise decision of the Supreme Court of India that eased the hiring of contract workers as a setting that exogenously led to an increase in the proportion of contract workers. We find that the firms in states with relatively more stringent labor laws used the judgment to increase the proportion of contract workers. Based on the above finding, we compare the responsiveness of output of firms located in states having stringent labor laws and firms in other states, before and after the judgment.

We find that the responsiveness of firms' output to monetary policy changes moderates due to the presence of contract workers. The relatively lower rigidity of contract workers' wages, when compared to the wages of regular workers, seems to be the mechanism at work. The higher presence of contract workers appears to be the reason for moderating the impact of monetary policy changes in states with pro-worker labor legislation.

It is important to highlight two significant limitations of our study. First, since the ASI data capture information at an annual level, we are forced to study the impact of monetary policy changes at an annual level. Thus, our analysis misses out on fluctuations in monetary policy stance within a year. In extreme cases, such as a financial crisis or when inflation suddenly flares up, there could be significant intra-year movement in the monetary policy stance of the central banks. We do not capture the impact of such movements fully.

Second, we do not distinguish between rate hikes and rate decreases. Given that we measure shocks at an annual frequency and have 10 years of panel data, the number of rate increases and decreases is, respectively, 6 and 4, as noted in Section 3. The time gap between tightening and easing years is also significant. Therefore, it is difficult to conduct meaningful tests for rate hikes and declines separately.

Despite the above limitations, the finding that the contract workers' wages respond more to the monetary policy changes, and thereby shield the impact on output, is likely to help better understand the extent of the impact of monetary policy changes on the cross-section of firms.

9 Figures & Tables

Figure 1: Evolution of WACR

In this figure, we plot the evolution of the monthly Weighted Average Call Rate (WACR) during our sample period.

