Empirical Evidence of Anchoring Effect in Litigations[†]

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Abstract

Given its wide acceptance, it is surprising that the empirical, rather than experimental, evidence for anchoring effect is rare and inconclusive. We offer the first large-scale court evidence for anchoring in judicial decision-making. Using Taiwan's court cases on trespassing, matched with transaction data of lands and another dataset on judge experience, we provide evidence that the plaintiff's claim strongly anchors the court's judgment: Both the plaintiff's claim and defendant's counter-claim significantly influence the decisions of the less-experienced judges, but not the more-experienced judges. Therefore, we not only provide evidence for anchoring in litigation, but also suggest experience as a crucial debiaser.

Keywords

Anchoring effect, litigation, compensation, unjust enrichment, rental yield rate, judicial yield rate, hedonic estimate, land price, judge's experience

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1. INTRODUCTION

The anchoring effect refers to the cognitive bias in which human decisions rely too much on the first piece of information encountered, or other (even possibly irrelevant) information in their consciousness. Its power in affecting decision-making is well established in the literature of psychology,[1] and is also well received in law, management, economics, and in fact almost every discipline in social science.[2] Given this acceptance, it is surprising to find that the empirical, rather than experimental, evidence in support of the anchoring effect is rather scarce and inconclusive. This scarcity is mainly due to the difficulty faced by empirical studies that, unlike experimental studies, for real-world decisions there does not exist a "control group" against whose "fair" or "correct" decision the distortion in outcome of the "treatment group" can be measured, and thereby attributed to anchoring. The evidence offered for anchoring has thus been predominantly experimental.[3]

In the empirical literature, several strategies have been adopted by economists to overcome the difficulty mentioned above, mainly by way of the "hedonic value". For example, Beggs and Graddy (2009) and Graddy et al. (2014) collected data on the auction prices for paintings, and provided evidence that the strike price of a painting (or its reservation price) is positively correlated with its previous sale price.[4] For real estate transactions, data on land characteristics and prices can be used to estimate the land's hedonic value, thereby enabling investigators to identify deviation from the

[1] See Tversky and Kahneman (1974) and Kahneman and Tversky (1979) for seminal contributions, and Kahneman, Slovic, and Tversky (1982) and Gilovich, Griffin, and Kahneman (2002) for important later contributions.

[2] See, for example, Kahneman and Tversky (2000), Ariely (2008), Thaler and Sunstein (2008), and Kahneman (2011). The anchoring effect is highly related to the more general class of bias proposed in prospect theory. See DellaVigna (2009) for an excellent survey of field evidence.

[3] The experimental literature is too large to survey here. Please see Gilovich et al. (2002), Ariely (2008), Camerer and Tally (2007), and Furman and Boo (2011) for general discussion, and Ariely et al. (2003) and Maniadis et al. (2014) for two of the representative publications.

[4] Other evidences from auctions are Ariely and Simonson (2003) and Kamins et al. (2004).

hedonic value as caused by a specific anchor in question. Therefore, price deviations from this hedonic value can be attributed to various interpretations of anchoring. (See, for example, Bokhari and Geltner (2011) and Lambson et al. (2004).)

Among decisions that might be subject to the influence of the anchoring effect, legal decisions arguably result in the most serious consequence, as they directly affect the material welfare, freedom, or even life of the people involved. What is more, those who are affected by anchoring usually fall victim to other people's cognitive bias (such as a jury's or judge's), rather than that of their own. Indeed, legal scholars have repeatedly cautioned against the influence of the anchoring effect in legal decisions (e.g., Sunstein 2000, Bibas 2004, and Miller 2013).

The evidence in support of the anchoring effect in legal decisions, however, is even more predominantly experimental. For an example of earlier experimental studies, Chapman and Bornstein (1996) recruited undergraduate students as mock jurors to investigate their judgments on personal injury cases. They found that for cases with the same extent and nature of injury and with the same evidence, the jurors gave higher judgments if the plaintiff had requested a higher amount of compensation.[5]

A critique of these experiments might be that the respondents who served as mock jurors were not in the legal profession. More knowledgeable legal professionals, such as judges and lawyers, might be aware of the trap and be able to correct the bias caused by anchoring. Additional experimental evidence shows that the influence of the anchoring effect extends to the legal profession as well. In Rachlinski et al. (2006; 2007), 113 bankruptcy judges were recruited to participate in an experiment on setting the interest rate on a restructured loan. The subjects were randomly assigned to two groups. In the anchor group, judges received the message that "both parties have agreed that

[5] For experiments in a similar spirit, see Hastie, Schkade, and Payne (1999) and Viscusi (2001).

the original contract interest rate of 21% is irrelevant." The control group received the message that "both parties have agreed that the original contract interest rate is irrelevant." While the message for the anchor group and that for the control group differ only in whether the number "21%" was included, it was found that judges in the anchor group awarded significantly higher interest rates.[6] For criminal cases, Englich and Mussweiler (2001) recruited German criminal trial judges to examine their sentencing decisions for identical hypothetical cases of alleged rape. Their experimental results indicated that the judgments were strongly influenced by the prosecutor's sentencing demand.

We are aware of only one study that used real court data to test for the anchoring effect. Ebbesen and Konečni (1975) collected real court hearing data regarding bail-setting of 5 judges from the San Diego felony arraignment court. It was found that the district attorney's recommendation on bail served as a strong anchor: after controlling for the defender's background and the categories of the crime, the judge's decision was almost exclusively determined by the district attorney's recommendation. Their result, however, is subject to two constraints, one pertaining to data, the other to methodology. The data contained only 23 observations from 5 judges, which casts doubt on how statistically significant the identified relationship is. Moreover, and perhaps more importantly, since the amount of bail is positively related to the severity of the crime (see, e.g., Goldfarb and Goldberg 1965), more severe crime corresponds to a higher level of bail, both recommended by the district attorney and set by the judge. Therefore, a positive relationship between the two might only reflect the severity of the crime, rather than the anchoring effect.[7]

[6] See also Guthrie, Rachlinski, and Wistrich (2000) and Wistrich, Guthrie, and Rachlinski (2005) for related experiments.

[7] To be sure, Ebbesen and Konečni (1975) did control for the categories of the crime. However, the control might not be convincing given 14 categories of crime and only 23 observations.

