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The Moderating Effect of Bureaucratic Quality on the Pricing of Policy Instability

By Swee-Sum Lam, Weina Zhang

Executive Summary

The private and people sectors can be greatly affected by government policies. For example, if the government were to decide to change the tax incentives for charitable giving, the amount and the frequency of the donations will be significantly affected. If the government were to impose heavy financial penalty on environmental pollution, firms will become more conscious of not engaging in environmentally harmful operations. However, in many countries, a policy change is never as simple as the examples given above. The shifts in government policies are often self-seeking, bureaucratic, and complicated. Moreover, one policy that works in one country will not necessarily be embraced in another country due to institutional, cultural and social differences. Therefore, it is necessary for the public sector to calibrate and evaluate the impact of one single policy change.

In this study, we find an ideal experimental setting to isolate the real impact of government policy shifts. Here, the impact is measured by the cost of capital in the economy, which affects all sectors in the economy. The policy shifts being studied offer much less political risk, complexity, and uncertainty compared to the usual policy data used in the literature. This is because the Chinese government has taken a deliberate experimental approach in making policy changes since the end of 1970s. When one policy did not seem to work, the government would not hesitate to reverse it. When the social and economic situation became stable again, the tracked policy could be re-launched again.

Linking policy shifts to changes in the cost of capital, the study finds that the bureaucratic quality associated with each policy shift has the most important impact on the cost of capital. We define “bureaucratic quality” as the predictability, credibility, or timeliness of the government in implementing policies.

If a policy is implemented in a predictable, credible or timely manner, the cost of capital and its volatility are significantly reduced and vice versa. We also find that the bureaucratic quality is a complex concept. If it is measured more precisely, its positive or negative impact on the cost of capital and its associated volatility is bigger.

The results have two important implications for the private, people and the public sectors (3Ps). First, 3Ps can use an objective market indicator, such as the cost of capital to measure the impact of a policy shift. Such objectivity would greatly reduce the ambiguity and complexity in evaluating an important policy shift. Second, since public sector policy action can have such profound impact on other sectors, it is important for a government to be responsive and consistent in making new policies. It is also highly recommended for a government to continue to improve its bureaucratic quality as it benefits the private and people sectors economically.

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The Moderating Effect of Bureaucratic Quality on the Pricing of Policy Instability

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Abstract

We examine how policy instability is priced in interest rates. Policy instability refers to the likelihood that the current policy will be changed in the future in the absence of political power shifts. Chinese government's experimental policymaking approach provides an ideal set of frequent policy flip-flops which allows us to identify the effect of policy changes. Conditional on the bureaucratic quality of policymaking, a good-quality policy reversal is related to reductions in interest rate term spread and volatility; a bad-quality policy reversal is related to increases in the spread and volatility. The bureaucratic quality is multi-dimensional and the moderating effect is stronger on interest rates when it is measured more precisely.

JEL Classification: E4; G1

Keywords: bureaucratic quality; interbank repo; interest rate; policy instability; policy reversal; risk premium

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1. Introduction

Policy instability refers to the likelihood that the government may change the policy in the future. Recent theoretical literature has predicted some links between policy instability and financial assets. For example, Perotti (1995) predicts that a policy change or reversal can increase uncertainty in firms' cash flows and subsequently affect equity returns. Pástor and Veronesi (2013) show that policy instability always commands an equity risk premium, and it increases volatility and correlations among stocks when the economy is weak.[1] However, as far as we know, no empirical paper has examined the price impact of policy instability on financial assets in general.[2] Our study fills this void.

In this study, we focus on the pricing of policy instability in interest rates dynamics. Given that the literature on the determinants of interest rates has been well established, we can easily control for the usual driving forces of interest rate movements (such as monetary policies and macroeconomic conditions). Moreover, since interest rates are importantly related to many other financial assets (such as equity and real estate), the existence of systematic policy risk in interest rates can be very important for investors to make good investment decisions.

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[1] Pastor and Veronesi (2013) use *political uncertainty* to represent our concept of policy instability. However, we decide not to use their definition because the literature usually uses *political uncertainty* to represent the uncertainty that a government can stay in power (e.g., Boutchkova, Doshi, Durnev, and Molchanov, 2012; Durnev, 2011; Julio and Yook, 2012; 2014; and International Country Risk Guide).

[2] Although few empirical studies have shown the pricing impact of specific policy change (e.g., tax rate, trade or fiscal policies) on stock prices or bond spreads (e.g., Sialm, 2009; Gomes, Michaelides, and Polkovnichenko, 2009; Croce, Kung, Nguyen, and Schmid, 2012; and Ulrich 2013), we are interested in the effect of general policy instability in this study.

China offers an ideal natural setting for us to conduct a comprehensive empirical analysis on policy instability. First, the stability of the ruling communist party in China since 1949 minimizes the concern of *political instability*, which refers to the likelihood of political power change. Policy instability may naturally arise when a different political party is elected. [3] Moreover, Dur and Swank (1997) also show that a policy can be changed or reversed because the government is concerned about its survival prospect in the future election. Hence, to identify the pure price impact of policy instability, we need to remove the convoluted impacts of political instability, which have been extensively documented in the literature.[4] If we collect policy data from advanced democratic countries such as U.S., we cannot dismiss the effect of political uncertainty in the analysis as easily.[5]

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[3] For example, Dastidar, Fisman and Khanna (2008) use the 2004 Indian political election to show that stock prices of government-controlled companies slated for privatization by the prior government dropped less than those that were under study for possible privatization because investors believe that the probability of reversal is smaller for more advanced reforms.

[4] The literature has shown that political instability affects stock prices, returns, volatilities and sovereign bond spread. For example, Santa-Clara and Valkanov (2003) and Belo, Gala and Li (2013) document a relation between political cycles and stock returns. Erb, Harvey, and Viskanta (1996) relate political risk to future country stock returns. Boutchkova, Doshi, Durnev, and Molchanov (2012) find a relation between political uncertainty and industry return volatility. Other related studies examine the real effects of political uncertainty on firm investment response to stock prices and firm's financing decisions (e.g., Durnev, 2011; Julio and Yook, 2012; 2014). Another study examines the impact of political risk on sovereign bond spreads and default risk (e.g., Cuadra and Sapriza, 2008).

[5] We are not claiming that political instability does not exist in China. Indeed, many policy changes are made by the government because of its concern for social unrest. It is the lack of a strong opposition party in China that conscribes little political risk in this country in comparison to other democratic countries. Moreover, all the past

Second, policy instability is different from *policy uncertainty*, which is the uncertainty arisen from the unknown effects of the new policy (Pastor and Veronesi, 2012). Policy instability and policy uncertainty can be closely related in a typical policy change. Pastor and Veronesi (2012) are among the first to explicitly differentiate policy instability from policy uncertainty and predict that the combined effects result in negative stock return on average and an increase in return volatility. A few recent empirical studies have shown how policy uncertainty affects stock returns (e.g., Broggard and Detzel, 2015; Kang and Ratti, 2015), option volatility (e.g., David and Veronesi, 2014), and corporate investment decisions (e.g., Wang, Chen and Huang, 2014). Aït-Sahalia, Andritzky, Jobst, Nowak, and Tamirisa (2012) investigate the direct link between the interbank credit and liquidity risk premia and the change of various macroeconomic and financial sector policies. Most of these policies are also associated with significant policy uncertainty since they are new policy initiatives by various governments during the recent financial crisis. In our sample, the empirical measures of policy instability are associated with little policy uncertainty. Chinese government has taken an experimental approach in making new financial market policies since 1978.[6] If a policy causes market upheavals, the government may reverse the policy. If the policy is considered successful, it will be applied more widely. In this

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Chinese leaders such as the chairmen of the country have been pre-determined many years before the actual election. Hence, there is not much uncertainty about who will be the next Chinese leader in past three decades.

[6] We note that a drastic policy shift by the policymakers may also represent political instability to some extent. The conventional wisdom is that the popularity and stability of the government is intimately related to the government's fiscal and monetary policies. Given that our sample policies are the financial market liberalization policies, we are less concerned about the political instability embedded in these policies. Moreover, these policies are also expected from the Chinese government to fulfill the membership requirement of World Trade Organization (WTO) since December 11, 2001.

study, we only select the subsequent policy flip-flops after the initial new policy is introduced into our sample and we name them as *policy reversals* hereafter. These reversals are related to little policy uncertainty because investors have learnt about the initial new policy before the reversals.

Third, policy change usually takes place after the targeted market performs badly and is usually accompanied by many other simultaneous government actions (e.g., Pastor and Veronesi, 2012). For example, the 2008 short-sale ban of U.S. financial firms' stocks was preceded by the poor performance of the stock returns and is further confounded by the government's TARP program. Such an infrequent endogenous policy change with confounded policy announcements in the real world makes it hard to find a clean price effect of policy instability, if it truly exists (e.g., Boehmer, Charles, and Zhang, 2009; Beber and Pagano, 2013). Since our testing instrument is Chinese interbank repo rates, we choose the policy reversals that are targeted at other parts of Chinese financial market (besides the interbank market) to reduce endogeneity.

With a cleaned sample of 50 policy reversals (which are related to 22 financial market liberalization policies) from 1999 to 2009, we first test whether policy instability (proxied by the reversals) is systematically priced in the repo rates. Unconditionally, our results show that the policy instability can be priced positively, negatively, or negligibly in interest rate level, spread or conditional volatility. These findings indicate that the pricing of policy instability is not a simple yes or no answer.

More importantly, we hypothesize that the bureaucratic quality matters in the pricing of policy instability. Taylor (2010) claims that when the U.S. government did not articulate a clear and consistent strategy in regulating big financial institutions during the recent financial crisis, the crisis accelerated and interbank interest rates increased. Similarly, Callander (2011)

theoretically models that if investors do not believe that the government has the capability of making good policies, even a good policy will be badly received by investors. Given that bureaucracy makes policy decisions, we construct two empirical proxies of bureaucratic quality for each policy reversal and test their effects in the pricing of policy instability.

The two bureaucratic quality measures are constructed based on Nee and Opper (2009). The first proxy measures the credibility and predictability of the bureaucracy in reversing a policy. The second proxy measures the timeliness of the bureaucracy in reversing a policy. We find that the good-quality reversals are related to lower interest rate term spread and volatility. In terms of economic magnitude, the reduction of term spread is up to 5% and the reduction of volatility is up to 25%. Conversely, the bad-quality reversals are related to higher interest rate term spread and volatility. The maximum increases in term spread and volatility are about 1% and 8% respectively. Hence, the sign of the policy instability risk premia depends on an important moderating factor–bureaucratic quality. Our study is among the first that clearly documents that the pricing of policy instability is affected by the bureaucratic quality.

Moreover, we find that bureaucratic quality is multi-dimensional. The moderating effect is much stronger and more consistent when we employ both bureaucratic quality measures together as compared to working with each measure independently. The joint measures can capture different dimensions of the bureaucratic quality more precisely. In robustness tests, we use event study technique to validate the robustness of our main findings. We also eliminate the argument that the change of liquidity is an alternative explanation.

The rest of this paper is organized as the follows. Section 2 describes the data, hypotheses and methodology. Section 3 presents the empirical findings that show how policy instability is

priced in interest rates. Section 4 presents the evidence that bureaucratic quality moderates policy risk when policies are unstable. Section 5 conducts robustness tests and section 6 concludes.