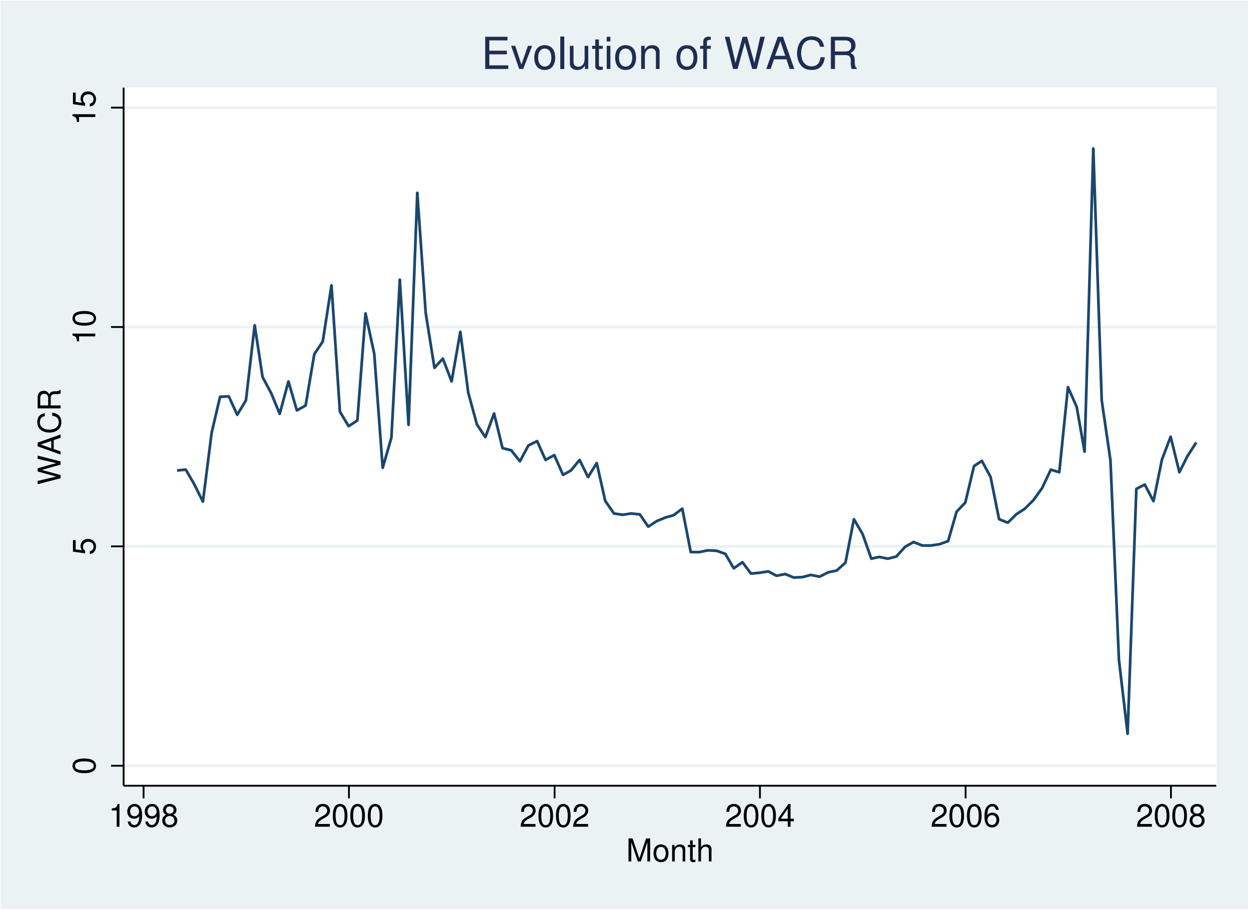

Figure 2: Plot of Triple-Interaction coefficients

In this figure, we plot the triple-interaction coefficients after the inclusion of separate year dummies in the regression equation (2). The dotted line indicates the beginning of post period.

