Politicians' Asset Allocation and Economic Bill Proposals*

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Abstract

We study the impact of politicians' asset allocation on their economic bill proposals. Using a novel database of comprehensive financial disclosures of Congress members in South Korea, we find that the Congress members with more real estate assets in their portfolios are less likely to propose economic bills tightening the real estate market. To address endogeneity concerns, we use instrumental variables uniquely available in our empirical setting: earthquake and military tensions between South and North Korea. Controlling for other confounding factors, we argue that the result is mainly driven by politicians' personal interests. Our findings suggest that politicians' financial positions have a material impact on their choice of economic bill proposals.

JEL classification: D72, G38, K25, P16
Keywords: political economy, economic bill proposal, politician's asset allocations, real estate

*We appreciate helpful comments from Viral Acharya, Sumit Agarwal, John Hackney, Karam Kang, David Schoenherr, and Hye Young You. This draft: Jan 26, 2022.

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1. Introduction

Soaring property prices worldwide have been threatening housing and rent affordability and triggering social unrest (Crawford (2021)). However, there has been little success in addressing these issues through drawing effective economic policies. Among various reasons for the unsuccessful policies, the misaligned incentive of politicians through their extensive holdings of real estate has been an unexplored but potentially important reason for the failures. In this paper, we study the effect of politicians' real estate holdings on their legislative behavior related to the real estate market.

Economic bills proposed by a legislature play an important role in shaping a government's policy direction. The extant literature proposes various determinants of politicians' legislative voting behaviors, such as the impact of constituents and special interests (Peltzman (1984); Mian et al. (2010)), ideological preferences (Lee et al. (2004)), or private interests (Benmelech and Moskowitz (2010); Tahoun and van Lent (2019)). In this paper, we postulate politicians' real estate holdings as their primary private interests and examine the effect of the real estate portion in Congress members' portfolios on their likelihood of proposing economic bills aimed at tightening the real estate market.

To answer this research question, we use a comprehensive disclosure of all South Korean Congress members' financial positions from 2011 to 2020. The data provides a unique opportunity to investigate the impact of politicians' personal portfolio holdings on economic bill proposals. We focus on the value of real estate assets in the South Korean Congress members' personal portfolios as a proxy for their private interests in the real estate market. Although real estate takes a significant portion of household wealth, politicians' disclosure requirement of real estate assets is less stringent than stock holdings in most countries. For example, in the U.S., compared to the complete disclosures of stock holdings and tradings, there are several exemptions given to the disclosure of real estate assets.[1] The database of South Korean

[1]The regulation requires mandatory disclosure only on the income-generating real estate, providing rooms to exclude primary residences, vacation homes, and vacant second homes (U.S. Senate Select Committee on Ethics (2021); U.S. House of Representatives Committee on Ethics (2021)). Moreover, real estate values are

Congress members' financial positions provides a complete and detailed description of all asset holdings, enabling us to accurately calculate all Congress members' portfolio composition in a panel dataset. The data includes detailed information on all assets and liabilities owned by Congress members with exact market value or fairly assessed value. The data is also free from biases of selective disclosures because it contains the asset holdings of all family members, including spouses, lineal ascendants, and descendants.

Additionally, our empirical setting has the advantage of measuring the policy directions of all proposed bills by Congress members. Using a textual analysis technique, we identify economic bill proposals related to real estate and classify their policy directions of tightening vs. loosening the real estate market. We can also afford to include a comprehensive list of controls capturing various demographic and political characteristics of Congress members.

To preview our result, we find that the reluctance of proposing economic bills tightening the real estate market (*Reluctance of Tightening Real Estate*) increases with the fraction of real estate in a Congress member's asset portfolio (*Ratio of Real Estate*). That is, Congress members are less likely to propose a bill that suppresses the real estate market when their interest in real estate is large. We control for various factors that can potentially affect the relation, such as the total asset size, other asset classes in the portfolios, demographic and legislative characteristics of Congress members. The economic significance is considerable that a one-standard-deviation increase in the *Ratio of Real Estate* increases 16% of the average value of *Reluctance of Tightening Real Estate*. The result is also robust to controlling for macro-level variables or year fixed effects.

To substantiate the impact of Congress members' private interest, it is important to control for other determinants of their legislative behaviors such as constituents' interests and ideology. In our baseline model, we include the electoral district fixed effect to control for voters' interests and preferences at the constituent level. In addition, we disaggregate the real estate holdings by the real estate assets location to investigate whether the holdings outside of Congress

subject to optional disclosure, letting a large number of real estate be reported with 0 dollar value (Baldauf et al. (2021)), which results in a lax screening of real estate assets than other asset classes.

members' electoral district also reduce their likelihood to propose economic bills tightening the real estate market. We find it does, indicating that constituents' interest does not solely drive our results. Moreover, we include affiliated party fixed effect to control for politicians' ideology. This approach well serves our purpose because we empirically find that their affiliated party distinctively defines the politicians' ideology in our empirical setting.

If the positive association between the reluctance of proposing tightening real estate bills (*Reluctance of Tightening Real Estate*) and the ratio of real estate assets (*Ratio of Real Estate*) is indeed due to the private interest of Congress members in the real estate market, we expect to find a more significant effect when the private interest is at a larger stake. We consider a case when Congress members have more items of real estate assets in their portfolios, controlling for the value of real estate assets in their total wealth. The Congress members with more items of real estate assets are likely to hold real estate assets for investment purposes and would be more exposed to the real estate market conditions. We find that the positive association between the *Ratio of Real Estate* and *Reluctance of Tightening Real Estate* gets stronger for the Congress members in the top quintile group in terms of the number of real estate assets.

Politicians are more likely to pursue their private interests when their political positions are more secure and entrenched. We define a Congress member as entrenched 1) if the Congress member won more than 50% of votes in the latest election, or 2) if the votes in the electoral district in the latest election are highly concentrated to the Congress member, or 3) if the Congress member's affiliated party took the majority seats in the metropolitan area in the latest election. We find that the entrenched Congress members are less likely to propose tightening real estate bills when the *Ratio of Real Estate* increases.

We conduct various robustness tests. Our results hold across different types of real estate assets and their actual owners within a family. And the result does not change when using alternative specifications to define the tightening real estate bills. In a placebo test, we estimate the impact of *Ratio of Real Estate* on the likelihood of proposing tightening economic bills unrelated to real estate. We find only insignificant effects, suggesting that our baseline

result is not driven by a Congress member's unobservable stance about economic policies. To address the concern that the result is driven by time-varying local interests and economic conditions, we augment the baseline regression model with metropolitan area $\times$ year fixed effects.[2] The baseline result still holds.

Despite the extensive control variables in our regression analysis, the ratio of real estate assets in Congress members' portfolios is not exogenously determined and prone to potential omitted variable biases. We address the endogeneity concern with two distinct instrumental variables that exogenously affect the ratio of Congress members' real estate assets in their portfolios. Our first instrumental variable is an earthquake that happened at Pohang, an industrialized city in South Korea, in 2017. South Korea is known as a safe place from seismic activity and the unexpected earthquake, the second-largest one in the country's modern history, lead to a significant shock to the people resulting in substantial price drop of nearby real estate assets. We first confirm the relevance condition that *Ratio of Real Estate* significantly drops for the Congress members who are exposed to the shock by holding real estate assets near the earthquake epicenter. The exclusion restriction condition reasonably holds because the localized shock would not materially change the legislative decisions at the National Assembly. Using the shock as an instrumental variable, the second stage regression supports the positive impact of *Ratio of Real Estate* on the reluctance of proposing bills tightening the real estate market (*Reluctance of Tightening Real Estate*).

The second instrumental variable is the tension level between South and North Korea. Being the only country divided in the world, the two Koreas still has political tensions which has changed unexpectedly over years. As the tension level changes, real estate prices near the border between the two countries are heavily affected. Using the conflict and cooperation index from the Global Database of Event, Language, and Tone (GDELT) as a measure of tension levels, we find that *Ratio of Real Estate* increases when the Conflict index decreases and when the Cooperation index rises. Because it is unlikely that the political tension between

[2]Because South Korea has a single constituency legislative system, our empirical setting does not allow including electoral district $\times$ year fixed effects in regression specifications.

South and North Korea would directly affect the likelihood of Congress members' real estate bill proposals at the national level, the exclusion restriction condition would hold. Using these instrumental variables, we find that the increase of *Ratio of Real Estate* due to the increased Cooperation index or decreased Conflict index reduces the likelihood of proposing bills that tighten the real estate market.

When individual Congress members show the legislative behavior favoring their own private interests, a more important question will be whether their individual behaviors can have an aggregate impact. To this end, we measure the Congress-level exposure to the real estate market by aggregating all Congress members' real estate assets values to their total assets. We find that the total number of proposed bills that tighten the real estate market decreases with the Congress-level exposure to real estate. Given that not all proposed bills are passed eventually, we also consider the total number of approved bills tightening the real estate market. We find that the total number of approved bills tightening real estate policy also decreases with the aggregate exposure of the Congress members to the real estate market. The results indicate that the aggregate private interests of Congress members can have a material impact on a country's economic policy, suggesting the importance of monitoring the politicians' private interests.

Our paper contributes to the literature on the determinants of politicians' legislative decisions. The literature has debated about the relative importance of constituents' interest (Peltzman (1984)) and a politician's ideological preferences (Lee et al. (2004); Bischof et al. (2020)) in the legislative decisions. Mian et al. (2010) argue that constituents, special interests, and ideology all matter but through different channels. Only a few studies has focused on the effect of the private interest of politicians in their legislative decisions. Benmelech and Moskowitz (2010) examine the private interest of entrenched politicians to set the usury limits. Cohen et al. (2013) report that legislators tend to vote for a bill favorably affecting the companies in which they have private interests. Tahoun and van Lent (2019) find that the politicians owning stocks of financial firms voted for the government support of financial

institutions during the Global Financial Crisis. Our paper complements the prior studies by investigating the effect of politicians' asset allocation on their economic bill proposals, the first stage of the legislative process.[3] We focus on the politicians' bill proposals rather than their voting on proposed bills because it is well known that not only the private interest but also the decision of party leadership matters when it comes to voting on the legislative proposals (Tahoun and van Lent (2019)).[4] Therefore, studying the bill proposals would better serve our research purpose of understanding the effect of politicians' private interests on their legislative behaviors related to the real estate market. Moreover, we also show the aggregate effect of the politician's private interest on a country's economic policy, suggesting the danger of politicians' homogeneous exposure to the private interests.

Our paper also contributes to the literature analyzing politicians' private investment using insider information. The literature finds evidence on the politicians' outperformance in financial investment such as the stock investment of the U.S. Senate (Ziobrowski et al. (2004)), the U.S. House of Representatives (Ziobrowski et al. (2011)), and the spouses of the U.S. Congress members (Karadas (2018)), through informed insider trading (Karadas et al. (2021)). Similarly, Baldauf et al. (2021) find that the U.S. Congress members can time the real estate market to make an abnormal return from real estate investment. We raise an unexplored question of whether politicians may actively create insider information themselves by proposing and approving the bills that potentially affect their private interests.

The rest of the paper is organized as follows. Section 2 describes the data and reports summary statistics, Section 3 presents the main empirical results, Section 4 reports the instrumental variable analysis, Section 5 reports potential aggregate effects on legislation, and Section 6 concludes.

[3]Several recent studies investigate how private real estate assets affect professional decision-makings for CEOs (Cronqvist et al. (2012)), corporate directors (Bahaj et al. (2020)), mutual fund managers (Pool et al. (2019)) and financial advisors (Dimmock et al. (2021)).

[4]Tahoun and van Lent (2019) argue that the vote in a later stage is likely to be affected by the party leadership. Therefore, they claim that the earlier legislative stage, such as the first vote, better reveals Congress members' personal preferences and interests.

2. Data and Summary Statistics

2.1. Financial Disclosure of Congress members in South Korea

South Korea has a unicameral legislative system and there are 300 members in Congress. General elections are held every four years and term limits are not imposed. Because South Korea has a single constituency system, each electoral district has only one Congress member representing the district.

To measure the financial positions of each Congress member, we use granular data of public officials' assets and liabilities from the Public Ethics and Transparency Initiative System (PETI System) in South Korea. Since 1993, "The Public Service Ethics Act" requires all public officials in South Korea, who are grades 4 or higher, to disclose their own and immediate family member's assets and liabilities in detail to the government system annually. To ensure the truthfulness of the disclosure, public officials are subject to disciplinary actions, such as fines or dismissal from public services, with any false disclosure. Notably, the information on senior-level public officials is publicly disclosed. The senior-level public officials include all high-ranked government officials, all Congress members, and all judiciary members.

There are several advantages of using this dataset. First, the data is free from any selection biases because all eligible public officials, including elected officials, must disclose their assets and liabilities every year. Moreover, the disclosure includes all assets and liabilities owned by public officials, spouses, and lineal ascendants and descendants.[5] We aggregate all assets and liabilities of family members to construct the assets and liabilities of a public official.

Second, our data provide a complete description of the assets and liabilities of public officials. The data includes cash and deposits; all types of securities, such as public equities, private equities, government bonds, municipal bonds, corporate bonds; all types of real estate assets, such as the ownership of land and buildings, superficies, and the lumpsum deposit

[5]There is an exemption rule that the lineal ascendants and descendants who are independent of the public officials can refuse to disclose. But the exemption should be approved by the Public Service Ethics Committee to prevent any intentional reduction or concealment of their assets. The exemption should be renewed every 3 years.

on rented residential properties (known as "Jeon-Se" in Korean); and other assets, such as vehicles, precious metals (gold, silver, platinum), jewelry, antiques, work of arts, intellectual property, and golf club memberships. The data also includes all types of debts associated with the public officials.

Third, the data includes detailed information on the characteristics of assets and liabilities. Our data has the exact market value (or fairly assessed value) of all types of assets and liabilities, which differs from other countries' datasets. For example, the members in the U.S. Congress are required to file their financial disclosure by indicating the range of their asset value but not reporting exact values. Our data also provide the property type, location, and market value (or appraisal value) for real estate assets and liabilities.

In this paper, we focus on Congress members to examine the role of personal portfolio composition on their professional law-making decisions. We particularly focus on the Congress members affiliated with the committees that make laws related to the real estate market. There are seven committees that are highly relevant to making laws affecting the government's real estate policies. These committees include "Land Infrastructure and Transport Committee," "Public Administration and Security Committee," "Trade, Industry, Energy, SMEs, and Startups Committee," "Strategy and Finance Committee," "Legislation and Judiciary Committee," "National Policy Committee," and "Agriculture, Food, Rural Affairs, Oceans, and Fisheries Committee." The committee membership can change during a legislative session and there are 181 Congress members on average in these committees.