2. Data, Hypotheses and Methodology

2.1. Key Independent Variable – Policy Reversals

Types of policies implemented by governments can be great in numbers and complicated in nature (e.g., Pástor and Veronesi, 2012). To make our study more tractable, we focus on the market liberalization policies and hand-collect those reversals related to Chinese financial market liberalization policies from Dow Jones, Reuter's Factiva, and the quarterly China's monetary policy executive reports available on the People's Bank of China (PBC)'s official website from 1999 to 2009.[7] We define event date as the announcement date rather than implementation date of a policy event. Given that policy reversals were targeted at various market segments in China, we group all reversed policies in three broad categories of policies, namely non-tradable shares (*NT*), market access (*MA*), and initial public offerings (*IPOs*) respectively. Prior literature has examined these policy types in the context of equity market or firm capital structure decisions.

The reason for focusing on these policies is that we are using the interbank repo rates as our testing instrument and we do not want to include the reversed policies that have a direct effect on market-driven riskless interest rates. The majority of the reversed policies (38 of the 50 reversals) are targeted primarily at the stock market, while the remaining 12 are targeted at futures markets (5 reversals), the real estate market (3 reversals), the corporate bond market (2 reversals), and commercial banks' fund management (2 reversals).

[7] The website source is at http://pbc.gov.cn.

Reversal NT: In China, shares of listed companies are structured as tradable and non-tradable shares. Non-tradable shares include state-owned shares and legal person shares. Both types of shares entitle the holders to the same voting and cash flow rights and any distinction between them is superficial. State shares are held by government bodies such as state asset management agencies and institutions authorized to hold shares on behalf of the state. Legal person shares are held by domestic institutions such as other companies, state-private mixed enterprises and non-bank financial institutions. Liberalization policy targets to convert non-tradable shares to tradable shares while the government retains state control over those listed state-owned enterprises (SOEs). However, the policies are often initiated, reversed and then re-implemented again due to various reasons.[8] Li, Wang, Cheung, and Jiang (2011) show that overall risk sharing offers important gains in this privatization process as market frictions are removed by the new liberalization policies. Huang, He and Zhang (2014) report empirical findings on 846 stated-owned enterprises (SOEs) that have completed the non-tradable shares reform from 2005 to 2009. We include 4 specific regulations related to tradability of shares, social security fund investment in relation to non-tradable shares, conversion to B-shares and employee shares/stock options in this category. These regulations are reversed or suspended at different times after the initial policies.

[8] For example, the Chinese government attempted the sell-off of state-owned shares in 1999 and 2001, but halted the reform after eleven months and three months respectively, before resuming it again in April 2005. The 1999 sell-off was halted because the demand for the non-tradable shares was limited as the high prices kept investors away while the 2001 sell-off was stopped due to fear of social unrest after stock market indices fell 30% within just four months of implementation. Investors panicked and were concerned that the increase in the supply of tradable shares would decrease the value of their shareholdings.

Reversal MA: Similarly, flip-flop in policies pertaining to investors' access to the financial market are recurring events. For example, with China's entry into the WTO in 2001, the government committed itself to opening up the economy to foreign investors. However, the relaxation of restrictions on foreign investment, including the liberalization of foreign investment in local futures brokerages through joint ventures and the Qualified Foreign Institutional Investor (QFII) scheme that allows overseas investors to buy yuan-denominated A-shares, has been subject to frequent reversals and many reasons have been given.[9] Fernald and Rogers (2002) find that domestic and foreign investors in China paid different prices for the A-share and B-share of the same company that entitle holders to the same underlying cash flows and voting rights. They attribute this to the limited alternative investments available to foreigners. We argue that the liberalization of financial markets provides market access, and therefore the removal of such binding restrictions on foreign ownership can help to reduce market frictions. We include 12 specific regulations that are reversed at different points of time after the initial policy, such as investment in futures brokerages, QFII scheme, stock index futures, overseas futures, fuel oil futures, short-selling and margin trading scheme, merger of main boards, commercial banks' fund management, corporate bonds, foreign real estate investment, Qualified Domestic Institutional Investor (QDII) scheme, and through-train schemes.

[9] For example, China first allowed foreign-funded companies in the country to hold stakes of up to 33% in domestic futures brokerage joint ventures on 4 June 2002. In September 2006, however, the authorities announced plans to temporarily block expansion by brokerages and prevent new firms from forming, stating that domestic securities firms needed time to get ready for competition. After reversing the suspension in December 2007, the government reinstated the restrictions less than two weeks later.

Reversal IPO: Since February 1994, the Chinese government has suspended new listings a total of five times stating various reasons including the implementation of new IPO pricing rules, the strain on the stock market caused by the sale of state-owned shares and weak market conditions. New schemes introduced to enhance the market such as the IPO subscription scheme and mutual funds priority scheme, were also quickly halted due to various reasons. Kao, Wu and Yang (2009) show that pricing regulation and penalty regulations of IPO have different effects on the behavior of IPO firms from 1996 to 1999. Sun and Liu (2012) also find that firms tend to be more affected by their connections with government after IPO. We include 6 specific regulations related to the suspension of IPOs due to new pricing rule, state-owned shares sale, and second board listings. Table 1 gives the summary of the reversals.

[Table 1 about here]

Table 1 shows that there are a total of 50 policy reversals from 1999 to 2009. There are 9 reversals for *Reversal NT*, 27 for *Reversal MA*, and 14 for *Reversal IPO*. To control for potential confounding effects, we also include 48 market liberalization policies and 33 policy uncertainties related to the reversed policies from 1999 to 2009. While policy reversals are the official suspensions, resumptions or postponements of government policies, policy uncertainty is the unofficial release of information by the authorities, government officials and industry insiders that increase the likelihood of a policy reversal.

2.2. Key dependent Variable – Repo Rates

Chinese interbank repo rates are our key dependent variables. A repo allows a borrower to use a financial security as collateral for a cash loan at a fixed rate of interest, for a specified tenor. The Chinese interbank repo transactions began in 1997, but the turnover before 1999 is

very tiny as shown in Figure 1. Before August 1999, commercial banks were the only participants in the interbank market. Thereafter, the central bank further allowed non-bank financial institutions such as insurance companies, mutual funds and securities firms as well as some big non-financial firms and foreign banks to trade in the interbank market. By the end of 2008, there were a total of 8,299 institutional investors, consisting mainly of non-financial institutions (about 68.5%) and banking institutions (about 13.8%). Large state commercial banks are the major supplier of liquidity in the repo market while other financial institutions are net recipients. The central bank sometimes performs open market operations in the interbank market.

Due to the problem of non-performing uncollateralized interbank loans, interbank collateral repo transactions have since become the most important form of interbank borrowing and lending. In a collateralized repo, the ownership of the underlying bond is not transferred but held in a custodian account in the China Government Securities Depository Trust and Clearing Corporation Ltd. The underlying collateral can be Chinese government bonds, including Treasuries, policy financing bonds (PFB), and central bank notes (CBNs). All of these government bonds are backed by the central bank.

Interbank repos are available in maturities of 1, 7, 14 and 21 days, 1, 2, 3, 4, 6, and 9 months, and 1 year. The 7-day repo rate is widely regarded as a benchmark for the short-term market-driven interest rate in China. Short-term (below 1 month) repos constitute close to 80% percent of the total turnover of all repo on average. In this study, we choose to use the five most liquid collateral repos with the longest data history. That is, IBR07, IBR14, IBR21, IBR1M, and IBR2M. The numbers after the symbols represent the time-to-maturity of the repo rates in days or months. The five repos have maturities of 7 days, 14 days, 21 days, 1 month, and 2 month respectively.

2.3. Control Variables

We include various control variables drawn from the literature and add others that we think would help to isolate a clean price effect of policy instability. Prior literature has shown that stock market variables, government bond market variables, repo market trading volume, and macroeconomic variables are important determinants of interbank repo rates (e.g., Fan and Zhang, 2006; Porter and Xu, 2009; Fan and Johansson, 2010; and Hong, Lin and Wang, 2010). We collect these data from various databases such as WIND, CSMAR, Datastream and Bloomberg. Stock market variables are SSE A-share index annualized daily return (*Aret*), the logarithmic of the SSE A-share daily trading volume in 100 million yuan (*Avol*), and a dummy variable for the launch of IPO (*ipo*). Government bond market variables include the annualized equally-weighted daily return of all government bonds in the interbank market (*Ibret*), the logarithmic of the trading volume of government bonds in 100 million yuan in the interbank market (*Ibvol*). Repo market variables include the natural logarithmic of interbank repo trading volume of the five repo products in 100 million yuan (*Irvol*). Macroeconomic variables include monthly consumer price index (*cpi),* fixed investment growth rate (*fixinv*), and quarterly GDP growth rate (*gdp*). In addition, as the Chinese financial market can be closed for a prolonged period due to public holidays (e.g., Lunar New Year) and this can significantly affect interest rate volatility (i.e., Lim and Zhang, 2000; Porter and Xu, 2009), we include two dummy variables, *sh* that equals 1 if the market is closed for 3 to 5 calendar days and *lh* that equals 1 if the market is closed for more than 5 calendar days. Hong, Lin and Wang (2010) also show that benchmark interest rates controlled by the government can affect repo rates, so we include the 1-year benchmark lending rate (*lending*) that is fixed by the central bank. We also include a dummy variable *mktlib* that equals to 1 on the day when a new liberalization policy is introduced to

control for confounding policy announcements and a dummy variable *pu* that equals 1 on the day when there is an unofficial release or statement made by government officials related to the policy reversals to control for uncertainty in the reversals.

2.4. Hypothesis Development and Identification Methodology

The literature suggests that policy instability can increase uncertainty in firms' cash flows and affect equity return and volatility (e.g., Perotti, 1995; Pástor and Veronesi, 2012, 2013). Pástor and Veronesi (2012) also suggest that policy instability can affect discount rate due to uncertainty in the new policy. Since Weber (2010) shows that in theory real interest rate contains a subcomponent that is subjective discount rate, the nominal interest rate can be affected by policy instability through the channel of discount rate. If the price effect of policy instability were to exist in nominal interest rates, policy risk shall be considered as an important systematic risk in the economy since interest rates can affect many financial assets, economic, and consumption growth (e.g., Harvey, 1988; Estrella and Hardouvelis, 1991), and interest rate volatility is closely related to macroeconomic volatility (e.g., Gerlach-Kristen and Rudolf, 2010). Hence, our first empirical hypothesis is stated as the followings,

Hypothesis 1: *Policy instability is systematically priced in interest rates such as interest rate level, spread and volatility*.

Using weekly Chinese interbank collateral repo rates, Fan and Zhang (2006) propose an AR(3)-EGARCH(1,1) model for the spot repo rates and the term spread. Hong, Lin and Wang (2010) test various term structure models for using daily 7-day interbank repo rate and conclude that all tested models are mis-specified in capturing marginal distribution and dynamics simultaneously. They suggest that administrative force could be an important missing element in

the proposed structural models. Hence, we propose the following multivariate AR(5)-EGARCH(1,1) model that includes control variables and policy variables to test the impact of policy instability induced by reversals,

$$Y_t = \alpha + \beta \times \text{reversals}_t + \gamma_j \times \sum_{j=1}^{5} Y_{t-j} + \text{control variables}_t + \varepsilon_t, \quad (1)$$

$$\log \sigma_t^2 = c + \theta \frac{|\varepsilon_t|}{\sqrt{\sigma_{t-1}^2}} + \varphi \frac{\varepsilon_t}{\sqrt{\sigma_{t-1}^2}} + \kappa \log(\sigma_{t-1}^2) + \delta \times \text{reversals}_t + \text{control variables}_t, \quad (2)$$

where Y_t is the five repo rates on day t respectively (i.e., IBR07, IBR14, IBR21, IBR1M, and IBR2M), and *reversals*$_t$ is the dummy variable for reversal announcements. If policy reversals were systematically priced, we expect both coefficients β and δ to be positive in equation (1) and (2). Control variables include stock market variables, bond market variables, repo market variables, macroeconomic variables, other liberalization policy announcements, and policy uncertainty announcements. In the estimation of interest rate spread, we use four spreads as the dependent variables, which are the rate differences between the longer-maturity repos (i.e., IBR14, IBR21, IBR1M and IBR2M) and the shortest repo IBR07. We term them IBR14-07, IBR21-07, IBR1M-07 and IBR2M-07 respectively. We also include the benchmark rate IBR07 and its five lags as additional control variables in equation (1).