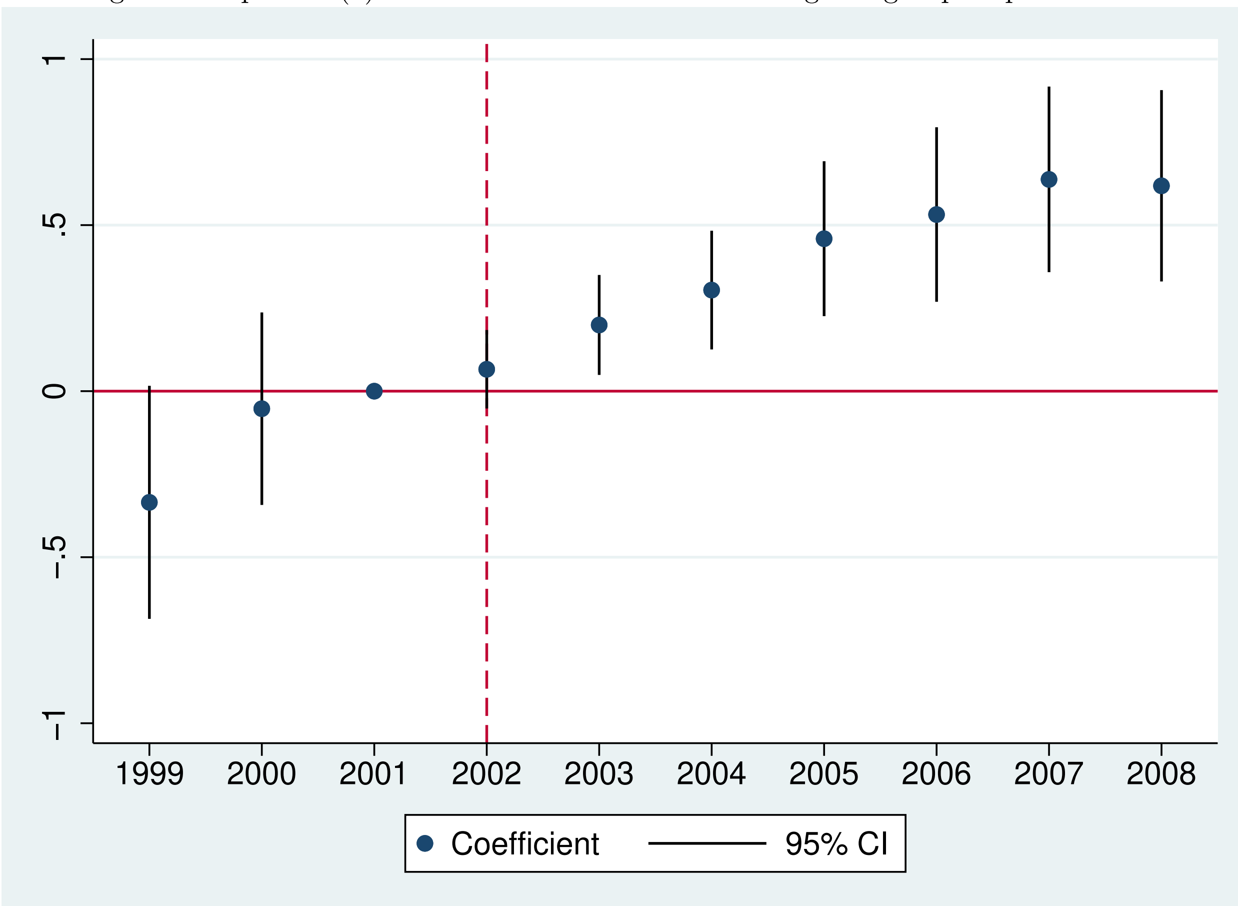

Table 1: Variable Definition

Variable	Definition	Data Source
No. of Regular Workers	Number of workers directly employed by the factory	ASI
No. of Contract Workers	Number of workers employed by the factory through contractors	ASI
No. of Total Workers	Sum of the number of regular workers and contract workers	ASI
ContractShare	Share of contract workers in total workers	ASI
Regular Wages	Total wages paid to regular workers in a financial year	ASI
Contract Wages	Total wages paid to contract workers in a financial year	ASI
Regular_Wage_Day_Paid	Ratio of regular wages to number of person-days paid of regular workers	ASI
Contract_Wage_Day_Paid	Ratio of contract wages to number of person-days paid of contract workers	ASI
Regular_Wage_Day_Worked	Ratio of regular wages to number of person-days worked of regular workers	ASI
Contract_Wage_Day_Worked	Ratio of contract wages to number of person-days worked of contract workers	ASI
Fixed Assets	Total gross value of fixed assets owned by a factory at the financial year. Fixed Assets include land, building, plant & machinery, and others.	ASI
Output	Total ex-factory value of products and by-products manufactured by a factory in a year	ASI
WACR	Monthly average of Weighted Average Call Rate	RBI
ΔWACR	Changed in the WACR between years $t-1$ and $t-2$	RBI
Credit Growth	Growth in the monthly average of outstanding bank credit from the previous financial year	RBI
Inflation	Growth in the monthly average of the Wholesale Price Index (WPI) from the previous financial year	CEA
GDP Growth	Growth in the real value of the Gross Domestic Product during the financial year	RBI
US Dollar/INR Change	Growth in the monthly average of the USD-INR exchange rate from the previous financial year	RBI
Market Return	Growth in the monthly average of the Bombay Stock Exchange (BSE) Index from the previous financial year	RBI
FII Flow	Ratio of the cumulative foreign institutional investor flows to the average BSE market capitalization during a financial year	RBI
Labor	Indicator variable set to one pro-worker states and zero otherwise	
Post	Indicator variable set to one from the year 2002 onwards and zero otherwise	

Table 2: Sample Construction

This table reports the details of sample construction

Sample Period - FY 1998-99 to FY 2007-08	
Number of factory-year observations in the ASI Census Scheme	166296
Number of factory-year observations after excluding factories inactive/closed status	138248
Number of factory-year observations after excluding factories with invalid state codes	138143
Number of factory-year observations with Besley and Burgess (2004) scores	123694
Number of factory-year observations with data about number of regular workers	116385
Number of factory-year observations where reporting year is a financial year	115541
Number of factory-year observations with at least 50 regular workers	77911
Main Sample - 77351 Observations	
Number of unique factories in the final sample	18413
Number of unique industries in the final sample	80
Number of unique states in the final sample	19
Number of observations in the pre-period	17525
Number of observations in the post-period	59826
Number of observations involving pro-worker states	21059
Number of observations involving other states	56292

Table 3: Summary Statistics

This table presents the descriptive statistics. Panel A reports the summary statistics of the main factory-year level variables from the Annual Survey of Industries (ASI) spanning 1998-99 to 2007-08. Panel B reports the summary statistics of the key year-level macroeconomic variables used in our analysis. Panel C illustrates how the share of contract workers changed. INR stands for Indian Rupee. WACR stands for the weighted average call rate. Detailed description of these variables is provided in the Table 1.

