Presidential Approval Ratings and Foreign Exchange Market

The Case of the Korean Won during the Park Government

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Abstract

Do presidential approval ratings affect exchange rates? The empirical purview of the vast literature on this topic has been confined to the run-up to elections. The importance of approval ratings in non-election periods has therefore been understudied. Examining the daily data of the exchange rates of the Korean won (KRW) during the presidency of Park Geun Hye, the paper reports that KRW weakened 1) when Park's ratings were low and 2) when bounced back unexpectedly from a low level. This result explains why the impeachment did not lead to a serious panic in the KRW market. The KRW rates seem to have already reflected the market's concerns about the uncertainty created by government well before the impeachment.

keyword: KRW; Approval Rating; GARCH; Exchange Rates

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1. Introduction

The extant literature of international political economy (IPE) has firmly established that political uncertainty is one of the most significant sources of financial market turmoil. In particular, the destabilizing effect of political uncertainty on foreign exchange (FoReX) markets is well documented. Empirical studies often find that electoral decisiveness (Carnahan and Saiegh 2020), ruling parties' political ideologies (Leblang 2003), democratic transition (Son 2016), veto power (Han 2009), or political regime types (Steinberg, Koesel and Thompson 2015) are sources of a FoReX market cataclysm as those factors engender and amplify political uncertainties.

Given this empirical regularity, it seems reasonable to posit that the political crisis that unfolded in South Korea between late 2016 and early 2017, eventually leading to the impeachment of the then-president Park Geun Hye, would have stirred a financial panic in the Korean One (KRW) market. The impeachment process entailed a non-negligible period of a complete power vacuum and a subsequent snap election. The observers of the market predicted that this crisis would surely throw the market into chaos (Teso, Yoon and Karunungan 2016).

The FoReX market exhibited little to no abnormality, however. While not completely tranquil, the movements of KRW in the run-up to the National Assembly's vote on the presidential impeachment was far from chaotic. The KRW per dollar rates at the end of 2016 actually stayed in a range slightly narrower than did those of the year before. More importantly, the depreciatory force subsided shortly after the period. Why did the FoReX market not panic over this unprecedented political turmoil in a small open economy?

This paper aims to answer this question by focusing on the relationship between the KRW market and the public approval ratings of Park government. The prediction that the impeachment would trigger market turmoil is predicated on two assumptions: 1) the market preferred the incumbent government in power to the opposition's takeover and 2) the crisis caught the market by surprise. Given a series of political disasters and blunders of the Park government before the impeachment, however, this assumption seems untenable. Instead, one can posit that the market had updated their priors about the Park government, observing a variety of political crises building up to the impeachment. The currency traders might have hedged against the policy uncertainty the government was creating, as implied in the political crises, well before the impeachment. As such, the impeachment itself would not have had such a strong impact to alter the currency traders' priors about the political landscape of South Korea. In fact, the removal of Park from power would be considered an event reducing uncertainties. The empirical consequence of this assumption would be found in the values of the KRW—the changes in the rates closely reflected Park's approval ratings.

This paper documents evidence of this empirical expectation. Using daily KRW data covering almost the entire period of Park's presidency, it finds that KRW weakens (strengthens) when Park's approval ratings are low (high). This effect is amplified with a sudden, unexpected increase in the ratings taking place when Park was largely unpopular. This 'bounce-back-from-the-bottom' moments made the political landscape unpredictable and further increased the policy uncertainty that was already high because of the low approval rating. The result was particularly weak (and unstable) KRW.

The paper contributes significantly to the literature on the relationship between financial markets and political information. Much of the contemporary IPE literature focuses on the run-up to elections to examine the effect of increasing political uncertainty arising from the popularity of political leaders on financial markets (e.g., Schamis and Way 2003). Doing so leaves out questions as to how the uncertainty reflected in popularity affects the market in the non-election season.[1] Given ample empirical evidence on the effect of presidential approval ratings on economic policy changes, it is reasonable to presume that financial markets react to the political shocks regardless of electoral calendars. Filling this lacuna, the paper offers compelling empirical evidence illuminating a general effect of presidential approval ratings on exchange rates.

The paper offers a nuanced understanding of the economic consequences of the popularity of political leaders. The extant literature suggests that the financial market in general (Addoum and Kumar 2016; Joo, Kim and Park 2020) and foreign exchange market in particular (Liu and Shaliastovich 2021) perceive an improvement in political leaders' approval rating as good news. While largely corroborative with this line of literature, the findings here also identify a situation where this is not necessarily the case. When the incumbent's approval rating is unambiguously low, information inconsistent with such an observation—e.g., the sudden gains s/he makes in popularity—confuses the market. The paper therefore joins recent studies reporting possible negative consequences of incumbents' high approval ratings (e.g., Herrera, Ordonez and Trebesch 2020).

The paper is also a first attempt to analyze the KRW movement during the Park regime in a political economy perspective. Korean economy has been generally seen as "quite resilient to external shocks and tensions" (Rhee et al. 2017) and the KRW market in particular has remained surprisingly tranquil since the Bank of Korea let the currency float in the aftermath of the 1997 crisis. However, the paper suggests that such a narrative does not reveal how the market was nonetheless affected by the risks posed by the Park government.

The paper is comprised of six parts. In the section following this introduction, the existing studies on the relationship between politics and FoReX market are briefly reviewed to highlight the importance of studying approval ratings. In the third section the political crises of the Park government are detailed to contextualize the role of approval

[1] Liu and Shaliastovich (2021) is an important exception.

ratings in generating uncertainty. Three testable hypotheses reflecting the implications of these crises on the financial market are also derived. The research design and the result of statistical analysis are discussed in the fourth and fifth sections, respectively. The paper concludes with briefly revisiting the findings and their implications.

2. Presidential Approval Ratings and Markets

The effect of political uncertainty on market dynamics has long been established as one of the most important theoretical tenets for institutional political economy (e.g., North 1990). Major changes in economic policies are known to have strong ramifications for market participants. Consistent with this theoretical intuition, the literature extensively documents that forward-looking investors are sensitive to political information that might help them predict such changes in advance and adjust their investment portfolios accordingly (Frankel and Rose 1996).

FoReX markets, where investment decisions have instantaneous and substantial effects in returns, have often been the empirical domain to examine the relationship between political uncertainty and investors. These studies commonly assume that whether or not policy changes occur is essentially personal information of policymakers and the market tries to read the signals revealing such information through various ways (Hays, Freeman and Nesseth 2003). Given that investors are generally risk-averse, a large body of empirical studies reports that political uncertainty shies away currency traders from the market, creating a downward pressure on the currency.[2]

Elections are featured prominently in this literature. While scholars propose various institutional determinants of uncertainty (Freeman, Hays and Stix 2000; Bechtel 2009), a dominant position in the empirical IPE literature is that changes of economic policymakers are the major source of shifts in the existing macroeconomic policy equilibrium. Given the conspicuous nature of electoral uncertainty, the literature on exchange rates is abound with findings of the destabilizing effect of elections on currency markets (e.g., Leblang and Satyanath 2006).

This salience of elections in financial markets generates two different empirical expectations for the incumbent government's approval ratings depending on the types of governments. Where elections are endogenous, namely, in parliamentary systems, low ratings point to an early election, generating rather direct implications for economic policy changes. Where election timings are exogenous, as in presidential systems, the ratings are known to mean not much more than the president's popularity polling, offering only not-so-immediate implications for policy changes. Not surprisingly, studies linking the approval ratings of the incumbent party and/or president to exchange rate markets are

[2] See Broz and Frieden (2001) for an exhaustive review of the traditional literature on this topic.

almost exclusively focused on the run-up to elections (Martínez and Santiso 2003; Leblang and Bernhard 2006; Cermeño, Grier and Grier 2010).