3. The Pricing of Policy Instability in Interest Rates

3.1. Summary Statistics

Table 2 reports the summary statistics of the key dependent and control variables. Daily repo data are from WIND January 1999 to December 2009. We report in Panel A of Table 2 the summary statistics of the five repo rates and four spreads.

[Table 2 about here]

The average repo rate level is 2.25%, 2.36%, 2.42%, 2.49%, and 2.59% for the five repos respectively, i.e., IBR07, IBR14, IBR21, IBR1M, and IBR2M. On average, the level of all five repo rates is 2.42%. The term structure is upward sloping in general with a mean of 0.21% for all four spreads. The standard deviations of the repo rates and the spreads are 0.83% and 0.31% respectively. These results are largely consistent with Fan and Zhang (2006).

Panel A also reports the mean, median, standard deviation, skewness, and kurtosis of the control variables from 1999 to 2009. We do not observe any abnormal patterns for the variables included. One thing to note is that the 1-year benchmark interest rate has a standard deviation of 0.63%, lower than that of the repo rates. This indicates that additional market forces may be driving the fluctuations of repo rates other than monetary policy itself.

Panel B of Table 2 presents the correlation matrix of the key variables (excluding the dummy variables). The average repo level is correlated with the average repo spread at 0.34. The average repo level and spread are weakly correlated with the A-share return (-0.03 and 0.00) and trading volumes of SSE A-shares (0.05 and 0.29). The weak correlations justify our research design of using repo rates to reduce the endogeneity issue. Moreover, the repo level and spread are weakly related to interbank government bond returns (-0.07 and -0.01), which are consistent with the understanding that the government bond market is not highly correlated with the repo market.

As repo rates are nominal interest rates, it is not surprising that the repo rate level and spread are highly correlated with the consumer price index at 0.41 and 0.50. It is also consistent with the economic theory that GDP growth rate is positively correlated with repo rate and spread

(0.28 and 0.49). Moreover, it is intuitive that repo rates are highly correlated with government controlled benchmark interest rates as the correlation between the repo level, spread and 1-year benchmark lending rate ranges from 0.37 to 0.67. This indicates that the market-driven repo rates fluctuate around the administrative interest rate.

3.2. The Pricing of Policy Instability in Interest Rates

Table 3 reports the test results of **Hypothesis 1**. We report the structural estimates of equation (1) and (2) of five interbank repo rates and four spreads in Table 3, including IBR07, IBR14, IBR21, IBR1M, IBR2M, IBR14-07, IBR21-07, IBR1M-07 and IBR2M-07.

[Table 3 about here]

The first five columns in Table 3 show that across all five repos, the β coefficients of the interest rate level are positively significant for three of them at the 1% level (e.g., IBR14, IBR1M, and IBR2M). The coefficient β is zero for IBR07 and is negative at -0.008 for IBR21. There is some evidence that the spreads are affected by reversals negatively in the short-end, and positively at the longer-end. Specifically, the coefficient β is -0.001 for the spread IBR14-07 and -0.006 for the spread IBR21-07 whereas it is 0.009 for the spread IBR1M-07. As for the conditional variance, only one out of nine coefficients δ is negative at -2.886 at a 1% level and the rest are all insignificant. The results indicate that the pricing of policy instability is not a simple yes or no answer, as the coefficients of policy reversals are positive, zero, or negative with respect to interest rate level, spread and variance. Overall, we do not find strong evidence in supporting **Hypothesis 1**.

The coefficients of other control variables are mostly consistent with the extant literature. For instance, SSE A-share return (*Aret*), interbank government bond trading volume (*Ibvol*), interbank repo trading volume (*Irvol*), IPO dummy (*ipo*), GDP growth rate (*gdp*), fixed investment growth rate (*fixinv*), 1-year lending rate (*lending*) are generally related to higher interest rate levels. These variables are also largely positively related to interest rate spreads. Conditional variances of the repo rates and the spreads are significantly positively related to SSE A-share trading volume (*Avol*), long holiday dummy (*lh*), consumer price index (*cpi*), and GDP growth rate (*gdp*). They are significantly negatively related to interbank government bond returns (*Ibret*) and interbank repo trading volume (*Irvol*). Across all five repos, the adjusted R^2 ranges from 88.4% to 94.8%. As for the four spreads, the adjusted R^2 is also high but lower than before (i.e., 54.4% to 78.3%). Moreover, most of the AR(5) and EGARCH(1,1) parameters are statistically significant at the 1% level. These results indicate a good fit by an AR(5)-EGARCH(1,1) model.

It is also interesting to note that although the initial financial market liberalization policies are not targeted at the interest rate market directly and should therefore have no direct impact on interest rates, we find that these initial policies are somewhat related to higher interest rate level (except for IBR07), higher spread, but with lower variance (as 5 of the 9 coefficients are statistically significantly negative). Our finding extends the literature on the benefits of liberalization (e.g., Henry, 2000; Bekaert, Harvey and Lundblad, 2005; Gupta and Yuan, 2009) as it can reduce interest rate volatility.Overall, we do not find strong support for **Hypothesis 1**. In the next section, we propose an explanation for the price effects of policy instability in interest rates.

4. The Moderating Factor – Bureaucratic Quality

4.1. Bureaucratic Quality

We conjecture that people's learning of the policy quality influences their response to the unstable policy. A reduction in interest rate level, spread or volatility suggests that some reversals are well received by investors. Dur and Swank (1997) propose that incomplete information about the consequences of all policy bundles and the democratic election process can lead to reversals. Callander (2011) models a dynamic policy making process where citizens do not have complete knowledge of how policies are mapped onto outcomes. They learn about the mapping through repeated elections. The policy choice is path-dependent and a policy may get stuck (fail) if citizens do not have a good experience with the previous policy. Moreover, citizens may not want to continue the experiment if they believe that policy makers are not able to crystalize a good policy. But Callander's (2011) prediction combines the effects of political instability and policy instability together. Without considering political instability, Strulovici (2010) models how citizens learn about their policy preferences through policy experimentation. His model suggests that citizens' experience of the past policy making process may have a significant impact on their response to the new policy. However, his model does not predict how the policy instability is priced in financial assets. Pástor and Veronesi (2012) explicitly consider the pricing impact of learning the new policy on stock prices, but their setting is different from ours. Our policy data are policy reversals, which do not require much learning about the uncertainty effect of the new policy because the new policy is not "new". Interestingly, investors can learn about the quality of the reversed policy because they can infer the quality by the sequence of policy changes taken by the bureaucracy. Such learning can affect investors' response toward the policy change. This line of reasoning leads to our second hypothesis.

Hypothesis 2: *The quality of policies serves as a moderating factor in the pricing of policy instability in interest rates.*

The quality of policies can be subjective in nature. Since financial policies are often made by bureaucracy, we use the measures of bureaucracy quality to proxy for the quality of the policies in this study. The political economy literature has long established the concept of bureaucratic quality. Studies have shown that bureaucratic quality can affect economic growth and the pricing of equities. Evans and Rauch (1999) are among the first to provide a direct causality between bureaucratic quality and GDP growth. They conduct a survey among political economists and experts in 35 countries and compute a Weberian bureaucratic quality score for each country from 1970 to 1985. Their cross-country analysis shows that the bureaucracy score is an important determinant for economic growth after controlling for other country-level factors. Rauch and Evans (2000) further construct proxies for bureaucratic quality from International Country Risk Guide (ICRG) ratings and Business and Environmental Risk Intelligence (BERI) ratings and find that meritocratic recruitment is the most important determinant for improving bureaucratic performance. More recently, Nee and Opper (2009) establish a direct causality between bureaucratic quality and financial market development. Interestingly, after controlling for bureaucratic quality, they do not find a direct causality between legal origin and financial market development that was documented in the literature. Specifically, they propose several measures of bureaucratic quality. A related study by Becerra, Cavallo, and Scartascini (2012) finds that both high opposition in interest group to financial development and low government capabilities are related to the low level of financial development across countries. In a cross-country study of 19 countries, Lam, Tan and Wee (2007) also find that higher bureaucratic

quality is related to less underpricing in PIPOs. Using 49 countries' data, Lam and Zhang (2015) also find that the bureaucratic quality is priced in the international equity market.

Following the definition proposed in Nee and Opper (2009), we define two bureaucratic quality measures. First, predictable and credible bureaucratic action, and second, it's timeliness. In the setting of policy reversals, we consider pro-liberalization reversals, i.e., the second and fourth reversals (after the initial liberalization policies) as predictable and credible bureaucratic actions since they are consistent with the long-term goal of the government to liberalize the financial market and are therefore predictable and credible. On the other hand, the first and third reversals (after the initial liberalization policies) are considered non-predictable and non-credible bureaucratic actions as they are anti-liberalization and contradict the pre-specified long-term goal.[10] This definition captures the investors' preference for predictable and credible policies over non-predictable and non-credible policies in place.

The second bureaucratic quality measure of timely bureaucratic action pertains to the time interval between a policy reversal and the prior policy change. Timely bureaucratic quality action is defined to be a reversal that takes place within a short period from the prior policy change in our setting. We use a cut-off of 180 calendar days because the longest repo maturity in our sample is about 2 months and such an interval allows us to isolate the effect of each policy reversal in the term spread clearly. Figure 2 displays the histogram of time intervals for all

[10] There are 3 exceptional cases here. The *Reversal 2* under Market Access (*MA*) category 3 "Stock index futures" is the 2nd reversal in time sequence, but is considered as non-predictable and non-credible bureaucratic action. The *Reversal 2* and *Reversal 3* under Market Access (MA) category 10 "Foreign real estate investment" are the 2nd and 3rd reversal in time sequence, but are considered as predictable and credible, and non-predictable and non-credible actions respectively.

reversals in our sample. The figure shows that even if we vary the breakpoint between 150 to 210 days, our results would remain the same. A further justification for the reasonableness of the chosen time interval is that the Chinese stock market has an average turnover rate of 1000% in one year, which suggests that the average investors are holding the stock for about 1-2 months (Li, 2005). Hence, anything that goes beyond 150 calendar days are usually considered as long term (or slow) in Chinese investors' mind.

We report the exact time interval between the sequences of reversals in Panel A of Table 4. From the two independent constructs of the bureaucratic quality, we group all reversals into two subgroups along each quality measure, namely, predictable and credible versus non-predictable and non-credible reversals, and timely versus non-timely reversals. If we use the two bureaucratic quality measures jointly, we can form four groups of reversals, including short pro-liberalization reversals, long pro-liberalization reversals, short anti-liberalization reversals, and long anti-liberalization reversals. Panel B of Table 4 tabulates the yearly breakdown of the four groups. The number of pro-liberalization reversals is similar to that of anti-liberalization ones (24 in the pro-liberalization group and 26 in the anti-liberalization group). The number of long reversals is 35, more than twice that of short ones (i.e., 15).