Panel A - Factory Variables

	N	Mean	Median	St. Dev.	p25	p75
No. of Regular Workers	77,351	345.21	179.00	850.61	106.00	337.00
No. of Contract Workers	77,351	88.67	0.00	844.47	0.00	42.00
No. of Total Workers	77,351	433.88	220.00	1,241.92	127.00	413.00
ContractShare (%)	77,351	12.46	0.00	22.36	0.00	16.98
Regular_Wage_Per_Day_Paid (INR)	52,149	186.53	131.99	906.81	85.00	219.36
Contract_Wage_Per_Day_Paid (INR)	18,198	141.31	114.00	633.79	89.39	150.00
Regular_Wage_Per_Day_Worked (INR)	77,337	189.59	139.03	180.38	85.81	234.07
Contract_Wage_Per_Day_Worked (INR)	25,798	123.78	105.35	86.55	80.22	143.98
Regular Wages (INR Million)	77,337	24.82	8.04	107.73	3.42	20.04
Contract Wages (INR Million)	77,337	3.16	0.00	20.59	0.00	1.30
Fixed Assets (INR Million)	57,662	920.61	172.33	6,020.11	59.11	518.71
Output (INR Million)	67,856	1,188.54	244.27	9,547.17	81.38	687.77
Output Growth (%)	53,908	7.24	7.57	60.38	-9.23	24.99

Panel B - Macroeconomic Variables

	N	Mean	Median	St. Dev.	p25	p75
WACR	10	6.71	6.62	1.61	5.60	7.83
ΔWACR	10	-0.06	0.16	1.22	-1.27	0.95
Credit Growth (%)	10	19.48	20.10	5.33	14.13	22.93
Inflation (%)	10	4.86	4.92	1.26	3.55	5.77
GDP Growth (%)	10	6.88	6.84	1.95	5.65	8.62
US Dollar/INR Change (%)	10	0.80	1.82	6.50	-2.24	4.30
Market Return (%)	10	14.69	27.07	24.62	-8.46	34.22
FII Flow (%)	10	1.62	1.35	1.36	0.73	2.17

Panel C - Contract Worker Share

	N	Mean	Median	St. Dev.	p25	p75
ContractShare (Pre-Period)	17,525	9.26	0.00	18.96	0.00	7.89
ContractShare (Post-Period)	59,826	13.40	0.00	23.18	0.00	20.48
ContractShare (Pre-Period & Pro-Worker States)	5,114	11.42	0.00	20.69	0.00	15.10
ContractShare (Post-Period & Pro-Worker States)	15,945	18.43	0.00	25.55	0.00	34.69
ContractShare (Pre-Period & Other States)	12,411	8.37	0.00	18.13	0.00	3.79
ContractShare (Post-Period & Other States)	43,881	11.57	0.00	21.98	0.00	12.44

Table 4: Impact of Labor Composition on Monetary Policy Transmission

This table demonstrates the association between labor composition and sensitivity of output to monetary policy. Our data are organized at the factory-year level. The dependent variable is the logarithm of the output produced by the factory i in year t. $ContractShare$ is the share of contract workers in the total workers at the end of previous year. $\Delta WACR$ is the change in weighted average call rate during the previous year ($\Delta WACR = WACR_{t-1} - WACR_{t-2}$). All four columns include factory fixed effects. Further, columns (1) and (3) contain industry-specific time trends. We control for a vector of macroeconomic variables – summarized in Panel B of Table 3 – in Column (1). We include year fixed effects in columns (2) and (3), and industry × year fixed effects in column (4). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(Value of Output)*			
	(1)	(2)	(3)	(4)
ContractShare × ΔWACR	0.037***	0.069***	0.037***	0.047***
	(0.012)	(0.015)	(0.012)	(0.013)
ContractShare	0.157***	0.201***	0.157***	0.149***
	(0.029)	(0.034)	(0.029)	(0.029)
ΔWACR	-0.032**			
	(0.013)			
Observations	51,461	51,461	51,461	51,420
R^2	0.929	0.926	0.929	0.930
Factory FE	Yes	Yes	Yes	Yes
Industry time-trends	Yes		Yes	
Macro Controls	Yes			
Year FE		Yes	Yes	
Industry × Year FE				Yes