However, a fixed electoral calendar does not necessarily mean a complete lack of critical junctures at which major turns in economic policies occur. First, presidential elections do not take place in a complete vacuum. Voters evaluate the incumbent government in the long period leading up to the election day. Approval rating, in this sense, can be understood as a snapshot of this evaluation and, thus, a predictor of the reelection although its predictive power might diminish the longer down the road the election is scheduled. It is not surprising that policymakers react to the approval ratings and try to adjust policies accordingly to boost reelection chances. Moreover, the leaders and rank-and-file officers of the presidential party are concerned about the 'coattail effect' of the approval ratings on their own elections (Fullmer and Daniel 2018) and would also exert influence over policy making processes.

Second, approval ratings serve as public information about the president's popularity, which then affects the government's policy agenda. Indeed, American politics literature has long maintained that high approval ratings embolden presidents (Brody 1991), who would in turn "aim for a more ambitious agenda" (Gronke and Brehm 2002, 425-426). Canes-Wrone and de Marchi (2002) report that this effect is particularly strong for salient policy issues. Recent empirical studies report mounting evidence confirming this regularity in a comparative perspective (Calvo 2007; Carlin, Love and Martínez-Gallardo 2015). Arnold, Doyle and Wiesehomeier (2017) find that approval ratings have a conditioning effect on policy compromises of Latin American presidents, offering a direct insight into the relationship between approval ratings and policy changes.

To the extent that this relationship between approval rating and policy-agenda formation is plausible, one can assume that investors trying to predict policy changes would base their calculations on presidential approval ratings. Very high or low levels of approval ratings might be viewed as signs of strong or weak political momentum for the government and, thus, as a force moving policies from the current equilibrium. Forward-looking investors would adjust their investment to the the presidential approval ratings, regardless of electoral calendars. Empirical evidence supporting this expectation is rare but not unfound. Joo, Kim and Park (2020) and Addoum and Kumar (2016) find that high presidential approval ratings reduce financial market uncertainty. Likewise, Liu and Shaliastovich (2021) offer rare direct evidence demonstrating the strong relationship between the presidential approval ratings and the value of the US dollar. They find that the contemporaneous correlation between US presidents and the value of US dollar is 0.52.[3]

This effect of approval ratings on the market is expected to be particularly profound in a low information environment. The importance of reliable and predictable information on government policies for financial markets is well documented (e.g., Hays,

[3]A similar correlation for Park's presidency is 0.33.

Freeman and Nesseth 2003). When the government's positions on economic issues are uncertain/unstable and, thus, national economic policies are hard to predict, investors scramble for any reliable clues available (e.g., de jure peg or central bank independence) that might help them ascertain governments' policy intentions (Broz 2002; Herrendorf 1999). Approval ratings can be one of few sources that might provide the market with such clues. The less alternative sources for policy information available, the more effect approval ratings might have on the market, one would presume.

3. South Korea and KRW during the Park Government

3.1. Information Scarcity and Uncertainty

I argue that the information about policies was scarce during Park's presidency. The information scarcity then led the FoReX market to be attentive to approval ratings as a major source of information from which future government policies could be inferred. The government and the president herself were viewed generally "uncommunicatable" (Harris 2016) with the rare press conferences often staying strictly in the course of pre-scripted conversations. Not only was the information scarce, the market was largely—and increasingly—confused about the general policy orientations as the government sent mixed signals upon the dwindling public support.

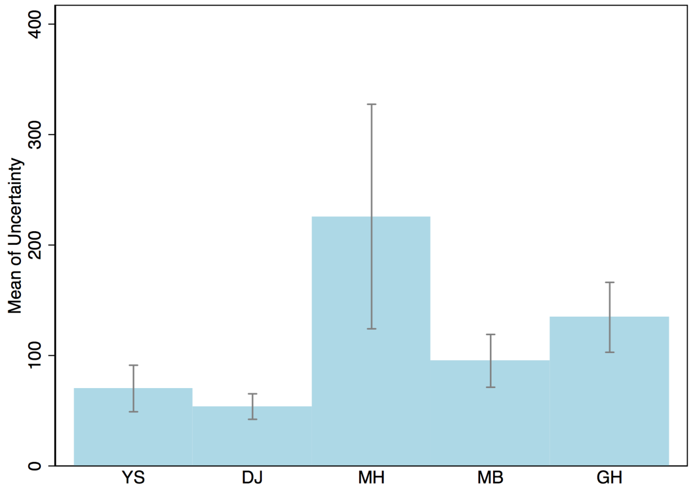
Confusion was abound from the beginning. Figure 1 plots the average economic policy uncertainty index of the first six months of each presidency using the monthly data compiled by Baker, Bloom and Davis (2016). The index is based on news stories of six major daily papers and can be a function of a slew of non-political factors such as trade surplus or foreign exchange reserves. It is, however, safe to assume that the evaluations of the government policies feature prominently in the news coverage—and therefore the index—during the early months of each presidency. The figure illustrates fairly straightforwardly that Park government started out with a relatively high level of economic policy uncertainty.[4]

The source of this initial uncertainty lies in the inconsistency in the economic policy platform of the government. During the presidential campaign in 2012, Park proposed "welfare without tax hikes" and "economic democratization," promising a substantial fiscal expansion with low tax rates.[5] The budget deficit naturally expected to accrue to this rather oxymoronic idea was designed to be canceled out by the projected growth spurt through "Creative Economy" (Kwon 2017).

[4]The exceptionally high level of uncertainty in early 2003 (Roh Moo Hyun government) as well as the wide confidence interval of the mean can be explained by an external factor in the global economy, namely the Iraq War, whose effect subsided precipitously. I thank an anonymous reviewer for this point.

[5]In fact, when the two months between the presidential election and the inauguration, the level of policy uncertainty for the Park government analogous to the one shown in Figure 1 is even higher.

Figure 1: Economic Uncertainty Index



Note: Average Economic Uncertainty Index for the first six months of each presidency in South Korea with 95 % confidence intervals. YS: Kim Young Sam; DJ: Kim Dae Jung; MH: Roh Moo Hyun; MB: Lee Myung Bak; GH: Park Geun Hye).

This campaign promise generated several questions not addressed until the end of the presidency. First, Park's proposal of aggressive welfare expansion was a complete and sudden departure from her party's traditional pro-market agenda, which established a "welfare residualism" in the country (Gao et al. 2011). The country's social spending grew dramatically in the post-1997 Kim Dae Jung era and Park's conservative party had been ardently hostile toward such a trend until the 2012 presidential election. For observers, this shift was unexpected and confusing (Kim 2013).

In the meantime, Park's critics questioned the reliability of such an abrupt shift in major economic policies (Kwon 2017). Not surprisingly, outcries for tax hikes to balance the budget (*The Korea Times*, September 22, 2014) or voices of resistance to the welfare expansion (*The Korea Herald*, February 3, 2015) from her own Saenuri Party were rampant during Park's presidency. Upon the signs of the declining support, Park hinted that 'economic democratization' was more or less completed in an attempt to rally the support from the traditional conservative supporters (Kang 2015). This incident set the precedent that the government was highly sensitive to public support and could make rather drastic swings in policies to shore it up.

