Institutions, Exchange Rate Flexibility and Firm Employment*

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Abstract

In this paper, we investigate the effect of exchange rate regime choices on firm employment under varying degrees of institutional quality. Our theoretical analysis shows that firms tend to hire more workers under a flexible exchange rate regime when institutional quality is relatively low. Conversely, as institutional quality improves, firms may increase employment when the exchange rate is more stable. To test our theoretical predictions, we construct an industry-level exchange rate flexibility index and examine how its flexibility influences Chinese firms' employment across different levels of institutional quality. Our empirical results strongly support the theoretical predictions.

JEL classification: E24, E02, F31.

Keywords: Exchange rate regime; Institution quality; Firm employment.

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1 Introduction

Institutions play a pivotal role in a country's economic performance across various aspects. The literature extensively discusses how institutions can affect an economy. Mauro (1995) demonstrates that corruption lowers investment, thereby reducing the growth rate. Wei (2000) finds that corruption diminishes a country's inward FDI. In the trade literature, several studies analyze how a country's institutional quality shapes its comparative advantage (Costinot, 2009; Levchenko, 2007). Given the importance of institutional quality to a country's development, a large body of studies focuses on the determinants of institutional quality (Acemoglu et al., 2001; Jiao and Wei, 2017). In this paper, instead of examining the determinants of institutional quality, we investigate the effect of macroeconomic policy under varying degrees of institutional quality. Specifically, we aim to analyze how exchange rate flexibility influences firms' employment decisions under different institutional qualities.

To better explain the mechanism of how exchange rate flexibility affects firms' decisions, we build a simple theoretical model. Our model shows that firms tend to hire more workers under a flexible exchange rate regime when institutional quality is relatively low. Conversely, as institutional quality improves, firms may increase employment when the exchange rate is more stable. The logic is as follows. As in the standard open economy literature, when the exchange rate depreciates (appreciates), the comparative advantage of domestic products on the global market strengthens (weakens). When institutional quality is extremely low, preventing firms from producing efficiently, firms may only engage in production when exchange rates are very weak. In such a case, a flexible exchange rate regime with the possibility of a weak domestic currency is more likely to stimulate production and encourage firms to hire compared to a fixed exchange rate regime. When the degree of institutional quality is high, the result can be reversed. This is because the benefits from exchange rate depreciations can be outweighed by the losses from exchange rate appreciations. Consider an extreme case where institutional quality is sufficiently high, encouraging firms to engage in production in most scenarios. Our theoretical model shows that although exchange rate depreciations benefit firms by increasing revenues, they do not incentivize firms to change their production status, i.e., from not producing to producing. On the other hand, if the Home currency appreciates strongly, it not only reduces firms' revenue from each unit of labor but also drives firms out of production. Hence, the losses from exchange rate appreciations in this case dominate the benefits from exchange rate depreciations. As a result, fixing the exchange rates can encourage firms to hire more workers and expand their production.

We then provide empirical evidence to support our theoretical predictions. The challenge in the empirical study lies in the lack of firm-level information for many countries worldwide. Consequently, we cannot directly test how exchange rate policy in different countries affects their firms' employment. To address this issue, we focus exclusively on Chinese firms. The two crucial indices needed for our empirical tests are the degrees of institutional quality and the exchange rate flexibility index. Fortunately, China has reported a regional institutional quality index, the *Fan Gang* index, since 1997. For the exchange rate, we utilize export information to construct an exchange rate index for firms in different industries. After controlling for a set of firm-level characteristics, our empirical results strongly support our theoretical predictions. Specifically, firms tend to hire more workers under a more flexible exchange rate when institutional quality is low. Conversely, firms are more likely to increase employment under a fixed exchange rate regime when institutional quality is high.

Our work contributes to the literature in two key aspects. First, to the best of our knowledge, this is the first study to demonstrate that the effects of macroeconomic policies, such as exchange rate policies, are contingent upon institutional quality. We show, both theoretically and empirically, that institutions can lead to opposite effects of changes in exchange rate flexibility. Second, we utilize disaggregated data to analyze the impact of institutions on employment. This approach offers a clearer and more precise understanding of the underlying mechanisms.

Our study connects to two bodies of literature. First, our work is related to the literature on how institutional quality influences a country's economic performance. Mauro (1995) shows that corruption lowers private investment, thereby reducing economic growth, even in subsamples of countries with cumbersome bureaucratic regulations. Chong and Calderon (2000) present cross-country evidence on the link between institutional quality and income inequality and find a negative relationship between institutional quality and income inequality. Rodrik et al. (2004) show that institutional quality plays a dominant role in driving income differences across countries. Our empirical analysis also shows significant variations in the degree of institutional quality across different regions in China. However, we do not attempt to explain the differences in institutional quality or analyze how institutional qualities affect regional development. Instead, we analyze firms' behaviors in different regions responding to exchange rate policies, which helps us better understand the pattern of regional development in China.

Second, our study is related to the rapidly growing literature on the interaction between institutions and trade or capital account openness. On one hand, several studies examine how institutions may shape trade or capital flow patterns for a country (Costinot, 2009; Anderson and Marcouiller, 2002; Rajan and Lee, 2003; Nunn, 2007; Ju and Wei, 2011). On the other hand, Levchenko (2007, 2011) analyze the effect of international trade on institutions. Rodrik (2008) show that overvalued currencies are associated with foreign currency shortages, rent-seeking, corruption, unsustainably large current account deficits, balance of payments crises, and stop-and-go macroeconomic cycles, all of which are damaging to growth. Our work also studies institutions in an open economy framework; however, it differs substantially from the existing literature. Instead of analyzing the relationship between trade (or capital flows) and institutions, we examine the effect of exchange rate policies under various degrees of institutional quality.

The remaining paper is organized as follows. Section 2 introduces a simple theoretical model and outlines the main theoretical predictions. Section 3 describes the data and empirical strategy we adopt in our analysis. Section 4 presents the empirical results. Section 5 offers the concluding remarks.

2 MODEL

Although we primarily focus on providing empirical evidence on how the effects of exchange rate flexibility depend on institutions, we first build a simple model to illustrate the theoretical mechanism. We consider a small open economy, Home. For simplicity, we assume that Home firms use labor to produce: one unit of labor input can produce z units of a tradable good, and z can differ across workers. We assume perfect competition and the law of one price for the tradable good. Let $\mathcal{E}$ denote the nominal exchange rate of Home, defined as the price of one unit of foreign currency in terms of Home currency. In this way, a higher value of $\mathcal{E}$ means a depreciation. If we normalize the world price of the tradable good to one (in terms of foreign currency), the perfect competition and the law of one price assumption imply that $\mathcal{E}$ is also the price of the tradable good in Home.

In our model, production occurs according to the following timeline: first, firms incur hiring costs to recruit workers. After being matched with firms, workers' productivities are revealed. We assume heterogeneous labor, meaning each worker receives an idiosyncratic productivity draw upon matching with a firm. Once firms observe the workers' productivities, they decide which workers to use in production.