2.2. Tightening Real Estate Bills Proposed by Congress Members

We obtain a complete list of bill proposals from the database provided by the National Assembly of South Korea. There are a total of 46,569 bills from 2011 to 2020 proposed by all Congress members. The database offers detailed information on all proposed bills, such as the title of the proposed bill, a summary of the bill, the proposal date of the bill, assigned committee, related ministry in government, and the detailed outcomes in the legislative progress

of the proposed bill. We also identify the name of the Congress member who proposed the bill, including information on whether the Congress member is a primary sponsor or not.

We are particularly interested in bills related to real estate as a possible vehicle for the Congress members to convey their personal incentives in drafting their proposals. To identify real estate bills, we use two-step screening. We first narrow down all proposed bills to those associated with government ministries implementing real estate policy. The ministries are "Ministry of Land, Infrastructure, and Transport," "Ministry of the Interior and Safety," "Ministry of Economy and Finance," "Ministry of Justice," "Ministry of Trade, Industry and Energy," and "Financial Services Commission." Among the total 46,569 proposed bills, 19,869 bills are associated with those six ministries of government.

We then apply a textual analysis technique of keyword searching for the real estate bills. We first extract the general keywords for real estate bills from the titles of pre-existing real estate laws classified by the Korean Law Information Center.[6] The general keywords include "Real Estate," "Housing," "Land," "Development Gain," "Real Estate Agent," "Appraisal Value," "Renter," "Residence," "Reconstruction," and "New Home Sales."

Since the bills associated with a particular ministry are likely to have some specific keywords by the ministry's objective, we also extract the ministry-specific keywords that enhance the identification of real estate-related bills of the particular ministry. For example, the real estate bills associated with the "Ministry of Economy and Finance" are mostly tax-related, so we use "Tax" for the ministry-specific keyword. On the other hand, there are bills associated with "Ministry of Land, infrastructure, and Transport" that contain our general keywords but are related to infrastructure, which is not our primary interest. To remove those bills, we drop bills with a list of ministry-specific keywords such as "Harbor," "Airport," or "Ground Water." Applying the general and ministry-specific keywords to the title and summary of proposed bills, we find 2,560 proposed bills that are associated with real estate.

To measure the policy direction of the real estate bills, we use the keyword search to dif-

[6]We observe that most of the proposed bills are revising pre-existing laws (94%) rather than legislating entirely new laws.

ferentiate tightening real estate bills from other real estate bills. The tightening keywords are "Enforcement," "Enhancement," "Elimination," "Obligation," "Prohibition," "Permission," "Restriction," "Sanction," "Speculation," "Unfair," "Violation." The loosening keywords are "Reduction," "Tax Exemption," "Tax Credit," "Tax Benefit," "Allowance," "Unnecessary," "Incentive," and "Abolition." We then count the number of tightening keywords and loosening keywords from the summary of a real estate bill. We define a real estate bill as tightening if the number of tightening keywords is more than that of loosening keywords. Among 2,560 real estate bills, we find 849 tightening real estate bills. Figure 1 reports the number of real estate bills and the number of tightening real estate bills by year. On average, 33% of the real estate bills are tightening bills.

To ensure the validity of our measure of tightening bills, we cross-check our measure with an alternative measure using the official list of tightening bills categorized by the South Korean government from 2015 to 2020.[7] While the sample period of this alternative measure is limited from 2015 to 2020, we find that our measure is positively correlated with the alternative measure with statistical significance at a 1% level, indicating the consistency of our measure. Due to the shortened sample period, we use this measure for checking the robustness of our main results in a later section.

In this paper, the first reason for focusing on the politicians' bill proposals (rather than their voting behaviors) is that a bill proposal is the first legislative step reflecting a politician's personal or ideological interests. And the data offers another reason; avoiding a possible selection bias. Not all proposed bills are approved eventually. For example, when multiple congress members propose similar bills, the committee's chair sometimes proposes a new combined bill, which will be referred to the full Congress for a vote. Sometimes, only the proposed bills that are likely to pass the vote at the full Congress would be referred. Figure 2 reports the likelihood of a bill being approved by the full Congress when the bill is referred. There is a clear pattern that the votes for approving the bills are well above 90%, indicating

[7]See the South Korean government website for explaining government regulations at https://www.better.go.kr/rz.law.AssemblyLawListSlPL.laf

that referred bills are very likely to be approved. For such a reason, in the following sections, we focus on the bill proposals instead of the voting on those proposed bills.

2.3. Description of Variables and Summary Statistics

Using the financial disclosure data of Congress members, we construct variables describing their portfolio compositions and report the summary statistics in Panel B of Table 1.

The Congress members have total assets of 2.4 billion Korean Won (KRW) on average, which is about 2 million USD as of 2021.[8] We aggregate the detailed components of assets into five categories: Real Estate, Cash and Deposits, Residential Deposits, Stocks, and Other Assets. Real estate takes the largest part of total assets (*Ratio of Real Estate*) with about 48% on average, with a standard deviation of 24%. Cash and deposits (*Ratio of Cash*) also take a considerable portion in the Congress members' portfolios with an average ratio of 29% and a standard deviation of 17%. Residential deposits (*Ratio of Residential Deposits*), which take about 12% of the total assets, are the lumpsum cash deposit on rented residential properties.[9] Stock holdings (*Ratio of Stocks*) take about 1% of the total assets and Other Assets (*Ratio of Other Assets*) with 7%. On average, Congress members also maintain 22% leverage (*Leverage*), defined as total debts to total assets.

The data suggests that real estate asset is a significant part of the Congress members' portfolios while the fraction of stock ownership is limited. Therefore, it is more plausible that the real estate would carry more weight in determining Congress members' personal interests among all asset classes and we will use the ratio of real estate assets in Congress members' portfolios (*Ratio of Real Estate*) as our main independent variable. Figure 3 reports the average portfolio ratio for each asset class and leverage ratio by year. The figure clearly shows that real estate asset takes the largest portion of Congress members' financial assets over the

[8] All monetary amounts are inflation-adjusted with GDP deflator.

[9] In Korea, renters usually post a large deposit and do not pay monthly rents until the expiration of the lease. At the end of the lease contract, the deposit is returned to the renter. This unique contract, called "Jeon-se," is the dominant form of rental contracts in Korea. For non-homeowners, the residential deposits usually take a large portion of their total asset.

sample period, suggesting that real estate has been serving as a crucial asset class affecting Congress members' financial interests over the years.

To measure the propensity of Congress members being reluctant to propose tightening real estate bills, we construct a dummy variable, *Reluctance of Tightening Real Estate*, that equals to 1 if a Congress member i does not propose any tightening real estate bill in year t, and 0 if otherwise. Panel B reports the summary statistics of the variable. On average, 25% of Congress members do not propose any tightening real estate bill during the sample period.

We also collect the detailed characteristics of Congress members[10] and report the summary statistics in Panel C. *Conservative Party* is an indicator variable that equals to 1 if the Congress member i is associated with the conservative party in year t, which is less likely to regulate the housing market, and 0 otherwise. *Terms Served* is a Congress member i's number of serving terms as a Congress member as of year t. On average, Congress members have two terms of experience. *Primary Sponsor* is an indicator variable that equals to 1 if the Congress member i proposes at least one real estate bill as the primary sponsor in year t, and 0 otherwise.

Age is the age of the Congress member i in year t. The average age of Congress members is 58, with six years of standard deviation. *Female* is a dummy variable that equals to 1 if the Congress member i is female, and 0 otherwise. 12% of the Congress members are female. To measure the educational level of Congress members, we divide Congress members into three groups by their final degrees and define three indicator variables: *Education (high school or below)*, *Education (college)*, and *Education (postgraduate)*. 62% of Congress members have postgraduate degrees, 36% have a college degree, and only 2% have final education lower than high school.

In Panel D, we report the variables that capture various aspects of real estate holdings. For example, *Number of Real Estate* is the number of real estate properties owned by a Congress member. The average (median) number of real estate properties is 7(4), but this number is

[10]The data is available at Open Assembly Information Website (https://open.assembly.go.kr/).

highly skewed with a 90th-percentile of 15. On average, 34% of total assets are residential real estate properties (*Ratio of Residential Real Estate*), and 13% of total assets are non-residential real estate properties (*Ratio of Non-residential Real Estate*). By the type of ownership, 27% of total assets are directly owned by Congress members (*Ratio of Owned by Congressmen*), and 20% of total assets are owned by their family members (*Ratio of Owned by Family*). While 36% of total assets are the real estate assets in the metropolitan area (*Ratio of Metropolitan Area*), 12% of total assets are the real estate assets in the non-metropolitan area (*Ratio of Non-metropolitan Area*). Interestingly, Congress members hold 13% of total assets in the real estate in their electoral districts (*Ratio of Own Electoral District*) but have 34% of total assets in the real estate outside of their electoral districts (*Ratio of Other Electoral Districts*).

3. Empirical Results

3.1. The Effect of Congress Members' Real Estate Holdings on Proposing Tightening Real Estate Bills

To test whether Congress members' financial positions affect their legislative decisions, we estimate a linear probability model for the effect of their real estate assets on their economic bill proposal behavior. Our regression specification is as follows:

$$\begin{aligned} &Reluctance\ of\ Tightening\ Real\ Estate_{i,t} \\ &\quad = \alpha + \beta \cdot Ratio\ of\ Real\ Estate_{i,t-1} + \gamma \cdot X_{i,t-1} + \delta \cdot M_{t-1} + \eta_i + \epsilon_{i,t}, \end{aligned} \quad (1)$$

where the dependent variable, $Reluctance\ of\ Tightening\ Real\ Estate_{i,t}$, is an indicator variable that equals to 1 if the Congress member i does not propose any bill that tightens the real estate market in year t, and the main independent variable, $Ratio\ of\ Real\ Estate_{i,t-1}$, is the ratio of real estate assets to total assets owned by a Congress member i in year $t-1$.

$X_{i,t-1}$ includes various control variables related to a Congress member's individual charac-

teristics such as 1) other components of asset portfolio such as *Log (Total Assets)*, *Leverage*, *Ratio of Cash*, and *Ratio of Residential Deposits*, 2) demographic variables such as *Age* and *Female*, and 3) party affiliation, *Conservative Party*. η_i include additional individual characteristics such as education level, *Terms Served*, *Primary Sponsor* and *Electoral District*, all of which are included as fixed effects.

Figure 4 reports the univariate relationship between the dependent variable, *Reluctance of Tightening Real Estate*, and our primary independent variable, *Ratio of Real Estate*. We clearly observe that the propensity to be reluctant to propose tightening real estate bills increases as *Ratio of Real Estate* increases. For example, while the Congress members with an average fraction of real estate wealth (48%) are likely not to propose tightening bills with a probability of 26%, the Congress members at one standard deviation (SD) above the mean (72%) do not propose tightening bills with a probability of 27.3% and the Congress members at one SD below the mean (24%) do not propose with a probability of 23.9%.

Panel A of Table 2 reports the estimated coefficients from regressions of *Reluctance of Tightening Real Estate* on *Ratio of Real Estate*. In Column (1), controlling for the Congress members' other portfolio positions, we find that the estimated coefficient on *Ratio of Real Estate* is 0.162, with t-statistic of 2.28, suggesting that an increase in the real estate holdings increases the propensity of reluctance of proposing bills that tighten real estate market, and this relation is statistically significant. In terms of economic significance, a one SD increase in the *Ratio of Real Estate* in the previous year increases 16% of the average value of *Reluctance of Tightening Real Estate* (=1 SD of the *Ratio of Real Estate* (0.24) $\times$ 0.162 / mean of the *Reluctance of Tightening Real Estate* (0.25)).

Column (2) in Panel A of Table 2 reports the regression coefficients with additional controls of demographic and legislative variables. As Mian et al. (2010) find the effects of various factors such as constituents' interest and ideology on Congress members' legislative behaviors, it is crucial to control for the other possible channels to identify the role of personal interests. Therefore, we include *Electoral District* fixed effects to control for the particular policy

demand from the voters in the electoral district of the Congress member.[11] In addition, to control for Congress members' ideology, we include *Conservative Party* fixed effects. This is because the ideology of Congress members in South Korea is starkly divided by their party affiliations. Figure 5 reports the distribution of Congress members' ideology scores[12] in the 20th National Assembly by their affiliated party, showing that the *Conservative Party* fixed effects are sufficient to control for the ideology of politicians in South Korea. Again, we find a similar result as in Column (1), indicating that the fraction of real estate assets in Congress members' portfolios decreases the likelihood of proposing tightening real estate bills.

Column (3) in Panel A of Table 2 reports the estimated regression coefficients with controls of macroeconomic factors: *GDP Growth* (lagged real GDP Growth) and *HPI Growth* (lagged House Price Index Growth minus Consumer Price Index Growth). We find a similar result that Congress members with more fraction of real estate assets in their portfolios are less likely to propose tightening real estate bills. Furthermore, Column (4) includes year fixed effects to control for any time-specific macro factors affecting the relation. We find a robust effect of the fraction of real estate assets in Congress members' portfolios on their likelihood of proposing tightening bills.

The real estate ownership in Congress members' electoral district is closely related to the constituent's economic interest and it may drive our results. To rule out this possibility, in Panel B of Table 2, we re-estimate the baseline regression model (Equation 1) but replace *Ratio of Real Estate* with *Ratio of Own Electoral District* and *Ratio of Other Electoral Districts*. We find that the likelihood of reluctance of tightening real estate bills increases with both *Ratio of Own Electoral District* and *Ratio of Other Electoral Districts*, indicating that the

[11] There are two types of Congress members in the National Assembly of South Korea: electorate members and list members. Electorate members are those the voters elect by an electoral district, and more than 80% of the Congress members belong to this type. List members for a party are elected by the proportion of votes the political party gets. Since there is no electoral district assigned to this group, we assign a same indicator variable for all Congress members in this group.

[12] The score is W-NOMINATE score (Poole and Rosenthal (1985), Poole (2005), Poole and Rosenthal (2007)) calculated by The Joongang, Pollab, and PolMetriX for the 20th National Assembly using Congress members' legislative voting behavior from June 2016 to end of 2019 (https://www.joongang.co.kr/article/23724222). If a legislator's ideology score is closer to -1, the legislator's vote is more liberal, while the vote is more conservative if the legislator's score is closer to 1.

effect is not entirely driven by economic interests of local constituents. Instead, the effect of real estate holdings outside of members' electoral districts shows a more significant effect on their legislative behavior.

3.2. Heterogeneity Analysis by the Scope of Real Estate Assets and Political Entrenchment

In the previous section, we find that the Congress members with a higher fraction of real estate assets in their portfolios are less likely to propose bills that tighten real estate markets. If the private interest is one of the main factors driving Congress members' legislative behavior, we expect to find a more substantial effect when the private interest is at a larger stake. To this end, we evaluate the effect of the real estate asset on their legislative actions in two scenarios with varying degrees of personal interests.