The pattern of myopic economic policies to shore up popular support repeated for the rest of Park's presidency as the government ran into a series of political crises and the approval ratings stayed low. One of these crises was the sinking of Sewol Ferry in 2014. It exposed the problem of the 'regulatory capture' (You and Park 2017) reminiscent of the old state-led authoritarian development that Park was deemed to have personally inherited from her father.[6] The inadequate government responses to the MERS epidemic

[6] Indeed, the correlation between the approval rating and policy uncertainty index (Baker, Bloom and

in the following year reinforced the public perception that the government was all-around incompetent (Choe 2015). Finally, in the run-up to the parliamentary election in 2016, the broad conservative coalition around the incumbent Saenuri party collapsed over internal conflicts. The party eventually lost the majority in the National Assembly to the opposition Democratic Party, which made it clear that the government entered a very early lame duck.

Upon these political crises, the government churned out a series of rather hasty monetary expansion and deregulation initiatives as well as development plans to regain popular support (Kwak 2016). These policies were centered around the real estate market (Kang 2014) and North Korea ('the unification is a bonanza,' Govindasamy, Tan and Park 2019), which are probably two of the most salient and politically combustible economic issues in South Korea. They were almost contradictory to the government's earlier commitments to welfare expansion and strictly reciprocal inter-Korean policies. In the end, the regularization of support-seeking economic policies highlighted to the market the importance of the presidential approval ratings as a relatively reliable predictor of changes to be made on economic policies: with low approval ratings comes an announcement of impulsive economic plans.[7]

In effect, financial market observers took notice of Park's (low) approval ratings and their implications for the policy uncertainty of South Korea. Global financial news outlets often inferred looming major changes in economic policies from Park's low popularity while unable to predict the direction of the changes (e.g., AFP 2015; Oxford Analytica 2016). Similarly, credit risk agencies such as Moody's raised their concerns over the effect of the lost political momentum on the uncertainty of economic policy making (KBS World 2016).

3.2. Argument

The literature on FoReX markets suggests that policy uncertainty affects the value of a currency significantly. The empirical reality of South Korea during Park's presidency was that the information about policy was scarce and the presidential approval ratings were offered to the market as a primary reference point for uncertainties. Synthesizing the literature and the reality leads to three testable hypotheses.

First, and foremost, the approval ratings should be closely related to the values of

Davis 2016) for the entire presidency of Park is -0.562 (p=0.000), which jumps up to -0.703 (p=0.000) for the post-Sewol Ferry disaster period. This difference is consistent with the increasing importance of approval ratings to the market over time even though the index might be an incomplete indicator of the market's perception of the government.

[7] Ascertaining why Park government reacted obsessively to popular support with impulsive economic plans would be beyond the purview of this paper; yet I suspect that the reasons lie in Park's personality-driven politics (Doucette 2017) as well as the narrow political coalition that the government drew on (Yun 2017).

KRW. Since weak public support for the president was considered indicative of policy uncertainties, risk-averse, forward-looking currency traders would shy away from KRW when the approval ratings were low. In other words, the first hypothesis can be written:

H_1 : The level of the presidential approval rating during Park's presidency is positively associated with the value of KRW.

With a sluggish approval rating, therefore, one can expect that the nominal KRW:USD rates go up, or KRW depreciates against the US dollar.

Second, it is also plausible to expect the change—in addition to the level—of approval ratings to be consequential. As Bernhard and Leblang (2006, 27) point out, "unanticipated shocks to the government's approval cause traders to update their expectations," thereby driving up or down the value of a currency. In Park's presidency where approval ratings are a particularly salient reference to the policy uncertainty, a sudden change in ratings can confuse the market. There are two possible ways in which approval rating shocks could affect KRW.

A simple, straightforward mechanism is that shocks are themselves an independent source of uncertainty. To the extent that approval ratings are considered a harbinger of upcoming elections and coalition politics (Huber 1996), the effect of approval rating shocks on the financial market can approximate that of an electoral surprise (e.g., Carnahan and Saiegh 2020): the market would hedge against the newly created uncertainty.

H_2 : An unexpected change in the presidential approval rating during Park's presidency weakens the value of KRW.

However, it might not be plausible to assume that all rating shocks are equally consequential. As Bernhard and Leblang (2006) demonstrate in the British context, the effect of opinion shocks on the currency market is highly contextual on the existing political landscape. Given that changes in polling results are not very uncommon, they report that only the shocks that actually have meaningful consequences in realpolitik (e.g., rating shocks that are a tie-breaker for an otherwise neck-and-neck competition between the government and opposition party) had an effect on the value of the pound.

Analogously to Bernhard and Leblang (2006), I focus on the possible conditioning effect of shocks on the relationship between the level of approval ratings and the value of KRW. I assume that a rating shock, be it positive (unexpected gains in popularity) or negative (unexpected losses in popularity), cab be either status quo-confirming or -altering with regard to the current level of the approval rating. A status quo-altering shock would *create* uncertainty while a status-quo confirming shock would *reduce* uncertainty. For instance, a positive shock could actually render the predictions about the political landscape in the immediate future difficult if it happens when the president's approval rating is very low (status quo-altering). Currency traders that had been trying to hedge against the low ratings would be taken aback by the new information pointing to the president's gains in popularity. By contrast, a negative shock in such a situation would imply the consolidation or continuation of the status quo and could in fact enhance the predictability of the president's future (Kiousis 2003). To the extent that the competition between the government and the opposition becoming decisive leads to policy certainty Carnahan and Saiegh (2020), a status quo-confirming approval rating shock would contribute to certainty, be it negative or positive.

Table 1: Conditioning Effect of Approval Ratings Shocks: Aggregate Level of Uncertainty

		rating shocks (unexpected change)	
		negative	positive
approval ratings	low	–A + B	–A –B
	high	A – B	A + B

'A' indicates policy certainty provided by high approval ratings such that '-A' indicates *un*certainty accompanied by low approval ratings. 'B' ('-B') is certainty (uncertainty) introduced by a shock that implies the change in the trend of approval ratings.

Combining the uncertainty generated by the level of approval ratings and the shocks presents a clear picture of how the aggregate level of uncertainty varies with different dynamics of president's popularity, as summarized in Table 1. Consider, for instance, a positive rating shock when the level of approval rating is low (top-right quadrant in Table 1). Not only would the low rating generate uncertainty (–A), the shock that challenges the status quo would also add extra uncertainty (–B). A very high degree of uncertainty (–A–B) is expected in such a situation. The same kind of shock, however, would reinforce (B) the low-uncertainty environment (A) further if it takes place when the president is already very popular: A very high degree of certainty is expected (A+B). A positive shock, in other words, would *amplify* the effect of the level of approval rating on uncertainty.

The third hypothesis then can be written as follows:

H_3 : A positive approval rating shock occurring when Park's approval rating is low (high) weakens (strengthens) the value of KRW.

In contrast, the conditioning effect of a negative shock would be less dramatic. Consider a negative shock happening when the president is unpopular (top-left quadrant in Table 1). The shock informs observers that the president will be even more unpopular, effectively clarifying the immediate political future of the government. The uncertainty brought about by the low ratings (–A) is reduced by the negative shock (B), in other words. Similarly, a negative shock to a popular government is status quo-altering (–B) and would erode the certainty (A) created by a high approval rating. A negative shock is expected to *negate* the difference in uncertainty generated by the level of approval rating.

Following the conventional wisdom (Leblang and Mukherjee 2004; Turner, Startz and Nelson 1989), I assume that the exchange rate volatility moves hand-in-hand with the level. Therefore, the three hypotheses proposed here also project the empirical expectations about the variability of KRW rates: When high rates (weak KRW) are expected, a high variability is also expected.