All taken, the discussion of literature above points to the fact that, despite the calls from the legal profession for policies to correct the unequal outcomes caused by anchoring,[8] an empirical study with relatively large-scale real court data and thorough statistical analysis on whether the courts' decisions are subject to anchoring is surprisingly lacking. Although the experimental literature as a whole offers convincing evidence for the anchoring effect in legal decisions, they are all decisions made in the laboratory. While ingenious design of experiments can clearly distill elements of the decision-making which are solely due to the influence of anchoring, they are only hypothetical cases. Moreover, many experiments design novel and strong anchors so that the subjects can easily fall into the "trap" of anchoring, a fact also pointed out by Maniadis et al. (2014). As such, scholars are yet to be convinced that judges are really subject to this bias in real litigation and, even if they are, whether the extent is great enough to warrant our attention or whether their experience can help them out of this.

In this paper, we provide court data on the decisions of judges in Taiwan for cases regarding compensation to landowners for trespassers' unlawful use of land, and investigate whether and to what extent the judges' awards are influenced by the requests of the plaintiffs. In other words, we test whether the plaintiff's claim is an anchor for the judgment in an actual civil litigation setting. The data and methodology have two advantages over those of Ebbesen and Konečni (1975). First, compared with only 23 cases in their empirical study, our full dataset contains 577 observations. Second, by matching the litigation data with the land transaction data and a dataset on the experience of the judges, we not only can control for the aforementioned possible correlation between the plaintiff's request and the judge's award that is not caused by anchoring, but also can investigate the role of the judge's experience. The nature of the

[8] e.g., Sunstein 2000, Bibas 2004, and Miller 2013.

data for cases of trespassing of lands also has an additional advantage in that the plaintiffs generally do not provide much verifiable information during trials beyond what is already revealed by the land transaction data, making their demands of compensation a weak objective evidence for the judgements (see Sections 2 and 7 for details).

We find strong evidence for the anchoring effect: After controlling for the correlation between the plaintiff's claim and the judgment that is caused by the variation in land values and other attributes, we find the judge's ruling to be strongly and positively related to the plaintiff's claim. Furthermore, neither the defendants' counterclaims nor cases handled by a three-judge panel have any effect on this relationship. However, if we take the judge's experience into consideration, then the above results are substantially altered. Specifically, we separated all cases into two groups, one whose judges' experience is above the sample median and the other below. For the less-experienced group, the plaintiff's claim has an even stronger effect on judgment than when experience is not controlled for. Moreover, the defendant's counterclaim has a negative effect on the judgment, implying that it ameliorates the plaintiff's claim. Finally, the three-judge panel exacerbates the effect of anchoring in that, for the cases handled by a panel with three less experienced judges, the court ruling is more strongly related to the plaintiff's claim than cases handled by a single judge. On the other hand, in the group with more-experienced judges, neither the plaintiffs' claim or the defendant's counter-claim, nor the three-judge panel has any significant effect on the judgment. Taken in all, our results not only provide evidence for the anchoring effect in real litigation, but also identify the judge's experience as a powerful debiaser. Furthermore, group decision-making by inexperienced judges can exacerbate the influence of anchoring.

Similar to Lambson et al. (2004), Bokhari and Geltner (2011), Beggs and Graddy

(2009) and Graddy et al. (2014), we used past transactions to build up a hedonic estimate, so that anchoring effect can be measured against this benchmark. However, our methodology is much more complicated in that corresponding to every dispute target (i.e., land's yield rate), there are three endogenous variables: the judicial judgment, the plaintiff's claim, and the defendant's decision of whether to contest the plaintiff's rate. As such, a structural model is required to endogenize these decisions. Moreover, since it is impossible to obtain land values (and rents) and judge experience from the written judgments, our data is constructed by matching three distinct dataset: one for disputes, one for land transactions, and another for judge experience.

Any evidence that lends support to anchoring in this type of study must face the challenge that the plaintiff's demand conveys information (observable or not) which influences the judgement. Therefore, the positive correlation might reflect information, rather than anchoring. In Sections 2 and 7, we explain in detail how our data and methodology can to a great extent overcome the challenge.

2. INSTITUTIONAL BACKGROUND

In this section we provide the institutional background for our research questions and data. We first explain the practice of trespassing litigation in Taiwan, then discuss several local measures of land prices upon which the judges and plaintiffs base their decisions regarding compensation.

2.1 Unjust Enrichment Law Regarding Unlawful Possession in Taiwan

As the trespassers of land usually do not cause the landowner any actual harm, the landowners in Taiwan generally base their claims in unjust enrichment (or restitution) law. A major distinction between a tort claim and an unjust enrichment claim is that the

plaintiff does not have to demonstrate any harm in the latter; rather, she needs to establish that the defendant has benefited at the expense of the plaintiff without any justifiable cause. The question is then: How should judges decide the amount of this benefit and, therefore, compensation?

The conventional wisdom of law and economics is that courts should "mimic the market" (Posner 1998). Indeed, several countries have concluded that unjust enrichment in this context is equivalent to rent — a hypothetical rent that both parties would have agreed on if they had bargained for it before the land in question was used non-consensually. For example, in the U.S., according to the Restatement (Third) of Restitution and Unjust Enrichment §40 comment b., defendant's unjust enrichment may be identified with ordinary rental value. Courts and scholars in Germany also use "equivalent to rent" as the standard for calculating compensation to landowners.[9]

In Taiwan, the case law has long established the "equivalent to rent" doctrine. More specifically, courts in Taiwan, following a Supreme Court precedent in 1972, employ the formula *Rent=(Land Value)×(Yield Rate)* to calculate the rent.[10] In other words, the annual rent should be computed by multiplying the owner's pre-filed self-assessed land value[11] by an annual market real estate rental yield rate (hereinafter "market yield rate" or "rental yield rate"). To date, this formula has become the guiding post for cases of unjust enrichment of land because of the precedential authority and the ease of its application by judges.[12]

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[9] The scholarly literature in Germany and the U.S. does not describe in detail how courts in practice assess the amount of rent, though one could reasonably guess that the assessment procedure would involve appraisers who use rent value of comparable land as a basis for the assessment.