Table 5: Exogenous Increase In Contract Workers

This table shows an increase in the hiring of contract workers post the Supreme Court judgment. Our data are organized at the factory-worker type-year level. For columns (1)-(3), the dependent variable is the logarithm of the one plus number of employees, and the logarithm of one plus wages for columns (4)-(6). *Post* is an indicator variable that takes the value of one from the year 2002 and zero otherwise. *Labor* and *Contract* are indicator variables identifying pro-worker states and contract worker type, respectively. We include factory fixed effects and industry-specific time trends in columns (1), (2), (4), and (5). Columns (1) and (4) contain macroeconomic control variables summarized in Panel B of Table 3. We include factory × year fixed effects in columns (3) and (6). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(1+No. of Employees)*			*log(1+Wages)*		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Labor × Contract	0.510***	0.510***	0.510***	0.297***	0.297***	0.296***
	(0.117)	(0.117)	(0.110)	(0.066)	(0.066)	(0.062)
Post × Contract	0.348***	0.348***	0.348***	0.109***	0.109***	0.109***
	(0.050)	(0.050)	(0.047)	(0.039)	(0.039)	(0.037)
Labor × Contract	0.256	0.256	0.256	-0.383**	-0.383**	-0.383***
	(0.264)	(0.264)	(0.248)	(0.151)	(0.151)	(0.141)
Contract	-4.245***	-4.245***	-4.245***	-1.859***	-1.859***	-1.859***
	(0.144)	(0.144)	(0.135)	(0.071)	(0.071)	(0.067)
Post × Labor	-0.230***	-0.230***		-0.151***	-0.151***	
	(0.053)	(0.052)		(0.036)	(0.036)	
Post	-0.229***			-0.146***		
	(0.047)			(0.030)		
Observations	154,702	154,702	154,702	154,673	154,673	154,672
R^2	0.735	0.735	0.779	0.750	0.750	0.787
Factory FE	Yes	Yes		Yes	Yes	
Industry time-trends	Yes	Yes		Yes	Yes	
Macro Controls	Yes			Yes		
Year FE		Yes			Yes	
Factory × Year FE			Yes			Yes

Table 6: Sensitivity of Output to Monetary Policy

This table shows the lower sensitivity of output to monetary policy in the pro-worker states after the Supreme Court judgment. The data are organized at the factory-year level. The dependent variable is the logarithm of the value of output for all four columns. *Post* is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* is an indicator variable identifying pro-worker states. $\Delta WACR$ is the change in weighted average call rate between the years $t-2$ and $t-1$. All four columns include factory fixed effects. Further, columns (1) and (3) contain industry-specific time trends. We control for a vector of macroeconomic variables – summarized in Panel B of Table 3 – in column (1). We include year fixed effects in columns (2) and (3), industry × year fixed effects in column (4). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(Value of Output)*			
	(1)	(2)	(3)	(4)
Post × Labor × ΔWACR	0.044**	0.051**	0.044**	0.047***
	(0.019)	(0.021)	(0.019)	(0.016)
Post × ΔWACR	0.073***			
	(0.015)			
Labor × ΔWACR	-0.015	-0.018	-0.015	-0.018
	(0.014)	(0.014)	(0.014)	(0.012)
ΔWACR	-0.195***			
	(0.026)			
Observations	63,416	63,416	63,416	63,372
R^2	0.916	0.913	0.916	0.918
Factory FE	Yes	Yes	Yes	Yes
Industry time-trends	Yes		Yes	
Macro Controls	Yes			
Year FE		Yes	Yes	
Industry × Year FE				Yes

Table 7: The Mechanism

This table demonstrates the lower rigidity of contract workers' wages. Our data are organized at the factory-worker type-year level. For columns (1), (2), (5), (6), the dependent variable is the wage per person-day paid to the regular (contract) worker, and for columns (3), (4), (7), (8), the dependent variable is the wage per person-day worked. *Contract* is an indicator variable identifying contract worker type. $\Delta WACR$ is the change in the weighted average call rate during the previous year ($\Delta WACR = WACR_{t-1} - WACR_{t-2}$). Odd-numbered columns include the factory fixed effects, year fixed effects, and industry-specific time trends, and even-numbered columns include the factory × year fixed effects. The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

	$0.05 \leq ContractShare \leq 0.95$				$0.20 \leq ContractShare \leq 0.80$			
	Wage per day paid		*Wage per day worked*		*Wage per day paid*		*Wage per day worked*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Contract × ΔWACR	-2.749**	-2.751***	-1.732*	-1.737**	-3.361**	-3.365***	-2.379**	-2.377**
	(1.105)	(1.008)	(0.902)	(0.832)	(1.304)	(1.178)	(1.129)	(1.031)
Contract	-90.622***	-90.657***	-113.911***	-113.898***	-94.134***	-94.170***	-117.213***	-117.208***
	(5.197)	(4.730)	(5.826)	(5.376)	(5.445)	(4.909)	(6.092)	(5.566)
Observations	34,201	34,162	47,836	47,826	25,237	25,210	33,935	33,930
R^2	0.626	0.697	0.636	0.706	0.639	0.703	0.648	0.712
Factory FE	Yes		Yes		Yes		Yes	
Industry time-trends	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Factory × Year FE		Yes		Yes		Yes		Yes