We analyze the firms' problem using backward induction. Assume that worker j has been matched with firm i. The total payoff to a representative firm i using labor j is given by:

$$r_{ij} = \mathcal{E}\theta_i z_j - f \tag{1}$$

where r_{ij} is the payoff to firm i from worker j, z_j is the productivity of worker j, and f is the cost incurred for each worker. We can interpret the cost f as the training cost spent on the worker if the firm uses the worker to produce. If the firm decides not to use the worker, it will not incur this cost. We assume that z_j is drawn from a random distribution $[z_{\min}, z_{\max}]$. $\theta_i(> 0)$ is a measure of institutional quality. In this paper, we assume that better institutional quality can lead to higher efficiencies in firms' production. As in our later empirical analysis, firms are located in different regions associated with varying degrees of institutional quality; hence, θ_i can be firm-specific. Lastly, we assume all firms are small, such that their individual behaviors cannot affect the nominal exchange rate $\mathcal{E}$. By (1), it is evident that firm i will only use worker j in production when z_j is sufficiently high:

$$z_j \geq \frac{f}{\mathcal{E}}\theta_i^{-1} \tag{2}$$

For technical convenience, we assume z follows a uniform distribution. We now consider how the choice of exchange rate regime will affect firms' production.

First, we consider a fixed exchange rate regime where $\mathcal{E} = 1$ (for simplicity, we normalize the equilibrium expected value of the nominal exchange rate to one). It can be easily shown that there exists a threshold θ^{fixed} below which firm i will not use any labor to produce. Mathematically,

$$\theta^{\text{fixed}} = \frac{f}{z_{\max}} \tag{3}$$

This implies that when firms suffer from very poor institutions, they will not produce under a fixed exchange rate regime. For $\theta_i \geq \theta^{\text{fixed}}$, there exists a threshold (z_i^{fixed}) of labor productivity z above which some workers will be required by firm i to produce. Specifically, this threshold satisfies

$$\theta_i z_i^{\text{fixed}} - f = 0 \Rightarrow z_i^{\text{fixed}} = \frac{f}{\theta_i} \tag{4}$$

Now we consider the hiring decisions by firms. For firm i, we assume that in order to find l_i workers, a quadratic cost $\frac{c}{2}l_i^2$ must be paid. For simplicity, we assume that $\frac{c}{2}l_i^2$ includes wage payment and other non-wage costs. In this case, the expected profit for firm i is given by:

$$\begin{aligned}\pi_i^{\text{fixed}} &= \left(\int_{z_i^{\text{fixed}}}^{z_{\max}} (\theta_i z - f)\, dG(z)\right) l_i - \frac{c}{2} l_i^2 \\ &= \frac{1}{2\Delta z}\left(\theta_i z_{\max}^2 - \frac{f^2}{\theta_i}\right) l_i - \frac{c}{2} l_i^2\end{aligned}$$

where $G(\cdot)$ is the distribution function of the random variable z and $\Delta z \equiv z_{\max} - z_{\min}$. The second equality holds because we have used the assumption that z is drawn from a uniform distribution $[z_{\min}, z_{\max}]$. The first order condition for firm i with respect to l_i is:

$$\frac{1}{2\Delta z}\left(\theta_i z_{\max}^2 - \frac{f^2}{\theta_i}\right) = c l_i$$

Hence, the employment in this case is:

$$l_i^{\text{fixed}} = \begin{cases} \frac{1}{2c\Delta z}\left(\theta_i z_{\max}^2 - \frac{f^2}{\theta_i}\right) & \text{if } \theta_i \geq \theta^{\text{fixed}} \\ 0 & \text{otherwise} \end{cases} \tag{5}$$

Equation (5) implies that under a fixed exchange rate regime, only firms in regions with better institutions will produce.

Second, we consider flexible exchange rates. Under flexible exchange rates, given exchange rate $\mathcal{E}$, we can compute the threshold of workers' productivities as:

$$z_i^{\text{flexible}}(\mathcal{E}) = \min\left\{\frac{f}{\theta_i \mathcal{E}}, z_{\max}\right\} \tag{6}$$

That is, for any worker with labor productivity $z > z_i^{\text{flexible}}(\mathcal{E})$, firm i will use the labor to produce. Note that the max operator in (6) implies that if $\mathcal{E}$ is very low (very strong Home currency), the firm will not hire any worker to produce. In this case, the expected payoff to firm i is:

$$\begin{aligned}\pi_i^{\text{flexible}} &= \left(\int_{\mathcal{E}}\int_{z_i^{\text{flexible}}(\mathcal{E})}^{z_{\max}} (\mathcal{E}\theta_i z - f)\, dG(z) dF(\mathcal{E})\right) l_i - \frac{c}{2} l_i^2 \\ &= \int_{\mathcal{E}} \frac{1}{2\Delta z} \max\left\{\mathcal{E}\theta_i z_{\max}^2 - \frac{f^2}{\mathcal{E}\theta_i}, 0\right\} l_i dF(\mathcal{E}) - \frac{c}{2} l_i^2\end{aligned} \tag{7}$$

where again the second equality holds because we have used the assumption that z is subject to a uniform distribution. The first order condition with respect to l_i is:

$$l_i^{\text{flexible}} = \frac{1}{2c\Delta z}\left[\theta_i z_{\max}^2 - \int_{\mathcal{E}} \min\left\{\frac{f^2}{\mathcal{E}\theta_i}, \mathcal{E}\theta_i z_{\max}^2\right\} dF(\mathcal{E})\right] \tag{8}$$

We now compare the labor inputs under two exchange rate regimes. Let Δ_i denote the difference in employment under the two exchange rate regimes,

$$\Delta_i \equiv l_i^{\text{flexible}} - l_i^{\text{fixed}}$$

We can now show the following proposition.

Proposition 1 *Under the assumption that z is drawn from a uniform distribution $[z_{\min}, z_{\max}]$, if $z_{\max}$ is sufficiently high, there exists a threshold of θ such that for θ_i below (above) the threshold, an increase in exchange rate flexibility will lead firms to hire more (fewer) workers.*

Proof. See Appendix A ■

A few remarks are in order. First, if the exchange rate depreciates (appreciates), the comparative advantage of domestic products on the global market strengthens (weakens). Consequently, the production income of domestic firms increases (decreases), making them more likely to expand (shrink) their labor force.

Second, why do firms hire more workers under a flexible exchange rate regime compared to a fixed exchange rate regime when institutional quality is low? Consider an extreme example where institutional quality is extremely low, and production costs for firms are very high. If the exchange rate is at a long-term equilibrium level, most firms are unwilling to hire workers for production (no firms produce in the theoretical model). However, under a flexible exchange rate regime, firms can remain relatively optimistic. When the exchange rate is weak enough, they can engage in partial production to obtain positive profits. In such a case, the expected output under a fixed exchange rate regime is close to zero, while the expected output under a flexible exchange rate regime, although not high, is more likely to be positive. Therefore, a flexible exchange rate regime is more likely to stimulate production compared to a fixed exchange rate regime. Thus, when institutional quality is very low, firms are more willing to hire workers under a flexible exchange rate regime.