[Table 4 about here]

Based on the two bureaucratic quality measures, we can interpret each reversal as high or low quality policy. Predictable and credible, and/or timely reversals reflect high bureaucratic quality. Non-predictable and non-credible, and/or non-timely reversals reflect low bureaucratic quality. Moreover, we also need to take into account that there is learning of bureaucratic quality in policymaking over time as suggested by prior literature (e.g., Callander, 2011). Hence, we use

cumulative measures of reversals to capture the smooth and incremental nature of bureaucratic quality learnt over time. For example, if there are two short (i.e., timely) reversals in January 1999 and December 2000 respectively, the bureaucratic quality measure takes a value of 1 after January 1999 and 2 after December 2000.

4.2. Policy Instability and Bureaucratic Quality

Here, we test **Hypothesis 2**. We estimate results by using the interbank repo rates and spreads and report the results in Table 5. As before, we employ five repo products and four spreads, i.e., IBR07, IBR14, IBR21, IBR1M, IBR2M, IBR14-07, IBR21-07, IBR1M-07 and IBR2M-07. The structural model is an AR(5)-EGARCH(1,1) model,

$$Y_t = \alpha + \beta_i \times BQ_{i,t} + \gamma_j \times \sum_{j=1}^{5} Y_{t-j} + \text{control variables}_t + \varepsilon_t, \tag{3}$$

$$\log \sigma_t^2 = c + \theta \frac{|\varepsilon_t|}{\sqrt{\sigma_{t-1}^2}} + \varphi \frac{\varepsilon_t}{\sqrt{\sigma_{t-1}^2}} + \kappa \log(\sigma_{t-1}^2) + \delta_i \times BQ_{i,t} + \text{control variables}_t, \tag{4}$$

where Y_t is the repo rate or the spread between R007 and the other four repo rates on day t, $BQ_{i,t}$ include predictable and credible actions (BQ_{pc}) and non-predictable and non-credible actions (BQ_{npc}) on day t based on the first bureaucratic quality measure,[11] timely actions (BQ_t) and non-timely actions (BQ_{nt}) on day t based on the second measure, and predictable, credible, and timely actions (BQ_{pc_t}), predictable, credible, and non-timely actions (BQ_{pc_nt}), non-predictable, non-credible, and timely actions (BQ_{npc_t}), and non-predictable, non-credible, and non-timely actions (BQ_{npc_nt}) on day t based on the interactions of the two measures. The control variables we include in the level equation are *Aret, Avol*, *Ibret*, *Ibvol*, *Irvol, cpi, gdp, fixinv*, *ipo*, *lending*, market liberalization discrete variable (*mktlib_d*), and policy uncertainty discrete variable (*pu_d*).

[11] For brevity, we drop the time subscript, t, for all subsequent notations of bureaucratic quality.

Here, we re-define the market liberalization and policy uncertainty variables as discrete variables that take an incremental value of 1 when there is a new market liberalization policy or when there is a policy uncertainty event. Such discrete variables definitions provide a similar interpretation as the bureaucratic quality measures because they capture the learning process of new policies by investors. When we estimate equation (3) for the four term spreads, i.e., R014-R007, R028-R007, R091-R007, and R182-R007, we also include R007 and its five lags.

We find that the first dimension of bureaucratic quality, that is, predictable and credible action has little differentiation power for interest rate level and spread. However, there is some weak evidence suggesting that high quality actions in terms of predictability and credibility are related to lower volatility. Panel A in Table 5 shows that predictable and credible actions are significantly related to lower interest rate level in 2 of the 5 repo rates, lower term spreads in 2 of the 4 spreads, and lower variance in 4 out of the 9 δ coefficients at a 10% level. But they are also significantly positively related to 1 of the 5 repo rates and 1 of the 4 spreads. Non-predictable and non-credible actions are significantly related to lower interest rate level in 4 of the 5 repo rates, lower term spreads in 2 of the 4 spreads, and lower variance in 1 of the 9 δ coefficients at a 10% level. The other coefficients are statistically insignificant at a 10% level.

[Table 5 about here]

In contrast, we find that the second metric of bureaucratic quality offers higher differentiation power for interest rate level and spread than the first quality metric. Panel B of Table 5 shows that timely actions are significantly related to lower interest rate level in 3 of the 5 repo rates, lower term spreads in all 4 spreads, and lower variance in 8 of the 9 δ coefficients at a 10% level. Conversely, non-timely actions are significantly related to higher interest rate level

in 1 of the 5 repo rates, higher term spreads in 1 of the 4 spreads, and higher variance in 3 of the 9 δ coefficients at a 10% level.

As the above results indicate that both quality measures may capture different aspects of bureaucratic quality, we put the two quality measures together to form a more refined group of quality measures. We report the joint results in Panel C of Table 5. Predictable, credible and timely actions are significantly related to lower interest rate level in 3 of the 5 repo rates, lower term spreads in all 4 spreads, and lower variance in all 9 δ coefficients at a 5% level. The economic magnitude of the reduction in the level is less than 0.2% of the unconditional mean (i.e., up to -0.5 basis points). The percentage change in the spread ranges from -0.6% to -5.5% of the unconditional spread (i.e., about -0.2 bps to -0.6 bps). The percentage change in conditional variance is much larger, ranging from -13.6% to -43.4% with one additional good-quality policy change. These percentage changes in variance translate to the percentage changes of -7.0% to -24.8% in conditional volatility.

Conversely, non-predictable, non-credible and non-timely actions are significantly related to higher interest rate level in 1 of the 5 repo rates, higher term spread in 2 of the 4 spreads, and higher variance in 8 of the 9 δ coefficients at a 10% level. The economic magnitude of the maximum increases in the level is almost zero. The maximum percentage increase in the spread is about 1% of the average spread level (i.e., about 0.1 bps). The maximum percentage change in conditional volatility is much higher, about 8% with one additional bad-quality policy change. If one quality measure is good and the other is bad, the results are much more mixed in interest rate level and spread reduction, and are more consistent in the reduction of conditional variance.

Figure 3 presents the net effect of bureaucratic quality associated with each policy reversal on the conditional volatility of IBR07. When there is a bad-quality reversal, the percentage change in conditional volatility is 8%. When there is a good-quality reversal, the percentage change in conditional volatility is -24.7%. From 1999 to 2009, we observe that the net effect of policy reversals on the conditional volatility increases initially till 2005, and starts to fluctuate afterwards. The lack of good-quality (i.e., timely, predictable and credible) reversals before 2005 is the main reason that we do not observe any reduction in the conditional volatility initially. The latter fluctuations reflect that the learning of bureaucratic quality is not one-directional. As the government keeps on changing policies, investors learn about the timeliness, credibility and predictability of the government's actions.

Overall, we find strong empirical support for **Hypothesis 2**. High bureaucratic quality can be an important moderating factor in reducing risk premia in interest rate spread and volatility when policy is unstable. The reduction in the volatility is consistent across the two quality measures independently as well as interactively. Moreover, we obtain stronger and more consistent results by using interactive bureaucratic quality measures. This suggests that bureaucratic quality is multi-dimensional. Different aspects of the bureaucratic action in relation to the policy change can help an investor better gauge uncertainties associated with policy change. Our study is among the first to provide empirical evidence for the significance of bureaucratic quality in the pricing of policy instability in interest rates. Good-quality policy change can reduce the interest rate volatility risk premia up to 25% and the bad-quality policy change can increase the premia up to 8%.

5. Robustness Tests

We conduct two robustness tests. First, we determine if our main finding will hold with the alternative unconditional level, spread, and volatility measures to validate the robustness of our main findings. Second, we test whether bureaucratic quality affects trading activities.

5.1. Unconditional Level, Spread, and Volatility

Here, we use the simple average of the daily level, spread, and two intuitive and naïve measures of daily volatility to validate our main findings. If the result is consistent, we can be more confident that our main finding is robust even if the structural model was mis-specified. The average level is the average of the five repo products measured on the daily basis. The average spread is the average of the four repo spreads measured on the daily basis. We define unconditional volatility by using the daily high, low and average repo rates as follows,

$$R\_Vol_t = \frac{1}{N}\sum_{i=1}^{N} R\_Vol_{i,t} = \frac{1}{N}\sum_{i=1}^{N} \frac{R\_High_{i,t} - R\_Low_{i,t}}{R\_Avg_{i,t}}, N = 1,2,...,5, \quad (5)$$

where $R\_High_{i,t}$ is the daily high value of repo rate i on day t, $R\_Low_{i,t}$ is the daily low value of repo rate i on day t, and $R\_avg_{i,t}$ is the average of the daily open and close rates of repo i on day t. We use the same five repo rates to construct the *Average Volatility* of the repo rates (*R_vol*). Similarly, we use the same four repo spreads to compute the *Average Spread Volatility* where *R_High*, *R_Low* and *R_Avg* refer to the daily high spread, low spread, and the average of the daily spread respectively. We use an event study method to test the difference of level, spread, level volatility, and spread volatility before and after each policy reversal. The results are reported in Table 6 for the event window of 10, 20 and 30 days respectively.

[Table 6 about here]

The first row in Table 6 shows that the interest rate level, spread and unconditional volatility do not significantly change before and after the reversals when we aggregate all reversal events together. The only exception is that the average spread reduces by 6.2 bps after the reversal in the 30-day event window at a 10% level. Overall, the unconditional level, spread, and volatility can increase or decrease as a result of a reversal.

After categorizing reversals according to the two bureaucratic quality measures, we find that the increase and reduction in the level and volatility are largely consistent with the conditional estimates, but with less statistical significance. For example, the level reduces by 7.4 bps for pro-liberalization reversals (i.e., predictable and credible actions) and 11 bps for timely reversals (i.e. timely actions) in 30-day window at a 10% level. It increases by 17.9 bps after anti-liberalization reversals (i.e., non-predictable and non-credible actions) in the 10-day window at a 10% level. The level volatility reduces by 1 bps and 0.9 bps for pro-liberalization reversal in the 20-day and 30-day window at 5% level respectively, whereas it increases by 2.6 bps and 1.2 bps respectively in the 10-day window at a 10% level for anti-liberalization reversals and non-timely reversals. The spread volatility also increases by 3.4 bps and 2.4 bps in the 10-day window at a 10% level for anti-liberalization reversals and non-timely reversals respectively. There is some evidence that the average spread increases for timely reversals (i.e., 10.5 bps, 11.1 bps and 8.8 bps for 10-day, 20-day and 30-day window respectively at a 10% level), and decreases for non-timely reversals (i.e., -3.9 bps in 30-day window at a 5% level), which are inconsistent with our predictions. All other changes in the level and volatility are not statistically significant at 10% level.

When we join the two bureaucratic quality measures together, we find stronger and more consistent results, especially with respect to the volatility. Good-quality reversals (i.e., timely

pro-liberalization reversals) are associated with maximum percentage changes of -11% in the level, -4% in the volatility of the level, and -22% in the volatility of the spread. All the reductions, except one, are statistically significant at the 10% level across all event windows. Moreover, bad-quality reversals (i.e. non-timely anti-liberalization reversals) are associated with maximum increases of 3% in the volatility of the level and 10% in the volatility of the spread. Figure 4 plots the 5-day moving average of unconditional term spread volatility for the event window [-10, 10]. The moving average is the average of past 5 days' unconditional spread volatility. It decreases after a good-quality reversal and increases after a bad-quality reversal. Similar to our earlier findings, the changes of the levels and spreads are less significant.

Overall, with the simplest measure of volatility, we still find that good bureaucratic quality can reduce volatility risk premia in interest rates. That is, good-quality (i.e., predictable, credible, and timely) bureaucratic actions are associated with reduction in volatility and vice versa.

5.2. Bureaucratic Quality and Trading

Prior literature suggests that the return and trading volume are highly related and bond returns or yields can be affected by liquidity (e.g., Amihud and Mendelson, 1991; Lo and Wang, 2006; Li, Wang, Wu and He, 2009; Aït-Sahalia, Andritzky, Jobst, Nowak, and Tamirisa, 2012). To further confirm the causality between bureaucratic quality and interest rates, we want to eliminate one plausible transmission channel through trading. Specifically, we test whether different bureaucratic actions affect the trading activities of repos differently.