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Online Appendix

Table A1: Classification of States into Pro-Worker, Pro-Employer, and Neutral

This table lists the classification of states, following Besley and Burgess (2004)'s method. Note that we also consider the formation of new states. Three new states, namely Chattisgarh, Jharkhand, and Uttarakhand, were formed in 2000. These were part of Madhya Pradesh, Bihar, and Uttar Pradesh, respectively. The classification of the parent state is assigned to the new state (Chaurey (2015)).

Pro-Worker	Neutral	Pro-Employer
Besley and Burgess (2004)'s Classification		
Maharashtra	Assam	Karnataka
Orissa	Bihar	Kerala
West Bengal	Punjab	Rajasthan
Gujarat	Uttar Pradesh	Tamil Nadu
	Haryana	Andhra Pradesh
		Madhya Pradesh
Our Classification		
Maharashtra	Assam	Karnataka
Orissa	Bihar	Kerala
West Bengal	Punjab	Rajasthan
Andhra Pradesh	Uttarakhand	Tamil Nadu
	Himachal Pradesh	Gujarat
	Haryana	Madhya Pradesh
	Jharkhand	Chattisgarh
	Uttar Pradesh	

Table A2: Growth in Contract Workers - Alternative Specifications

This table shows that the result of exogenous growth in contract workers continues to hold using other specifications. We use a negative binomial model to estimate the coefficients in column (1), and linear regression in columns (2) and (3). The dependent variables are the number of employees, number of employees scaled by total fixed assets, and wages scaled by total fixed assets, respectively. Our data are organized at the factory-worker type-year level. *Post* is an indicator variable that takes the value of one from the year 2002 and zero otherwise. *Labor* and *Contract* are indicator variables identifying pro-worker states and contract worker type, respectively. We include industry × year effects in both columns. The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	Number of Employees	Scaled number of employees	Scaled wages
	(1)	(2)	(3)
Post × Labor × Contract	0.203*	0.260*	0.019***
	(0.110)	(0.143)	(0.006)
Post × Contract	0.554***	0.635***	0.016***
	(0.055)	(0.063)	(0.003)
Labor × Contract	0.207	0.144	-0.018
	(0.281)	(0.366)	(0.013)
Contract	-2.384***	-2.630***	-0.109***
	(0.182)	(0.203)	(0.007)
Post × Labor	-0.107**	-0.189*	-0.016***
	(0.042)	(0.102)	(0.004)
Observations	154,702	115,324	115,300
Log-likelihood	-810,393.28	-238,378.85	126,605.80
R^2		0.29	0.32
Industry × Year FE	Yes	Yes	Yes

Table A3: Growth In Contract Workers - Factories With Less Than 50 Regular Workers

This table examines the growth in contract workers among factories with less than 50 regular workers. Our data are organized at the factory-worker type-year level. For columns (1)-(3), the dependent variable is the logarithm of the one plus number of employees, and the logarithm of one plus wages for columns (4)-(6). *Post* is an indicator variable that takes the value of one from the year 2002 and zero otherwise. *Labor* and *Contract* are indicator variables identifying pro-worker states and contract worker type, respectively. We include factory fixed effects and industry-specific time trends in columns (1), (2), (4), and (5). Columns (1) and (4) contain macroeconomic control variables summarized in Panel B of Table 3. We include factory × year fixed effects in columns (3) and (6). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(1+No. of Employees)*			*log(1+Wages)*		
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Labor × Contract	0.149	0.149	0.149	0.082	0.082	0.082
	(0.168)	(0.168)	(0.145)	(0.063)	(0.063)	(0.055)
Post × Contract	0.207*	0.207*	0.207**	-0.008	-0.008	-0.008
	(0.108)	(0.108)	(0.093)	(0.029)	(0.029)	(0.025)
Labor × Contract	0.410	0.410	0.410*	0.016	0.016	0.016
	(0.264)	(0.264)	(0.228)	(0.101)	(0.101)	(0.087)
Contract	-1.665***	-1.665***	-1.665***	-0.124***	-0.124***	-0.124***
	(0.147)	(0.147)	(0.127)	(0.038)	(0.038)	(0.033)
Post × Labor	-0.103	-0.106		-0.044	-0.043	
	(0.092)	(0.091)		(0.036)	(0.036)	
Post	-0.139**			-0.020		
	(0.057)			(0.017)		
Observations	76,380	76,380	76,380	76,370	76,370	76,370
R^2	0.598	0.598	0.628	0.585	0.585	0.629
Factory FE	Yes	Yes		Yes	Yes	
Industry time-trends	Yes	Yes		Yes	Yes	
Macro Controls	Yes			Yes		
Year FE		Yes			Yes	
Factory × Year FE			Yes			Yes