Third, why are firms likely to hire more workers under a fixed exchange rate regime when institutional quality is high? This is because the benefits from exchange rate depreciations can be outweighed by the losses from exchange rate appreciations. Consider an extreme case where institutional quality is sufficiently high such that firms will use all matched workers (even those with the lowest productivity draw $z_{\min}$) to produce when the nominal exchange rate is at its long-run equilibrium level. In this scenario, although exchange rate depreciations still benefit firms by increasing revenues, they do not encourage firms to employ a wider range of workers in production. On the other hand, consider the impact of exchange rate appreciations. If the Home currency appreciates strongly, it not only reduces firms' revenue from each unit of labor but also discourages firms from using a wider range of workers in production. Hence, the losses from exchange rate appreciations in this case dominate the benefits from exchange rate depreciations. As a result, fixing the exchange rates can encourage firms to hire more workers and expand their production.

Fourth, (5) implies that firms will not produce if the institutional quality is very low. This result stems from our simplifying assumption of a one-good economy. In a more realistic model, considering multiple goods, we would see that for certain goods whose production is significantly affected by institutions, low institutional quality would drive most firms out of the goods market. However, some firms would still operate in the region and produce other goods. Nevertheless, our main theoretical prediction—that the effects of exchange rate flexibility on firms' employment depend on institutional quality—will still hold.

3 Data and Empirical Specification

3.1 data

Before proceeding to the empirical estimations, we first describe the data used in our analysis. Our data comes from three sources: the *Fan Gang* marketization index, China's Customs Statistics, and the Annual Survey of Industrial Enterprises Database. Below we provide explanations on how we construct indices used in our regressions.

Institutional quality We adopt the *Fan Gang* marketization index (FG) to measure regional institutional quality in China.[1] By evaluating the following six dimensions: the relationship between government and market, the development of the non-state economy, the development of product markets, the development of factor markets, the development of intermediary organizations and the

[1]Data can be obtained from the website: https://cmi.ssap.com.cn/

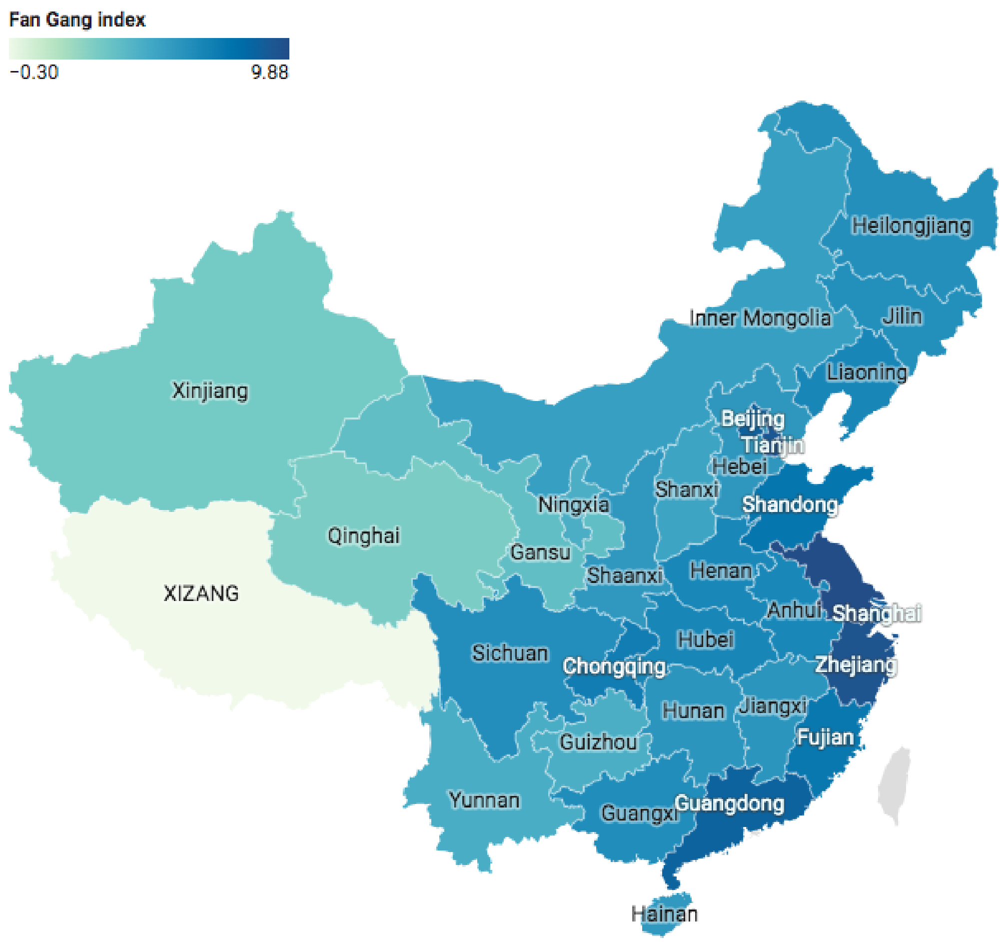

Figure 1: Institutional Quality across Chinese Provinces, year 2013

legal environment, and the degree of market openness, the *Fan Gang* index generates a comprehensive score reflecting the degree of marketization in different regions. Figure 1 shows the distribution of the institutional quality index across Chinese provinces. We can clearly see substantial variations in institutional quality across different regions. Specifically, the southeastern regions, on average, are associated with higher marketization degrees than the northwestern regions in China.

Exchange rate flexibility Another key variable in our regressions is the exchange rate flexibility index faced by firms. At the firm level, even though firms are located in the same region, they may face different exchange rate flexibilities. For instance, consider two firms: Firm A, whose major exporting market is the US, and Firm B, whose major exporting market is the Eurozone. Before 2006, Firm A faced a much more stable exchange rate than Firm B because the Chinese Yuan was pegged to the US dollar but not to the Euro. This implies that firm-level exchange rate flexibility depends on the export destinations. Hence, to construct the index, we rely on two pieces of information: firms' export data and the bilateral exchange rate regime between China and the firms' export destinations.

The bilateral exchange rate regime index we use is from Klein and Shambaugh (2006).[2] It is important to note that there can be two types of pegs between a pair of countries in Klein and Shambaugh (2006): direct peg and indirect peg. The index *kspeg* used in Klein and Shambaugh (2006) represents the direct peg. Specifically, *kspeg* takes the value of one if China and country A have a direct peg to each other, and zero otherwise. However, the *kspeg* index cannot capture indirect pegs between countries. For instance, if China and country B are not directly pegged to each other, but both China and country B are directly pegged to country A, then the relationship between China and country B is considered an indirect peg. In our analysis, we use *inkspeg* to denote indirect pegs between countries, which takes the value of one if an indirect peg exists between a pair of countries and zero otherwise. In our empirical analysis, we define a variable *fixed* to represent the fixed exchange rate regime between China and the exporting destination country i, where *fixed* = *kspeg* + *inkspeg*.