First, holding the amounts of total wealth and the fraction of real estate in the portfolio, we expect private incentives to increase with the number of real estate in their portfolios because the scope of their legislative decisions' potential impacts is greater. To this end, we define *Large Number*, an indicator variable that equals to 1 if the number of real estate assets is above the top quintile of the distribution in each year t and 0 otherwise. The *Large Number* variable has a mean of 0.22 with a standard deviation of 0.42, indicating that about 22% of Congress members own more than 7 real estate assets. We augment the baseline regression with the interaction term between *Ratio of Real Estate* and the *Large Number* dummy variable. In Table 3, we report the estimated coefficient on the interaction term between *Ratio of Real Estate* and *Large Number*. The result shows that the effect of *Ratio of Real Estate* gets stronger with a large number of real estate assets. In terms of economic significance, a one-standard-deviation increase in the *Ratio of Real Estate* in the previous year increases 32% of the average value of *Reluctance of Tightening Real Estate* for the group with a large number of real estate assets (=1 SD of the *Ratio of Real Estate* (0.24) $\times$ 0.332/ mean of the *Reluctance of Tightening Real Estate* (0.25)).

Second, entrenched Congress members are more likely to pursue their private incentives with less concerns about their reelections. To classify entrenched Congress members, we use the latest election results. We first define the *High Votes*, an indicator variable that equals to 1 if a Congress member i wins 50% of votes from the latest election and 0 otherwise. Column (1) of Table 4 reports the result interacting *Ratio of Real Estate* with *High Votes*. We employ the same regression specification as in the Column (4) of Table 2, which has year fixed effects. We find that, when a Congress member won an election by significant votes, the positive effect of *Ratio of Real Estate* on the likelihood to be reluctant to propose tightening real estate bills becomes stronger.

We also classify entrenched Congress members using the concentration of votes in his/her latest election proxied by the Herfindahl index of all candidates' votes in an electoral district. High Herfindahl index of all candidates' votes implies the winner (i.e., the current Congress member) received disproportionately more votes compared to their losing rivals. We define the *Vote Concentration* indicator variable that equals to 1 if the Herfindahl index is above the median in the distribution of the Herfindahl index of the election and 0 otherwise. We add the interaction term between the *Ratio of Real Estate* and *Vote Concentration* to the same stringent regression specification as in the Column (4) of Table 2, which has year fixed effects. Column (2) of Table 4 reports the estimated coefficient on the interaction term between *Ratio of Real Estate* and *Vote Concentration*. We again find that the more the Congress members won with a high Herfindahl index, the more the positive effect of *Ratio of Real Estate* on the reluctance of the proposal of tightening real estate bills.

Sometimes, the Congress members' affiliated party is more influential to the voters than the Congress member himself. In this case, we expect the Congress members to be more entrenched if they are representing the electoral districts in the province where the party takes a majority of seats. Therefore, we construct the *Party Shares*, a binary variable equals to 1 if the fraction of the party's seats in the total number of seats in the province is above the top tercile of the distribution and 0 otherwise. Column (3) of Table 4 reports the regression

result interacting *Ratio of Real Estate* with *Party Shares*. We again find that the more the party of Congress members won in the province, the stronger the positive effect of *Ratio of Real Estate* on the reluctance of proposing tightening real estate bills becomes.

3.3. Robustness Checks

We find that *Ratio of Real Estate* negatively affects the propensity to propose tightening real estate bills. For checking robustness of the results, we disaggregate our main independent variable (*Ratio of Real Estate*) into several components and examine whether the results are driven by a particular component of *Ratio of Real Estate*.

First, we disaggregate *Ratio of Real Estate* by the owner of the real estate asset. As explained in the data section, we aggregate all assets owned by the Congress member himself and his family members to define the portfolio of a Congress member. In Panel D of Table 1, we report the summary statistics of *Ratio of Real Estate* by ownership. Among the 48% of real estate assets in Congress members' portfolios, 27% of total assets are the real estate assets directly owned by Congress members (*Ratio of Owned by Congressmen*), but 20% of total assets are the real estate assets owned by their family members (*Ratio of Owned by Family*).

In Panel A of Table 5, we re-estimate the baseline regression model (Equation 1) but replace *Ratio of Real Estate* with *Ratio of Owned by Congressmen* and *Ratio of Owned by Family*. For brevity, we do not report the estimated coefficients on other control variables. Again, we find that the reluctance of tightening real estate bills increases with both *Ratio of Owned by Congressmen* and *Ratio of Owned by Family*. Moreover, the magnitude of effects is similar, suggesting that the family members' interests are as important as Congress members' direct interests.

Second, we disaggregate *Ratio of Real Estate* by the property type of the real estate assets. For example, in Panel D of Table 1, we report that 34% of total assets are residential real estate (*Ratio of Residential Real Estate*) and 13% are non-residential real estate (*Ratio of*

Non-residential Real Estate). In Panel B of Table 5, we re-estimate the baseline regression model (Equation 1) but replace *Ratio of Real Estate* with *Ratio of Residential Real Estate* and *Ratio of Non-residential Real Estate*. We find that the reluctance of tightening real estate bills increases with both *Ratio of Residential Real Estate* and *Ratio of Non-residential Real Estate*.

Third, we disaggregate *Ratio of Real Estate* by the source of the portfolio changes. For example, *Ratio of Real Estate* can change because of the changes in real estate value in the portfolio or the new purchase or sales of the real estate assets. We define a dummy variable, *Composition Changes*, that equals to 1 if a Congress member in the year has any new acquisition, sales, and real estate inheritance and 0 otherwise. While 27% of member-year observations in our data have such an event, 73% of member-year observations do not have any composition changes of real estate assets in their portfolios. In Panel C of Table 5, we rerun the regression specification in Table 2, Column (4) but include the interaction term between *Composition Changes* dummy and *Ratio of Real Estate*. Again, we find that the effect of *Ratio of Real Estate* is not different across the samples with and without compositional changes, indicating that our results are not driven by any particular source of changes in *Ratio of Real Estate*.

We also test the robustness of our results regarding the specification of the dependent variable. First, we use alternative categorization of bills to construct our dependent variable, *Reluctance of Tightening Real Estate*. For the subset of years from 2015 to 2020, the Korean government officially categorizes all proposed bills on their policy direction (i.e., tightening vs. loosening). Therefore, we can alternatively define the dependent variable using the categorization imputed by the Korean government, *Reluctance of Tightening Real Estate (Government sorted)*. We use *Reluctance of Tightening Real Estate (Government sorted)* as a dependent variable. Table 6 reports the estimated coefficients from the baseline regression model (Equation 1) with this dependent variable. We still find that the reluctance of a Congress member to propose a tightening real estate bill increases as the ratio of real estate assets increases.

Second, we construct our dependent variable excluding all bill proposals that are potentially not genuine but a copy of other politicians' bills with a minor tweak. We calculate the similarity of 849 tightening real estate bills using TF-IDF (Term Frequency-Inverse Document Frequency) and drop those bills above a certain level of similarity from our construction of the dependent variable. As shown in Appendix Table 2, our baseline results in Table 2 remain the same after removing potentially duplicative bill proposals from our dependent variable.

Third, we use an alternative measure of Congress members' bill proposal behaviors. Instead of using the indicator variable of any tightening bill proposal by Congress members, we calculate the ratio of tightening real estate bills to total real estate bills proposed by Congress members in each year and define a dummy that equals to 1 if the ratio is below the median in the distribution of the ratio in the Congress in the year (*Reluctance of Tightening Real Estate (Alt)*). Again, we find similar results as in Table 2, reported in Appendix Table 3.

In a placebo test (Appendix Table 4), we re-estimate the baseline regression model (Equation 1) using the Congress members' bill proposals related to economic policies other than the real estate market. If our results are solely driven by politicians' unobservable stance to economic policies, we expect to find similar legislative behaviors on other economic bills. Using all other economic bill proposals that are not related to the real estate market, we construct *Tightening Economic Policy*.[13] In Appendix Table 4, we find that *Ratio of Real Estate* does not change Congress members' behavior on the bills related to other economic policies, suggesting that our results are not solely driven by politicians' distinct stance to economic policies.

In Appendix Table 5, we further rule out the possibility that our results are driven by time-varying local interests or economic conditions of a Congress member's constituents. In Panel A, following Mian et al. (2010), we augment the baseline regression model with time-varying variables representing local socioeconomic conditions at the constituent level such as industry composition, education attainment, and poverty level. We still find the baseline result holds.

[13]We consider all economic bills related to the "Ministry of Economy and Finance" and the "Financial Services Commission" and classify them as non-real estate bills based on the textual analysis as in Section 2.

In Panel B, we include metropolitan area × year fixed effects in Equation (1) to further control for unobservable time-varying local conditions.[14] Although the metropolitan area is broader than a single constituent, this specification would still capture the time-varying local interests in the real estate market. The analysis result remains consistent with the baseline result.

4. Instrumental Variable Analyses

In the above section, using the rich panel structure of our data to control for various endogenous factors, we find that the fraction of real estate assets in Congress members' portfolios positively affects the Congress member's reluctance of proposing a bill tightening the real estate market. However, there still remains a concern on biases arising from potential omitted variables that we were not able to control since *Ratio of Real Estate* is not exogenously determined. In this section, we exploit two unique instrumental variables that exogenously change the *Ratio of Real Estate* of Congress members and link them to their bill proposal behaviors.

4.1. An Earthquake as an Instrumental Variable

We first use an unpredicted earthquake in South Korea as an instrumental variable for *Ratio of Real Estate*. South Korea had been known as a safe place from seismic activity compared to neighboring countries like Japan or China. However, on November 15, 2017, a 5.4-magnitude earthquake occurred at Pohang, an industrialized city located in the south-eastern part of South Korea. The earthquake was the second-largest one in the country's modern history. The earthquake caused a significant shock to the people around Pohang since the quake was not expected, particularly at Pohang where a number of nuclear power plants are present.[15] In addition, the earthquake caused significant damage to the densely populated

[14]Because South Korea has a single constituency legislative system, our empirical setting does not allow for including electoral district × year fixed effects in regression specifications.

[15]Later, it turns out that the earthquake was a man-made disaster from the introduction of a geothermal plant, which harvests energy by injecting high-pressure water deep into

industrialized city, injuring 135 people and damaging 57,000 structures that cost around $123 million. Afterward, Pohang suffered from reduced real estate prices, the number of tourists decreased, the population outflowed, and local businesses shrank. (Lee (2019)).

We use this event as an exogenous shock to our main independent variable, *Ratio of Real Estate*. We restrict our sample to the Congress members with financial disclosures information around the time of the Pohang earthquake during 2017 and 2020, which contain 457 member-year observations. We first measure the distance of all real estate assets owned by the Congress members to the epicenter of the Pohang earthquake based on their longitudes and latitudes.[16] Then, for each Congress member i, we calculate the fraction of the real estate value within 40 miles from the epicenter of the earthquake to the total real estate value of the Congress member at the beginning of 2017. This distance includes all nearby areas to Pohang but does not include neighboring major metropolitan regions such as Daegu and Busan, where real estate prices are likely to be driven by other local shocks.

In Figure 6, we report the 40-mile radius from the earthquake's epicenter. About 7% of Congress members have some real estate assets within 40 miles from the epicenter before the earthquake. We define *Ratio Within 40 Miles* as the fraction of real estate value in the radius to the total real estate assets owned by Congress members, with the mean of 3% and a standard deviation of 0.14, and use it as an instrumental variable for our main independent variable, *Ratio of Real Estate*.

Columns (1)-(2) of Table 7 report the instrumental variable regression results using the Pohang earthquake. Column (1) reports the first stage regression of *Ratio of Real Estate* on *Ratio Within 40 Miles*. The regression specification is similar to Column (4) of Table 2 with time-fixed effects, but we replace the *Electoral District* fixed effects with the *Metropolitan* fixed effects due to the much narrower area coverage in the data than the main sample. We find that *Ratio Within 40 Miles* decreases *Ratio of Real Estate* by -0.146 with t-statistics of -3.29.

Earth. See https://www.science.org/content/article/second-largest-earthquake-modern-south-korean-history-tied-geothermal-plant

[16]More specifically, we use the Haversine formula, a way of measuring distances between two locations on the surface of a sphere.

The reduction in *Ratio of Real Estate* of Congress members indicates that the real estate price within 40 miles from the earthquake's epicenter significantly fell after the earthquake or that Congress members sold real estate assets nearby the epicenter after the earthquake. In any case, the instrumental variable satisfies the relevance condition.

For exclusion restriction, we argue that the fraction of Congress members' real estate within 40 miles of the earthquake's epicenter would not directly change the likelihood of proposing tightening bills except through *Ratio of Real Estate*. The National Assembly usually enacts laws affecting the overall country rather than a specific city or town. In Korea, proposing a bill for a specific region is often harshly criticized as favoritism and Congress members actively avoid such scandals.

Column (2) of Table 7 reports the second stage regression results of instrumenting *Ratio of Real Estate* with *Ratio Within 40 Miles*. We find that the Congress members with a higher instrumented *Ratio of Real Estate* are more likely to be reluctant to propose tightening real estate bills. Overall, the instrumental variable analysis based on the unexpected earthquake supports our main finding that Congress members with a more financial interest in the real estate market are less likely to propose tightening real estate bills.

4.2. Tensions in the Korean Peninsula as an Instrumental Variable

We next use the time-varying tension between South and North Korea as an instrumental variable for the ratio of real estate assets to Congress members' total assets. Being the only divided country in the world, the two Korea have experienced different degrees of tensions over years. For example, the tension suddenly increased when North Korea bombarded Yeonpyeong island with their artilleries in November 2010. The tension suddenly subdued when the North Korean envoy appeared at the Pyeongchang Winter Olympics in South Korea in February 2018. As a result, there exist time-varying levels of conflict and cooperation between the two countries.

As the tension level changes, real estate prices near the northern border of South Korea

are heavily affected. When the tension is high, the real estate price decreases as the likelihood of the North Korean military provocation increases. When the tension is low, the real estate price increases as the likelihood of reunification increases, and the border area is expected to be a bridgehead for the South Korean firms to expand their businesses in North Korea. Like the Pohang earthquake, the level of tension exogenously changes the real estate prices, changing *Ratio of Real Estate* of Congress members who own real estate in the border area. Therefore, we use the tension between two countries as an instrumental variable for *Ratio of Real Estate*.