Table A4: Sensitivity of Output to Monetary Policy - Factories With Less than 50 Regular Workers

This table examines the sensitivity of output to monetary policy among factories with less than 50 regular workers. The data are organized at the factory-year level. The dependent variable is the logarithm of the value of output for all four columns. *Post* is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* is an indicator variable identifying pro-worker states. $\Delta WACR$ is the change in weighted average call rate between the years $t-2$ and $t-1$. All four columns include factory fixed effects. Further, columns (1) and (3) contain industry-specific time trends. We control for a vector of macroeconomic variables – summarized in Panel B of Table 3 – in column (1). We include year fixed effects in columns (2) and (3), industry × year fixed effects in column (4). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(Value of Output)*			
	(1)	(2)	(3)	(4)
Post × Labor × ΔWACR	0.011	0.010	0.011	0.037
	(0.058)	(0.061)	(0.058)	(0.064)
Post × ΔWACR	0.015			
	(0.054)			
Labor × ΔWACR	0.003	0.005	0.003	-0.031
	(0.057)	(0.061)	(0.057)	(0.062)
ΔWACR	-0.195**			
	(0.089)			
Observations	23,452	23,452	23,452	23,379
R^2	0.934	0.931	0.934	0.937
Factory FE	Yes	Yes	Yes	Yes
Industry time-trends	Yes		Yes	
Macro Controls	Yes			
Year FE		Yes	Yes	
Industry × Year FE				Yes

Table A5: Sensitivity of Output to Monetary Policy - With Factory Controls

This table demonstrates that the differences in observable factory characteristics are not driving our results. Panel A presents the comparison of key factory-level variables before the judgment (i.e., during 1999-2001). In Panel-B, we control for the factory level variables identified in Panel A and their interaction with *Post*. The data are organized at the factory-year level. The dependent variable is the logarithm of the value of output for all four columns. *Post* is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* is an indicator variable identifying pro-worker states. $\Delta WACR$ is the change in weighted average call rate between the years $t-2$ and $t-1$. All four columns include factory fixed effects. Further, columns (1) and (3) contain industry-specific time trends. We control for a vector of macroeconomic variables – summarized in Panel B of Table 3 – in column (1). We include year fixed effects in columns (2) and (3), industry × year fixed effects in column (4). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Panel A	Pro-Worker States	Other States	Difference	t-stat
Log(Production Cost)	19.22	18.58	-0.65***	(-19.22)
Log(Plant & Machinery)	18.52	18.33	-0.20***	(-5.49)
Log(Current Assets)	18.53	17.62	-0.91***	(-24.70)
Log(Current Liabilities)	18.38	17.57	-0.82***	(-24.37)
Age	33.45	27.78	-5.67***	(-5.07)
Number of months operation	11.35	11.31	-0.04	(-1.42)
Log(Total Wages)	2.86	2.29	-0.57***	(-28.61)
Log(Number of Employees)	5.81	5.54	-0.26***	(-16.05)
Log(Fixed Assets)	18.94	18.74	-0.20***	(-5.67)

Panel B	*log(Value of Output)*			
	(1)	(2)	(3)	(4)
Post × Labor × ΔWACR	0.028*	0.027*	0.028*	0.030**
	(0.016)	(0.016)	(0.016)	(0.013)
Post × ΔWACR	0.072***			
	(0.015)			
Labor × ΔWACR	-0.007	-0.002	-0.007	-0.007
	(0.014)	(0.013)	(0.014)	(0.012)
ΔWACR	-0.060***			
	(0.012)			
Observations	45,734	45,734	45,734	45,703
R^2	0.950	0.949	0.950	0.950
Factory FE	Yes	Yes	Yes	Yes
Industry time-trends	Yes		Yes	
Macro Controls	Yes			
Factory Controls × Post	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	
Industry × Year FE				Yes