Next, we construct an industry-level exchange rate regime index using export information from China's Customs Statistics. China's Customs Statistics provides detailed records of daily import and export transactions, including the names of firms involved in each transaction, the importing or exporting country of the product, the quantity of imports and exports, and the trade volume. Based on this data, we use the industry-level export share to compute the industry-level exchange rate regime index. Notably, exchange rate fluctuations in the current year can affect a firm's exports. Therefore, the exchange rate regime indicator calculated based on the industry-level export share in the current year is likely to have serious endogeneity issues. To avoid this issue, we select the year 2000 as the base year. Using the industry-level export share in 2000, we compute the industry-level exchange rate regime indicator $er_{h,t}$ based on the following formula:

$$er_{h,t} = \sum_{c=1}^{N} \frac{Export_{h,c}}{Export_h} \times er_{c,t} \tag{9}$$

where N is the number of export destination countries, $Export_{h,c}$ represents exports of China's industry h to country c in 2000, $Export_h$ stands for total exports of China's industry h in 2000, and $er_{c,t}$ is the indicator for measuring whether the exchange rate between country c and China is pegged in year t. This includes three dummy variables: $fixed$, $kspeg$, and $inkspeg$. We can then

[2] Data can be obtained from the website: http://www.gwu.edu/~iiep/about/faculty/jshambaugh/data.cfm

obtain the exchange rate fixity for firm i in industry h in year t, denoted as $fixed_{h,t}$, $peg_{h,t}$, and $inpeg_{h,t}$. An increase in $fixed_{h,t}$ ($peg_{h,t}$ or $inpeg_{h,t}$) is associated with a decrease in exchange rate flexibility.

There are two reasons why we choose to construct industry-level exchange rate regime indicators instead of firm-level exchange rate regime indicators. Firstly, a single firm may only export to a limited number of countries. Therefore, using firm-level export share to compute a firm-level exchange rate regime index can lead to the issue of endogeneity. For instance, firm A may decide not to export to the US when the exchange rate between the US dollar (USD) and the Chinese yuan (CNY) is extremely low. When the exchange rate rises to a sufficiently high level, firm A's decision might change. This suggests that the exchange rate can affect a firm's behavior. However, at the industry level, since the industry's exports are global, the issue mentioned above can be largely ignored. Secondly, adopting an industry-level exchange rate regime indicator is more closely related to our theory in this paper, and the rationale is as follows. In an open economy, the price of products within an industry largely depends on the equilibrium price of the product traded worldwide. Therefore, this equilibrium price will affect the production decisions of each firm within the industry, including non-exporting firms. If we use firm-level export share as a weight to calculate a firm-level exchange rate regime index, we then limit the sample to exporting firms only and ignore the effects of industry-level competition on non-exporting firms, which is significantly different from our theoretical model. To be consistent with our theory, we construct industry-level exchange rate regime indicators based on the industry-level export share.

It is noteworthy that the issue of endogeneity in our regression may arise from two main aspects: Firstly, the weights we choose may be endogenous when constructing industry-level exchange rate regime indicators. To address this, we use the year 2000 as the base year and employ the industry-level export share from 2000 as the weight. Secondly, endogeneity may stem from the exchange rate regime itself. However, since we primarily use firm-level data for our empirical analysis, and exchange rates between countries are generally not influenced by the behavior of individual firms, the endogeneity of exchange rates is relatively minor for individual firms.

Other firm-level variables We also control for a set of firm-level characteristics: the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.[3]

The firm-level data used in this paper is obtained from the Annual Survey of Industrial Enterprises Database, which covers over 160,000 manufacturing firms. Although the dataset contains rich information, several variables are noisy due to misreporting by certain firms. To overcome this issue, we adopt the approach of Feenstra et al. (2014) and use the following criteria to clean our sample: (i) firms with fewer than eight employees; (ii) firms with a gross value of industrial output below 5,000 RMB; (iii) firms with accumulated depreciation below the current year's depreciation; (iv) firms with total assets lower than liquid assets; (v) firms with paid-in capital less than zero; (vi) firms established before 1949 and firms with age less than zero; and (vii) firms with missing key financial variables such as total assets. All variables are adjusted using specific deflators. For instance, sales revenue is adjusted using the Industrial Producer Price Index, and total assets are deflated by the fixed assets investment price index. The deflators are all sourced from the China Statistical Yearbook.

It should be noted that China issued a new "Classification of National Economic Industries" in 2002. The China Industry Classification (CIC) code underwent significant adjustments in 2002, with some industries being split and others restructured. To make the industries of different years comparable, we adjust them based on the code matching table from Brandt et al. (2012). Specifically, we exclude the following industries: coal mining and washing industries (6), oil and gas extraction industry (7), black metal mining and dressing industry (8), nonferrous metal mining and dressing industry (9), nonmetallic mining and dressing industry (10), other mining industry (11), production and supply of electricity and heat industry (44), gas production and supply industry (45), and water production and supply industry (46). Finally, only 31 manufacturing industries with interquartile codes 13-43 are retained. Our final sample contains 576,474 firms with 296,323 observations from 2000 to 2013.

3.2 Empirical specification

The empirical specification of our empirical model is as follows:

$$\Delta lemp_{i,t} = \alpha_0 + \beta FG_{p,t} \times fixed_{h,t} + \theta fixed_{h,t} + \rho FG_{p,t} + \lambda z'_{i,t} + f_i + f_t + \varepsilon_{i,t} \quad (10)$$

[3] Table 1 provides the summary statistics of the variables used in our estimations.

where p stands for the province where the firm is located, h represents the firm's industry, i denotes the firm, and t indicates the year. $\Delta lemp_{i,t}$ is our dependent variable and represents the net increase in a firm's employment, calculated as the first difference of the logarithm of year t's employment numbers for firm i in industry h:

$$\Delta lemp_{i,t} = \log(employment)_{i,t} - \log(employment)_{i,t-1} \tag{11}$$

$FG_{p,t}$ is the *Fan Gang* index, which represents a higher degree of institutional quality if the index takes a higher value. $fixed_{h,t}$ is the industry-level exchange rate regime indicator we constructed. $z_{i,t}$ represents the set of firm-level variables discussed in previous analysis. f_i and f_t are firm fixed effects and time fixed effects, respectively. $\varepsilon_{i,t}$ is the error term. In our estimations, we cluster the standard errors at the industry level.

Our interest is to determine how changes in exchange rate flexibility will affect firms' employment. Specifically, we focus on the term $\beta FG_{p,t} + \theta$. The theory predicts that a rise in exchange rate flexibility (a decrease in $fixed_{h,t}$) will lead to an increase in employment when institutional quality is low. That is, we predict $\theta < 0$. As institutional quality improves, the pattern may reverse. A decrease in exchange rate flexibility (an increase in $fixed_{h,t}$) is more likely to be associated with an increase in employment. Hence, we predict $\beta > 0$.