4. Research Design

4.1. Data and Variables

4.1.1. Dependent Variable

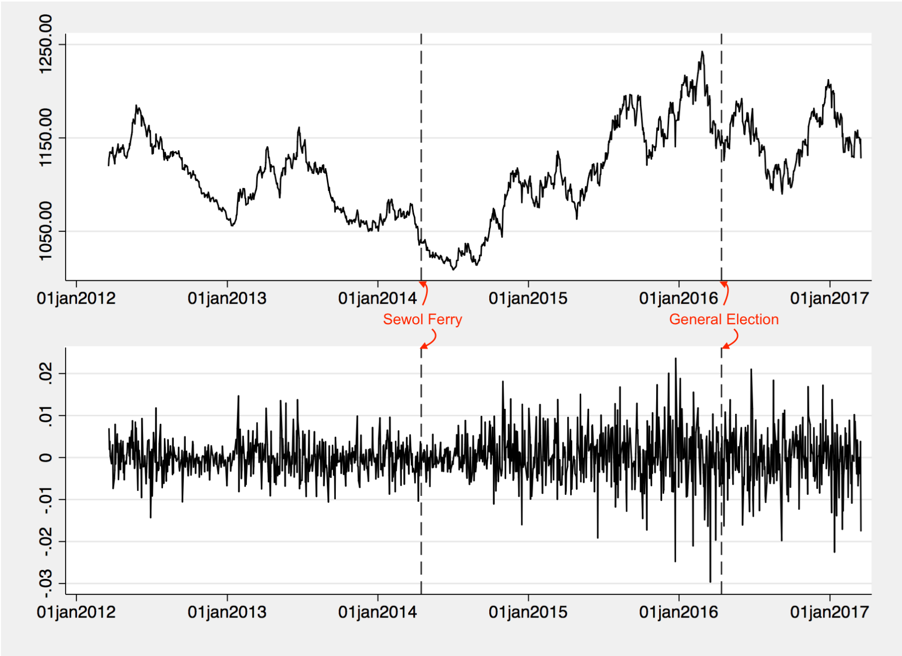
This paper studies the relationship between the presidential approval ratings and the nominal exchange rate changes of the Korea won (KRW) from March 22, 2013, to December 9, 2016. This temporal coverage corresponds exactly to the period during which Park's presidential approval rating data are available. The exchange rate data capture daily spot exchange rates of KRW:USD data (the Korean won value of one US dollar) available from the International Monetary Fund's (IMF) International Financial Statistics International Monetary Fund (2016). Exchange rate time series are known to be non-stationary. Indeed, Augmented Dickey-Fuller (ADF) test fails to reject the null hypothesis that the KRW series has a unit root (Mackinnon approximate p-value=0.3837). To obtain stationarity, following the common practice in the literature, the exchange rate variable is a differenced log value such that it represents daily percentage changes. More formally, the dependent variable Y is,

$$Y = log(KRW_t) - log(KRW_{t-1}), \tag{1}$$

where KRW_t is the price of KRW per USD at date t. The ADF test on this series confirms that it obtains stationarity (Mackinnon approximate p-value=0.000).

Figure 2 plots the temporal trend of KRW. The upper panel of the figure represents KRW trend (raw data) during the period of interest in this paper while the bottom panel indicates the trend of differenced KRW, Y, of equation 1. The figure lends an intuitive support to H_1. Towards the end of Park's term where the approval ratings changed erratically (see Figure 3 below), KRW rates had become increasingly volatile and, though mildly, weaker. Of particular importance is the changes in KRW rates following major political crises. The sinking of Sewol Ferry and the government's mismanagement of the tragedy in the aftermath seems to have quite clearly contributed to the weakening/destabilizing trend on KRW. The months following the accident during which the public outcry over the authority's inappropriate treatment of the victims and lack of transparency in the investigation coincides with the 'tipping point' at which the value and stability of KRW switched to a generally low/volatile status. Similarly, the Twentieth Legislative Election at which the opposition Democratic Party took over the majority in the National Assembly is followed by a substantial weakening of KRW. The crises were accompanied with drastic reduction in the approval ratings and increased uncertainties over policies, which eventually undercut the investor confidence in the future values of KRW.

Figure 2: KRW Trend during Park Government



Note: The top panel is the daily spot rates of KRW per USD. The bottom panel represents differenced log values of KRW (Y of Equation 1). The first vertical dashed line indicates the day that the Sewol ferry sank; the second one indicates the general election day.

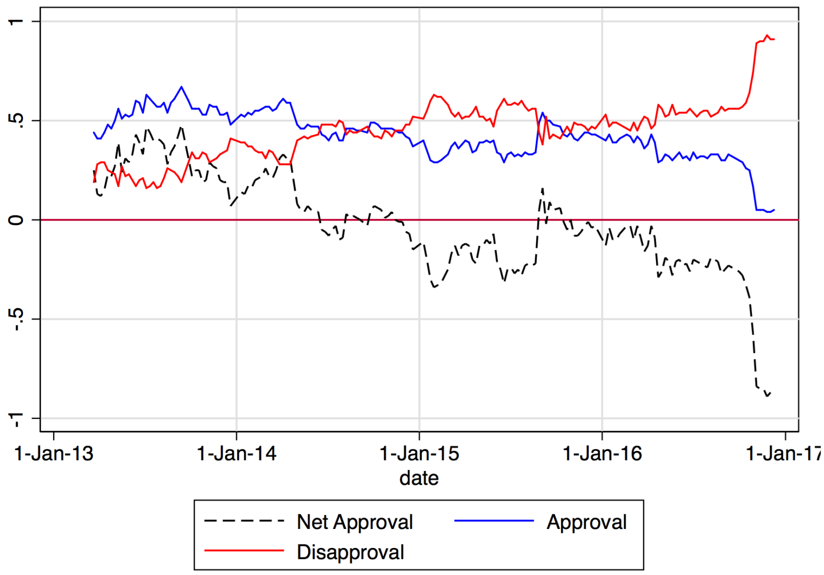
4.1.2. Operationalization of the Approval Ratings

The central independent variable that captures the uncertainty that the financial market have about the South Korean government is the net presidential approval ratings of Park Geun Hye. The variable is derived from two types of presidential approval ratings, namely, 'approval' and 'disapproval.' Given that the positive and negative ratings often move rather independently (e.g., Canes-Wrone and de Marchi 2002), the difference between these two indicators, or 'Net Rating,' is used rather than choosing one over the other.

Another primary independent variables are approval rating shocks. The shocks are defined by a change that defies the expectation based on the temporal trend. To obtain the temporal trend, a simple Autoregressive Integrated Moving Average (ARIMA) model is employed (see Appendix A1 for details). As such, approval ratings that fall outside of a band of the temporal trend predicted by the ARIMA model are identified as shocks.

The data for ratings are from Gallup Korea, which has been consistently polling presidential approval ratings since the 1980s on a weekly basis. For all the approval data in the sample, Gallup Korea carries out the polls Tuesday through Thursday and release the result on Friday each week. Once the poll results are disclosed through the web pages of Gallup Korea and the National Election Commission, the information is made almost instantaneously available to the public through major media outlets. This openness and fixed time table is important, in that it implies that 1) the approval rating is 'public' information that the market can almost costlessly observe and 2) the market can expect to update this information in an extremely regular basis and thus might find Gallup Korea's data a relatively more useful source of information than other alternatives.