To measure the level of tension, we obtain data on cooperation and conflict between South and North Korea from the Global Database of Event, Language, and Tone (GDELT)[17]. Based on hundreds of thousands of broadcast, print, and online news sources from every corner of the globe, the GDELT project has evaluated over a quarter-billion event records over the world from 1979. For each event, the event's impact on the relation between two parties is measured by a Goldstein score (Goldstein (1992)) that assigns numerical numbers from -10 to 10, where the positive score indicates cooperative events, but the negative score indicates conflictual events.

With all events between South Korea and North Korea,[18] we compute the monthly average Goldstein score among positive events to construct a *Cooperation Index* and the average score among adverse events to construct a *Conflict Index*. Figure 7 plots the monthly Cooperation and Conflict Indexes from 2009 to 2018. The solid line reports the *Conflict Index*, and the dashed line reports the *Cooperation Index*. The figure clearly shows that the indices reflect the actual events. We observe a sharp increase in the *Conflict Index* in November 2010 when North Korea bombarded Yeonpyeong island in South Korea. Conversely, we observe a sharp reduction in the *Conflict Index* in February 2018 when the North Korean envoy visited the Pyeongchang Winter Olympics. Since our unit of observations is annual, we compute the

[17]The data is available at https://www.gdeltproject.org/

[18]We use the "Actor1 country" code as PKR (North Korea) and the "Actor 2 country" code as KOR (South Korea).

annual cooperation and conflict index by taking the year's maximum value.

However, the impact of the tension will differ across Congress members by the fraction of their real estate assets in the border area. Therefore, to accommodate the difference, we consider a weighted value of the indices by multiplying the *Cooperation* and *Conflict Index* with the fraction of Congress members' real estate value in the regions bordering North Korea to their total real estate value.[19] Figure 8 reports the regions bordering North Korea.[20] About 5% of Congress members own real estate in the border region, and the real estate assets in those regions take 2% of total real estate assets in their portfolios. In other words, we use the Cooperation and Conflict index multiplied by the portfolio ratio as the instrumental variables for *Ratio of Real Estate*.

Columns (3)-(4) of Table 7 report the instrumental variable regression results based on the *Cooperation* and *Conflict* Indices.[21] Column (3) reports the first stage regression result of regressing *Ratio of Real Estate* on the cooperation and conflict index. The regression specification is the same as Column (4) of Table 2. We find that the reduction in the conflict index and the increase in the cooperation index increases *Ratio of Real Estate*, supporting the relevance condition of the instrumental variables.

The exclusion restriction of the instrumental variables holds as long as the conflict and cooperation indexes affect the likelihood of proposing tightening real estate bills only through the change in *Ratio of Real Estate*. Because the diplomatic relation between the two countries is not likely to be correlated with the legislative decisions targeting the overall real estate market in South Korea, the exclusion restriction would hold reasonably. Column (4) of Table 7 reports the second stage regression results with the instrumented *Ratio of Real Estate*.

[19] Considering the delayed effect of the tension on real estate value and annual disclosure of Congress members' portfolios, we multiply two-year lagged annual indexes with a one-year lagged ratio of real estate in the border region.

[20] Along the border, there exists a Korean Demilitarized Zone (DMZ), which is 160 miles long, crossing the peninsula. Therefore, we set those regions next to the DMZ area as bordering regions, including Ganghwa, Gimpo, Paju, Yangju, Dongducheon, Uijeongbu, Pocheon, Yeoncheon, Cheorwon, Hwacheon, Yanggu, Goseong, and Inje.

[21] Since the effect of tension on *Ratio of Real Estate* is likely to happen through the change in real estate prices by the nature of the shock, we narrow our sample to the Congress members who disclose their portfolios in two consecutive years and whose real estate portfolios are not associated with purchases, sales, and inheritances.

We find that the increase in *Ratio of Real Estate* in Congress members' portfolios raises the propensity for reluctance of proposing tightening real estate bills.

5. Aggregate Effect on Legislation Decisions

The National Assembly makes laws that influence people's daily lives through legislative debate and compromise. When the fraction of real estate assets in Congress members' portfolios decreases the likelihood of proposing tightening real estate bills, an important question will be whether these individual behaviors have aggregate effects.

Similar to the diversification benefit from the portfolio formation, we expect that the politicians' individual behaviors will be diversified away when there exists a reasonable heterogeneity in *Ratio of Real Estate* among Congress members. If so, we would not see any aggregate impact. However, when real estate is a common private interest among Congress members, the politicians' individual effects would not be canceled away, but they will be summed to an aggregate impact. To evaluate the aggregate impact, we estimate a time-series regression of Congress members' collective legislative actions related to real estate bills on their aggregate ratio of real estate assets over the sample period.

To measure the Congress-level exposure to real estate assets, we define *Aggregated Ratio of Real Estate*, the ratio of aggregate real estate asset values in all Congress members' portfolios to the aggregate total asset values of all Congress members. *Aggregated Ratio of Real Estate* has the mean of 0.43 with a standard deviation of 0.11, indicating that 43% of aggregated assets of all Congress members are real estate assets over the sample period.

We first examine how the Congress-level *Aggregated Ratio of Real Estate* in year t is associated with the total number of tightening real estate bills proposed in year t, *Log # of Tightening Bills Proposed*. In Column (1) in Panel A of Table 8, we report the estimated coefficients from the regression of *Log # of Tightening Bills Proposed* on *Aggregated Ratio of Real Estate*. We find that the number of tightening proposals decreases as the aggregated

fraction of real estate increases. In terms of economic significance, a 1 SD increase in *Aggregated Ratio of Real Estate* decreases 76% of 1 SD of *Log # of Tightening Bills Proposed*. The result remains the same when we control for *GDP growth* and *HPI growth* in Column (2).

However, not all proposed bills are referred to the full congress for a vote. Because the bills referred to the full Congress are more likely to reflect the consensus among Congress members, we instead use the total number of tightening real estate bills approved in year t, *Log # of Tightening Bills Approved*, as the dependent variable. In Column (3), we find that the number of approvals on tightening bills decreases as the aggregated fraction of real estate increases. In terms of economic significance, a 1 SD increase in *Aggregated Ratio of Real Estate* decreases 58% of 1 SD of *Log # of Tightening Bills Approved*. The result indicates that the Congress-level interest in real estate explains which proposed bills are to be referred to and approved. The result is the same when we include additional control variables in Column (4).

In Panel B of Table 8, we report the impact of *Aggregated Ratio of Real Estate* limiting our attention to the Congress members of the ruling party. While the approval of a bill requires a collective action among Congress members, not all Congress members have equal weight but the ruling party members may have a greater influence. Therefore, we modify *Aggregated Ratio of Real Estate* to aggregate the real estate assets of only the Congress members belonging to the ruling party. We report the results in Panel B of Table 8 to find the same results as Panel A.

Overall, the aggregate effect analysis suggests that the personal interests on bill proposals are not canceled out among the Congress members, highlighting the significant impact of the total personal interests on their legislative decisions. We discuss policy implications in the conclusion section.

6. Conclusion

This paper finds that the fraction of real estate assets in Congress members' portfolios decreases the likelihood of proposing tightening real estate bills. That is, the private interest of Congress members in real estate can affect their behavior of proposing bills on the real estate market. We use two instrumental variables, an unexpected earthquake and the tension between South and North Korea, to find a causal effect of Congress members' personal interests on their legislative behaviors. Finally, by extending our analysis to the Congress-level, we also find that the Congress-level exposure to real estate assets is negatively associated with the total number of tightening bills proposed and approved by Congress.

This result offers a policy implication about the composition of Congress members. As board diversity improves firm value by lowering volatility and improving firm performance (e.g., Bernile et al. (2018)), the diversity among Congress members in terms of their financial positions may balance the legislative decisions enacted by Congress. Our empirical result indicates that, without the diversity in the private interests, Congress is less likely to propose and approve bills against their aggregate financial positions, suggesting the importance of monitoring politicians' private interests.

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Figure 1: The Number of Proposed Bills by Year

This figure reports the number of proposed bills related to the real estate market and the number of tightening real estate bills among the proposed bills based on the textual analysis from 2011 to 2020. The proportion of tightening real estate bill proposals ranges from 27.4% (in 2016) to 38.7% (in 2012) over the sample period.

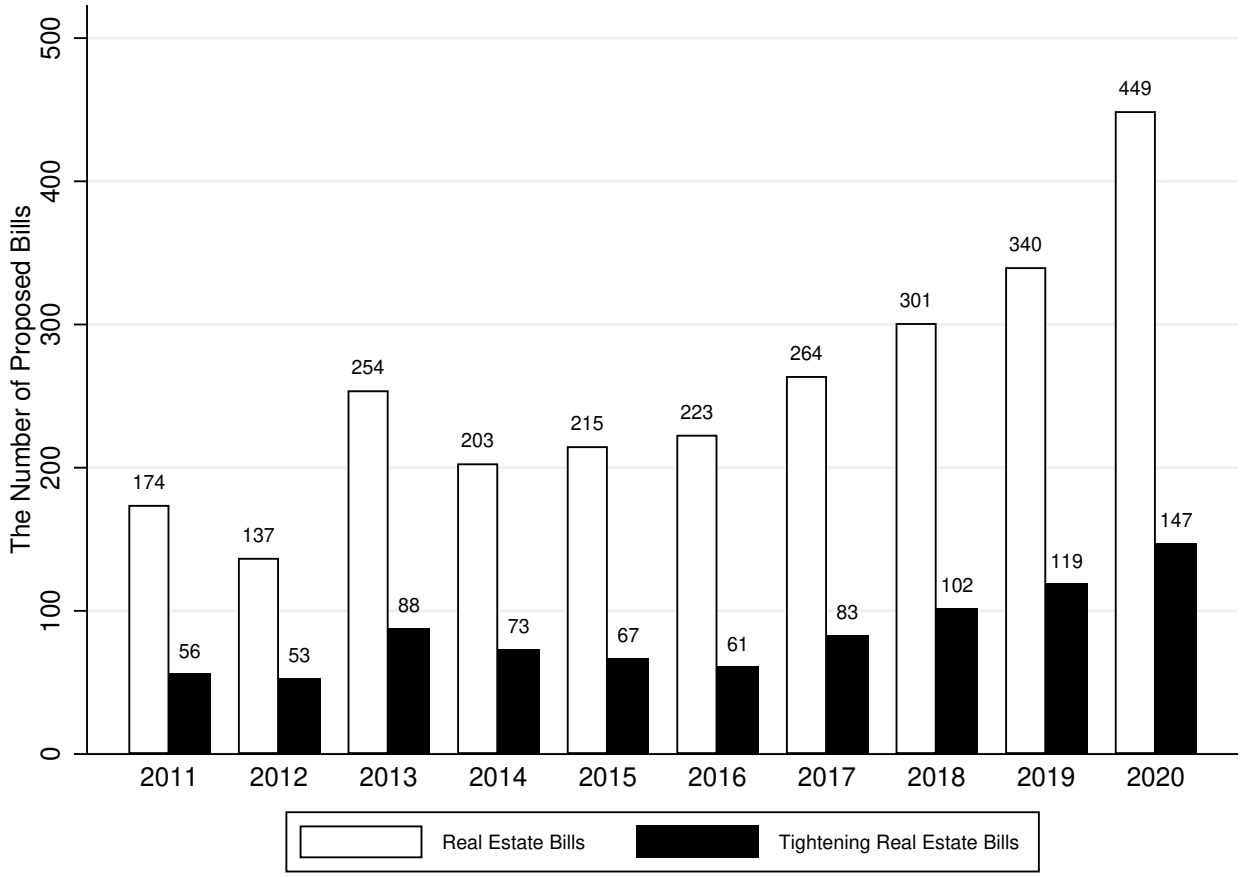

Figure 2: Voting Behavior on Tightening Real Estate Bills

The stacked bar graph reports the aggregate vote counts by year on the passage of tightening real estate bills. The votes are divided into Approval, Objection, and Abstention. Since there are multiple bills voted in a year, we aggregate vote counts for all referred tightening real estate bills in a year. The orange solid line graph plots the proportion of the approval votes to total vote counts.

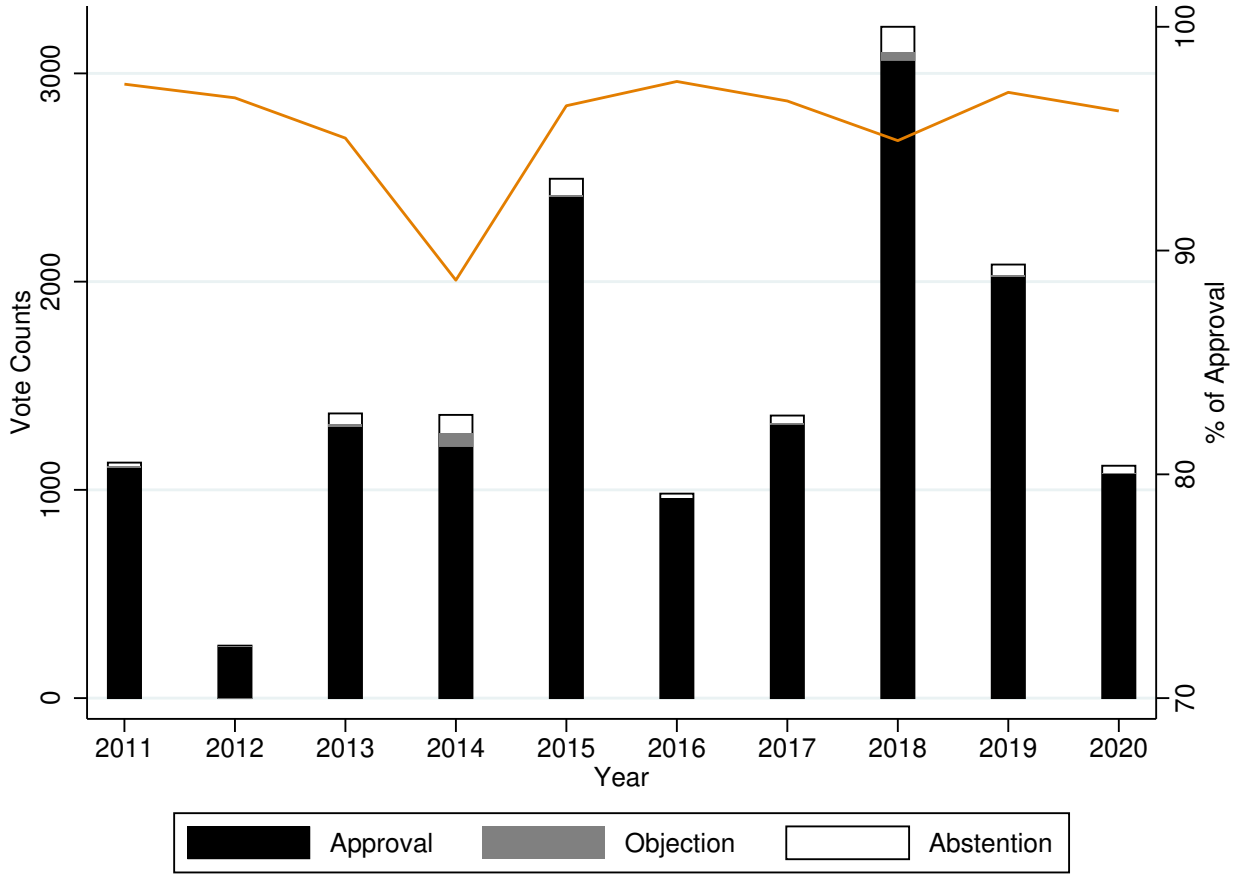

Figure 3: Asset Composition of Congress Members' Portfolio

The figure reports annual asset compositions in the portfolios of the Congress members of the National Assembly of South Korea from 2011 to 2020. Total assets are divided into *Ratio of Real Estate*, *Ratio of Cash*, *Ratio of Residential Deposits*, *Ratio of Stocks*, and *Ratio of Other Assets* and reported in the bar graph. *Leverage* is also computed as the ratio to the total assets and is reported with the negative sign.