As the literature does not provide a comprehensive model for trading activity in the repo market, we estimate one vector auto regressive (VAR) model specified as follows by assuming that the trading activities of different repo products affect each other,

$$\left[Vol_{1,t} \quad \ldots \quad Vol_{5,t} \right]' = \alpha + \sum_{j=1}^{5} \sum_{k=1}^{10} c_{j,k} Vol_{j,t-k} + \beta_i \times BQ_{i,t} + \text{exogenous variables} + \varepsilon_t, \qquad (6)$$

where $Vol_{i,t}$ are the natural logs of trading volume in 100 million for five interbank repo IBR07, IBR14, IBR21, IBR1M, and IBR2M from January 1999 to December 2009, $BQ_{i,t}$ include predictable and credible actions (BQ_{pc}) and non-predictable and non-credible actions (BQ_{npc}) on day t based on the first bureaucratic quality measure, timely actions (BQ_t) and non-timely actions (BQ_{nt}) on day t based on the second measure, and predictable, credible, and timely actions (BQ_{pc_t}), predictable, credible, and non-timely actions (BQ_{pc_nt}), non-predictable, non-credible, and timely actions (BQ_{npc_t}), and non-predictable, non-credible, and non-timely actions (BQ_{npc_nt}) on day t based on the interactions of the two measures. The exogenous variables include SSE A-share return (*Aret*), SSE A-share volume (*Avol*), Interbank government bond return (*Ibret*), interbank government bond trading volume (*Ibvol*), consumer price index (*cpi*), GDP growth rate (*gdp*), fixed investment rate (*fixinv*), IPO dummy (*ipo*), short holiday dummy (*sh*), long holiday dummy (*lh*), 1-year lending rate (*lending*), market liberalization discrete variable (*mktlib_d*), and policy uncertainty discrete variable (*pu_d*). We present the results in Table 7.

[Table 7 about here]

Table 7 shows no significant and consistent relation between bureaucratic quality and trading volume of the five repo products. If the change of liquidity were an explanatory variable, we would expect that coefficient β be positive for good bureaucratic actions and negative for bad actions. Panel A of Table 7 reports the result for the first bureaucratic quality measure. We find

that only 2 of the 10 coefficients are consistent with our prediction at a 10% level. Panel B reports the results for the second bureaucratic quality measure and only 2 of the 10 coefficients are consistent with the prediction at a 10% level. Panel C reports the results of interacted bureaucratic quality measures, and only 1 of the 10 coefficients is consistent with the prediction at a 5% level. Overall, we find little evidence that liquidity change can explain the increase or reduction in interest rate spread and volatility across all five repo products. Hence, our main results are robust with respect to the alternative explanations.

6. Conclusion

Given the fact that governments often change existing policies due to unforeseen circumstance or public pressure, it is important to understand how policy instability can affect financial markets. Our study provides an answer to this question in the context of interest rates.

We find that the pricing of policy instability is strongly affected by the investors' view about bureaucratic quality related to each policy reversal. We find that a good-quality reversal (i.e., predictable, credible, and timely policy reversal) is related to reductions in interest rate spread and volatility. Conversely, a bad-quality reversal is related to increases in the spread and volatility. Hence, bureaucracy quality in policymaking is an important moderating factor that can make policy risk premia become positive, negative or zero. Moreover, our results also suggest that the bureaucratic quality is multi-dimensional and the moderating effect is stronger when the bureaucratic quality is measured more precisely.

Our study has two broad implications. First, investors' responses to a policy change can be significantly affected by bureaucratic quality in policy making, which involves the appropriate design and communication of policy change. This important relation corroborates

with recent research that finds that ad-hoc policy making can bring detrimental effects to financial markets (e.g., Taylor, 2010). Hence, our study highlights the significance of building good policymaking quality in a country's bureaucracy (such as credibility and responsiveness). This is especially important for the developing economies with newly elected governments which want to implement major reforms to spur economic growth.

Second, our results point to the systematic effects of policy risk that is now found to affect interest rate dynamics. Since interest rates can affect many other financial assets such as bonds and real estate, our finding is useful for investors who invest in those emerging economies that are fraught with unstable policies.

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Table 1: Descriptions of Policy Variables

This table describes hand-collected policy variables such as policy reversals, initial policies, policy uncertainties, and liberalization policies from January 1999 to December 2009. The policy reversals are grouped into 3 broad categories and 22 sub-categories that include all official suspensions, resumptions or postponements of government policies in relation to financial market liberalization. Initial policy (IP) refers to the announcement of liberalization policies within the sample period and is labeled with a "Yes". Number of Reversals (NP) is the number of reversals since the implementation of the initial policy. The maximum number of reversals in our sample is five. Policy uncertainty (PU) is the number of unofficial announcements made by authorities, government officials and industry insiders in relation to each sub-category policy reversal.

		IP	NP	PU
Non-tradable Shares (NT)				
1)	Tradability of shares	Yes	4	1
2)	Social security fund	Yes	2	0
3)	Conversion to B shares	Yes	1	0
4)	Employee shares/stock options	No	2	0
Market Access (MA)				
1)	Investment in futures brokerages	Yes	3	2
2)	QFII scheme	No	3	2
3)	Stock index futures	Yes	2	4
4)	Overseas futures	No	1	0
5)	Fuel oil futures	No	1	3
6)	Short selling and margin trade	Yes	4	3
7)	Merger of main boards	Yes	1	0
8)	Fund management	Yes	2	1
9)	Corporate bonds	Yes	2	1
10)	Foreign real estate investment	No	3	0
11)	QDII scheme	Yes	4	3
12)	Through-train scheme	Yes	1	2
Initial Public Offering (IPO)				
1)	Suspension (new pricing rule)	No	4	1
2)	Suspension (State-owned shares sale)	No	2	4
3)	Suspension (real estate)	No	2	0
4)	Suspension (financial crisis)	No	2	3
5)	Subscription scheme	Yes	2	0
6)	Second board	Yes	2	3
Total		**15**	**50**	**33**

Table 2: Summary Statistics

This table presents the summary statistics and correlation coefficients of key variables used. The sample period begins January 1999 through December 2009. Repo rates are in percentage terms. There are five repo rates, i.e., IBR07, IBR14, IBR21, IBR1M, and IBR2M. IBR07 refers to the repo that has a maturity of 7 days. The other four repo names are defined in a similar way according to the maturities. There are four spreads that are the difference between IBR07 and other longer-dated repo rates such as IBR14, IBR21, IBR1M and IBR2M. The spreads are denoted as IBR14-07, IBR21-07, IBR1M-07, and IBR2M-07. Control variables include stock and bond market information as well as macroeconomic variables. *Aret* is the A-share index daily return on Shanghai Stock Exchange (SSE) in annual term. *Avol* is the natural log of daily trading volume of A-shares on SSE in 100 million. *Ibret* is the equal-weighted government bond daily return in annual term in the interbank market. *Ibvol* is the natural log of the government bond trading volume in 100 million in the interbank market. *Irvol* is the natural log of five interbank repos' trading volume in 100 million. c*pi* is the monthly consumer price index. *gdp* is the quarterly GDP growth rate. *fixinv* is the monthly fixed investment rate by government. *ipo* is the dummy variable that takes a value of 1 when an IPO is launched on that day. *sh* is a dummy variable that takes a value of 1 if there are 3 to 5 calendar days of holiday prior to the current trading day. *lh* is a dummy variable that takes a value of 1 if there are more than 5 calendar days of holiday prior to the current trading day. *lending* is the 1-year benchmark lending rate administered by People's Bank of China. Panel A reports the summary statistics of the variables. Panel B reports the correlation matrix of the variables excluding dummy variables.

Panel A: Summary Statistics

Variable Names	N	Mean	Median	Std	Skew	Kurt	Min	Max
Dependent Variables								
IBR07	2654	2.25	2.24	0.78	1.70	9.41	0.87	10.12
IBR14	2653	2.36	2.30	0.88	2.41	18.17	0.90	14.19
IBR21	2647	2.42	2.34	0.88	2.24	15.74	0.92	12.42
IBR1M	2649	2.49	2.40	0.85	1.39	5.77	0.87	9.21
IBR2M	2644	2.59	2.46	0.89	1.32	4.40	0.93	7.82
Average Level	**2643**	**2.42**	**2.35**	**0.83**	**1.55**	**7.81**	**0.94**	**10.70**
IBR14-07	2653	0.11	0.03	0.30	8.60	103.48	-1.02	5.54
IBR21-07	2646	0.16	0.07	0.34	5.89	56.20	-1.44	4.40
IBR1M-07	2649	0.24	0.15	0.37	3.37	26.14	-1.41	4.48
IBR2M-07	2644	0.33	0.20	0.44	2.12	20.38	-2.58	4.35
Average Spread	**2643**	**0.21**	**0.12**	**0.31**	**5.34**	**48.37**	**-0.73**	**4.32**
Control Variables								
Aret	2654	0.42	0.30	6.60	0.71	5.20	-27.88	43.38
Avol	2654	5.13	4.80	1.26	0.56	-0.91	2.45	7.99
Ibret	2654	4.97	3.79	4.06	2.38	8.82	0.00	35.15
Ibvol	2654	1.07	1.32	0.98	-1.13	2.08	-4.82	2.73
Irvol	2654	5.97	6.21	1.68	-1.06	0.74	-1.20	8.40
cpi	2654	1.57	1.20	2.54	0.90	0.20	-2.20	8.70
gdp	2654	10.15	10.00	1.97	0.64	-0.36	6.60	14.50

fixinv	2654	24.39	26.50	8.19	-0.16	0.80	6.30	52.96
ipo	2654	0.15	0.00	0.36	1.95	1.79	0.00	1.00
sh	2654	0.20	0.00	0.40	1.54	0.37	0.00	1.00
lh	2654	0.01	0.00	0.11	9.25	83.64	0.00	1.00
lending	2654	5.86	5.85	0.63	1.36	0.96	5.31	7.47

Panel B: Correlation Matrix

Variable Names		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	*Average Level*	1.00									
(2)	*Average Spread*	0.34	1.00								
(3)	*Aret*	-0.03	0.00	1.00							
(4)	*Avol*	0.05	0.29	0.11	1.00						
(5)	*Ibret*	-0.07	-0.01	0.00	-0.01	1.00					
(6)	*Ibvol*	-0.10	0.27	0.04	0.58	-0.02	1.00				
(7)	*Irvol*	-0.19	0.25	0.00	0.63	0.08	0.73	1.00			
(8)	*cpi*	0.41	0.50	-0.03	0.39	0.07	0.39	0.47	1.00		
(9)	*gdp*	0.28	0.49	0.04	0.34	-0.01	0.46	0.46	0.63	1.00	
(10)	*fixinv*	-0.17	0.18	0.00	0.31	-0.04	0.63	0.66	0.31	0.38	1.00
(11)	*lending*	0.67	0.37	-0.02	0.41	-0.01	0.13	0.13	0.63	0.41	-0.17

Table 3: The Pricing of Policy Instability in Interest Rate Level, Spread and Variance

This table reports the structural model estimation of interbank repo in relation to policy instability proxied by policy reversals from January 1999 through December 2009. The structural model is an AR(5) – EGARCH(1,1) model specified as follows,

$$Y_t = \alpha + \beta \times \text{reversals}_t + \gamma_j \times \sum_{j=1}^{5} Y_{t-j} + \text{control variables}_t + \varepsilon_t,$$

$$\log \sigma_t^2 = c + \theta \frac{|\varepsilon_t|}{\sqrt{\sigma_{t-1}^2}} + \varphi \frac{\varepsilon_t}{\sqrt{\sigma_{t-1}^2}} + \kappa \log(\sigma_{t-1}^2) + \delta \times \text{reversals}_t + \text{control variables}_t,$$

where Y_t is the respective five interbank repo rates and four spreads on day t defined in Table 2, and $reversals_t$ is the dummy variable that takes a value of 1 when there is a reversal announcement on day t. We label the coefficients β and δ with the bracket *(all)* for all reversals. Control variables include SSE A-share return (*Aret*), SSE A-share volume (*Avol*), interbank government bond return *(Ibret),* interbank government bond trading volume (*Ibvol*), interbank repo volume (*Irvol*), consumer price index (*cpi*), GDP growth rate (*gdp*), fixed investment rate (*fixinv*), IPO dummy (*ipo*), short holiday dummy (*sh*), long holiday dummy (*lh*), 1-year lending rate (*lending*), market liberalization dummy (*mktlib*), and policy uncertainty dummy (*pu*). When we estimate the structural model for the spread, we add in six additional control variables in the first equation, i.e., $IBR07_t$ and its five lags. We label the coefficients *h1* to *h6* for these variables. More detailed definitions of the variables are given in Table 1 and Table 2. The asterisks *, **, and *** represent the statistical significance level at 10%, 5%, and 1% respectively.