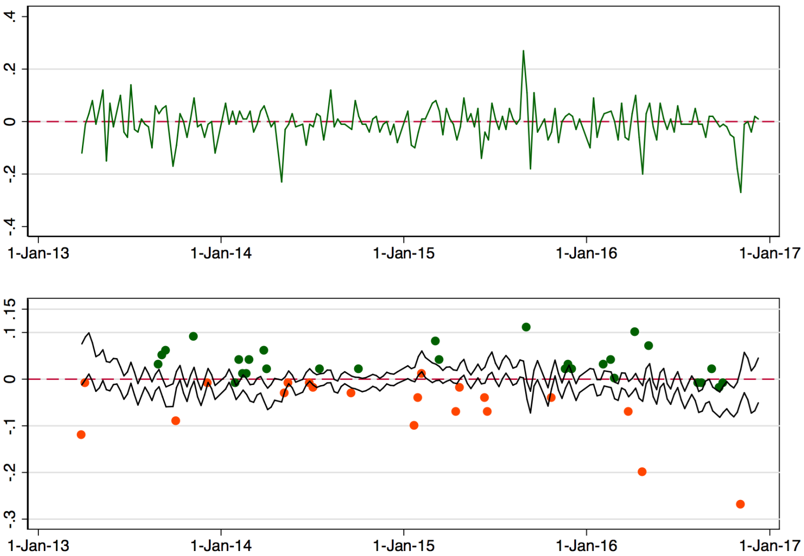
Figure 3: Park's Approval Rating



Note: 'Approval (Disapproval)' indicates the percentage of respondents who said 'well (not well)' to the question, 'do you approve or disapprove of the way President Park has handled her job as president?'. 'Net Approval' is the difference between 'Approval' and 'Disapproval.'

Figure 3 plots the temporal trend of the approval, disapproval, and their difference, 'net approval' ratings of Park. The figure suggests that Park's net approval rating was generally on a declining path and, particularly since around early 2015 on, it had been consistently negative. Figure 4 depicts the first-differenced ratings, ΔRating (top panel), as well as the positive and negative shocks (bottom panel). The figure suggests that there were more positive approval rating shocks (a total of 29, about 16 % of the sample) than negative ones (a total of 19, about 10 % of the sample). This may not come as a surprise given that, overall, Park's approval ratings had been in a declining trend. Given this baseline trend, up-ticks should be more likely to be unexpected than down-ticks could be.

Figure 4: Approval Rating 'Shocks'



Note: The top panel plots the weekly change in Park's approval rating. The solid lines in the bottom panel indicates the 95 % confidence interval of the ARIMA estimates of the net approval rating trend detailed in Appendix A1. The green (orange) balls are positive (negative) approval shocks.

4.2. Models and Covariates

Quantitative financial analysis literature has long established that generalized autoregressive conditional heteroskedasticity (GARCH) models are best suited for examining high-frequency time-series (e.g., Balke and Fomby 1994; Engle 1982). This conventional wisdom is also widely accepted in the political economy literature (e.g., Leblang and Bernhard 2006; Leblang and Mukherjee 2004). The primary benefit of using GARCH models is that it allows researchers to estimate both level (conditional mean) and stability (conditional variance) of the dependent variable, a feature particularly suitable for testing the two hypotheses in this paper. Accordingly, this paper adopts a standard GARCH model to estimate the level and variance of KRW. GARCH (1,1) is chosen given that it usually outperforms, or at least not outperformed by, more sophisticated specifications or autoregressive structures (e.g., Hansen and Lunde 2005). Likewise, when GARCH (1,2) or (2,1) were applied, the benchmark finding was not altered (see Appendix Table A1).

The benchmark GARCH (1,1) model is composed of two parts: mean and variance equations. The mean component of the GARCH model–that is, the part of the model that explains the 'level' of the dependent variable–is defined simply as:

$$\Delta ln(KRW_t) = \lambda + \beta_i \mathbf{X}_t + \varepsilon_t, \tag{2}$$

where λ is a constant, $\mathbf{X}$ is a vector of i number of independent variables, and ε_t is an error term normally distributed with zero-mean and variance σ_t^2. On the other hand, the conditional variance model is written as:

$$ln(\sigma_t^2) = \omega + \alpha\varepsilon_{t-1}^2 + \beta_1 ln(\sigma_{t-1}^2) + \gamma_j \mathbf{I}_t, \tag{3}$$

where ω is a constant, σ_{t-1}^2 is the GARCH term (forecast variance from the previous period), ε_{t-1}^2 is the ARCH term (new information on volatility based on the previous one), and I is j number of exogenous variables that account for the variance (Leblang and Mukherjee 2004, 307). α, β, and γ are the parameters to be estimated. Time-dependent volatility test confirms that the series contains an ARCH effect ($\chi^2 = 13.458$, p=0.0002), confirming that using a GARCH model is feasible. Geweke/Porter-Hudak of long memory (fractional integration) parameter, d (= 0.157), indicates that it is not necessary to use a fractionally-integrated GARCH model (p-value = 0.246).

A number of covariates are employed in X and I. While the conceptual proximity to the hypotheses put forth above should be the prime guidance to model specifications, computational efficiency and parsimony are also considered strong criteria. As Zivot's (2009) extensive literature survey affirms, computational difficulties are a perennial problem in any high-frequency financial time-series analysis and particularly so in GARCH models. Much of the problem lies in the large number of independent variables included in the right-hand side of equations. Not only is a specification of large number of covariates conducive to convergence issues, but the estimates are likely to be inaccurate and biased (Brooks, Burke and Persand 2001). To avoid this problem, some of the variables that 1) are found consistently insignificant and 2) have little effect on the result of the primary independent variable across permutations of specifications, and/or 3) pose computational challenges that render estimates unobtainable are excluded from the benchmark model. The covariates included in the benchmark model, in other words, are theoretically and empirically relevant while not generating computational problems.

First to be included in $\mathbf{X}$ are, as discussed above, the approval rating 'level' variable and the rating shock variables to test the two hypotheses pointing to their direct effect on KRW (H_1 and H_2). If the two hypotheses are supported, the level variable should be significantly *negative* while the shock variables should be significantly *positive* as higher values in the dependent variable indicate weaker KRW. Also included in some specifications are the multiplicative interaction terms between them to test the conditional hypothesis (H_3). As demonstrated by Bernhard and Leblang (2006), these interaction terms illuminate if the sudden changes can condition the effect of high and low levels of approval ratings in a GARCH model. If the GARCH estimates lend support to H_3, therefore, the marginal coefficient of the approval ratings should be significantly *negative* when a positive shock occurs. The the shock variables are not included in $\mathbf{I}$ (the variance equation) as they are consistently insignificant across various model specifications. The interaction terms cause a convergence problem and, thus, are not included in the variance equation.

Since the approval rating data are a weekly series, the daily observations are created using a simple linear interpolation following the standard practice of high-frequency financial data analysis (Gençay et al. 2001). While keeping the values constant for each week does not make any significant difference in the result, I argue that interpolation yields more accurate results. Given that the weekly approval rating data are not the only source of new information, upon which investors update their prior on the political uncertainty, linear smoothing stands on a more plausible assumption.

For control variables, first, given that the market is closed in weekends and holidays, during which uncertainty naturally increases, a dummy variable coded one that captures the day that follows any period the market was closed is employed in $\mathbf{X}$ (Leblang and Mukherjee 2004). Additionally, two political events that are expected to have significant effects on the market, the sinking of Sewol ferry and the general election, are included in $\mathbf{I}$. Given that the public viewed the government's handling of the Sewol accident as increasingly erratic over time (Lee 2017), *Sewol* is a counting variable that captures the number of days that had elapsed since the accident. On the other hand, the upset caused by the electoral result is modeled as traditional event variables: two dummy variables capturing the day of, and day after, the election are employed.[8]

Finally, given that KRW movements have been affected by the monetary policies of advanced economies, the daily changes of the Japanese yen are taken as a control variable in I. Given the interconnectedness between the yen and the US dollar, employing this variable effectively controls for the general effect of the monetary policies of the United States which are otherwise difficult to incorporate into the model where the dependent variable is constructed in part by the value of the US dollar.