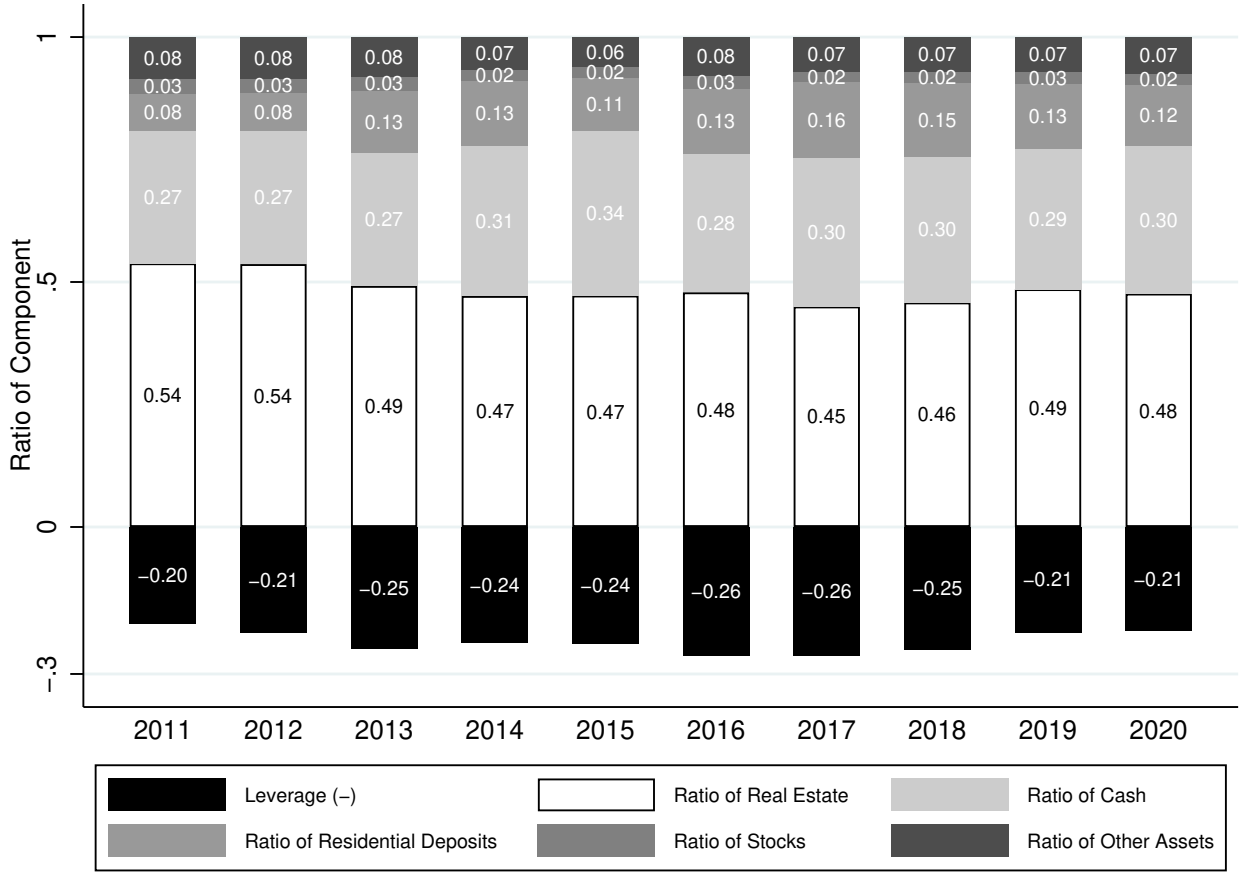

Figure 4: Ratio of Real Estate and Propensity for Reluctance of Tightening Real Estate Bills

The figure reports the propensity for the *Reluctance of Tightening Real Estate* by the *Ratio of Real Estate*, using univariate local polynomial regression. The solid line indicates the propensity for reluctance of tightening real estate bills for a given level of *Ratio of Real Estate*, and the 95% confidential intervals are reported in the dotted line.

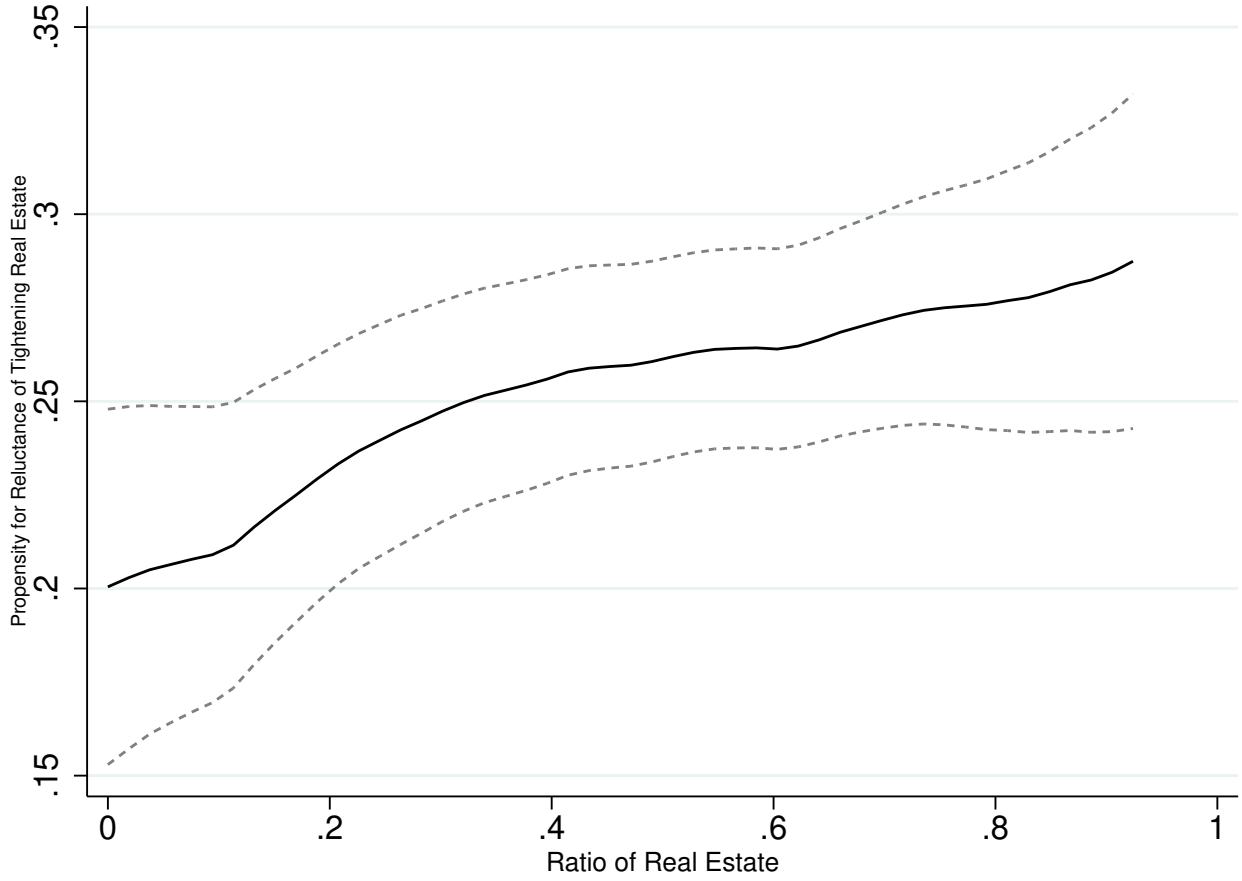

Figure 5: Ideology Score and Affiliated Party

The figure illustrates the distribution of Congress members' ideology score by their affiliated party. Ideology score is based on each Congress member's legislative voting behavior (Poole and Rosenthal (1985), Poole (2005), Poole and Rosenthal (2007)). We present the distribution of the ideology scores for the 20th National Assembly based on Congress members' legislative voting behavior from June 2016 to December 2019. If the score is closer to -1, the legislator's vote is more liberal, while the vote is more conservative if the legislator's score is closer to 1. The colored and white bar graphs represent the number of members in each interval of ideology scores for the conservative and democratic parties, respectively. The line and dash graphs are kernel density estimations of the bar graph.

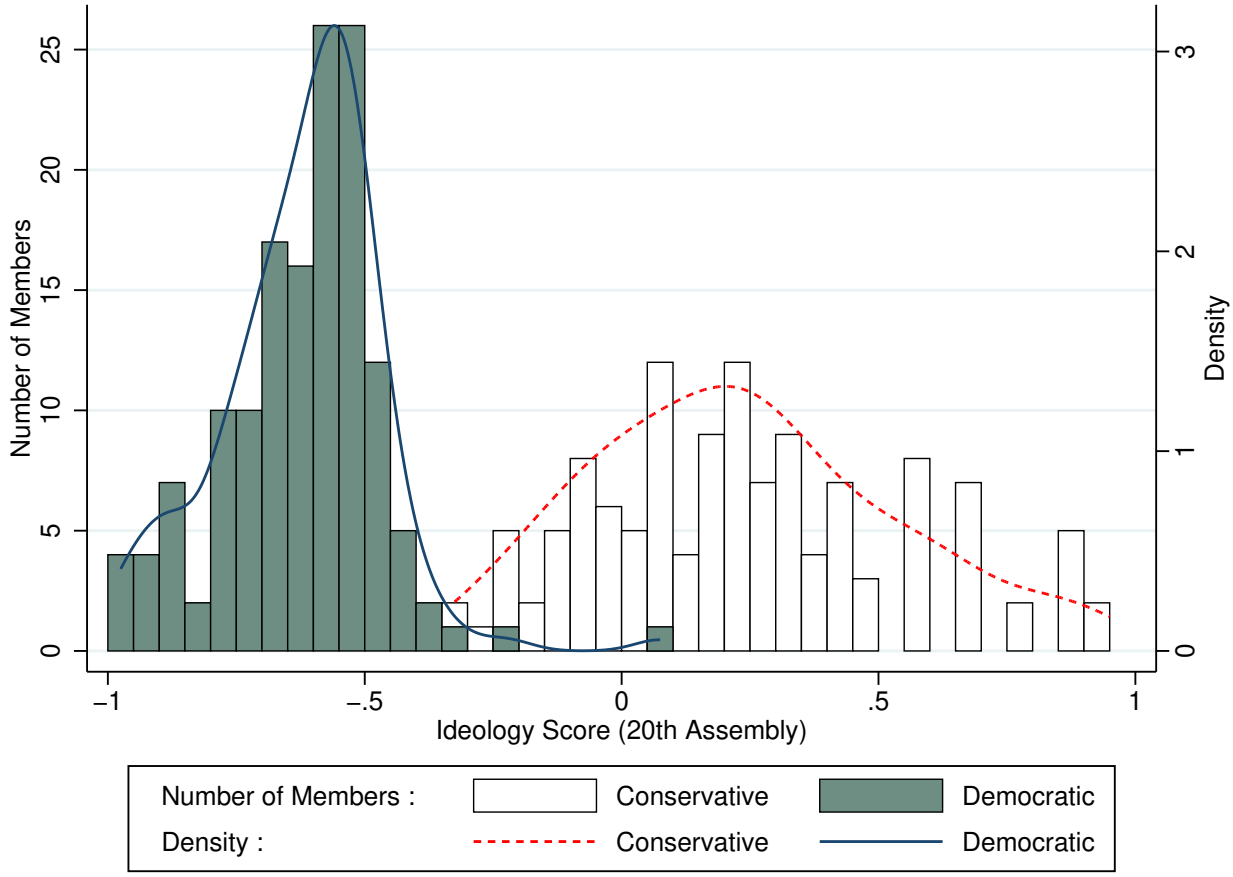

Figure 6: Regions within 40 Miles from the Pohang Earthquake Epicenter

The figure reports the epicenter of the Pohang earthquake in 2017 and the surrounding regions in the south-eastern part of South Korea. The red circle represents the 40-mile radius from the epicenter. Note that the radius does not include neighboring major metropolitan areas such as Daegu and Busan.