	Interbank Repo with Different Maturities					Interbank Repo Spread			
	IBR07	**IBR14**	**IBR21**	**IBR1M**	**IBR2M**	**IBR14-07**	**IBR21-07**	**IBR1M-07**	**IBR2M-07**
Level									
β (all)	0.000	0.002***	-0.008***	0.005***	0.000***	-0.001*	-0.006***	0.009***	0.000*
Aret	0.000	0.000	0.000	0.000**	0.000**	0.000	0.000***	0.000**	0.000*
Avol	0.000	-0.001***	0.000***	0.000	0.000***	0.001***	-0.001***	-0.001**	0.000**
Ibret	0.000	0.000	0.000	0.000***	0.000	0.000	0.000	0.000	0.000
Ibvol	0.000***	0.000**	0.000***	0.000***	0.000***	0.000**	0.000	0.000	0.000***
Irvol	0.000***	0.000	0.000***	0.000**	0.000***	0.000	0.000	0.000	0.000***
ipo	0.001***	0.000***	0.000	0.000	0.000***	-0.001*	0.000	0.000	0.000*
cpi	-0.001***	-0.001***	0.000*	0.000	0.000***	0.000	0.001***	0.001***	0.000***
gdp	0.000***	0.000***	0.000***	0.000***	0.000***	0.001***	0.001***	0.000	0.000***
fixinv	0.000***	0.000***	0.000***	0.000***	0.000***	0.000	0.000***	0.000**	0.000
lending	0.002***	0.001*	0.001***	0.001***	0.003***	0.002***	0.000	0.002***	0.002***
mktlib	-0.001***	0.000	0.000***	0.000*	0.000***	0.003***	0.000	-0.001	0.000***
pu	-0.001***	-0.002***	0.002***	0.000	0.000	-0.003*	0.002***	0.000	0.001***
γ1	1.188***	1.016***	0.978***	0.972***	0.991***	0.820***	0.924***	0.885***	0.999***
γ2	-0.141***	0.012***	0.025***	0.021***	-0.001***	0.046***	0.032***	0.046***	0.001***
γ3	-0.009	-0.006	-0.008***	0.009***	0.011***	0.068***	-0.005	0.038***	0.001***
γ4	-0.017***	-0.03***	0.037***	-0.001	-0.004***	-0.019***	0.007	0.005	0.001***
γ5	-0.022***	0.006***	-0.032***	-0.001	0.003***	-0.009***	0.009***	0.022***	-0.002***
h1						-0.366***	-0.469***	-0.701***	-0.067***
h2						0.373***	0.482***	0.590***	0.132***
h3						0.003***	0.017***	0.097***	-0.067***
h4						0.002	-0.031***	0.009	0.004***
h5						-0.022***	-0.009*	-0.015*	0.002*
h6						0.012***	0.011***	0.018***	-0.004***
α	-0.008***	-0.001	-0.006***	-0.005***	-0.014***	-0.032***	-0.010***	-0.009*	-0.015***
Volatility									
δ (all)	-0.094	0.374	-0.010	0.140	0.137	-2.886***	0.049	0.127	0.205
c	-4.091***	-3.584***	-1.951***	-0.766***	-0.313	-3.211***	-1.35***	-0.748***	-1.344***
θ	0.745***	0.616***	0.521***	0.524***	1.100***	-0.057***	0.347***	0.479***	0.852***
φ	0.299***	0.301***	0.279***	0.275***	0.011	0.058***	0.145***	0.175***	0.003
κ	0.773***	0.829***	0.881***	0.917***	0.890***	0.645***	0.911***	0.913***	0.874***
Aret	-0.017***	-0.010*	-0.005	0.007	0.003	-0.009**	-0.005	0.002	-0.011
Avol	0.241***	0.134***	0.057***	0.037**	0.039	0.117***	0.050***	0.043***	0.114***
Ibret	-0.004	0.009	-0.001	-0.026***	-0.020	-0.096***	-0.024***	-0.031***	-0.016
Ibvol	0.213***	0.004	0.021	0.007	-0.024	0.357***	0.052**	0.013	-0.006
Irvol	-0.120***	-0.025	0.046**	0.003	-0.051*	-0.026**	0.010	0.004	-0.036
sh	-0.556***	-0.064	0.215	0.261	-0.215	0.747***	0.059	0.142	-0.199
lh	0.703**	0.675*	1.086**	0.466	0.482	3.161***	0.377	0.315	0.557
ipo	-0.466***	-0.128	0.164	-0.020	-0.015	-0.220***	0.026	-0.056	0.050
cpi	0.088***	0.030**	0.028**	0.043***	0.046***	0.100***	0.021***	0.043***	0.040**
gdp	0.038**	0.067***	0.016	-0.014	0.046***	0.043***	0.018**	-0.007	0.053***
fixinv	0.004	0.002	-0.001	-0.003	-0.005	-0.016***	-0.003	-0.005**	-0.005
lending	0.160***	0.141***	0.051	0.024	-0.055	0.047*	0.039	0.006	0.000
mktlib	-0.514*	0.131	-0.518*	-0.327	-0.628*	-0.345**	-0.581***	-0.249	-0.140
pu	0.039	-0.715*	-0.357	0.424	0.409	0.242	-0.213	0.254	0.072
N	2638	2638	2638	2638	2638	2638	2638	2638	2638
R^2	0.900	0.884	0.906	0.948	0.945	0.544	0.740	0.783	0.615

Table 4: Bureaucratic Quality Constructs – Predictability, Credibility and Timeliness of Bureaucratic Quality

This table reports the details of the reversals that allow us to construct bureaucratic quality measures according to the timeliness, credibility and predictability of the reversals. Panel A presents the time interval in calendar days between policy reversals while Panel B tabulates the analysis of our four bureaucratic quality constructs from 1999 through 2009. In Panel A, 0-1 represents the interval between the initial policy and the first reversal. 1-2 (2-3, 3-4) represents the interval between the first and second (second and third, third and fourth) reversals. Since initial policy is always pro-liberalization, *Reversal 1* and *Reversal 3* are anti-liberalization reversals, and *Reversal 2* and *Reversal 4* are pro-liberalization reversals. We highlight those intervals with less than 180 calendar days in bold. NA represents the policy change that is missing in that category. Panel B shows the chronological analysis of the reversals in the four groups in terms of predictability and credibility (i.e., pro-liberalization), and timeliness (breakpoint at 180 calendar days) of bureaucratic quality.

Panel A: Time Intervals between Reversals

		0-1	**1-2**	**2-3**	**3-4**
Non-tradable Shares (NT)					
1)	Tradability of shares	411	262	**102**	1285
2)	Social security fund	377	2552	NA	NA
3)	Conversion to B shares	NA	3488	NA	NA
4)	Employee shares/stock options	NA	2602	997	NA
Market Access (MA)					
1)	Investment in futures brokerages	1563	469	**13**	NA
2)	QFII scheme	NA	2643	**28**	219
3)	Stock index futures	437	461	NA	NA
4)	Overseas futures	NA	2062	NA	NA
5)	Fuel oil futures	NA	3745	NA	NA
6)	Short selling and margin trade	790	**148**	**33**	**2**
7)	Merger of main boards	**122**	NA	NA	NA
8)	Fund management	906	422	NA	NA
9)	Corporate bonds	387	312	NA	NA
10)	Foreign real estate investment	NA	**48**	591	NA
11)	QDII scheme	304	352	**105**	568
12)	Through-train scheme	**57**	NA	NA	NA
Initial Public Offering (IPO)					
1)	Suspension (new pricing rule)	NA	**137**	**5**	**96**
2)	Suspension (State-owned shares sale)	NA	357	NA	NA
3)	Suspension (real estate)	NA	**130**	NA	NA
4)	Suspension (financial crisis)	NA	248	NA	NA
5)	Subscription scheme	**15**	711	NA	NA
6)	Second board	222	3262	NA	NA

Panel B: Four Groups of Reversals, 1999-2009

	Pro-liberalization Reversals		Anti-liberalization Reversals	
Year	**Short**	**Long**	**Short**	**Long**
1999	0	0	0	0
2000	0	0	1	2
2001	0	1	2	0
2002	0	2	1	1
2003	0	2	0	2
2004	0	2	1	1
2005	2	3	1	1
2006	0	3	0	1
2007	1	1	1	3
2008	3	0	2	4
2009	0	5	0	1
Total	**6**	**19**	**9**	**16**

Table 5: The Pricing of Policy Instability and Bureaucratic Quality

This table reports the structural model estimation of interbank repo in relation to policy instability according to its associated bureaucratic quality from January 1999 through December 2009. The structural model is an AR(5) – EGARCH model that is specified as,

$$Y_t = \alpha + \beta_i \times BQ_{i,t} + \gamma_j \times \sum_{j=1}^{5} Y_{t-j} + \text{control variables}_t + \varepsilon_t,$$

$$\log \sigma_t^2 = c + \theta \frac{|\varepsilon_t|}{\sqrt{\sigma_{t-1}^2}} + \varphi \frac{\varepsilon_t}{\sqrt{\sigma_{t-1}^2}} + \kappa \log(\sigma_{t-1}^2) + \delta_i \times BQ_{i,t} + \text{control variables}_t,$$

where Y_t is the respective five interbank repo rates and four spreads on day t as defined in Table 2. In Panel A, $BQ_{i,t}$ include predictable and credible actions (BQ_{pc}) and non-predictable and non-credible actions (BQ_{npc}) on day t. In Panel B, $BQ_{i,t}$ include timely actions (BQ_t) and non-timely actions (BQ_{nt}) on day t. In Panel C, $BQ_{i,t}$ include predictable, credible, and timely actions (BQ_{pc_t}), predictable, credible, and non-timely actions (BQ_{pc_nt}), non-predictable, non-credible, and timely actions (BQ_{npc_t}), and non-predictable, non-credible, and non-timely actions (BQ_{npc_nt}) on day t. To save the space, we only report the coefficients of the key variables. Other control variables include SSE A-share return (*Aret*), SSE A-share volume(*Avol*), interbank government bond return *(Ibret),* interbank government bond trading volume (*Ibvol*), interbank repo volume (*Irvol*), consumer price index (*cpi*), GDP growth rate (*gdp*), fixed investment rate (*fixinv*), IPO dummy (*ipo*), short holiday dummy (*sh*), long holiday dummy (*lh*), 1-year lending rate (*lending*), market liberalization discrete variable (*mktlib_d*), and policy uncertainty discrete variable (*pu_d*). When we estimate the structural model for the spread, we also add in IBR07 and its five lags in the spread equation. More detailed definitions of the variables are given in Table 1 and Table 2. The numbers in brackets are the t-statistics. The asterisks *, **, and *** represent the statistical significance level at 10%, 5% and 1% respectively.