[10] While this formula, called the income capitalization approach, is used by appraisers to assess the value of commercial buildings (see, e.g., Huber, Messick, and Pivar 2006, pp. 309–31), we did not find any appraisal books (English or Chinese) advising appraisers to calculate rent based on this formula.

[11] All the official measures of land value will be discussed in the next subsection.

[12] This formula is not used in every case. When the two parties had a lease before the unlawful possession, courts often use the rent stipulated in the expired lease to calculate the compensation due to plaintiffs. This type of case accounts for most court cases that are sampled but not coded, as no yield rate was determined. Hence, we delete these cases from the database.

In order for the judges to apply the formula to compute the rent to be compensated, he must first decide the land value and its yield rate. The land value is hard to obtain, as before August 2012 the transaction prices and rents of land were never disclosed to the public (including the judges). The judges overcome this difficulty by quoting one of several official measures of land value. The definitions of these measures are explained in detail in Section 2.2. These measures, as we will see in that section, are seriously under-valued.

As to the yield rate, no law or doctrine prescribes how judges set the rental yield rate for compensation (the yield rate set by the judges in their judgments is hereinafter referred to as the "judicial yield rate"), except for two restrictions. The first is the stipulation in Articles 97, 105 and 110 of the Land Act of 1946 of an 8% ceiling on arable land and a 10% ceiling on non-arable land. The second is the civil-procedural doctrine that inhibits courts from awarding a judicial yield rate higher than the plaintiff's claimed yield rate (hereafter the "plaintiff claim rate"). Though the first two of the above articles regulate the yield rate of urban residential land and buildings only, almost all judges apply the cap to urban non-residential land, and rural land and buildings as well.[13] In summary, courts in Taiwan have discretion in determining the judicial yield rate,[14] as long as it is within the statutory cap of 10% or 8%, and is no larger than the plaintiff's claim rate.

Against this background, parties do not make claims — and judges do not adjudicate — based on real market values or market rental yield rates of land, as they were not available. Instead, parties and judges provide only casual reasoning, and

[13] In about a dozen cases, courts consider the 10% cap to be non-applicable. Nonetheless, in only two cases, the awarded judicial yield rate is above 10% (30% and 15%). These two cases are omitted from our analysis.

[14] Note that the judicial yield rate is a rental yield rate for real estate, not a "prejudgment interest rate" (Knoll 1996) or "judicial interest rate" (Acciarri and Garoupa 2013). Probably because lawyers and courts in Taiwan confuse judicial yield rates with prejudgment interest rates (the Chinese terms for them are the same!), no plaintiff asks for awarding of prejudgment interests.

neither appraisers nor real estate experts have ever been brought to the court as expert witnesses. When making decisions, the judges are only helped by several official measures of land value and their own field trips. The lack of an objective standard in calculating the market yield rates, compounded by the absence of expert witnesses, makes it an ideal setting for testing whether the yield rate claimed by the plaintiff has any influence on the judge's assessment, i.e., whether the plaintiff claim rate serves as an anchor to the judicial yield rate.

2.2 Assessment of Market Value of Land

Assessing the market value of land through the comparable sale approach should be highly technical and hard for career judges without appraisal training, but the judges in Taiwan avert this difficulty by putting "pre-determined" land value into the aforementioned formula. There are, however, three types of pre-determined land value: self-assessed Declared Land Value (DLV), Publicly Announced Land Value (PALV), and Assessed Current Land Value (ACLV). These land values are assessed in the following way: Every three years, local governments in Taiwan assign a PALV to each land parcel. Landowners are then allowed to report a self-assessed DLV (which is the basis for property taxes) to replace the PALV, as long as the DLV is between 80% and 120% of the PALV (Chang, 2012). The default tax rule is that if the private landowners do not declare a DLV, it is presumed to be 80% of the PALV (without any adverse effect). Consequently, almost no landowners bother to take any action. In short, for privately owned land, DLV=0.8×PALV.[15] As for the ACLV, every year the local governments in Taiwan assign an ACLV to each land parcel. It is used as the benchmark for levying land value increment tax.[16] Every three years the local governments announce ACLV

[15] For public land, pursuant to statutory fiat, DLV=PALV.
[16] For an introduction of the PALV and the ACLV, see Chang (2009).

and PALV on the same day.[17]

A fourth measure, the "government-assessed market value", is the land value used internally in local governments as a basis to determine ACLV and PALV. There is evidence, however, that this market value as assessed by the government is inaccurate and tends to under-evaluate the actual market value (Chang 2009). Government-assessed market value is assessed at the district level, not at the parcel level, and is not publicly available. The fact that both the PALV and the ACLV are below government-assessed market value is widely known in Taiwan, as the central government publicizes the ratios of the PALV to government-assessed market value and the ratios of the ACLV to government-assessed market value on the official website of the Department of Land Administration, Ministry of the Interior.[18] In 2013, the PALV was on average 20% of government-assessed market value. It suffices to know for our study that neither the three official values, nor the "government-assessed market value" accurately reflects actual market value, as transaction prices of lands were never made public before August of 2012.

Since August 2012, however, the prices of all real estate transactions and rents of certain real estate leases (together with their land characteristics) have to be disclosed to the public, and are available for free from the government. In other words, comprehensive and accurate data on sales, and selective data on leases, are available for land parcels that were transacted since August 2012. These data enable us to construct hedonic equations for land prices and rents, thereby estimating the market prices, and especially the market yield rates, of the land in our dispute data.[19]

[17] Despite this, ACLV and PALV drastically differ from each other.
[18] The information is available at http://www.land.moi.gov.tw/chhtml/content.asp?cid=14&mcid=194.
[19] Ideally, we should use the land prices in the published data for the rent formula in our study. Unfortunately, not a single land in the dispute data had a transaction.

3. RESEARCH QUESTIONS

This section explains why the legal context of unlawful possession and unjust enrichment in Taiwan is ideal for our purpose, and lays out our three major research questions regarding the anchoring effect.

In the cases we study, judges ultimately make decisions on the amount of unjust enrichment equivalent to rent, but the judicial rent is not the unit of our analysis. As described above, rents are computed by multiplying land values by yield rates. For the land values, the plaintiffs almost always quote DLV or ACLV as the base measure to claim compensation, and the judges almost always concur.[20] We thus focus on the judicial yield rate, as it is essentially the only discretion for the judges in the formula (while land value and rent are not). Our first research question is therefore whether the plaintiff claim rate serves as an anchor to the judicial yield rate. Specifically, is the judicial claim rate positively related to the plaintiff claim rate, all else being equal?