In order to see whether direct peg and indirect peg have different effects on firms' behaviors, we consider the following empirical specification:

$$\begin{aligned} \Delta lemp_{i,t} = & \alpha_0 + \beta^{inpeg} FG_{p,t} \times inpeg_{h,t} + \beta^{peg} FG_{p,t} \times peg_{h,t} + \theta^{inpeg} inpeg_{h,t} + \theta^{peg} peg_{h,t} \\ & + \rho FG_{p,t} + z'_{i,t} + f_i + f_t + \varepsilon_{i,t} \end{aligned} \tag{12}$$

Similarly, our theory predicts that $\beta^{peg} > 0$, $\beta^{inpeg} > 0$, $\theta^{peg} < 0$ and $\theta^{inpeg} < 0$.

To better capture the macro condition changes, we change the fixed effect combinations. Specifically, we replace the firm fixed effects and time fixed effects in (10) and (12) with firm fixed effect and industry $\times$ time fixed effects.

$$\begin{aligned} \Delta lemp_{i,t} = & \alpha_0 + \beta FG_{p,t} \times fixed_{h,t} + \rho FG_{p,t} + z'_{i,t} + f_i + \gamma_{h,t} + \varepsilon_{i,t} \\ \Delta lemp_{i,t} = & \alpha_0 + \beta^{inpeg} FG_{p,t} \times inpeg_{h,t} + \beta^{peg} FG_{p,t} \times peg_{h,t} + \rho FG_{p,t} + z'_{i,t} + f_i + \gamma_{h,t} + \varepsilon_{i,t} \end{aligned} \tag{13}$$

Note that once the industry $\times$ time fixed effect is included, the industry-level exchange rate indices will be captured by this effect. Hence, we can only test how the effect of exchange rate flexibility changes on firms' employment depends on institutions. Our theory predicts that $\beta > 0$, $\beta^{peg} > 0$, and $\beta^{inpeg} > 0$.

4 EMPIRICAL RESULTS

4.1 BASELINE REGRESSION RESULTS

Table 2 presents the baseline regression results. In Columns (1) and (2), we show the regression results when controlling for firm and time fixed effects. In Columns (3) and (4), we report the estimation results when controlling for firm and industry-time fixed effects. In the first two columns, the coefficients on exchange rate flexibility indices ($fixed$ in Column (1), *inpeg* and *peg* in Column (2)) are all negative and statistically significant at 1% level, while the coefficients on the interaction term between exchange rate flexibility and the *Fan Gang* index are all positive and statistically significant at 1% level. This is consistent with our theoretical prediction.

Quantitatively, based on the regression results from Column (1), when we take the minimum value of the institutional quality index (0.63), the marginal effect of changing from a pure fixed exchange rate regime (value 0) to a free-floating exchange rate regime (value 1) on firms' employment growth is -0.13 ($= -0.142 + 0.018 \times 0.63$), indicating a 13 percentage point decline. Conducting a t-test, we show that the marginal effect is statistically significant at the 1% level. When the degree of institutional quality is relatively high, such as at the 90th percentile of the institutional quality index (10.37), the fixed exchange rate regime increases firms' employment growth by about 0.04 ($= -0.142 + 0.018 \times 10.37$), or 4 percentage points, compared to the flexible exchange rate regime. Again, the t-test shows that this effect is statistically significant at the 1% level.

In Column (2), when we separate the direct peg and the indirect peg to examine potential differences in their effects on firms' employment, we do not observe a statistically significant difference in the coefficients for the two pegs.

In Columns (3) and (4), we replace the time fixed effect from the first two columns with industry-time fixed effect. The industry-level indirect peg and industry-level direct peg will be absorbed by the new fixed effect. Observing the coefficients of the interaction terms, we find that all of them in the last two columns are still positive and statistically significant at the 1% level. Therefore, as the degree of institutional quality rises and exceeds a certain threshold, the fixed exchange rate regime, compared to the flexible exchange rate regime, is more effective in promoting firms' employment growth.

4.2 Robustness Checks

We conduct three types of robustness checks in this section: i) using an alternative sample period by excluding the global financial crisis period, ii) using alternative institutional quality indices, and iii) using an alternative dependent variable.

Alternative Sample Period The sample period in the baseline regression is from 2000 to 2013. However, due to the impact of the global financial crisis (GFC) in 2008, economies around the world experienced a downturn, and international trade was severely affected. It is challenging to accurately distinguish whether the fluctuations in supply and demand in the labor market after 2008 are due to the financial crisis or the exchange rate regime. To avoid the potential impact of the uncertainty brought by the GFC on the regression results, we exclude the GFC period and re-run our regressions. The results are reported in Table 3. We observe that all results are similar to our baseline estimations.

Alternative Institutional Quality Index The *Fan Gang* index is an aggregate index that covers information on institutional quality from multiple aspects. To determine which aspect of institutional quality plays a more important role in shaping the effects of exchange rate flexibility changes on firms' employment, we conduct regressions using institutional quality indices in five different categories: the relationship between government and market, the development of the non-state economy, the development of product markets, the development of factor markets, and the development of the legal environment. Tables 4 to 8 report the regression results. We can see that in all tables, the coefficients on the exchange rate flexibility indices ($fixed$, $inpeg$, and peg) are all negative and statistically significant, while the coefficients on the interaction terms between exchange rate flexibility and the institutional quality index are all positive and statistically significant. This confirms that our baseline estimation results are robust across alternative institutional measures.

Alternative Dependent Variable Although our theory mainly focuses on the effects of exchange rate flexibility changes on firms' employment, a similar mechanism should also apply to firms' output. That is, when firms are located in a region with low institutional quality, flexible exchange rates are more likely to enhance firms' output. Conversely, if firms face high institutional quality, fixing the exchange rates is more likely to induce firms to expand their output. We test this prediction in this robustness check. Table 9 reports the results. We can see that after changing the dependent variable to the change in log value added, we observe negative and statistically significant coefficients on exchange rate flexibility measures, while we find positive and statistically significant coefficients on the interaction terms between exchange rate flexibility measures and the *Fan Gang* index. This confirms that our theoretical channel also works for output.

4.3 Heterogeneity analysis

In our baseline estimations, we pool all firms together and estimate how the effects of exchange rate flexibility on firms' behaviors depend on institutional quality. A potential concern is that whether the estimated effect we obtain in the baseline regression holds for all firms, or in other words, is there any heterogeneity among firms? In this case, we aim at studying firms' responses to exchange rate flexibility changes when we separate the types of firms.

Export vs. non-exporters We first separate firms into exporters and non-exporters. Tables 10 and 11 report the regression results for exporters and non-exporters, respectively. Interestingly, even though exporters seem to be affected by exchange rate adjustments more directly, the effects of exchange rate flexibility changes on firms' employment do not differ much between exporters and non-exporters. In fact, while all coefficients retain the same signs as in our baseline regression, the coefficients on *inpeg* and the interaction term $FG \times inpeg$ lose statistical significance for exporters but remain statistically significant for non-exporters.