Panel A: Bureaucratic Quality: Predictability and Credibility

	Interbank Repo with Different Maturities					Interbank Repo Spread			
	IBR07	**IBR14**	**IBR21**	**IBR1M**	**IBR2M**	**IBR14-07**	**IBR21-07**	**IBR1M-07**	**IBR2M-07**
					Coefficient β				
BQ_{pc}	-0.000	-0.000	-0.001***	-0.001***	0.000***	-0.001***	0.001***	0.000	-0.001***
	(-0.72)	(-0.16)	(-11.47)	(-10.26)	(61.83)	(-4.69)	(8.43)	(1.20)	(-7.43)
BQ_{npc}	-0.001***	0.000	-0.001***	-0.000***	-0.002***	0.000	-0.000***	-0.000	-0.001***
	(-6.58)	(0.53)	(-19.94)	(-3.05)	(-350.59)	(0.82)	(-3.12)	(-0.37)	(-7.26)
					Coefficient δ				
BQ_{pc}	-0.064*	-0.030	-0.078***	-0.012	-0.051*	-0.019	-0.061***	-0.020	-0.039
	(-1.90)	(-1.14)	(-2.84)	(-0.64)	(-1.77)	(-0.98)	(-3.12)	(-0.96)	(-1.62)
BQ_{npc}	-0.062*	0.011	-0.035	0.020	0.021	0.012	-0.010	0.017	0.017
	(-1.68)	(0.39)	(-1.38)	(1.04)	(0.65)	(0.57)	(-0.51)	(0.77)	(0.66)
N	2638	2638	2638	2638	2638	2638	2638	2638	2638
R^2	0.900	0.881	0.906	0.948	0.946	0.550	0.735	0.785	0.647

Panel B: Bureaucratic Quality: Timeliness

	Interbank Repo with Different Maturities					Interbank Repo Spread			
	IBR07	**IBR14**	**IBR21**	**IBR1M**	**IBR2M**	**IBR14-07**	**IBR21-07**	**IBR1M-07**	**IBR2M-07**
					Coefficient β				
BQ_t	-0.001***	-0.000	-0.001***	0.001***	-0.002***	-0.002***	-0.002***	-0.003***	-0.001***
	(-6.07)	(-0.17)	(-23.87)	(4.15)	(-334.31)	(-5.84)	(-6.48)	(-8.32)	(-5.60)
BQ_{nt}	-0.000***	0.000	-0.000	-0.001***	0.000***	-0.000	0.001***	0.000	-0.000
	(-5.70)	(1.31)	(-0.36)	(-8.85)	(38.40)	(-1.63)	(5.24)	(1.30)	(-0.32)
					Coefficient δ				
BQ_t	-0.317***	-0.122***	-0.095***	-0.048*	-0.027	-0.065**	-0.104***	-0.078***	-0.080**
	(-6.76)	(-3.19)	(-2.75)	(-1.67)	(-0.85)	(-2.28)	(-3.58)	(-2.88)	(-2.43)
BQ_{nt}	0.061**	0.048*	-0.030	0.028	-0.004	0.024	-0.014	0.036*	0.019
	(1.98)	(1.93)	(-1.49)	(1.40)	(-0.21)	(1.47)	(-0.89)	(1.94)	(0.94)
N	2638	2638	2638	2638	2638	2638	2638	2638	2638
R^2	0.900	0.881	0.906	0.948	0.945	0.566	0.740	0.785	0.646

Panel C: Bureaucratic Quality: Predictability, Credibility and Timeliness

	Interbank Repo with Different Maturities					Interbank Repo Spread			
	IBR07	**IBR14**	**IBR21**	**IBR1M**	**IBR2M**	**IBR14-07**	**IBR21-07**	**IBR1M-07**	**IBR2M-07**
					Coefficient β				
BQ_{pc_t}	0.001***	-0.002***	-0.001***	-0.005***	0.000	-0.006***	-0.005***	-0.005***	-0.002***
	(4.78)	(-7.08)	(-6.90)	(-13.17)	(1.40)	(-10.42)	(-9.91)	(-7.29)	(-6.06)
BQ_{pc_nt}	0.000	0.001***	0.000***	-0.000*	-0.001***	0.001***	0.001***	0.002***	-0.001***
	(1.36)	(3.95)	(3.50)	(-1.79)	(-30.71)	(2.69)	(5.02)	(7.08)	(-7.95)
BQ_{npc_t}	0.000***	0.000	0.000	0.000	-0.001***	0.000	-0.002***	0.000	0.000*
	(3.07)	(1.06)	(0.31)	(0.36)	(-53.28)	(-0.43)	(-6.31)	(0.64)	(-1.73)
BQ_{npc_nt}	-0.000*	-0.000*	-0.000***	0.001***	-0.001***	0.001***	0.001***	0.000	0.000
	(-1.72)	(-1.90)	(-4.59)	(5.61)	(-29.65)	(3.92)	(3.96)	(0.40)	(0.58)
					Coefficient δ				
BQ_{pc_t}	-0.434***	-0.316***	-0.177***	-0.136**	-0.193***	-0.197***	-0.200***	-0.189***	-0.178***
	(-5.78)	(-4.58)	(-2.80)	(-2.46)	(-2.78)	(-3.88)	(-3.87)	(-3.30)	(-3.11)
BQ_{pc_nt}	0.004	0.032	-0.045*	0.009	-0.013	0.019	-0.040***	0.023	-0.007
	(0.12)	(1.04)	(-1.83)	(0.41)	(-0.47)	(0.88)	(-2.04)	(1.01)	(-0.30)
BQ_{npc_t}	-0.268***	-0.036	-0.038	-0.021	0.005	-0.007	-0.073**	-0.036	-0.034
	(-3.91)	(-0.65)	(-0.88)	(-0.53)	(0.09)	(-0.17)	(-2.06)	(-0.89)	(-0.80)
BQ_{npc_nt}	0.168***	0.118**	0.021	0.081**	0.079*	0.057*	0.062**	0.098***	0.087**
	(2.68)	(2.41)	(0.60)	(2.18)	(1.87)	(1.70)	(2.09)	(2.61)	(2.32)
N	2638	2638	2638	2638	2638	2638	2638	2638	2638
R^2	0.900	0.881	0.906	0.948	0.946	0.547	0.739	0.783	0.646

Table 6: Robustness Tests with Unconditional Level, Spread and Volatility

This table documents the difference in the mean of the variables before and after the policy changes with set event window [T-K,T+K] where K = 10, 20, 30 from January 1999 through December 2009. Bureaucratic quality related reversals measures are *Pro-liberalization* or *Anti-liberalization Reversals*, *Short* or *Long Reversals*, *Short Pro-liberalization, Long Pro-liberalization*, *Short Pro-liberalization,* or *Long Pro-liberalization*. *Average Level* is defined as the average of the five interbank repos, i.e., IBR07, IBR14, IBR21, IBR1M, and IBR2M. *Average Spread* is defined as the average of the four spreads, i.e. IBR14-07, IBR21-07, IBR1M-07, and IBR2M-07. *Average Volatility* is defined as the daily high minus daily low and divided by daily average of the five repo rates. *Average Spread Volatility* is defined as the average of the daily high spread minus daily low spread and divided by the daily average spread. The asterisks *, **, and *** represent the statistical significance level at 10%, 5% and 1% respectively.

	Average Level			Average Spread			Average Volatility			Average Spread Volatility		
Event Window [T-K, T+K}	**K=10**	**K=20**	**K=30**	**K=10**	**K=20**	**K=30**	**K=10**	**K=20**	**K=30**	**K=10**	**K=20**	**K=30**
All Reversals	0.071	-0.036	-0.062*	0.009	0.026	-0.001	0.010	-0.001	-0.003	0.016	0.003	0.005
Bureaucratic Quality												
Predictability and Credibility												
Pro-liberalization	-0.035	-0.057	-0.074*	0.004	0.005	-0.004	-0.005	-0.010*	-0.009**	-0.001	-0.005	-0.003
Anti-Liberalization	0.179*	-0.016	-0.051	0.015	0.049	0.003	0.026**	0.007	0.003	0.034**	0.011	0.012
Timeliness												
Timely	0.156	-0.058	-0.110*	0.105*	0.111***	0.088***	0.006	-0.002	-0.002	-0.003	-0.017	-0.010
Non-timely	0.036	-0.027	-0.042	-0.031	-0.009	-0.039**	0.012*	0.000	-0.003	0.024*	0.012	0.011
Predictability, Credibility & Timeliness												
Timely Pro-liberalization	-0.095	-0.188**	-0.262***	0.047	0.089**	0.057*	-0.030***	-0.022***	-0.014*	-0.067**	-0.059***	-0.036**
Non-timely Pro-liberalization	-0.016	-0.015	-0.015	-0.009	-0.021	-0.023	0.003	-0.005	-0.007	0.019	0.013	0.007
Timely Anti-liberalization	0.323**	0.029	-0.008	0.144*	0.126**	0.109**	0.030	0.011	0.006	0.039	0.011	0.007
Non-timely Anti-liberalization	0.098	-0.041	-0.074	-0.057	0.005	-0.057*	0.023*	0.005	0.001	0.030*	0.011	0.016

Table 7: Bureaucratic Quality and Trading

This table reports the estimated coefficients of VAR model for trading activities in the interbank repo market. The estimated model is specified as follows,

$$\begin{bmatrix} Vol_{1,t} & Vol_{2,t} & Vol_{3,t} & Vol_{4,t} & Vol_{5,t} \end{bmatrix}' = \alpha + \sum_{j=1}^{5}\sum_{k=1}^{10} c_{j,k} Vol_{j,t-k} + \beta_i \times BQ_{i,t} + \text{exogenous variables} + \varepsilon_t .$$

The VAR model's dependent variables Vol_t are the natural logs of trading volume in 100 million for five interbank repos defined in Table 2 from January 1999 through December 2009. In Panel A, $BQ_{i,t}$ include predictable and credible actions (BQ_{pc}) and non-predictable and non-credible actions (BQ_{npc}) on day t. In Panel B, $BQ_{i,t}$ include timely actions (BQ_t) and non-timely actions (BQ_{nt}) on day t. In Panel C, $BQ_{i,t}$ include predictable, credible, and timely actions (BQ_{pc_t}), predictable, credible, and non-timely actions (BQ_{pc_nt}), non-predictable, non-credible, and timely actions (BQ_{npc_t}), and non-predictable, non-credible, and non-timely actions (BQ_{npc_nt}) on day t. The exogenous variables include SSE A-share return (*Aret*), SSE A-share volume (*Avol*), interbank government bond return (*Ibret*), interbank government bond trading volume (*Ibvol*), consumer price index (*cpi*), GDP growth rate (*gdp*), fixed investment rate (*fixinv*), IPO dummy (*ipo*), short holiday dummy (*sh*), long holiday dummy (*lh*), 1-year lending rate (*lending*), market liberalization discrete variable (*mktlib_d*), and policy uncertainty discrete variable (*pu_d*). The numbers in brackets are the t-statistics. The asterisks *, **, and *** represent the statistical significance level at 10%, 5% and 1% respectively.