Consideration of the anchoring effect is particularly appropriate in the legal context we study for the following reasons. Unlike most lawsuits, the plaintiff in an unjust enrichment lawsuit before a judge in Taiwan does not have to "prove" how she comes up with the claimed yield rate, nor does she need to provide evidence of the market yield rates or the market value of the land. Most plaintiffs at most vaguely claim that their land is located in a thriving neighborhood, but the association of their arguments with the specific claimed yield rate is ambiguous. The defendants and the courts are no exception in this regard. This is mainly due to the fact that, before August 2012, the transaction prices or rents of land parcels were never released. Therefore, the litigants cannot base their claims or counterclaims on objective measures of the real

[20] In two observations the plaintiff quoted PALV for land value while the judge quoted DLV. In general DLV = 0.8 x PALV, so we multiply the plaintiff's claimed rate by 1.25=(1/0.8) with upper bound 10% as the plaintiff's claim rate. We also ran regressions with these two observations deleted, and found no difference in any result.

return; neither can the judges when they make decisions for the judicial yield rates. This is further exacerbated by the fact that, as explained in Section 2, various official measures of land value not only vastly underestimate their market value, but also greatly differ from one another. As a result, the courts have a large discretion in determining the judicial yield rates within the two types of cap mentioned in Section 2. This discretion opens up the possibility for the judges to be subject to anchoring. Finally, for reasons given in Section 7.2, no expert witness testifies in the court and, as a common law country, there is no pre-trial discovery procedure in Taiwan. Both imply that little objective information is revealed in the plaintiff's brief.

This said, the judges and the litigants are not completely in the dark regarding the values and returns of the lands. Though flagrantly underestimating their true values, official indices do provide some information about the land's market value and return. The judges also make field trips to learn of the characteristics and surrounding environments of the land parcels in disputes. To the extent these pieces of information help the litigants and the judge form their own estimates of the yield rates, the judge's and the plaintiff's estimates must both be positively related to the market yield rates, which in turn creates a positive correlation between the plaintiff claim rate and the judicial yield rate. Such a positive correlation, however, only reflects the fact that they are both correlated with the land's market yield rate, rather than the anchoring effect in action.

In the controlled experiments (which most of the literature reviewed in Section 1 relies on), the subjects can be asked to give judgments on an identical case, so that the researcher can directly test for the correlation between the plaintiff's claim and the judgment. By contrast, in the real-world data such as ours, there is only one judgment for every case, and no two cases are the same. The variation in the land parcel's characteristics in different cases creates a seemingly positive correlation between the

plaintiff claim rate and the judicial yield rate. As explained, this is not an anchoring effect, and is only a confounding factor. In order to identify the anchoring effect, we must filter out the correlation that is solely brought about by the variation in the land's yield rates.

We are thus interested in the deviations of both the plaintiffs' claims and the judicial yield rates from the market yield rates. These deviations are components of the plaintiff claim rate and the judicial yield rate that are not justified by the publicly available information. We run a regression for the judicial yield rate's deviation from the market yield rate (hereafter called the "excess judicial yield rate") against the plaintiff claim rate's deviation from the market yield rate (hereafter called the "excess plaintiff claim rate"). If the latter positively influences the former, then the judges' decisions on the rental rates are biased by the anchor set by the plaintiff's claims. Our first hypothesis is therefore that the excess judicial yield rate is positively correlated with the excess plaintiff claim rate.[21]

Prior empirical literature has examined the relation between court-adjudicated pecuniary damages and court-adjudicated non-pecuniary damages (Hans and Reyna 2011), or that between a plaintiff's claim of pain and suffering damages and a judge's award of pain and suffering damage (Chang et al. 2015; Chang et al. 2017 forthcoming), and conjecture that the statistically significant correlations between the two variables could be explained by anchoring.[22] As explained above, the correlation might only reflect the positive relation between the case value and the claim/judgment. Our data and study are unique because although the market yield rate, an objective standard, is

[21] One might argue that the access plaintiff claim rate might still contain unobservable information, so that this information is correlated with both excess rates. This corresponds to a positive correlation between the error terms for the excess claim rate equation and the excess judicial yield rate equation. In Section 6.2, we will show that the correlation is actually negative, implying that these unobservables have opposite impact on the excess plaintiff claim rate and the excess judicial yield rate.

[22] To be fair, these papers only aim to record the positive relationship between claim and judgment, not to prove an anchoring effect.

not available, it can be estimated by the hedonic equations based on publicly observed land characteristics and transaction prices (and lease rents) available after August 2012. Besides, as we will see below, using maximum likelihood estimation for the structural equation model enables us to control for the unobservable factors when estimating the anchoring effect.

The second research question is whether the anchoring effect, if it exists, is strengthened or weakened when a case is handled by a three-judge panel. Under Taiwan's civil procedure law, a single judge handles cases in the court of the first instance. Nonetheless, when a case is (randomly) assigned to a junior judge (one with less than 2 years of experience on the bench), two senior colleagues will join her to form a panel.[23] This happened in 8.8% of our observations (see Panel B of Table 1). This procedural rule enables us to compare the effect of anchoring between cases determined by a single judge and a three-judge panel. The purpose of a three-judge panel is obviously to help the junior judges avoid possible errors in procedure or decisions that are caused by lack of experience. However, the "group polarization theory" (Sunstein et al. 2002, pp. 57–61) also suggests that a panel of three judges might even be more likely to render extreme decisions than a single judge. We take advantage of this rule to examine whether the plaintiff claim rate has a different impact on the judicial yield rate if, instead of a single judge, the case is deliberated by a panel of three judges.

A word of caution is that by the nature of the judicial procedure, a three-judge panel must include one junior judge. There can thus be two possible differences in the single- and three-judge panels: one is the judge's experience; the other is the number of judges. Therefore, the result of test should not be interpreted as group effect per se,

[23] Experience of two years is considered to be little. See the last paragraph of Section 6.

but a suggestive evidence on how a group with three judges containing an inexperienced judge will make any difference.