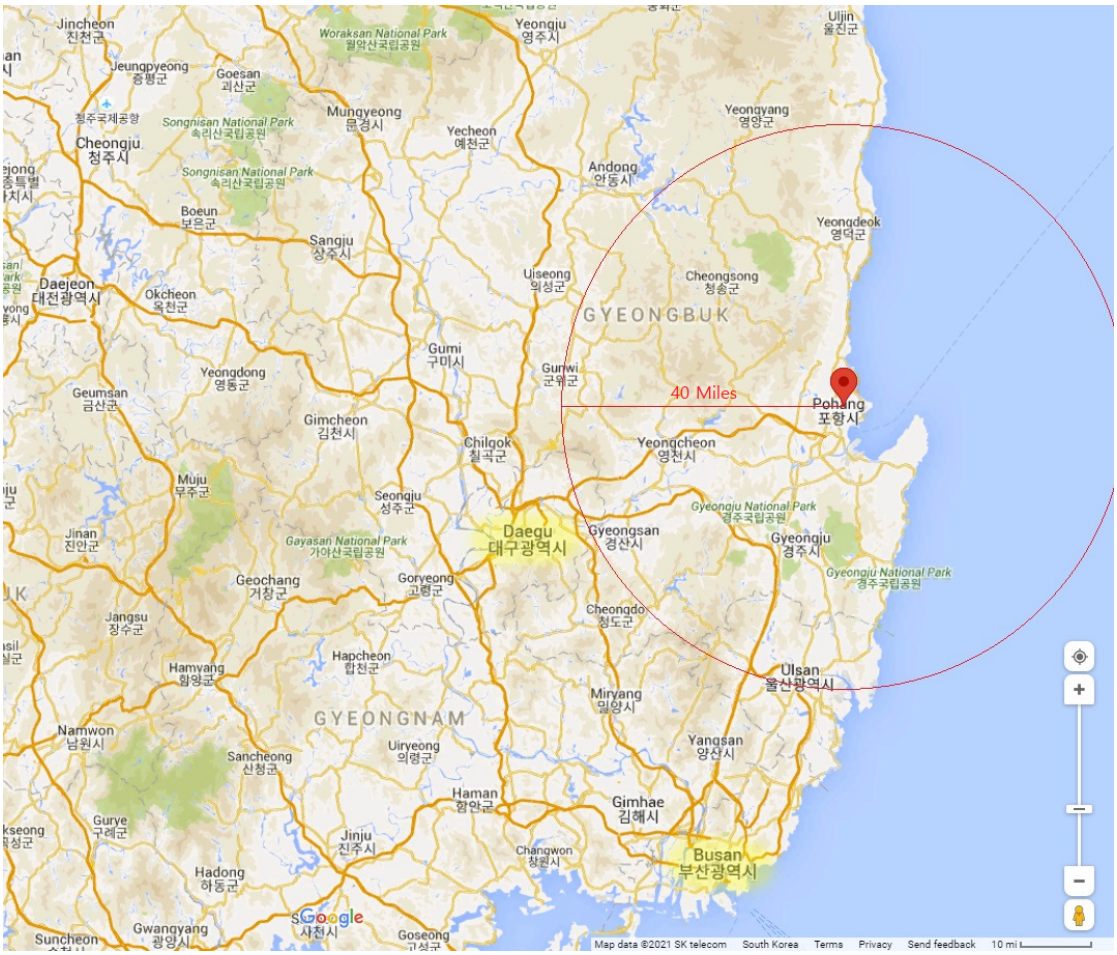

Figure 7: Conflict & Cooperation Index between South and North Korea

We plot the monthly Conflict & Cooperation Index between South and North Korea from 2009 to 2018. Blue solid line represents the time series of *Conflict Index*, defined as the absolute value of the average Goldstein score of all conflictual events between the two countries (Goldstein (1992)). Red dashed line represents the time series of *Cooperation Index*, defined as the average Goldstein score of all cooperative events between the two countries.

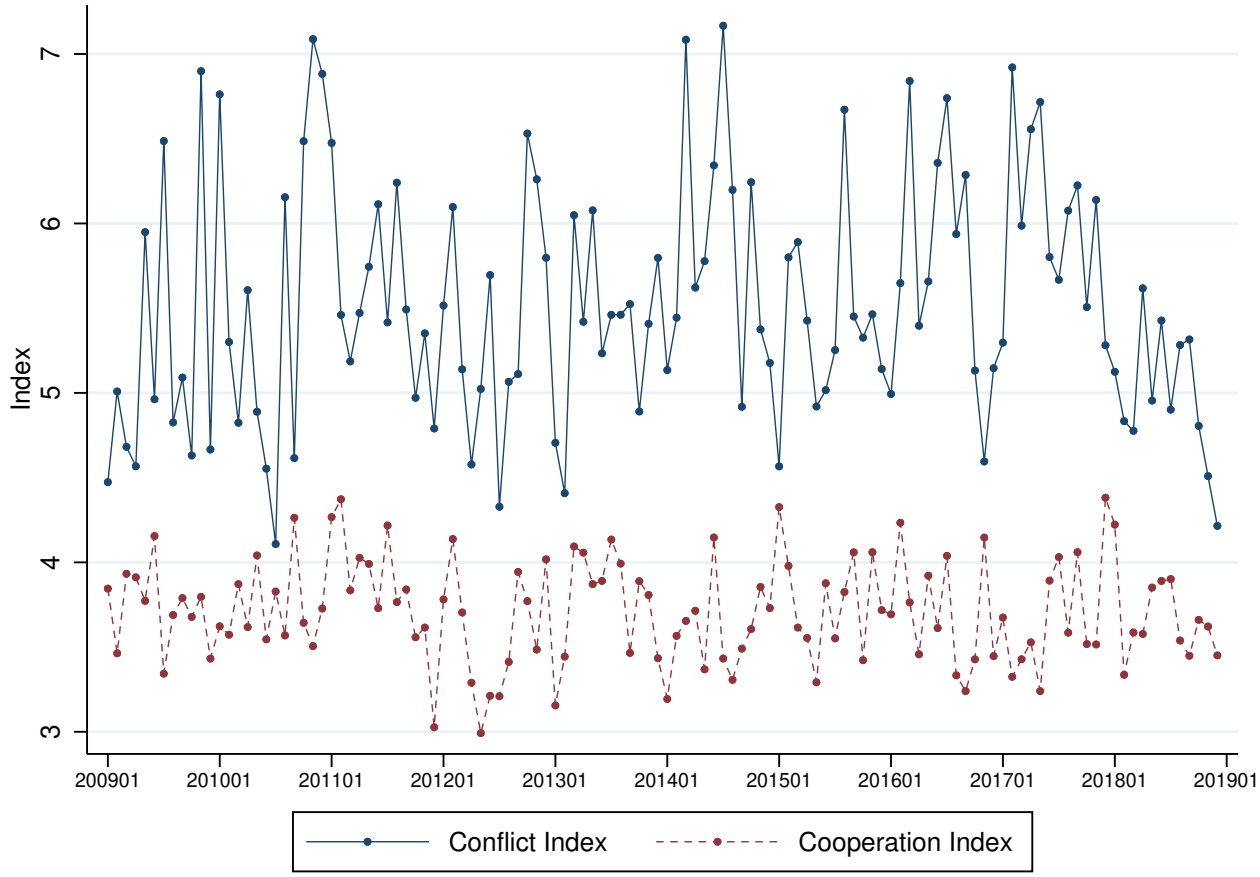

Figure 8: Regions in South Korea Bordering with North Korea

The figure plots the bordering regions at a municipal level next to the DMZ area in South Korea.

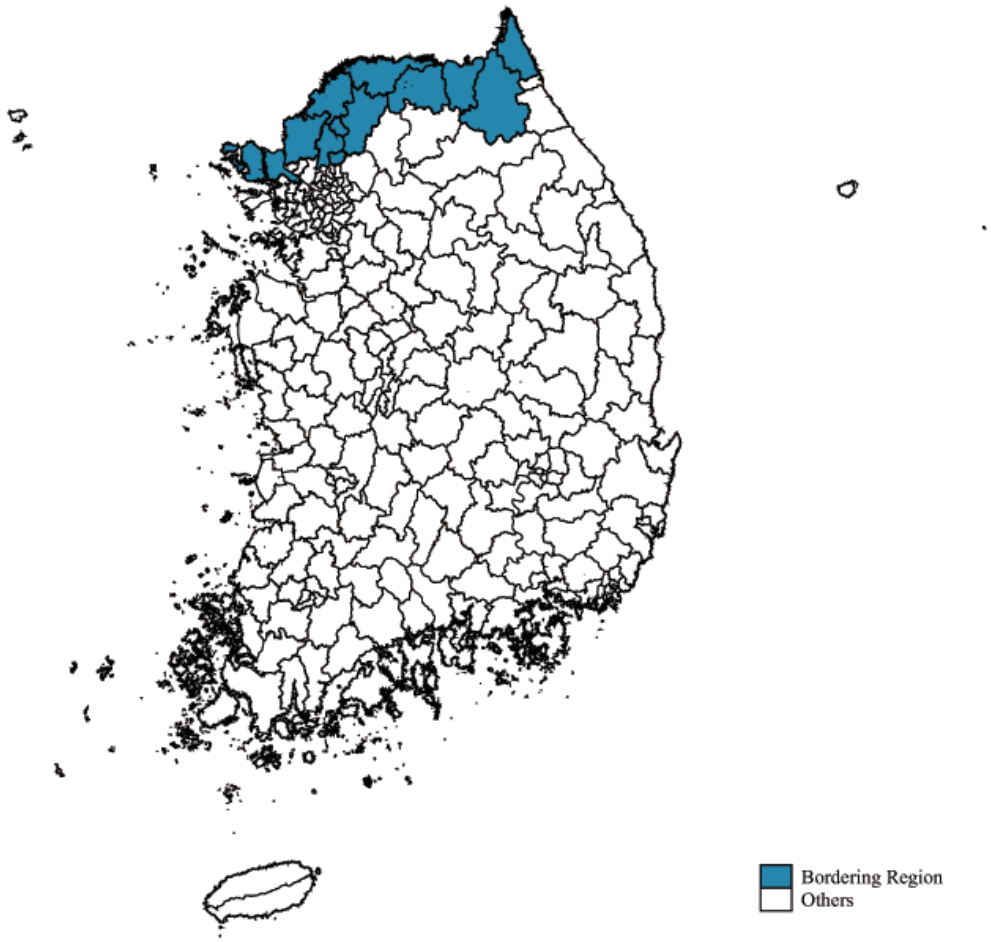

Table 1: Summary Statistics

We report the summary statistics of variables in our analysis. We restrict our sample to Congress members in the National Assembly of South Korea, who are affiliated with the committees that process real estate laws. The sample period is from 2011 to 2020. See Appendix Table 1 for the variable descriptions. All variables are constructed at the member-year level. We winsorize all variables at the 5% and 95% levels.

	Obs	Mean	Std.Dev.	10th pctl.	Median	90th pctl.
Panel A: Tightening Real Estate Bills						
Reluctance of Tightening Real Estate	1,809	0.25	0.44	0	1	1
Reluctance of Tightening Real Estate (Government sorted)	1,076	0.42	0.49	0	0	1
Panel B: Portfolio of Congress Members						
Total Assets (mils)	1,809	2,435	2,163	608	1,638	6,002
Log (Total Assets)	1,809	7.46	0.82	6.41	7.40	8.70
Ratio of Real Estate	1,809	0.48	0.24	0.12	0.49	0.80
Ratio of Cash	1,809	0.29	0.17	0.08	0.27	0.56
Ratio of Residential Deposits	1,809	0.12	0.15	0	0.05	0.36
Ratio of Stocks	1,809	0.01	0.03	0	0	0.06
Ratio of Other Assets	1,809	0.07	0.09	0	0.03	0.21
Leverage	1,809	0.22	0.20	0	0.18	0.53
Panel C: Characteristics of Congress Members						
Conservative Party	1,809	0.49	0.50	0	0	1
Terms Served	1,809	2.01	1.12	1	2	4
Primary Sponsor	1,809	0.39	0.49	0	0	1
Age	1,809	58.3	6.47	49	58	67
Female	1,809	0.12	0.32	0	0	1
Education (high school or below)	1,809	0.02	0.13	0	0	0
Education (college)	1,809	0.36	0.48	0	0	1
Education (postgraduate)	1,809	0.62	0.48	0	1	1
Panel D: Decomposing *Ratio of Real estate*						
Number of Real Estate	1,809	7.01	10.60	1	4	15
By the type of ownership						
Ratio of Owned by Congressmen	1,809	0.27	0.23	0	0.25	0.64
Ratio of Owned by Family	1,809	0.20	0.19	0	0.15	0.50
By the type of real estate						
Ratio of Residential Real Estate	1,809	0.34	0.22	0.02	0.34	0.64
Ratio of Non-residential Real Estate	1,809	0.13	0.19	0	0.04	0.47
By the type of location						
Ratio of Own Electoral District	1,809	0.13	0.19	0	0.03	0.45
Ratio of Other Electoral Districts	1,809	0.34	0.25	0	0.35	0.71
Composition Changes	1,809	0.27	0.45	0	0	1

Table 2: The Effect of Real Estate Ownership on the Reluctance of Proposing Bills Tightening the Real Estate Market

We report the coefficient estimates from panel regressions of the National Assembly of South Korea members' real estate bill proposal behavior (*Reluctance of Tightening Real Estate*) on their real estate asset ratios in their portfolios (*Ratio of Real Estate*). We use the member-year observations from 2011 to 2020. Panel A reports our baseline regression. The dependent variable is *Reluctance of Tightening Real Estate*, which is a dummy variable that equals to 1 if a Congress member does not propose any tightening real estate bills in a year and 0 otherwise. The main independent variable of interest is *Ratio of Real Estate*, which is the fraction of real estate assets in the Congress members' total assets. In Column (1), we include control variables on other components in the portfolio, such as *Log (Total Assets)*, *Leverage*, *Ratio of Cash*, and *Ratio of Residential Deposits*. Column (2) includes Congress members' characteristics and Electoral District fixed effects. *Other Controls* include *Terms Served*, *Primary Sponsor*, and *Education*. We additionally include macro variables in Column (3), such as *GDP Growth* and *HPI Growth*. We include year fixed effects in Column (4). In Panel B, we disaggregate *Ratio of Real Estate* by the location of the real estate; *Ratio of Own Electoral District*, the fraction of real estate assets located in the Congress members' own electoral district, and *Ratio of Other Electoral Districts*, the fraction of real estate assets located in other electoral districts. See Appendix Table 1 for the variable descriptions. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

Panel A: Baseline Regression	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Real Estate	0.162**	0.132*	0.150*	0.165**
	(2.28)	(1.66)	(1.93)	(2.13)
Log (Total Assets)	0.048***	0.037*	0.041*	0.028
	(3.26)	(1.73)	(1.96)	(1.35)
Leverage	0.007	0.156**	0.142*	0.121
	(0.10)	(1.98)	(1.82)	(1.59)
Ratio of Cash	0.152*	0.236**	0.264***	0.270***
	(1.65)	(2.26)	(2.60)	(2.69)
Ratio of Residential Deposits	0.072	0.094	0.123	0.137
	(0.71)	(0.79)	(1.05)	(1.20)
Conservative Party		0.106***	0.093***	0.113***
		(3.25)	(2.91)	(3.31)
Age		0.004	0.004*	0.004
		(1.60)	(1.69)	(1.54)
Female		0.050	0.051	0.049
		(1.19)	(1.23)	(1.15)
GDP Growth			5.844***	
			(7.38)	
HPI Growth			0.211	
			(0.39)	
Observations	1,809	1,809	1,809	1,809
Adjusted R-squared	0.010	0.136	0.169	0.244
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Year FE	NO	NO	NO	YES