As reported in Table 2, the Jarque-Bera test indicates that the residuals are not normally distributed. As a conventional measure (Bernhard and Leblang 2006), therefore, the Bollerslev-Wooldridge semi-robust standard errors are used (Bollerslev and Wooldridge 1992). Likewise, as the squared residuals are likely to be serially correlated, a first-order autoregressive term (AR1) is applied.

5. Empirical Analysis

5.1. Benchmark Result

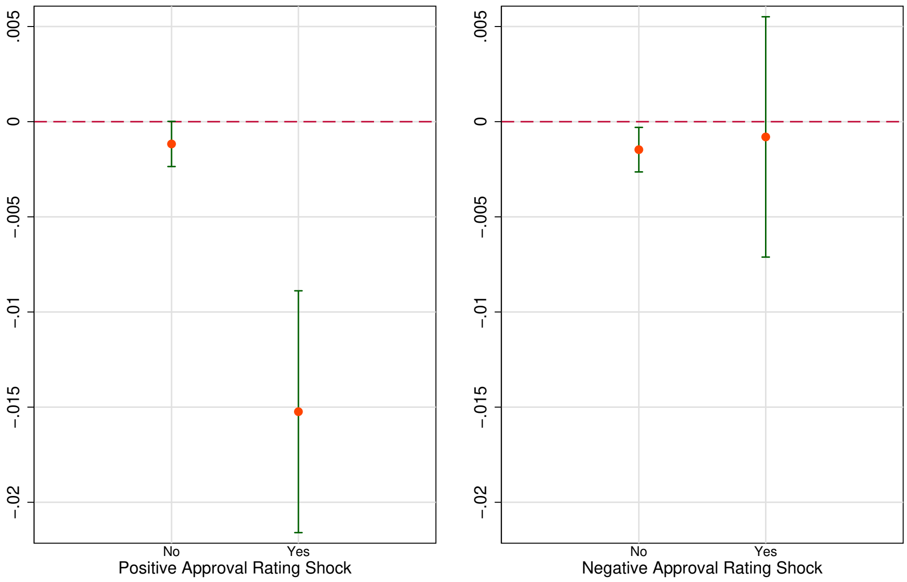
Table 2 reports the result of the benchmark GARCH model. The first column presents the result of a model that does not include any interaction term. The significantly

[8] An inclusion of a dummy variable for MERS does not change the result and the variable itself is highly insignificant. This lack of effect can be explained by the fact that the Park government had already been mired by the 'Sung-List' scandal. The variable was thus excluded from the model.

negative coefficient of the level of approval rating variable lends straightforward support to H_1, indicating that low levels of ratings of Park is related to high KRW rates, or weak KRW. Not surprisingly, the variable's coefficient is significantly positive in the variance equation, implying that the uncertainty generated by low approval ratings makes KRW rates unstable.

On the other hand, neither of the approval rating shock variables is significant, suggesting that H_2 is not supported. An unexpected change in approval ratings predicted by the temporal trend in itself does not generate policy uncertainty strong enough to alter currency traders' behaviors. One possible explanation for this null result lies in the fact that shocks are not all the same. Some of the rating shocks might not be that much surprising, particularly when they are followed by political events generally reflective of the current level of the president's popularity. As H_3 implies, it might be that only those shocks that point to a change in status quo (e.g, a positive shock amid low popularity) are truly 'shocking.' If that is the case, lumping different kinds of shocks together in the same category would yield a null result.

Figure 5: Marginal Effect of the level of approval ratings



Note: Conditional coefficients of the level of approval rating variable with 90% confidence intervals. The x-axis represents the presence/absence of a positive approval rating shock. The Y-axis indicates the marginal effect of the approval ratings on the KRW:USD rates: lower values point to stronger KRW. The left and right panels are based on the estimates reported in Models 2 and 3 of Table 2, respectively. A nearly identical figure is plotted when the estimates of Model 4 are used instead. See Appendix Figure A1 to see how the marginal coefficient of a positive shock changes by gradation of the levels of approval rating.

Column 2 of Table 2 reports that a positive shock does amplify the effect of the level of approval rating as the significant coefficient of the multiplicative interaction term suggests. The left panel of Figure 5 offers a straightforward illustration of this conditioning

Table 2: GARCH Model

	(1)	(2)	(3)	(4)
Mean Equation				
holiday_{t-1}	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$\text{positive surprise}_t$	0.001	0.003^{**}	0.001	0.003^{**}
	(0.001)	(0.001)	(0.001)	(0.001)
$\text{negative surprise}_t$	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
$\text{net approval rating}_t$	-0.001^{**}	-0.001^{*}	-0.001^{**}	-0.001^{*}
	(0.001)	(0.001)	(0.001)	(0.001)
$\text{approval rating}_t \times \text{positive surprise}_t$		-0.014^{**}		-0.014^{**}
		(0.004)		(0.004)
$\text{approval rating}_t \times \text{negative surprise}_t$			0.001	0.000
			(0.004)	(0.004)
constant	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
AR(1)	-0.022	-0.015	-0.022	-0.015
	(0.036)	(0.036)	(0.036)	(0.036)
Variance Equation				
Δyen	-0.016	-0.013	-0.016	-0.013
	(0.043)	(0.044)	(0.043)	(0.044)
$\text{net approval rating}_t$	0.812^{**}	0.768^{**}	0.813^{**}	0.769^{**}
	(0.373)	(0.375)	(0.373)	(0.375)
election_t	-3.099^{**}	-3.052^{**}	-3.098^{**}	-3.049^{**}
	(0.293)	(0.291)	(0.294)	(0.291)
election_{t+1}	-1.035^{**}	-1.037^{**}	-1.034^{**}	-1.037^{**}
	(0.239)	(0.238)	(0.240)	(0.237)
Sewol	0.002^{**}	0.002^{**}	0.002^{**}	0.002^{**}
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-10.830^{**}	-10.847^{**}	-10.830^{**}	-10.847^{**}
	(0.160)	(0.159)	(0.161)	(0.159)
ARCH	0.089^{**}	0.095^{**}	0.089^{**}	0.095^{**}
	(0.039)	(0.041)	(0.039)	(0.041)
GARCH	-0.434^{**}	-0.426^{**}	-0.435^{**}	-0.426^{**}
	(0.127)	(0.124)	(0.127)	(0.124)
N	934	934	934	934
log-pseudolikelihood	3563.170	3567.303	3563.177	3567.305
Ljung-Box (p-value)	0.701	0.771	0.703	0.773
Ljung-Box^2 (p-value)	0.648	0.602	0.648	0.601
Jarque-Bera test (p-value)	0.000	0.000	0.000	0.000

GARCH (1,1) estimates with Bollerslev-Wooldridge semi-robust standard errors in the parentheses. * $p < 0.1$, ** $p < 0.05$. The approval shock variables are not included in the variance equation as they were consistently insignificant if included.

effect. Absent a positive approval shock, the effect of approval ratings on the value of KRW is small, though still marginally significant. The presence of a positive shock increases this effect by about 8 times. As the confidence intervals indicate, this difference is not only substantive but also statistically significant. Taken together, Columns 1 and 2 suggest that when low levels of presidential approval ratings in general concern the foreign exchange market, president making an unexpected rating gain would confuse currency traders even more because the future is that much unpredictable. The result supports H_3.