Finally, and perhaps most importantly, an additional dataset that we acquired on the judges' background enables us to more precisely measure the experience of the judges, thereby making it possible to pose the third research question, namely whether experience has any implication on the anchoring effect. Certain evidence has shown that experience can alleviate the influence of anchoring (Wilson et al., 1996; Furnham and Boo, 2001, Alevy et al., 2015). Our hypothesis is therefore that more experienced judges are less susceptible to anchoring.

4. EMPIRICAL MODEL

4.1 Main Regression

Since courts in Taiwan employ the formula of *Rent= Land Value x Yield Rate* to determine the yield rate, we first construct the hedonic estimates of the market value and the lease rent of land by using the transaction data (for both land prices and lease rents) available after August 2012. We then plug the characteristics of the land parcels in our disputes data into the two hedonic equations to estimate their market values and market rents, and calculate the market yield rate (r) by dividing the estimated rent by the estimated land value. Finally, we calculate the deviation of judicial rate (R) from the market rate, R-r, and the deviation of plaintiff claim rate (b) from the market yield rate, (b–r), and regress the former against the latter and other covariates. Recall that R-r is exactly the excess judicial rate and b-r is the excess plaintiff claim rate.

There are, however, three additional complications in the model. The first comes from the regulation that the judicial yield rate cannot exceed the plaintiff's claimed rate, which implies that R is right-censored at b. The second complication is the 10% legal

cap on the yield rate that can be awarded, which affects the plaintiff's claim. (The 8% cap for arable land will later be taken care of by a dummy.) This essentially makes *b* right-censored at 0.1 (10%). The third is that the defendants who decide to contest the plaintiffs' claims (about 31% of all defendants) might be those who possess certain private information which is correlated with the judicial yield rate or the plaintiff's claimed rate. We therefore endogenize the defendant's decision of whether to contest the plaintiff's claimed rate.

We adopt a structural model to handle the upper limits restriction and endogeneity problem. The system consists of three equations for the judicial yield rates, the defendant's reactions, and plaintiff claim rates, respectively. Specifically, we run the following regression:

$$R_i - r_i = \begin{cases} R_i^* - r_i, & if \quad R_i < b_i, \\ b_i - r_i, & if \quad R_i = b_i, \end{cases} \tag{1}$$

$$R_i^* - r_i = (b_i - r_i)\gamma_1 + D_i\gamma_2 + Th_i\gamma_3 + C_i\beta_1 + X_i\beta_2 + e_{1i},$$

$$D_i = 1\big((b_i - r_i)\gamma_4 + X_i\beta_3 + L_i\delta_1 + Z_{i1}\delta_2 + e_{2i} > 0\big), \tag{2}$$

$$b_i = \min\{X_i\beta_4 + Z_{i1}\delta_3 + Z_{i2}\delta_4 + e_{3i}, 0.1\}. \tag{3}$$

In the equations, *R–r* is the observed excess judicial yield rate under the upper limit; R^*–*r* is the latent counterpart capturing the judges' true excess judicial rate without the upper limit; *b–r* is the observed difference between the plaintiff's claimed yield rate and the market yield rate (excess plaintiff claim rate); *D* in equation (1) is a dummy variable which equals one when the defendants contest plaintiff claim rates. It is to capture the impact of defendants' counterclaims on the judicial rates. In our data, 31% of the defendants either made specific counterclaims in yield rates (68 cases) or merely contended that the plaintiff's claimed yield rates were too high (112 cases). The litigation strategy of the other 69% of defendants was often to move for dismissal of the case altogether, with no second line of defense, whereas some defendants focused

on establishing their possession as legal. Since counter-claim might contain information not collected in our data that is correlated with judgements, we endogenize this decision in equation (2). The vector *Th* contains three variables: a dummy variable for a three-judge panel, an interaction term of three-judge panel and the excess plaintiff claim rate, and a dummy variable that equals 1 when the case was decided after August 2012, when market transaction data become available; *C* is a set of three dummy variables to capture the four combinations of whether plaintiffs and/or defendants are represented by attorneys; 1(A) is an indicator function, which equals 1 if condition A holds, and is 0 otherwise. The vector *L* contains a dummy variable on whether the defendant hired an attorney, together with the number of defendants.

The common explanatory variables in equations (1)–(3), *X*, mainly capture the information or factors that could explain the decisions of the judges, plaintiffs, and defendants. They basically contain land characteristics (size, location, zoning, timing, etc.) and the nature of the dispute (whether the plaintiff or the defendant is the state, etc.). Detailed definitions of variables in *X* and their summary statistics are relegated to Section 5.

Due to the nature of our problem, some specific explanatory variables, in addition to *X*, are added for equations (2) and (3). These potential determinants of the litigants' strategies (Z_I) include market rates and a dummy on whether the plaintiff was represented by lawyers. In addition, the excess plaintiff claim rate might have affected the defendants' decisions of whether to counterclaim, so this variable (*b*-*r*) is included in equation (2).

We include the number of defendants (*L*, in natural log) as the identifying instrumental variable in equation (2). The number of defendants is a proper identifying instrumental variable because the number itself should hardly affect how plaintiffs

claim or judges award land yield rates.[24] Moreover, in our coding, if any of the multiple defendants counterclaim, D is coded as 1. Therefore, the more numerous defendants are, the more likely it is that one of them will explicitly counterclaim.

Next we explain our specification of the attorney's role. First, we have reason to believe that defendants with attorneys are more likely to counter the yield rates claimed by plaintiffs, as this generally requires certain degree of legal reasoning. Therefore, whether the defendant hires lawyers is used as an explanatory variable in equation (2).[25] Second, plaintiffs do not know whether defendants will hire attorneys when making their claims;[26] thus, we do not add any variable regarding defendants' decision to retain attorneys in equation (3). Third, for judges, while attorney representation on both sides might affect their decisions, it is the combination of whether one or the other party hires attorneys that can more accurately capture the difference of mobilized legal resource—and such combinations are taken into account in equation (1).

In addition to X and Z_1, for the equation of the plaintiff claim rate (equation (3)) we add Z_2, which includes two variables: natural log of the numbers of plaintiffs, and a dummy variable that controls whether the land was arable. The latter variable is included because the Land Act of Taiwan stipulates that the cap on annual interest rates for arable land is 8%, rather than the aforementioned 10%. Whether the land in question is arable should not affect whether defendants explicitly object, and given that the plaintiffs have already taken into account the statutory cap for arable land, whether the

[24] We verify this condition of irrelevance by adding the log of the number of defendants in both equations (1) and (3) and then estimating the new system. The estimated coefficients are all statistically insignificant at the 10% level.