SOEs vs. non-SOEs We then separate firms into SOEs and non-SOEs. The main idea is that SOEs may not suffer as much as non-SOEs if the institutional quality is low. In this case, exchange rate flexibility changes may have a weaker effect on SOEs than on non-SOEs. Tables 12 and 13 report the regression results for SOEs and non-SOEs, respectively. As predicted, for non-SOEs, all coefficients are similar in signs and statistical significance compared to our baseline regression. However, for SOEs, we do not obtain any significant coefficients on either exchange rate flexibility measures or the interaction terms between the exchange rate flexibility measures and the institutional quality index.

4.4 Mechanism analysis

One underlying assumption that ensures our theory holds is that better institutional quality will yield higher firm productivity. In this section, we test this assumption.

We first estimate firm-level productivity using the method proposed by Olley and Pakes (1996). Next, we examine how the *Fan Gang* institutional quality index affects firms' productivities. Table 14 reports the regression results. The coefficients on the institutional quality index are all positive and statistically significant, implying that better institutions are associated with higher firm productivity. This confirms that our assumption holds in the data.

5 Concluding remarks

In this paper, we investigate the effect of exchange rate regime choices on firm employment under varying degrees of institutional quality. Using a straightforward theoretical model, we demonstrate that firms tend to hire more workers under a flexible exchange rate regime when institutional quality is relatively low. Conversely, as institutional quality improves, firms may increase employment when the exchange rate is more stable.

To empirically test our theoretical predictions, we utilize Chinese data to construct an industry-level exchange rate flexibility index and examine its impact on Chinese firms' employment across different levels of institutional quality. Our empirical analysis provides robust evidence supporting our theoretical predictions, showing a clear relationship between exchange rate flexibility, institutional quality, and employment outcomes in firms.

References

Acemoglu, Daron, Simon Johnson, and James A Robinson, "The colonial origins of comparative development: An empirical investigation," *American economic review*, 2001, *91* (5), 1369–1401.

Anderson, James E and Douglas Marcouiller, "Insecurity and the pattern of trade: An empirical investigation," *Review of Economics and statistics*, 2002, *84* (2), 342–352.

Brandt, Loren, Johannes Van Biesebroeck, and Yifan Zhang, "Creative accounting or creative destruction? Firm-level productivity growth in Chinese manufacturing," *Journal of development economics*, 2012, *97* (2), 339–351.

Chong, Alberto and Cesar Calderon, "Institutional quality and income distribution," *Economic Development and Cultural Change*, 2000, *48* (4), 761–786.

Costinot, Arnaud, "On the origins of comparative advantage," *Journal of International Economics*, 2009, *77* (2), 255–264.

Feenstra, Robert C, Zhiyuan Li, and Miaojie Yu, "Exports and credit constraints under incomplete information: Theory and evidence from China," *Review of Economics and Statistics*, 2014, *96* (4), 729–744.

Jiao, Yang and Shang-Jin Wei, "Intrinsic openness and endogenous institutional quality," Technical Report, National Bureau of Economic Research 2017.

Ju, Jiandong and Shang-Jin Wei, "When is quality of financial system a source of comparative advantage?," *Journal of International Economics*, 2011, *84* (2), 178–187.

Klein, Michael W and Jay C Shambaugh, "Fixed exchange rates and trade," *Journal of international Economics*, 2006, *70* (2), 359–383.

Levchenko, Andrei A, "Institutional quality and international trade," *The Review of Economic Studies*, 2007, *74* (3), 791–819.

_____ , "International trade and institutional change," Technical Report, National Bureau of Economic Research 2011.

Mauro, Paolo, "Corruption and growth," *The quarterly journal of economics*, 1995, *110* (3), 681–712.

Nunn, Nathan, "Relationship-specificity, incomplete contracts, and the pattern of trade," *The Quarterly Journal of Economics*, 2007, *122* (2), 569–600.

Olley, G. Steven and Ariel Pakes, "The Dynamics of Productivity in the Telecommunications Equipment Industry," *Econometrica*, 1996, *64* (6), 1263–1297.

Rajan, Priya and Jae Young Lee, "Contract enforcement and the volume of international trade in different types of goods," *Working Paper*, 2003.

Rodrik, Dani, "The real exchange rate and economic growth," *Brookings papers on economic activity*, 2008, *2008* (2), 365–412.

_____ **, Arvind Subramanian, and Francesco Trebbi**, "Institutions rule: the primacy of institutions over geography and integration in economic development," *Journal of economic growth*, 2004, *9*, 131–165.

Wei, Shang-Jin, "How taxing is corruption on international investors?," *Review of economics and statistics*, 2000, *82* (1), 1–11.

Appendix

A Proof of Proposition 1

By (5) and (8), we can show that:

$$\Delta_i = \frac{1}{2c\Delta z}\left[\theta_i z_{\max}^2 - \int_{\mathcal{E}} \min\left\{\frac{f^2}{\mathcal{E}\theta_i}, \mathcal{E}\theta_i z_{\max}^2\right\} dF(\mathcal{E}) - \max\left\{\theta_i z_{\max}^2 - \frac{f^2}{\theta_i}, 0\right\}\right] \tag{14}$$

By simplifying the algebra, we can show that:

$$\Delta_i = \frac{1}{2c\Delta z}\left[\frac{f^2}{\theta_i} - \left(\frac{f^2}{\theta_i}\left(\int_{\mathcal{E}>\frac{f}{\theta_i z_{\max}}} \frac{1}{\mathcal{E}} dF(\mathcal{E})\right) + \theta_i z_{\max}^2 \left(\int_{\mathcal{E}\leq\frac{f}{\theta_i z_{\max}}} \mathcal{E} dF(\mathcal{E})\right)\right)\right] \tag{15}$$

If θ_i is sufficiently low such that $\theta_i < \frac{f}{z_{\max}}$, Equation (14) implies that:

$$\Delta_i = \frac{1}{2c\Delta z}\left[\theta_i z_{\max}^2 - \int_{\mathcal{E}} \min\left\{\frac{f^2}{\mathcal{E}\theta_i}, \mathcal{E}\theta_i z_{\max}^2\right\} dF(\mathcal{E})\right]$$

Clearly, for some exchange rate level $\mathcal{E}$ which is sufficiently high,

$$\mathcal{E}\theta_i z_{\max}^2 - \frac{f^2}{\mathcal{E}\theta_i} > 0$$

Hence,

$$\begin{aligned}
\Delta_i &= \frac{1}{2c\Delta z}\left[\theta_i z_{\max}^2 - \int_{\mathcal{E}} \min\left\{\frac{f^2}{\mathcal{E}\theta_i}, \mathcal{E}\theta_i z_{\max}^2\right\} dF(\mathcal{E})\right] \\
&> \frac{1}{2c\Delta z}\left[\theta_i z_{\max}^2 - \int_{\mathcal{E}} \mathcal{E}\theta_i z_{\max}^2 dF(\mathcal{E})\right] = 0
\end{aligned}$$