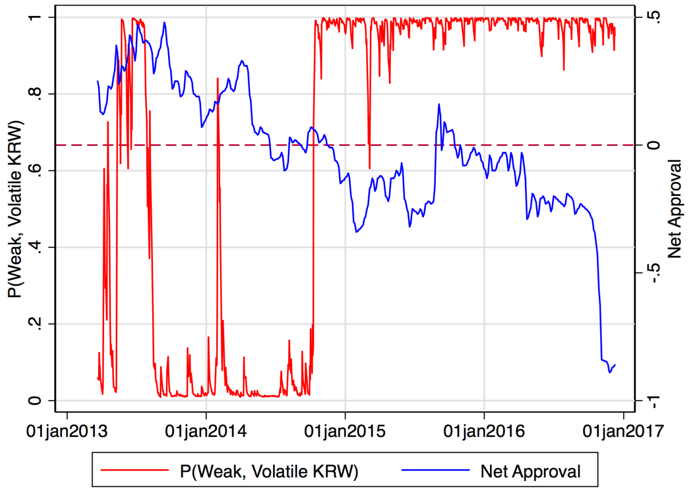
Column 3 of Table 2 suggests that the same cannot be told about negative shocks as the interaction term is not significant. As indicated in the right panel of Figure 5, the effect of the approval rating variable with and without a negative shock is essentially identical. Column 4 of the table reports the result when both interaction terms are included in the same model. The result confirms that the estimates reported in Column 2 is robust to this alternative. Overall, the result of the models containing the interaction term is consistent with the argument summarized in Table 1.

Turning to other parts of Table 2, both ARCH and GARCH terms are significant. This indicates that the volatility of KRW and its random errors from the previous period (t-1) affect the current volatility of KRW, which is also evident from the bottom panel of Figure 2. The Sewol variable is strongly significant in the variance equation. This result suggests that the market understood Park government's mishandling of the aftermath of the disaster and the political crisis stemming from it as a source of uncertainty independently of the approval rating. The two election variables have significantly negative coefficients in the variance equation, implying that the election day stabilized the value of KRW. While this is somewhat counter-intuitive, one plausible interpretation of this result can be that the two large elections (the local election in 2014 and the general election in 2016) during Park's presidency did not really offer the financial market any new information about the government. Their results were largely consistent with Park's approval rating at the time and therefore reaffirmed what the market knew about the government before each election. The reaffirmation must have reduced the uncertainty.

5.2. Robustness Check: Markov Regime-switching Model

An estimator often used as an alternative to a GARCH model is Markov Regime-switching model (Turner, Startz and Nelson 1989). While Leblang and Mukherjee (2004) convincingly demonstrate that GARCH models (modestly) outperform Markov Switch regressions, it should nonetheless strengthen our confidence in the benchmark result presented in Table 2 if the Markov-switching models produce results consistent with it. A lagged dependent variable is included following the conventional wisdom. The approval rating variable is not included because of a convergence problem.

Figure 6: The Probability of Unstable/Weak KRW



Note: The red line indicates the probability of 'weak and volatile' KRW based on the Markov dynamic regime switch model estimates (State 2). The blue line represents the 'Net Approval.'

Appendix Table A2 reports the result fitting a Markov Dynamic Regime Switch model where the core independent variables of the benchmark model are also included. The result is generally consistent with the benchmark result. The 'positive shock' variable is significantly positive in State 2, indicating that a sudden gain in the presidential approval rating increases the possibility that KRW weakens/destabilizes. Given that State 2 in large part overlaps with the period the approval rating was relatively low (Figure 6), this result corroborates the benchmark finding that the positive shock matters in conjunction with the level of approval ratings.

Figure 6 also indicates that the point at which the 'regime' of the value of KRW switched from a strong/stable one to a weak/volatile one corresponds to the period during which Park's net approval rating tanked to the sub-zero level. As the approval rating stayed in the sub-zero area for the rest of the term, the value of KRW remained in the weak/volatile status. This finding is analogous to the benchmark finding that the presidential approval rating exerts profound influence on the nominal value of KRW.

6. Conclusion

The empirical regularity between sudden, high-profile political events and market turmoil is well-established. Be it government turnover (Leblang and Satyanath 2006), assassination of government officials (Sachs, Tornell and Velasco 1996), or an electoral surprise (Carnahan and Saiegh 2020), financial market participants react erratically to salient, unexpected political events as they increase the uncertainty over the economic policies of the country. The lack of financial panic in the midst of an unprecedented political crisis in South Korea between the late 2016 and early 2017 is, therefore, puzzling. While political crises appeared to generate great uncertainties over the country's economic policies, the currency market was relatively tranquil. Financial analysts tended to attribute this tranquility to the generally "excellent economic fundamentals" of the country (NBAD 2017, 26), which is closely related to its free-floating exchange rate regime as well as a staggering amount of foreign exchange reserves the Bank of Korea has been boarding.

The paper proposes an alternative explanation: the market remained tranquil perhaps because it was not surprised to see the impeachment. Currency traders had already updated their priors on the uncertainty that the Park government generated, informed by the weekly approval ratings. The paper documents the empirical consequence of this explanation by demonstrating the relationship between the presidential approval ratings and daily KRW movements. With the the economic policies largely uncertain and/or unpredictable, the approval ratings loomed large for currency traders. Using GARCH models, the paper reports that when Park's approval ratings were low, the market's anxiety over the future policies increased as indicated in the weakening/destabilizing KRW rates. When Park made unexpected gains in approval ratings while the overall popularity was low, the uncertainty was particularly large, weakening KRW substantially.

The paper offers several implications for the political economy literature. First, the paper highlights a special case in which gains in presidential approval ratings can actually be a harbinger of financial market instability, a counter-intuitive phenomenon gaining traction in the studies of emerging markets (Herrera, Ordonez and Trebesch 2020). Second, by finding a significant relationship between Park's approval ratings and KRW over her entire presidency, the paper suggests that the financial implications of presidents' popularity can go far beyond the run-up to elections. This complements the existing studies on approval ratings and financial markets that are primarily focused on the periods around elections. Third, the paper adds another layer to the political economy studies on the Korean financial market. Extant empirical studies report null results on the Korean financial market's reaction to exogenous security shocks originating from North Korea (e.g., Noland 2006; Kim and Roland 2014). The paper suggests that while the market might remain calm against external shocks to the country, it pays close attention to domestic factors directly related to the predictability of economic policies of the country such as presidential approval ratings.