[25] On the other hand, there is a weak link between whether the plaintiff hires lawyers and the defendant's decision to counterclaim. In our data, the defendant counterclaims in 32% (26%) of the cases in which the plaintiff hires (does not hire) lawyers, and the difference is not significant. Indeed, the result in Table 4 shows that whether the plaintiff hires lawyers has no influence on the decision to counterclaim.

[26] Except the 3.1% government defendants, most defendants are natural persons. Besides, in civil litigation in Taiwan, less than 40% of defendants hire attorneys. Litigation is generally far less expensive than that in the U.S., so we conjecture that pre-trial negotiation in Taiwan may not be as lengthy and frequent as that in the U.S. All things considered, it should be reasonable to posit that plaintiffs, when making their claims, do not know whether defendants will hire attorneys.

land is arable should not affect judicial decisions, either. This arable land dummy is thus an identifying instrumental variable for equation (3). The variable on the number of plaintiffs is included, though we do not expect it to affect any of the three dependent variables substantially.[27] It is included in the third equation more as a control. As expected, it turns out to be statistically insignificant.[28]

The specifications in equations (1) and (3) are meant to capture the first and second aforementioned complications (the caps on the judicial yield rate and the plaintiff's claimed yield rate); and that in equation (2) is to capture the third complication, by endogenizing the defendant's decision of whether to contest the plaintiff's claimed yield rate. We use the Tobit model to control for the fact that the plaintiffs' claims are right-censored at 10% in our data. Since in our model the defendant's contest is coded as a binary variable *D*, we use the Probit specification for the defendant's behavior in reacting to the plaintiff's claimed yield rate. Under the assumption that the underlying errors are jointly normally distributed, we use the maximum likelihood method to estimate the structural model.[29]

Our main interest is in the values of the estimated coefficients γ_1, γ_3. If γ_1 is significantly greater than zero, then the excess judicial yield rate is positively affected by the excess plaintiff claim. Since the deviations from the market rate cannot be explained by either the observable land hedonic characteristics or the facts of the cases, and the effect of the unobservable information is controlled through the structural equation model (more on this in the next two paragraphs), we will interpret it as the

[27] A valid instrumental variable should not have a direct effect in (1). We verified this condition by adding the log of the number of plaintiffs, the log of the number of defendants, and a dummy for whether the land is arable or not in (1) and then estimated the new system. The estimated coefficients are all insignificant at the 10% level.

[28] Similarly, we added the log of the number of plaintiffs and a dummy for whether the land is arable in (2) and then estimated the new system. The estimated coefficients are all insignificant at the 5% level.

[29] The model becomes a mixed-process model with two right-censored equations (for equation (1), censored at the plaintiff's excess claim rate; and for (3), censored at 10% or not) and a Probit specification (equation (2), countered or not). We also set the variance of e_{2i} to 1 to identify the parameters.

judge's decision being led by the amount of the plaintiff's claim, which is an exhibition of the anchoring effect. The effects of group deliberation on the anchoring effect is captured by the vector, γ_3, which is the coefficients for the dummy variable for a three-judge panel itself and the interaction term of the three-judge panel dummy and excess plaintiff claim rate. Also of interest is the coefficient γ_2. It not only controls for the effect of counter-claim on the judgment, but can also be interpreted as a piece of anchor-inconsistent knowledge.[30] If the defendant's counter-claim is effect, or if it is indeed an anchor-inconsistent knowledge, γ_2 should be negative.

One of the most important features of our model is that we also control for the possible correlations between the errors terms in (1) - (3). If such correlations are present, it implies that there will be an endogeneity problem caused by certain unobservable information. Put differently, the plaintiff's claim might contain information beyond the market yield rate which also affects the judicial yield rate. If this is true, the positive relationship between the excess judicial rate and excess claim rate might only reflect the positive correlation between e_1, and e_3, rather than anchoring. One effective way to handle the potential endogeneity problem is to estimate the structural model with limited-information dependent variables by using the maximum likelihood approach (Wooldridge 2010, pp. 681–85, especially pp. 684–85 for estimation).[31,32]

Our system is more complicated than that in Wooldridge (2010), as we have three, instead of two, equations. Due to the multidimensional generalization of normal distribution, however, Wooldridge's estimation extends straightforwardly to the general

[30] SeeChapman and Johnson (1999); Mussweiler, Strack, and Pfeiffer (2000); Galinsky and Mussweiler (2001).

[31] For similar procedures using the maximum likelihood approach in linear models to control for the endogeneity problem, see Greene (2003, p. 402), Davidson and MacKinnon (2004, pp. 537–38), Davidson and MacKinnon (1993, pp. 644–51), and Cameron and Trivedi (2005, p. 191).

[32] In Section 7.2, we also discuss in detail our litigation data to show that in fact very little information is revealed in the plaintiff's claim beyond the market yield rate.

recursive model, and (1)–(3) can be combined into a multi-equation system with jointly normally distributed error terms to handle the endogeneity problem. More specifically, under the joint multivariate normality of the errors in (1) – (3), we can further let

$$\begin{pmatrix} e_{1i} \\ e_{2i} \\ e_{3i} \end{pmatrix} | Th_i, C_i, X_i, L_i, Z_{i1}, Z_{i2} \sim N \left(0, \begin{bmatrix} \sigma_1^2 & \rho_{12}\sigma_1 & \rho_{13}\sigma_1\sigma_3 \\ \rho_{12}\sigma_1 & 1 & \rho_{23}\sigma_3 \\ \rho_{13}\sigma_1\sigma_3 & \rho_{23}\sigma_3 & \sigma_3^2 \end{bmatrix} \right),$$

and then write the following to capture the endogeneity:

$$\begin{cases} e_{2i} = \eta_{23} e_{3i} + v_{2i} \\ e_{1i} = \eta_{12} e_{2i} + \eta_{13} e_{3i} + v_{1i}, \end{cases}$$

where η_{23} captures the directly effect of e_{3i} on e_{2i}, η_{12} and η_{13} capture the directly effects of e_{2i} and e_{3i} on e_{1i}, respectively, e_{3i}, v_{2i}, and v_{1i} are mutually (conditionally) independent with conditional distributions $N(0, \sigma_3^2), N(0, \tau_2^2)$, and $N(0, \tau_1^2)$, respectively, such that $\tau_2 = \sqrt{1 - \eta_{23}^2 \sigma_3^2}$, $\tau_1 = \sqrt{\sigma_1^2 - (\eta_{12}^2 + \eta_{13}^2 \sigma_3^2 + 2\eta_{12}\eta_{13}\eta_{23}\sigma_3^2)}$, $\rho_{23} = \frac{cov(e_{2i}, e_{3i})}{\sigma_3} = \eta_{23}\sigma_3$,