For $\theta_i \geq \frac{f}{z_{\max}}$, we can show that:

$$\begin{aligned}
\Delta_i &= \frac{1}{2c\Delta z}\left[\theta_i z_{\max}^2 - \int_{\mathcal{E}} \min\left\{\frac{f^2}{\mathcal{E}\theta_i}, \mathcal{E}\theta_i z_{\max}^2\right\} dF(\mathcal{E}) - \left(\theta_i z_{\max}^2 - \frac{f^2}{\theta_i}\right)\right] \\
&= \frac{1}{2c\Delta z}\left[\frac{f^2}{\theta_i} - \int_{\mathcal{E}} \min\left\{\frac{f^2}{\mathcal{E}\theta_i}, \mathcal{E}\theta_i z_{\max}^2\right\} dF(\mathcal{E})\right] \\
&= \frac{1}{2c\Delta z}\left[\frac{f^2}{\theta_i} - \left(\int_{\mathcal{E}\leq\frac{f}{\theta_i z_{\max}}} \mathcal{E} dF(\mathcal{E})\right)\theta_i z_{\max}^2 - \left(\int_{\mathcal{E}>\frac{f}{\theta_i z_{\max}}} \frac{1}{\mathcal{E}} dF(\mathcal{E})\right)\frac{f^2}{\theta_i}\right]
\end{aligned}$$

where the third equality holds due to the assumption that the mean of the exchange rate is one, $\int_{\mathcal{E}} \mathcal{E} dF(\mathcal{E}) = 1$.

We can see that the employment under flexible exchange rates consists of two parts: $\int_{\mathcal{E}>\frac{f}{\theta_i z_{\max}}} \frac{1}{\mathcal{E}} dF(\mathcal{E})$ and $\int_{\mathcal{E}\leq\frac{f}{\theta_i z_{\max}}} \mathcal{E} dF(\mathcal{E})$. In the first term, we can see that the function $1/\mathcal{E}$ is convex, which implies by Jensen's inequality that exchange rate fluctuations (variations in $\mathcal{E}$) will yield a higher expected value of the term. The second term is linear in $\mathcal{E}$, and hence exchange rate fluctuations do not lead to any changes in its expected value. Due to continuity, for θ_i very close to $\frac{f}{z_{\max}}$, based on our previous analysis, we can still have $\Delta_i > 0$.

When θ_i achieves a very high value, the sign of Δ_i may change. In the extreme case where θ_i is sufficiently high (for instance $\theta_i \to \infty$), we can show that:

$$\frac{f^2}{\theta_i}\left(\int_{\mathcal{E}>\frac{f}{\theta_i z_{\max}}} \frac{1}{\mathcal{E}} dF(\mathcal{E})\right) + \theta_i z_{\max}^2 \left(\int_{\mathcal{E}\leq\frac{f}{\theta_i z_{\max}}} \mathcal{E} dF(\mathcal{E})\right) \to \frac{f^2}{\theta_i}\mathbb{E}\left[\frac{1}{\mathcal{E}}\right]$$

where $\mathbb{E}$ is the expectation operator. In this case,

$$\Delta_i = \frac{f^2}{\theta_i}\left(1 - \mathbb{E}\left[\frac{1}{\mathcal{E}}\right]\right) < \frac{f^2}{\theta_i}\left(1 - \frac{1}{\mathbb{E}[\mathcal{E}]}\right) = 0$$

where we have applied Jensen's inequality for the inequality. Due to continuity, as long as θ_i is sufficiently high, we can show that $\Delta_i < 0$.

Lastly, we demonstrate that if $z_{\max}$ is sufficiently high, there exists a unique threshold of θ above which flexible exchange rates will always yield lower employment than fixed exchange rates. This can be seen from (15). Based on previous analysis, fixed exchange rates can result in higher firm employment only when $\theta_i \geq \frac{f}{z_{\max}}$. In this scenario, $\theta_i z_{\max}^2 \geq \frac{f^2}{\theta_i}$. Therefore, as long as $z_{\max}$ is sufficiently high, the derivative $\partial\Delta_i/\partial\theta_i$ will be negative, suggesting that as θ_i continues to increase, Δ_i will decrease. Consequently, the threshold of θ_i is unique.

Tables

Table 1: Summary Statistics of the Key Variables

Variable	Descriptions	Mean	Std. Dev.	Min	Max	Obs.
$\Delta lemp$	Change in firm's employment	0.02	0.35	-5.11	4.57	242,456
$fixed$	Industry-level fixed exchange rate	0.49	0.40	0	1	242,456
$inpeg$	Industry-level indirect peg	0.14	0.24	0	1	242,456
peg	Industry-level direct peg	0.35	0.37	0	1	242,456
FG	institution quality level index	8.43	1.61	0.63	10.92	242,456
lva	Log value added	9.04	1.27	0	17.81	242,456
$lwage$	Log wage payment	-1.96	0.56	-7.59	1.79	242,456
lr	Leverage ratio	0.51	0.28	0	13.93	242,456
age	Firms' age	11.62	9.12	1	60	242,456
$dsub$	Government subsidy dummy	0.16	0.37	0	1	242,456

Table 2: Baseline Regression Results

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.018***		0.013***	
	(0.003)		(0.003)	
$FG \times inpeg$		0.019***		0.012***
		(0.005)		(0.004)
$FG \times peg$		0.019***		0.013***
		(0.003)		(0.004)
$fixed$	-0.142***			
	(0.022)			
$inpeg$		-0.154***		
		(0.047)		
peg		-0.136***		
		(0.027)		
FG	0.038***	0.037***	0.030***	0.030***
	(0.004)	(0.004)	(0.004)	(0.004)
$lag\ lva$	-0.047***	-0.047***	-0.048***	-0.048***
	(0.004)	(0.004)	(0.004)	(0.004)
$lwage$	-0.192***	-0.192***	-0.194***	-0.194***
	(0.009)	(0.009)	(0.009)	(0.009)
lr	0.004	0.004	0.005	0.005
	(0.011)	(0.011)	(0.011)	(0.011)
age	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$dsub$	0.015***	0.015***	0.013***	0.013***
	(0.004)	(0.004)	(0.004)	(0.004)
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	242,456	242,456	242,438	242,438
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Alternative Sample Period, 2000-2007

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.019***		0.014***	
	(0.003)		(0.003)	
$FG \times inpeg$		0.021***		0.015***
		(0.006)		(0.004)
$FG \times peg$		0.019***		0.013***
		(0.003)		(0.004)
$fixed$	-0.152***			
	(0.023)			
$inpeg$		-0.170***		
		(0.047)		
peg		-0.142***		
		(0.027)		
FG	0.034***	0.034***	0.028***	0.028***
	(0.005)	(0.005)	(0.005)	(0.005)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	223,866	223,866	223,854	223,854
R^2	0.33	0.33	0.34	0.34

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. We exclude the GFC period from the sample. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 4: Alternative Institutional Quality: Government and Market