Table A6: Sensitivity of Output to Monetary Policy - Matched Sample Analysis

This table demonstrates the sensitivity of output to monetary policy using matched sample analysis. We match factories located in pro-worker states and other states based on several observable characteristics – identified in Panel A of Table A5 – as of 2001. The data are organized at the factory-year level. The dependent variable is the logarithm of the value of output for all four columns. *Post* is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* is an indicator variable identifying pro-worker states. $\Delta WACR$ is the change in weighted average call rate between the years $t-2$ and $t-1$. All four columns include factory fixed effects. Further, columns (1) and (3) contain industry-specific time trends. We control for a vector of macroeconomic variables – summarized in Panel B of Table 3 – in column (1). We include year fixed effects in columns (2) and (3), industry × year fixed effects in column (4). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(Value of Output)*			
	(1)	(2)	(3)	(4)
Post × Labor × ΔWACR	0.036*	0.041*	0.036*	0.036**
	(0.019)	(0.021)	(0.019)	(0.015)
Post × ΔWACR	0.096***			
	(0.018)			
Labor × ΔWACR	-0.010	-0.010	-0.010	-0.009
	(0.014)	(0.014)	(0.014)	(0.012)
ΔWACR	-0.218***			
	(0.035)			
Observations	36,171	36,171	36,171	36,126
R^2	0.905	0.900	0.905	0.908
Factory FE	Yes	Yes	Yes	Yes
Industry time-trends	Yes		Yes	
Macro Controls	Yes			
Year FE		Yes	Yes	
Industry × Year FE				Yes

Table A7: Effect of Labor Intensity

This table demonstrates the effect of labor intensity on sensitivity of output to monetary policy, conditional on the share of contract workers. Our definition of labor intensity is the ratio of total wages to fixed assets. We divide factories into terciles, by industry and year, based on the labor intensity in the previous year. Our data are organized at the factory-year level. The dependent variable is the logarithm of the output produced by the factory i in year t. *ContractShare* is the share of contract workers in the total workers at the end of previous year. $\Delta WACR$ is the change in weighted average call rate during the previous year ($\Delta WACR = WACR_{t-1} - WACR_{t-2}$). Columns (Low), (Medium), (High) report the results for factories with low, medium, and high labor intensities, respectively. We include factory fixed effects and year fixed effects in all three columns. The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

		log(Value of Output)	
Labor Intensity	(Low)	(Medium)	(High)
ContractShare × ΔWACR	0.034	0.071***	0.066**
	(0.024)	(0.025)	(0.027)
ContractShare	0.162***	0.177***	0.407***
	(0.059)	(0.059)	(0.088)
ΔWACR			
Observations	13,473	12,704	11,907
R^2	0.923	0.925	0.915
Factory FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table A8: Sensitivity of Output to Monetary Policy (Excluding Neutral States)

This table shows the lower sensitivity of output to monetary policy holds even after exclusion of neutral states. The data are organized at the factory-year level. The dependent variable is the logarithm of the value of output for all four columns. *Post* is an indicator variable that takes the value of one from the year 2002 onwards and zero otherwise. *Labor* is an indicator variable identifying pro-worker states. $\Delta WACR$ is the change in weighted average call rate between the years $t-2$ and $t-1$. All four columns include factory fixed effects. Further, columns (1) and (3) contain industry-specific time trends. We control for a vector of macroeconomic variables – summarized in Panel B of Table 3 – in column (1). We include year fixed effects in columns (2) and (3), industry × year fixed effects in column (4). The standard errors are clustered at the state and industry level (3-digit NIC code). Standard errors are reported in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively.

Dependent Variable	*log(Value of Output)*			
	(1)	(2)	(3)	(4)
Post × Labor × ΔWACR	0.047**	0.054**	0.047**	0.040**
	(0.023)	(0.025)	(0.023)	(0.016)
Post × ΔWACR	0.070***			
	(0.020)			
Labor × ΔWACR	-0.020	-0.020	-0.020	-0.014
	(0.019)	(0.018)	(0.019)	(0.015)
ΔWACR	-0.201***			
	(0.029)			
Observations	45,107	45,107	45,107	45,066
R^2	0.914	0.910	0.914	0.915
Factory FE	Yes	Yes	Yes	Yes
Industry time-trends	Yes		Yes	
Macro Controls	Yes			
Year FE		Yes	Yes	
Industry × Year FE				Yes