Continued on the next page

Table 2 continues

Panel B: By Property Location	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Own Electoral District	0.110	0.157	0.172*	0.175*
	(1.33)	(1.55)	(1.75)	(1.78)
Ratio of Other Electoral Districts	0.195***	0.158**	0.176**	0.188**
	(2.67)	(1.97)	(2.25)	(2.42)
Log (Total Assets)	0.043***	0.037*	0.041*	0.028
	(2.85)	(1.68)	(1.89)	(1.28)
Leverage	0.009	0.156**	0.143*	0.121
	(0.14)	(1.99)	(1.82)	(1.59)
Ratio of Cash	0.159*	0.254**	0.280***	0.282***
	(1.76)	(2.43)	(2.76)	(2.82)
Ratio of Residential Deposits	0.062	0.113	0.140	0.146
	(0.62)	(0.93)	(1.19)	(1.27)
Conservative Party		0.105***	0.092***	0.111***
		(3.19)	(2.84)	(3.23)
Age		0.004	0.004	0.003
		(1.56)	(1.64)	(1.50)
Female		0.050	0.051	0.048
		(1.19)	(1.22)	(1.13)
GDP Growth			5.851***	
			(7.37)	
HPI Growth			0.203	
			(0.37)	
Observations	1,809	1,809	1,809	1,809
Adjusted R-squared	0.011	0.136	0.169	0.244
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Year FE	NO	NO	NO	YES

Table 3 : The Effect of Real Estate Ownership on the Reluctance of Tightening the Real Estate Market: By The Number of Real Estate Assets

We report the coefficient estimates from panel regressions of the National Assembly of the South Korea members' real estate bill proposal behavior (*Reluctance of Tightening Real Estate*) on their real estate asset ratios in their portfolios (*Ratio of Real Estate*) by the number of real estate assets. We use the member-year observations from 2011 to 2020. The dependent variable is *Reluctance of Tightening Real Estate*, which is a dummy variable that equals to 1 if a Congress member does not propose any tightening real estate bills in a year and 0 otherwise. *Large Number* is an indicator variable equals to 1 if the number of real estate assets is in the top quintile of the distribution in each year t and 0 otherwise. Our main variable of interest is the interaction term between *Ratio of Real Estate*, which is the fraction of real estate assets in the Congress members' total assets, and *Large Number*. Regression specifications are the same as in Table 2. See Appendix Table 1 for the variable descriptions. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Real Estate × Large Number	0.204	0.296**	0.283**	0.307**
	(1.62)	(2.16)	(2.09)	(2.39)
Ratio of Real Estate	0.128*	0.073	0.092	0.098
	(1.68)	(0.83)	(1.06)	(1.12)
Large Number	-0.184**	-0.218***	-0.199**	-0.198***
	(-2.55)	(-2.77)	(-2.54)	(-2.63)
Log (Total Assets)	0.061***	0.042**	0.045**	0.030
	(4.02)	(1.97)	(2.12)	(1.41)
Leverage	0.010	0.163**	0.151*	0.131*
	(0.15)	(2.07)	(1.92)	(1.72)
Ratio of Cash	0.140	0.213**	0.244**	0.251**
	(1.57)	(2.05)	(2.41)	(2.51)
Ratio of Residential Deposits	0.034	0.044	0.074	0.081
	(0.35)	(0.36)	(0.61)	(0.68)
Conservative Party		0.100***	0.088***	0.109***
		(3.05)	(2.74)	(3.18)
Age		0.004*	0.004*	0.004*
		(1.72)	(1.81)	(1.67)
Female		0.048	0.050	0.048
		(1.16)	(1.20)	(1.14)
GDP Growth			5.788***	
			(7.28)	
HPI Growth			0.239	
			(0.44)	
Observations	1,809	1,809	1,809	1,809
Adjusted R-squared	0.014	0.138	0.171	0.246
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Year FE	NO	NO	NO	YES

Table 4 : The Effect of Real Estate Ownership on the Reluctance of Proposing Bills Tightening the Real Estate Market: Entrenched Congress Members

We report the coefficient estimates from panel regressions of the National Assembly of South Korea members' real estate bill proposal behavior on their real estate asset ratios in their portfolios by the degree of political entrenchment for Congress members. The dependent variable is *Reluctance of Tightening Real Estate*, which is a dummy variable that equals to 1 if a Congress member does not propose any tightening real estate bills in a year and 0 otherwise. We restrict our sample to Electorate members who have their own electoral district, by excluding the List members who are elected based on their own party's total votes. We use *High Votes* in Column (1), *Vote Concentration* in Column (2), and *Party Shares* in Column (3) as the measurement of *Entrenched*. Our main variable of interest is the interaction term between *Ratio of Real Estate*, which is the fraction of real estate assets in the Congress members' total assets, and *Entrenched*. Regression specifications are the same as in Table 2, Column (4). See Appendix Table 1 for the variable descriptions. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

	(1)	(2)	(3)
Measure of Entrenchment:	*High Votes*	*Vote Concentration*	*Party Shares*
	Reluctance of Tightening Real Estate		
Ratio of Real Estate × *Entrenched*	0.274**	0.193**	0.221**
	(2.57)	(1.98)	(1.99)
Ratio of Real Estate	0.067	0.126	0.134
	(0.67)	(1.32)	(1.48)
Entrenched	-0.129**	-0.120**	-0.106**
	(-2.32)	(-2.29)	(-2.00)
Log (Total Assets)	0.029	0.030	0.031
	(1.14)	(1.19)	(1.26)
Leverage	0.194**	0.185**	0.194**
	(2.28)	(2.19)	(2.33)
Ratio of Cash	0.353***	0.354***	0.350***
	(3.39)	(3.34)	(3.33)
Ratio of Residential Deposits	0.210	0.220*	0.195
	(1.64)	(1.70)	(1.50)
Conservative Party	0.136***	0.129***	0.137***
	(3.61)	(3.47)	(3.53)
Age	0.007***	0.007***	0.007***
	(2.75)	(2.75)	(2.66)
Female	0.047	0.048	0.055
	(0.88)	(0.89)	(1.04)
Observations	1,610	1,610	1,610
Adjusted R-squared	0.238	0.237	0.237
Other Controls	YES	YES	YES
Electoral District FE	YES	YES	YES
Year FE	YES	YES	YES

Table 5: Robustness of the Baseline Regression: Property Ownership and Type

We report the robustness of our results in Table 2 by disaggregating *Ratio of Real Estate* into its components. We disaggregate *Ratio of Real Estate* by the owner of the real estate in Panel A, by the property type of the real estate in Panel B, and by the source of the changes in Panel C. The regression specifications are the same as in Table 2, but we do not report the estimated coefficients on other variables for brevity. See Appendix Table 1 for the variable descriptions. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

Panel A: By Property Ownership	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Owned by Congressmen	0.143*	0.099	0.117	0.142*
	(1.92)	(1.13)	(1.37)	(1.66)
Ratio of Owned by Family	0.132	0.140	0.158*	0.157*
	(1.61)	(1.57)	(1.82)	(1.81)
Panel B: By Property Type	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Residential Real Estate	0.180**	0.137*	0.151*	0.159**
	(2.38)	(1.73)	(1.95)	(2.04)
Ratio of Non-residential Real Estate	0.132	0.186*	0.209**	0.246**
	(1.53)	(1.90)	(2.16)	(2.57)
Panel C: By Type of Changes	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Real Estate × *Composition Changes*	-0.115	-0.143	-0.133	-0.131
	(-1.17)	(-1.38)	(-1.32)	(-1.41)
Ratio of Real Estate	0.192***	0.160*	0.176**	0.190**
	(2.60)	(1.86)	(2.09)	(2.25)
Composition Changes	0.073	0.104*	0.098*	0.098*
	(1.29)	(1.83)	(1.75)	(1.92)
Observations	1,809	1,809	1,809	1,809
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Macro Controls	NO	NO	YES	NO
Year FE	NO	NO	NO	YES

Table 6: Robustness of the Baseline Regression: Alternative Categorization of Proposed Bills

We report the robustness of our results in Table 2 using an alternative dependent variable based on the official list of tightening bills categorized by the South Korean government. We use the member-year observations from 2015 to 2020, which is shorter than the full sample period due to data availability. The dependent variable is *Reluctance of Tightening Real Estate (Government sorted)*, a dummy variable equals to 1 if a Congress member i does not propose any real estate bill in the official list of tightening bills categorized by the government in the year t, and 0 if otherwise. Regression specifications are the same as in Table 2. See Appendix Table 1 for the variable descriptions. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate (Government sorted)			
Ratio of Real Estate	0.246**	0.273*	0.266	0.308*
	(2.08)	(1.73)	(1.65)	(1.85)
Log (Total Assets)	0.073***	0.062**	0.054*	0.063**
	(3.35)	(2.15)	(1.82)	(2.07)
Leverage	0.011	0.097	0.104	0.056
	(0.11)	(0.78)	(0.84)	(0.45)
Ratio of Cash	0.266*	0.245	0.210	0.340*
	(1.73)	(1.41)	(1.19)	(1.89)
Ratio of Residential Deposits	0.293*	0.382*	0.363*	0.415**
	(1.81)	(1.93)	(1.80)	(2.04)
Conservative Party		0.061	0.083*	0.061
		(1.43)	(1.88)	(1.38)
Age		0.001	-0.001	0.003
		(0.32)	(-0.26)	(0.67)
Female		-0.166***	-0.176***	-0.157**
		(-2.62)	(-2.72)	(-2.34)
GDP Growth			-43.413***	
			(-4.01)	
HPI Growth			-6.190***	
			(-4.06)	
Observations	1,076	1,076	1,076	1,076
Adjusted R-squared	0.014	0.161	0.182	0.278
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Year FE	NO	NO	NO	YES

Table 7: Instrumental Variable Analysis

We report the instrumental variables regression results using two exogenous events, the 2017 Pohang Earthquake in Columns (1)-(2) and the conflict and cooperation index with North Korea in Columns (3)-(4). Column (1) reports the first stage regression result of *Ratio of Real Estate* on *Ratio Within 40 Miles*. Column (2) reports the second stage regression result of *Reluctance of Tightening Real Estate* on the instrumented *Ratio of Real Estate* using the earthquake shock. Column (3) reports the first stage regression result of *Ratio of Real Estate* on *Conflict Index* and *Cooperation Index*. Column (4) reports the second stage regression result of *Reluctance of Tightening Real Estate* on the instrumented *Ratio of Real Estate* using the conflict and cooperation index. We include control variables, such as *Log (Total Assets)*, *Leverage*, *Ratio of Cash*, and *Ratio of Residential Deposits*. We also include other Congress members' characteristics and Metropolitan fixed effects. See Appendix Table 1 for the variable descriptions. The table reports point estimates with t-statistics in parentheses. Standard errors in Column (1) are clustered at the individual level. Standard errors in Column (2) are calculated using the bootstrap method, and clustered at the individual level. ***, **, * denote 1%, 5%, and 10% statistical significance.

IV:	Pohang Earthquake		North Korea Tension	
	1st Stage	2nd Stage	1st Stage	2nd Stage
	(1)	(2)	(3)	(4)
	Ratio of Real Estate	*Reluctance of Tightening Real Estate*	*Ratio of Real Estate*	*Reluctance of Tightening Real Estate*
Ratio Within 40 Miles	-0.146***			
	(-3.29)			
Conflict Index			-0.232***	
			(-2.75)	
Cooperation Index			0.319**	
			(2.43)	
$\widehat{Ratio\ of\ Real\ Estate}$		1.379**		0.580**
		(1.98)		(2.18)
Log (Total Assets)	-0.045**	0.103***	-0.019	0.034*
	(-2.34)	(2.85)	(-1.46)	(1.68)
Leverage	0.130*	0.155	0.015	0.024
	(1.69)	(0.92)	(0.32)	(0.27)
Ratio of Cash	-0.729***	1.144**	-0.801***	0.463**
	(-9.17)	(2.08)	(-17.51)	(2.16)
Ratio of Residential Deposits	-0.891***	1.214*	-0.938***	0.525*
	(-14.70)	(1.74)	(-22.55)	(1.92)
Conservative Party	0.024	0.025	0.009	0.058
	(0.88)	(0.58)	(0.49)	(1.39)
Age	-0.001	0.004	-0.000	-0.000
	(-0.43)	(1.58)	(-0.34)	(-0.03)
Female	0.006	0.059	-0.003	0.093
	(0.22)	(0.74)	(-0.12)	(1.55)
Observations	457	457	993	993
Other Controls	YES	YES	YES	YES
Metropolitan FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 8: Aggregated Effect of Ratio of Real Estate Assets

We report the regression estimates of the relation between the aggregated real estate holdings of the National Assembly of South Korea members and their annual activities regarding tightening real estate bills. In Columns (1) and (2), the dependent variable is *Log # of Tightening Bills Proposed*, which is the logarithm of the total number of proposed tightening real estate bills in each year. In Columns (3) and (4), the dependent variable is *Log # of Tightening Bills Approved*, which is the logarithm of the total number of approved tightening real estate bills in each year. The key independent variable in Panel A is *Aggregated Ratio of Real Estate*, which is defined as the ratio of the total aggregate amount of all Congress members' real estate assets to the total aggregate amount of all Congress members' assets in year t. In Panel B, regression specifications are the same as in Panel A, but we restrict the sample to Congress members affiliated with the ruling party as of calculating *Aggregated Ratio of Real Estate*. The t-statistics reported in parentheses are based on standard errors adjusted for heteroscedasticity. ***, **, * denote 1%, 5%, and 10% statistical significance.