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Appendix

A1. Identifying Approval Rating Shocks

A simple ARIMA model can capture an 'average' approval rating of the current period by actively modeling the trend of a variable. For the ARIMA model to be used, in addition to the autoregressive (AR2) and moving average (MA2) terms, the short- and long-term temporal trend measured by a previous level of ratings and trend cubic polynomials (that is, t, t^2, and t^3), respectively, are included. To put it more formally, the ARIMA (2, 1, 2) model can be written:

$$\begin{aligned}\Delta Rating_t =& \alpha + \rho_1 \Delta Rating_{t-1} + \rho_2 \Delta Rating_{t-2} + \\ & \theta_1 \epsilon_{t-1} + \theta_2 \epsilon_{t-2} + \\ & \beta_1 Rating_{t-1} + trend + trend^2 + trend^3 + \epsilon_t\end{aligned}$$

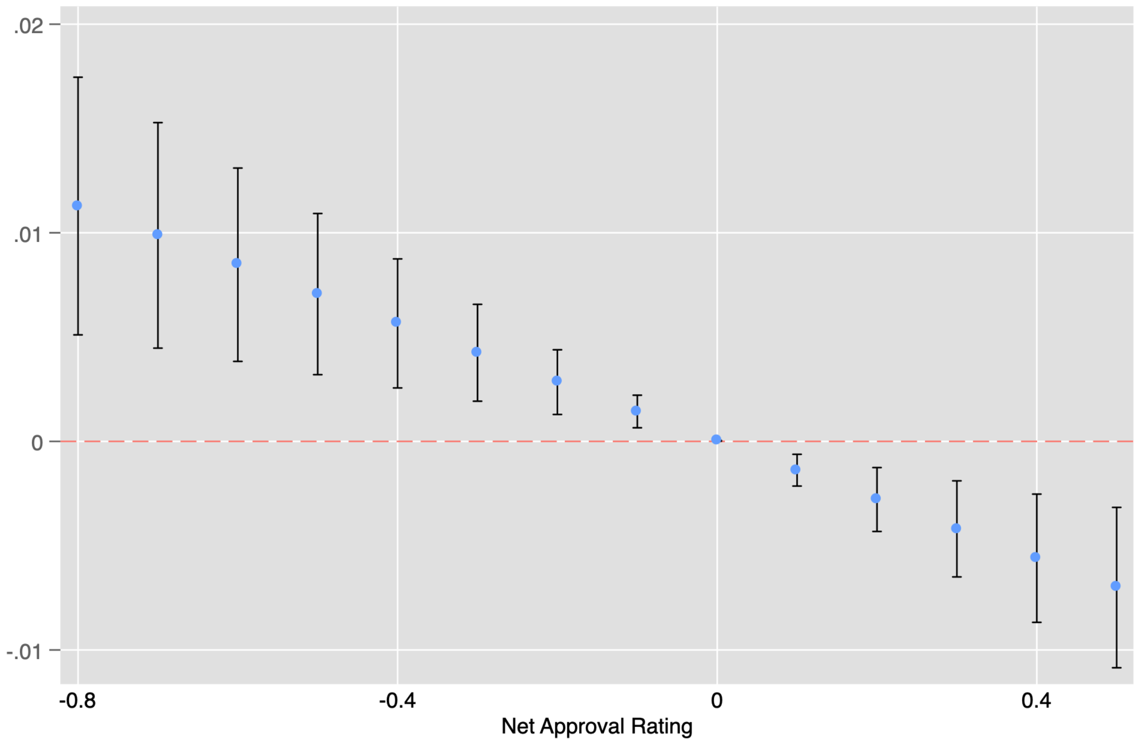
, where ρ and θ are coefficients for the AR and MA terms and ϵs are errors. For the fitted values of $Rating_t$ ($\Delta \widehat{Rating_t}$), 95 % confidence intervals are computed. The ARIMA parameters, namely, (2, 1, 2), are chosen based on the model fit, particularly Akaike information criterion (AIC) as well as unit root tests. Using the confidence intervals, one can identify moments where approval ratings changed in an unexpected by the trend—a method akin to the one used by Bernhard and Leblang (2006): any observation of $\Delta Rating_t$ that is above the confidence interval are considered a 'positive shock,' indicating that the degree to which the presidential net approval rating has changed from the previous week was more favorable to the president than the trend implies. Similarly, a 'negative shock' is a case where the observation is below the confidence interval, indicating the approval rating change was less favorable to the president than expected from the trend. Each type of shocks is identified as a dummy variable. To put it more formally,

$$\begin{cases} \text{positive shock} = 1 & \text{if } \Delta\text{Rating} \geq \text{upper bound of 95\% C.I. of } \Delta \widehat{Rating}_t \\ \text{negative shock} = 1 & \text{if } \Delta\text{Rating} \leq \text{lower bound of 95\% C.I. of } \Delta \widehat{Rating}_t \end{cases},$$

while all other observations of the shocks variables are coded zero—i.e., 'unsurprising' approval ratings falling within the margin predicted by the previous levels and cubic polynomial temporal trend.

A2. Appendix Figures and Tables

Figure A1: Marginal Effect of a positive approval rating shock



Note: The x-axis represents the level of the current approval rating and the y-axis is the effect of the positive approval shock on the level of the value of KRW (higher values represent weaker KRW). Each point indicates a point estimate while the bars are 95 % confidence intervals.

Table A1: GARCH(1,2) and (2,1)

	(1) GARCH(2,1)	(2) GARCH(1,2)
Mean Equation		
Holiday_{t-1}	-0.001	-0.001
	(0.000)	(0.000)
Positive Shock_t	0.003**	0.003**
	(0.001)	(0.001)
Negative Shock_t	-0.000	-0.000
	(0.001)	(0.001)
approval rating_t × positive surprise_t	-0.014**	-0.014**
	(0.004)	(0.004)
approval rating_t × negative surprise_t	-0.000	0.000
	(0.004)	(0.004)
net approval rating_t	-0.001	-0.001
	(0.001)	(0.001)
Constant	0.000	0.000
	(0.000)	(0.000)
AR(1)	-0.017	-0.019
	(0.036)	(0.038)
Variance Equation		
Δ yen	-0.005	0.035
	(0.037)	(0.108)
net approval rating_t	0.716**	0.696**
	(0.318)	(0.299)
election_t	-0.717**	-2.778**
	(0.213)	(0.551)
election_{t+1}	-0.008	-5.720
	(0.206)	(3.944)
Sewol	0.002**	0.002**
	(0.000)	(0.000)
Constant	-10.550**	-11.271**
	(0.313)	(0.225)
ARCH_{t-1}	0.093**	0.076**
	(0.038)	(0.036)
ARCH_{t-2}		-0.067**
		(0.021)
GARCH_{t-1}	-0.576**	0.124
	(0.255)	(0.194)
GARCH_{t-2}	-0.260	
	(0.206)	
N	934	934

GARCH estimates with Bollerslev-Wooldridge semi-robust standard errors. * $p < 0.1$, ** $p < 0.05$

Table A2: Markov Dynamic Regime Switch Model Estimates

	Coefficient	Robust Standard Error	p-value
State1: Strong and Stable KRW			
$\Delta\ln(\text{KRW})_{t-1}$	0.028734	0.0732172	0.695
holidays_{t-1}	0.0001756	0.0004466	0.694
positive shock_t	-0.0171437	0.0228899	0.454
negative shock_t	0.0060314	0.0064722	0.351
μ_1	-0.0002533	0.0002564	0.323
σ_1^2	0.0034591	0.0002258	0.000
State2: Weak and Volatile KRW			
$\Delta\ln(\text{KRW})_{t-1}$	-0.0320668	0.0453586	0.480
holidays_{t-1}	-0.0009599	0.0005593	0.086
positive shock_t	0.0494268	0.0147513	0.001
negative shock_t	-0.0028836	0.0149516	0.847
μ_2	0.0003524	0.0003174	0.267
σ_2^2	0.0064871	0.0002822	0.000
log likelihood	3567.1656		
Diagnostics			
H_0: P_{11} = 1 - P_{22}		p = 0.0000	
H_0: $\mu_1 = \mu_2$		p = 0.1735	
H_0: $\sigma_1^2 = \sigma_2^2$		p = 0.0000	
Ljung-Box(1)		p = 0.5617	
Ljung-Box(3)		p = 0.5158	

Note: N=934. Markov Regime Switch model estimates with robust standard errors. Two-tail test.