Interbank Repo with Different Maturities					
	BTR07	**BTR14**	**BTR21**	**BTR1M**	**BTR2M**
Panel A: Predictability and Credibility					
BQ_{pc}	-0.039**	-0.050	-0.016	-0.107**	-0.023
	(-2.17)	(-1.69)	(-0.29)	(-2.06)	(-0.29)
BQ_{npc}	0.048***	-0.005	-0.037	-0.101*	-0.237***
	(2.55)	(-0.16)	(-0.65)	(-1.88)	(-2.81)
N	2633	2633	2633	2633	2633
R^2	0.82	0.49	0.17	0.12	0.09
Panel B: Timeliness					
BQ_t	0.052**	-0.052	-0.027	-0.126*	-0.161
	(2.11)	(-1.27)	(-0.37)	(-1.77)	(-1.46)
BQ_{nt}	-0.021	-0.018	-0.025	-0.094**	-0.109
	(-1.23)	(-0.67)	(-0.52)	(-2.05)	(-1.53)
N	2633	2633	2633	2633	2633
R^2	0.82	0.49	0.17	0.13	0.09
Panel C: Predictability, Credibility and Timeliness					
BQ_{pc_t}	-0.068	-0.173**	0.035	-0.188	0.015
	(-1.60)	(-2.45)	(0.27)	(-1.53)	(0.08)
BQ_{pc_nt}	-0.033*	-0.034	-0.019	-0.103*	-0.039
	(-1.75)	(-1.08)	(-0.33)	(-1.84)	(-0.46)
BQ_{npc_t}	0.121***	0.022	-0.053	-0.072	-0.190
	(3.77)	(0.40)	(-0.53)	(-0.78)	(-1.31)
BQ_{npc_nt}	0.004	0.009	-0.035	-0.091	-0.267**
	(0.16)	(0.18)	(-0.43)	(-1.72)	(-2.20)
N	2633	2633	2633	2633	2633
R^2	0.82	0.49	0.16	0.12	0.09

Figure 1: Treasury Bond and Repo Turnover in the Interbank Market

This figure shows the turnover of the spot Treasury bond and Repo traded in the interbank market from 1997 through 2008. The data is sourced from WIND. The repo turnover is the top portion of each column. The Treasury bond turnover is the bottom portion of each column. The y-axis is measured in Billons of RMB.

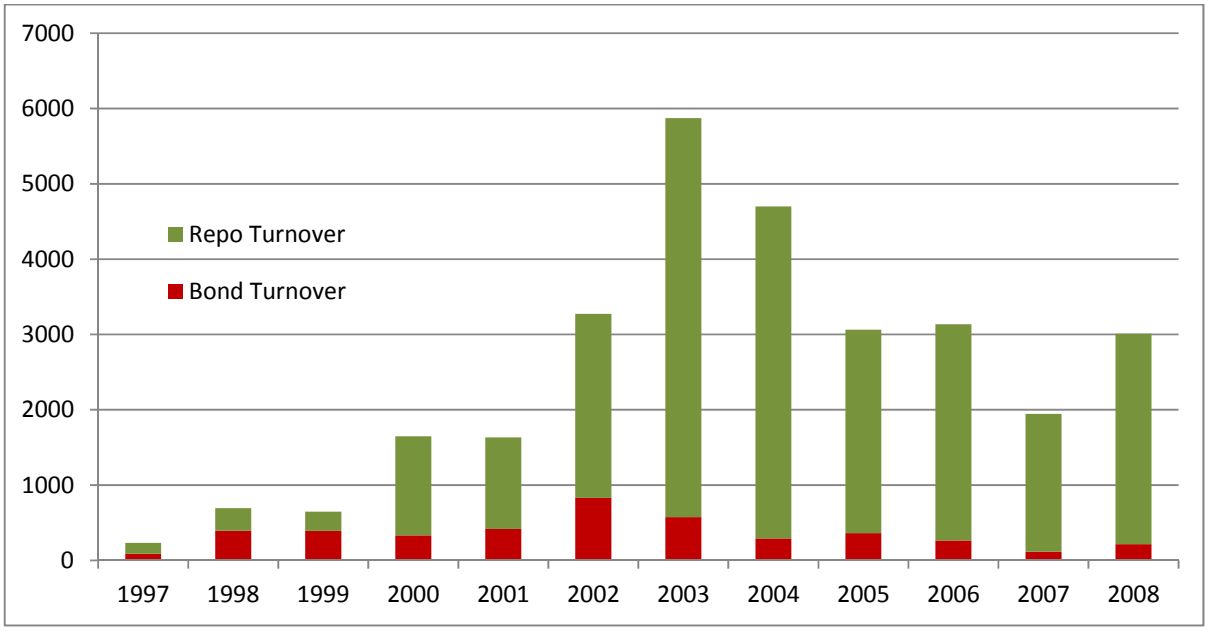

Figure 2: The Histogram of Time Intervals of Policy Reversals

The figure shows the histogram of time intervals between two policy changes from 1999 through 2009 measured in calendar days. The x-axis represents the number of calendar days between a prior policy change and the current policy change. The y-axis represents the number of reversals that falls into each interval category.

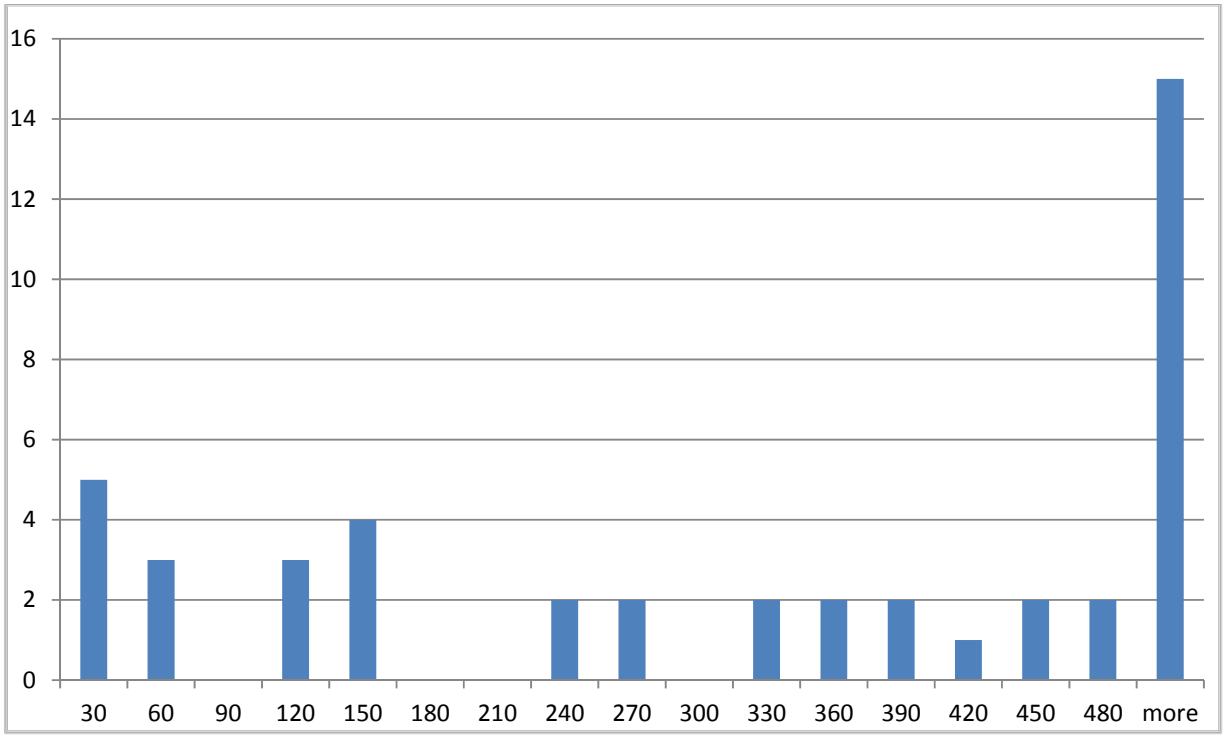

Figure 3: The Impact of Bureaucratic Quality on Interest Rate Volatility

This figure presents the net effect of bureaucratic quality of policy making associated with each reversal on the conditional volatility of IBR07 from 1999 through 2009. The x-axis is the sample period. The y-axis is the percentage change in conditional volatility after each reversal after accounting for bureaucratic quality and the learning of the quality. The thick line represents the impact of good-quality reversals on the conditional volatility. On the other hand, the thin line represents the impact of bad-quality reversals on the volatility. The dotted line represents the net impact of all reversals on the volatility.

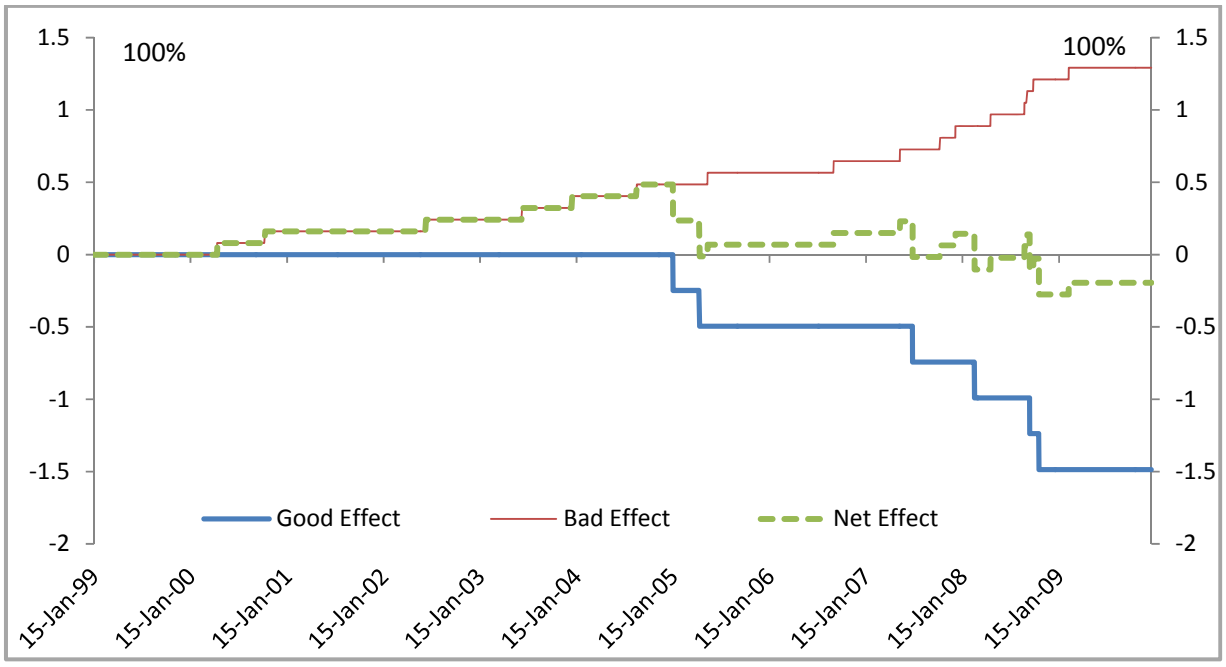

Figure 4: Unconditional Spread Volatility Surrounding a Policy Reversal

This figure charts the unconditional volatility of term spread surrounding a policy reversal for a [-10, 10] event window. The x-axis is the event day of each reversal. The y-axis is the moving average of unconditional volatility in percentage terms, which is average of the unconditional volatility of the term spread in past 5 days. The solid line represents the moving average of the unconditional spread volatility surrounding all good-quality reversals. The dotted line represents the moving average of the unconditional spread volatility surrounding all bad-quality reversals.