Panel A: All Congress Members	(1)	(2)	(3)	(4)
	Log # of Tightening Bills Proposed		*Log # of Tightening Bills Approved*	
Aggregated Ratio of Real Estate	-2.421***	-2.550**	-2.602*	-2.639**
	(-4.09)	(-3.04)	(-2.10)	(-2.53)
GDP Growth		-0.785		-11.422*
		(-0.53)		(-2.19)
HPI Growth		-1.996		-4.125
		(-0.50)		(-0.87)
Observations	10	10	10	10
Adjusted R-squared	0.530	0.391	0.252	0.242
Panel B: Leading Party Members	(1)	(2)	(3)	(4)
	Log # of Tightening Bills Proposed		*Log # of Tightening Bills Approved*	
Aggregated Ratio of Real Estate	-1.558***	-1.551**	-1.667**	-1.598**
	(-3.95)	(-2.89)	(-2.68)	(-2.53)
GDP Growth		-1.290		-11.957
		(-0.33)		(-1.55)
HPI Growth		-0.259		-2.306
		(-0.05)		(-0.37)
Observations	10	10	10	10
Adjusted R-squared	0.644	0.531	0.314	0.312

Appendix Table 1: Definitions of Variables

Variable	Description
Tightening Real Estate Bills	
Reluctance of Tightening Real Estate	1 if a Congress member i does not propose any tightening real estate bill in year t and 0 if otherwise
Reluctance of Tightening Real Estate (Government sorted)	1 if a Congress member i does not propose any tightening (categorized by government) real estate bill in year t and 0 if otherwise
Portfolio of Congress Members	
Total Assets (mils)	Total amount of all assets disclosed by a Congress member i in year t in million KRW
Log (Total Assets)	The logarithm of *Total Assets*
Leverage	The ratio of total debt amount to total asset amount disclosed by a Congress member i in year t
Ratio of Real Estate	The ratio of total amount of land and buildings ownership to total asset amount disclosed by a Congress member i in year t
Ratio of Cash	The ratio of total amount of cash and deposits to total asset amount disclosed by a Congress member i in year t
Ratio of Residential Deposits	The ratio of total amount of residential deposits to total asset amount disclosed by a Congress member i in year t
Ratio of Stocks	The ratio of total amount of stocks and blind trusts to total asset amount disclosed by a Congress member i in year t
Ratio of Other Assets	The ratio of total amount of other assets to total asset amount disclosed by a Congress member i in year t
Characteristics of Congress Members	
Conservative Party	1 if a Congress member i is associated with the conservative party in year t and 0 otherwise
Terms Served	The number of terms of a Congress member i serving as Congress member by year t
Primary Sponsor	1 if a Congress member i proposes at least one real estate bill as the primary sponsor in year t and 0 otherwise
Age	The age of a Congress member i in year t
Female	1 if a Congress member i is a female and 0 otherwise
Education (high school or below)	1 if a Congress member i's final education is high school or below and 0 otherwise
Education (college)	1 if a Congress member i's final education is college and 0 otherwise
Education (postgraduate)	1 if a Congress member i's final education is postgraduate and 0 otherwise
Macroeconomic Factors	
GDP Growth	Two-year lagged real GDP growth
HPI Growth	Two-year lagged House Price Index growth minus Consumer Price Index growth

Continued on the next page

Appendix Table 1 continues

Variable	Description
The Number of Real Estate Assets	
Number of Real Estate	The number of real estate assets owned by a Congress member i in year t
Large Number	1 if the number of real estate assets owned by a Congress member i is above the top quintile of the distribution in each year t and 0 otherwise
Decomposing Ratio of Real Estate	
By the type of ownership	
Ratio of Owned by Congressmen	The ratio of total amount of real estate directly owned by a member i to total asset amount disclosed by a Congress member i in year t
Ratio of Owned by Family	The ratio of total amount of real estate held by a member i's family to total asset amount disclosed by a Congress member i in year t
By the type of real estate	
Ratio of Residential Real Estate	The ratio of total amount of residential real estate to total asset amount disclosed by a Congress member i in year t
Ratio of Non-residential Real Estate	The ratio of total amount of non-residential real estate to total asset amount disclosed by a Congress member i in year t
By the type of location	
Ratio of Own Electoral District	The ratio of total real estate amount located in a Congress member i's own electoral district to total asset amount disclosed by the member i in year t
Ratio of Other Electoral Districts	The ratio of total real estate amount located in the other electoral district to total asset amount disclosed by a Congress member i in year t
Type of changes	
Composition Changes	1 if a Congress member i in year t has any new acquisition, sales, and real estate inheritance and 0 otherwise
Measure of Entrenchment	
High Votes	1 if a Congress member i wins 50% of votes from the latest election and 0 otherwise
Vote Concentration	1 if the Herfindahl index of candidates' votes in an electoral district is above the median in the distribution of that in the latest election and 0 otherwise
Party Shares	1 if the fraction of the party's seats in the total number of seats in the province is above the top tercile of the distribution and 0 otherwise

Continued on the next page

Appendix Table 1 continues

Variable	Description
IV (Pohang Earthquake)	
Ratio Within 40 Miles	The ratio of total real estate amount within 40 miles from Pohang epicenter to total real estate amount disclosed by a Congress member i at the beginning of 2017
IV (North Korea Tension)	
Conflict Index	Two-year lagged Conflict Index multiplied by a one-year lagged ratio of a Congress member i's real estate value in the regions bordering North Korea to their total real estate value
Cooperation Index	Two-year lagged Cooperation Index multiplied by a one-year lagged ratio of a Congress member i's real estate value in the regions bordering North Korea to their total real estate value
Additional Analyses	
Reluctance of Tightening Real Estate (Alt)	1 if the ratio of tightening real estate bills to total real estate bills proposed by a Congress member i is below the median in the distribution of that in year t
Tightening Economic Policy	1 if a Congress member i proposes any tightening economic policy in year t and 0 otherwise
Local Socioeconomic Variables	Source : Korean Statistical Information Service (kosis.kr)
Fraction of Workforce in Financial Industry	Fraction of the number of workforce in financials (District-level)
Fraction of Workforce in Real Estate Industry	Fraction of the number of workforce in real estate industry (District-level)
Fraction of Under High School	Fraction of people who are educated under high school (District-level)
Fraction of Graduates	Fraction of people who have master degree (District-level)
Fraction of People in Poverty	Fraction of people who are in poverty (Metropolitan-level)

Appendix Table 2: Excluding Duplicative Bills by Similarity Score

We report our baseline regression after excluding tightening real estate bills that are similar to others. The dependent variable is *Reluctance of Tightening Real Estate*. We calculate a similarity score between 0 and 1 for every two bills in our 849 tightening real estate bills using TF-IDF (Term Frequency-Inverse Document Frequency). We exclude bills if there is a tightening real estate bill proposed earlier in the same assembly by other members but is similar at a certain level. In Columns (1)-(4), we repeat our baseline regressions in Table 2 after dropping the duplicative bills with a similarity score above 0.5. Columns (5) and (6) show the results in Column (4) with the higher thresholds of similarity score. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

	(1)	(2)	(3)	(4)	(5)	(6)
Measure of Similar Bills:	Similarity > 0.5				> 0.75	> 0.9
	Reluctance of Tightening Real Estate					
Ratio of Real Estate	0.163**	0.136*	0.153**	0.166**	0.153**	0.163**
	(2.24)	(1.72)	(1.99)	(2.06)	(2.00)	(2.10)
Log (Total Assets)	0.060***	0.036*	0.040**	0.029	0.031	0.028
	(4.06)	(1.76)	(1.98)	(1.41)	(1.47)	(1.32)
Leverage	0.057	0.222***	0.209***	0.183**	0.141*	0.116
	(0.88)	(2.80)	(2.65)	(2.37)	(1.83)	(1.52)
Ratio of Cash	0.168*	0.233**	0.260**	0.252**	0.252**	0.262***
	(1.85)	(2.24)	(2.57)	(2.45)	(2.54)	(2.60)
Ratio of Residential Deposits	0.141	0.225*	0.253**	0.246**	0.132	0.136
	(1.36)	(1.93)	(2.21)	(2.13)	(1.16)	(1.19)
Conservative Party		0.140***	0.128***	0.151***	0.114***	0.115***
		(4.55)	(4.20)	(4.59)	(3.35)	(3.35)
Age		0.005**	0.005**	0.004*	0.004*	0.004
		(2.02)	(2.12)	(1.85)	(1.76)	(1.57)
Female		0.029	0.031	0.030	0.055	0.050
		(0.74)	(0.77)	(0.72)	(1.27)	(1.19)
GDP Growth			5.444***			
			(6.71)			
HPI Growth			0.331			
			(0.59)			
Observations	1,809	1,809	1,809	1,809	1,809	1,809
Adjusted R-squared	0.010	0.142	0.169	0.224	0.246	0.245
Other Controls	NO	YES	YES	YES	YES	YES
Electoral District FE	NO	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	YES	YES	YES

Appendix Table 3: Alternative Measure of Bill Proposals

We report our baseline regression using an alternative measure of Congress members' bill proposal behaviors. We define *Reluctance of Tightening Real Estate (Alt)* as a dummy that equals to 1 if the ratio of tightening real estate bills to total real estate bills proposed by a Congress member i is below the median in the distribution of that in year t. Regression specifications are the same as in Table 2. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate (Alt)			
Ratio of Real Estate	0.142	0.213**	0.210**	0.211**
	(1.47)	(2.03)	(2.00)	(2.00)
Log (Total Assets)	0.020	0.032	0.031	0.029
	(1.29)	(1.48)	(1.42)	(1.33)
Leverage	0.037	0.100	0.101	0.120
	(0.54)	(1.09)	(1.09)	(1.29)
Ratio of Cash	0.066	0.231*	0.230*	0.251**
	(0.59)	(1.83)	(1.81)	(1.97)
Ratio of Residential Deposits	0.091	0.305**	0.298**	0.296**
	(0.74)	(2.15)	(2.09)	(2.08)
Conservative Party		0.079**	0.083**	0.096***
		(2.40)	(2.50)	(2.80)
Age		0.008***	0.008***	0.008***
		(3.15)	(3.17)	(3.03)
Female		0.068	0.068	0.068
		(1.43)	(1.42)	(1.40)
GDP Growth			-1.157	
			(-1.29)	
HPI Growth			0.542	
			(0.71)	
Observations	1,809	1,809	1,809	1,809
Adjusted R-squared	0.001	0.035	0.035	0.037
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Year FE	NO	NO	NO	YES

Appendix Table 4: The Effect of Real Estate Ownership on Other Tightening Economic Policy Bills

We report the regression results on the effect of real estate ownership on other tightening economic policy bills. The dependent variable is *Tightening Economic Policy*, a dummy variable that equals to 1 if a Congress member i proposes any tightening non-real estate economic policy in year t and 0 otherwise. Regression specifications are the same as in Table 2. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

	(1)	(2)	(3)	(4)
	Tightening Economic Policy			
Ratio of Real Estate	-0.046	0.065	0.041	0.006
	(-0.81)	(0.88)	(0.57)	(0.09)
Log (Total Assets)	-0.043***	-0.059***	-0.063***	-0.049***
	(-4.12)	(-3.99)	(-4.40)	(-3.49)
Leverage	-0.043	-0.103	-0.094	-0.108*
	(-0.89)	(-1.64)	(-1.54)	(-1.81)
Ratio of Cash	-0.036	-0.036	-0.060	-0.127
	(-0.54)	(-0.42)	(-0.73)	(-1.56)
Ratio of Residential Deposits	0.087	0.060	0.023	-0.022
	(1.14)	(0.63)	(0.25)	(-0.25)
Conservative Party		-0.071***	-0.057**	-0.079***
		(-2.81)	(-2.33)	(-3.20)
Age		-0.005***	-0.006***	-0.006***
		(-2.79)	(-2.93)	(-3.00)
Female		0.023	0.015	0.008
		(0.67)	(0.45)	(0.25)
GDP Growth			-5.936***	
			(-8.16)	
HPI Growth			0.312	
			(0.81)	
Observations	1,809	1,809	1,809	1,809
Adjusted R-squared	0.012	0.183	0.230	0.315
Other Controls	NO	YES	YES	YES
Electoral District FE	NO	YES	YES	YES
Year FE	NO	NO	NO	YES

Appendix Table 5: Controlling for Time-Varying Local Interests or Economic Conditions

We report the robustness of our results with additional controls for time-varying local interests or economic conditions. Panel A includes additional controls at the electoral district level in the same manner of Mian et al. (2010). Column (1) reports the same result as in Column (4) of Table 2, but with a smaller sample size due to missing additional controls. Column (2) includes *Fraction of Workforce in Financial Industry* and *Fraction of Workforce in Real Estate Industry*. Column (3) includes variables regarding education: *Fraction of Under High School* and *Fraction of Graduates* Column (4) includes *Fraction of People in Poverty*. In Panel B, we re-estimate Table 2 by replacing *Electoral District* fixed effects with *Metropolitan* or *Metropolitan* × *Year* fixed effects. See Appendix Table 1 for the variable descriptions. The t-statistics reported in parentheses are based on standard errors clustered at the Congress member level. ***, **, * denote 1%, 5%, and 10% statistical significance.

Panel A: District-level Controls	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Real Estate	0.163**	0.170**	0.164**	0.164**
	(2.09)	(2.16)	(2.07)	(2.07)
Log (Total Assets)	0.028	0.028	0.027	0.027
	(1.33)	(1.34)	(1.27)	(1.29)
Leverage	0.121	0.125	0.116	0.112
	(1.59)	(1.65)	(1.50)	(1.44)
Ratio of Cash	0.269***	0.276***	0.271***	0.268***
	(2.68)	(2.75)	(2.69)	(2.66)
Ratio of Residential Deposits	0.135	0.148	0.152	0.154
	(1.18)	(1.27)	(1.31)	(1.33)
Conservative Party	0.113***	0.115***	0.116***	0.113***
	(3.31)	(3.39)	(3.45)	(3.31)
Age	0.004	0.004	0.004	0.004*
	(1.55)	(1.55)	(1.64)	(1.69)
Female	0.049	0.049	0.046	0.048
	(1.16)	(1.15)	(1.09)	(1.12)
Fraction of Workforce in Financial Industry		2.090	2.887	3.093
		(1.01)	(1.43)	(1.50)
Fraction of Workforce in Real Estate Industry		-4.407	-4.375	-4.570
		(-1.10)	(-1.10)	(-1.14)
Fraction of Under High School			4.122*	4.026*
			(1.90)	(1.83)
Fraction of Graduates			9.566	9.710
			(1.17)	(1.19)
Fraction of People in Poverty				-4.234
				(-0.87)
Observations	1,807	1,807	1,807	1,807
Adjusted R-squared	0.244	0.244	0.246	0.245
Other Controls	YES	YES	YES	YES
Electoral District FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

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Appendix Table 5 continues

Panel B: Metropolitan × Year FE	(1)	(2)	(3)	(4)
	Reluctance of Tightening Real Estate			
Ratio of Real Estate	0.162**	0.144**	0.156***	0.168***
	(2.28)	(2.42)	(2.65)	(2.70)
Log (Total Assets)	0.048***	0.030**	0.033**	0.028*
	(3.25)	(2.09)	(2.26)	(1.84)
Leverage	0.014	0.092	0.084	0.056
	(0.22)	(1.48)	(1.36)	(0.87)
Ratio of Cash	0.157*	0.161**	0.178**	0.173**
	(1.72)	(2.03)	(2.28)	(2.17)
Ratio of Residential Deposits	0.069	0.096	0.123	0.160*
	(0.69)	(1.08)	(1.42)	(1.80)
Conservative Party		0.076***	0.068***	0.067**
		(3.15)	(2.81)	(2.55)
Age		0.002	0.002	0.001
		(0.89)	(1.08)	(0.51)
Female		0.057	0.060	0.043
		(1.48)	(1.55)	(1.10)
GDP Growth			5.921***	
			(8.11)	
HPI Growth			0.050	
			(0.10)	
Observations	1,815	1,815	1,815	1,815
Adjusted R-squared	0.009	0.151	0.183	0.271
Other Controls	NO	YES	YES	YES
Metropolitan FE	NO	YES	YES	NO
Metropolitan × Year FE	NO	NO	NO	YES