$\rho_{12} = \dfrac{cov(e_{1i}, e_{2i})}{\sigma_1} = \dfrac{(\eta_{12} + \eta_{13}\eta_{23}\sigma_3^2)}{\sigma_1}$, and

$\rho_{13} = cov(e_{1i}, e_{3i})/\sigma_1\sigma_3 = (\eta_{13} + \eta_{12}\eta_{23})\sigma_3/\sigma_1$. Thus, $\eta_{23} = \rho_{23}/\sigma_3$,

$\eta_{13} = \frac{\sigma_1(\rho_{13} - \rho_{12}\rho_{23})}{[(1-\rho_{23}^2)\sigma_3]}$, and

$\eta_{12} = \sigma_1\rho_{12} - \eta_{13}\rho_{23}\sigma_3 = \frac{\sigma_1[\rho_{12} - \rho_{23}(\rho_{13} - \rho_{12}\rho_{23})]}{1-\rho_{23}^2}$. While it is traditionally difficult to analytically derive the conditional density and numerically maximize the likelihood in a multi-equation system, Roodman (2011) provides a useful STATA CMP (Conditional Mixed Process estimator with random effects and coefficients) procedure, which can also be applied to instrumental system problems with different types of dependent variables in different equations, to estimate the system under the joint normality assumption.

4.2 Estimation of the Market Yield Rates

The value of one variable that is needed for our estimation, but is conspicuously

lacking in data, is the market yield rate (r). Identifying the market rental yield rates is therefore crucial for our examination of the anchoring effects. This subsection describes how we estimate this key variable.

As mentioned earlier, the market yield rates of land parcels equal their lease rents divided by their market values. Again, neither their lease rents nor their market values are known to the parties or the judges.[33] We therefore used the data for prices and rents of land from August 2012 to February 2013 to estimate the hedonic values and rents of land parcels as a function of their characteristics. We then plugged the characteristics of the land parcels in our dispute data into the estimated equation to compute their hedonic prices and rents in December 2012 (the last month of our research period, and the month with the most numerous observations of transactions). Finally, we estimated the market yield rate by dividing the estimated rent of a land parcel by its estimated price.

We run two ordinary least square regressions with robust standard errors, one for leases and the other for sales. The dependent variable is lease rents for the rent equation, and sale prices for the price equation. The independent variables control for the land size, zoning, transaction month, and the number of plots involved. Only simple land sales and leases are included. That is, transactions involving buildings were omitted, as the judicial cases we sampled are limited to simple land disputes.[34] The equations take the following form:

$$P_i = \alpha + \beta A_i + \delta Z_i + \eta M_i + \gamma S_i + v_i; \qquad (4)$$

Equation (4) can be either the land sale equation or the land lease equation. When (4) is the sale equation, P is natural log of sale prices. When (4) is the lease equation, P is

[33] Note that although transaction data were made public after August 2012, none of the lands in our dispute data were transacted after August 2012.

[34] For the reason why we exclude transactions involving buildings, please see the first paragraph of Section 5.

natural log of lease rents for the rent equation. A is the natural log of land area; N is natural log of the number of land plots involved; Z are the 9 zoning dummies that capture 10 types of zonings: non-urban (agricultural—not prime), non-urban (agricultural—prime), non-urban (industrial), non-urban (preserved), non-urban (residential), urban (industrial), urban (residential), urban (business), urban (agricultural), and urban (other);[35] M are dummy variables indicating the month of the transaction. S are a series of dummies indicating the strata of the town or city in which the land in question is located. Strata 1 to 7 represent central business district, industrial and business districts, growing towns, towns with traditional industries, less developed towns, aging towns, and least developed towns, respectively.[36] The variable v is the error term. The coefficients to be estimated are $\alpha, \beta, \delta, \theta, \eta,$ and γ.

5. DATA

Data for the judicial cases were taken from the Taiwan Judicial Yuan Law and Regulations Retrieval System. We chose keywords to limit our search to one specific factual pattern: unlawful possession of others' land. Unlawful possession of others' buildings, among others, was thus excluded, because buildings and land are two separate real estate classes in Taiwan (and in Japan and China as well),[37] and official value data for buildings do not exist. Also, since we are mainly concerned with how judgments are influenced by claims when the plaintiff is deemed entitled to

[35] For the price equation, all ten zonings are used as independent variables. However, for the rent equation, the numbers of observations for non-urban (industrial) and non-urban (preserved) are 2 and 3, respectively. We initially include these two categories in the rent regression, but find that the estimated market yield rates for these observations are extreme. Therefore, for the rent equation we exclude observations in these two categories.

[36] The stratum classification is based on Hou et al. (2008), following which, the 309 towns and boroughs (under counties and cities, respectively) in Taiwan can be categorized into seven tiers based on socio-demographic variables (including age, education, industrial structure, occupation, and personal income). Stratum 1 is the most developed, while 7 is the least. Our data have relatively few observations in strata 6 and 7. We therefore combine them and use it as the baseline.

[37] That is, a land parcel and the house upon it can be and are often owned by different persons. See also Chang, Chen, and Wu 2016.

compensation, cases in which the plaintiff entirely lost were not sampled. There are three waves of major reform in the Book of Things in the Taiwan Civil Code in 2007, 2009, and 2010. The research period between January 1, 2004, and December 31, 2012 was chosen, so that the data include cases as early as three years before the reform, and those rendered as late as about three years after the reform. Finally, we focused on decisions by the court of first instance, as most of the cases were handled by them, and many of these decisions were final (see Guthrie, Rachlinski, and Wistrich 2007, p.4; and Eisenberg and Heise 2015).