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.020***		0.014***	
	(0.004)		(0.004)	
$FG \times inpeg$		0.020***		0.016**
		(0.006)		(0.007)
$FG \times peg$		0.020***		0.013**
		(0.005)		(0.005)
$fixed$	-0.171***			
	(0.035)			
$inpeg$		-0.180***		
		(0.061)		
peg		-0.168***		
		(0.045)		
FG	0.042***	0.042***	0.033***	0.033***
	(0.004)	(0.004)	(0.004)	(0.004)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	242,456	242,456	242,438	242,438
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 5: Alternative Institutional Quality: non-SOE Development

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.012***		0.007***	
	(0.002)		(0.002)	
$FG \times inpeg$		0.013***		0.009***
		(0.003)		(0.003)
$FG \times peg$		0.011***		0.006**
		(0.002)		(0.002)
$fixed$	-0.100***			
	(0.017)			
$inpeg$		-0.118***		
		(0.032)		
peg		-0.092***		
		(0.022)		
FG	0.040***	0.040***	0.032***	0.032***
	(0.004)	(0.004)	(0.004)	(0.004)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	242,456	242,456	242,438	242,438
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 6: Alternative Institutional Quality: Product Market Development

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.011***		0.003	
	(0.003)		(0.003)	
$FG \times inpeg$		0.011**		0.004
		(0.005)		(0.005)
$FG \times peg$		0.011***		0.003
		(0.004)		(0.004)
$fixed$	-0.092***			
	(0.026)			
$inpeg$		-0.096**		
		(0.044)		
peg		-0.088**		
		(0.035)		
FG	0.038***	0.038***	0.032***	0.032***
	(0.004)	(0.004)	(0.005)	(0.005)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	242,456	242,456	242,438	242,438
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 7: Alternative Institutional Quality: Factor Market Development

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.012***		0.008***	
	(0.002)		(0.002)	
$FG \times inpeg$		0.011***		0.008***
		(0.003)		(0.003)
$FG \times peg$		0.013***		0.009***
		(0.003)		(0.003)
$fixed$	-0.077***			
	(0.015)			
$inpeg$		-0.075***		
		(0.027)		
peg		-0.077***		
		(0.021)		
FG	0.037***	0.036***	0.029***	0.029***
	(0.004)	(0.004)	(0.004)	(0.005)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	242,456	242,456	242,438	242,438
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 8: Alternative Institutional Quality: Legal System Development

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.012***		0.009***	
	(0.002)		(0.002)	
$FG \times inpeg$		0.011***		0.008***
		(0.004)		(0.003)
$FG \times peg$		0.012***		0.009***
		(0.002)		(0.002)
$fixed$	-0.061***			
	(0.012)			
$inpeg$		-0.067**		
		(0.027)		
peg		-0.058***		
		(0.017)		
FG	0.042***	0.042***	0.033***	0.033***
	(0.004)	(0.004)	(0.004)	(0.004)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	242,456	242,456	242,438	242,438
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 9: Alternative Dependent Variable: Δ log value added

Variable	Δlva			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.056***		0.051***	
	(0.006)		(0.005)	
$FG \times inpeg$		0.063***		0.051***
		(0.012)		(0.010)
$FG \times peg$		0.053***		0.051***
		(0.007)		(0.006)
$fixed$	-0.445***			
	(0.056)			
$inpeg$		-0.503***		
		(0.111)		
peg		-0.418***		
		(0.069)		
FG	0.078***	0.077***	0.071***	0.071***
	(0.014)	(0.014)	(0.012)	(0.012)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	222,679	222,679	222,667	222,667
R^2	0.62	0.62	0.63	0.63

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 10: Firms' Employment vs Exchange Rate Flexibility: Exporters

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.011***		0.010***	
	(0.002)		(0.003)	
$FG \times inpeg$		0.007		0.004
		(0.006)		(0.005)
$FG \times peg$		0.013***		0.013***
		(0.003)		(0.004)
$fixed$	-0.079***			
	(0.020)			
$inpeg$		-0.060		
		(0.046)		
peg		-0.086***		
		(0.028)		
FG	0.029***	0.029***	0.022***	0.023***
	(0.007)	(0.007)	(0.007)	(0.007)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	95,507	95,507	95,454	95,454
R^2	0.34	0.34	0.35	0.35

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 11: Firms' Employment vs Exchange Rate Flexibility: Non-exporters

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.010***		0.007***	
	(0.002)		(0.002)	
$FG \times inpeg$		0.011***		0.009***
		(0.004)		(0.003)
$FG \times peg$		0.009***		0.007**
		(0.003)		(0.003)
$fixed$	-0.042***			
	(0.014)			
$inpeg$		-0.053*		
		(0.027)		
peg		-0.037**		
		(0.017)		
FG	0.034***	0.034***	0.032***	0.032***
	(0.006)	(0.006)	(0.007)	(0.007)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	134,136	134,136	134,081	134,081
R^2	0.33	0.33	0.34	0.34

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 12: Firms' Employment vs Exchange Rate Flexibility: SOEs

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.003		0.002	
	(0.005)		(0.006)	
$FG \times inpeg$		0.012		0.010
		(0.008)		(0.012)
$FG \times peg$		-0.001		-0.0003
		(0.007)		(0.007)
$fixed$	-0.015			
	(0.040)			
$inpeg$		-0.060		
		(0.052)		
peg		0.006		
		(0.047)		
FG	0.023	0.023	0.021	0.021
	(0.014)	(0.015)	(0.016)	(0.016)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	8,406	8,406	8,109	8,109
R^2	0.34	0.34	0.44	0.44

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 13: Firms' Employment vs Exchange Rate Flexibility: Non-SOEs

Variable	$\Delta lemp$			
	(1)	(2)	(3)	(4)
$FG \times fixed$	0.012***		0.009***	
	(0.002)		(0.002)	
$FG \times inpeg$		0.011***		0.008***
		(0.004)		(0.003)
$FG \times peg$		0.012***		0.010***
		(0.002)		(0.002)
$fixed$	-0.065***			
	(0.013)			
$inpeg$		-0.067**		
		(0.027)		
peg		-0.063***		
		(0.017)		
FG	0.043***	0.043***	0.034***	0.034***
	(0.004)	(0.004)	(0.005)	(0.005)
Control variables	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Time FE	YES	YES	NO	NO
$Industry \times Time$ FE	NO	NO	YES	YES
Obs.	230,211	230,211	230,193	230,193
R^2	0.32	0.32	0.33	0.33

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.

Table 14: Firms' Productivity vs Institutional Quality

Variable	Firms' total factor productivity	
	(1)	(2)
FG	0.466***	0.402***
	(0.089)	(0.088)
Control variables	NO	YES
Firm FE	YES	YES
Time FE	YES	YES
Obs.	242,456	242,456
R^2	0.71	0.72

Note: Robust standard errors (in parentheses) are clustered at the industry-level, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables in the regressions include the lag term of log firms' value added (lva), log firms' total wage payment ($lwage$), firms' leverage ratio (lr), firms' age (age), and a government subsidy dummy ($dsub$), which takes the value of one if a firm receives a government subsidy and zero otherwise.