In all, 2956 cases showed up in our search. Since it is very costly to collect all disputes that occurred in our study period,[38] we randomly sampled 34% of the cases in each of the 21 district courts in Taiwan. After excluding small-claim and simple-proceeding cases[39] and excluding cases in which the judges did not determine a judicial yield rate (as judges may rely on contract rent), we had 698 cases, producing 818 observations. Due to missing values and other reasons,[40] we eventually had 496 cases, producing 577 observations for the regression analysis.

The common explanatory variables in equations (1) – (3), X, include: (i) natural log of the area of land that the defendant has encroached on; (ii) natural log of the "pre-determined land value ($/m^2) adopted by the court" (hereinafter the "judicial land value"[41]); (iii) a dummy variable that indicates whether the unlawful use of the land

[38] As there is no standard format for the written judgments, it is necessary to read each judgment to distill and record the information we need for the study. This is also the reason why the empirical literature surveyed in Section 1 that used real court data all had very small numbers of observations.

[39] Small-claims and simple-proceedings cases were excluded because the written judgments in these cases usually do not contain enough information about the cases.

[40] We exclude observations with special legal issues, those without accurate estimates of important variables, and those involving land in special locations. For instance, we exclude observations when development of the land in dispute was legally prohibited. In addition, in 15% of the originally sampled cases, the plaintiff claim rates were missing, and were deleted. Also deleted from the dispute data (but not the price equation) were the observations of lands in non-urban (industrial) and non-urban (preserved) zones (see footnotes 37 and 41).

[41] This is the land prices cited in the judgments. As said, it could be DLV, PALV, or ACLV. Also note that in our data, the judges and the plaintiffs both quote the same one of the three measures in every case except two. In unreported regression models, we have deleted these two cases, and the results are the

was commercial; (iv) the length of trespass; and (v) two dummy variables on whether the plaintiff or the defendant is the state.[42] Also included are dummy variables to capture year (*YR*), the strata of location (*ST*), and zoning (*ZO*) fixed effects.

YR is a series of dummies (one for each year) that controls the timing of the judgment. *ZO* are 5 zoning dummies that capture 6 types of zoning: non-urban (agricultural), non-urban (residential), urban (industrial and business), urban (residential), urban (agricultural), and urban (other).[43] We compress the 7 strata into two. The dummy variable *ST* equals 1 when the observations are in central business districts and industrial and business districts (strata 1 and 2), and equals 0 if in the less developed regions (strata 3–7).

Summary statistics of the variables used in the regression models (*X*, together with Z_1, Z_2, and *Th* discussed in Section 4.1) are shown in Panels A and B of Table 1. As expected, the average plaintiff claim rate (8%) is higher than the defendant's claim yield rate (4%, unreported in table),[44] while the judicial yield rate (6%) falls in between. The mean and median areas of land in dispute are 1618 and 90 square meters, respectively. Two important control groups in our analysis, cases chaired by three judges and cases in which the defendants countered with claimed rates, account for 8.8% and 31.2% of all cases, respectively.

The distributions of the plaintiffs' claimed rate by plaintiff type and land type are in Panels C and D of Table 1, respectively. As can be seen, claimed rates are concentrated at 10% (8%) for non-arable (arable), and 5% if plaintiff is government.

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same. Please also see footnote 24.

[42] Not all judicial decisions provide accurate information regarding the length of time. In 40% of the observations, only minimum length of time is known, as most courts interpreted the law to confer only five years of compensation, and thus from the judgment it is only clear that the encroachment had lasted for at least five years. In some cases, courts are simply obscure about the exact length of trespass. In order not to lose so many observations, we presume that the minimum length is the actual length.

[43] We have far fewer observations for the equations of dispute ((1)-(3)) and for the hedonic rent than for the price. Therefore, although there are 10 zoning variables for the price equation, there are only 7 for the dispute and rent equations.

[44] The defendant has a specific counterclaim rate in only 68 (12%) of all cases.

This raised a doubt as to whether our results are caused by variations in land and plaintiff types, rather than by variation in claimed rates. We will discuss this in detail in Section 7.1.

The data for prices and rents for constructing the hedonic prediction of land are from the Department of Land Administration of the Ministry of the Interior, which keeps records of all land transaction prices and the rents of certain leased land parcels since August 2012, and are available for free download. Our data contain hedonic characteristics and prices of the sales and lease rents reported from August 2012 to February 2013. The actual transaction months extend to before August 2012 and after February 2013. After filtering out observations that have missing values, we have 60,530 observations for sales and 364 observations for leases, as summarized in Table 2.

6. EMPIRICAL FINDINGS

In Section 6.1, we report the results for our regression of the hedonic valuation of the land (equation (4)) and discuss their implications. Based on the estimation and interpretation, in Section 6.2 we discuss our regression results for the test of the anchoring effect.

6.1 Market Rates versus Judicial Rates

Table 3 reports the results of the hedonic regression from equation (4). It captures the market sale prices and lease rents quite well, with the R-square values 0.73 and 0.56, respectively. Not surprisingly, land size is highly statistically significant at the 0.1% level. The sign, relative size, and statistical significance of the five stratum dummies, again not surprisingly, show that land parcels in better economically developed regions are rented and sold at a higher price. The regression coefficients enable us to estimate

the hedonic market values and lease rents of the land parcels under our dispute data and, more importantly, the market yield rates, which equal lease rents divided by market values. The distribution of the estimated market yield rates is shown in Figure 1.

Several facts from the estimation results are relevant to our interpretations of the anchoring effect. First, the estimated market yield rates are only weakly correlated with either the plaintiff's claimed rates or the judicial yield rates (the correlation coefficients are 0.175 and 0.107, respectively, and are significantly different from zero at the 1% level). This implies that judges and plaintiffs either do not have a firm grasp of the market yield rate or, even in the unlikely case that they do, they do not mainly rely on it to make their decisions.

Second, the estimated market land values and market rents are substantially higher than the court-adjudicated land values and rents. Figure 2 shows that the percentage of judicial land value (cited in the judgment) to market value ranges from 8.3% to 84.9%,[45] demonstrating its great variance and large divide between the two values. The fact that the land values cited in the judgments are almost always far lower than the market values is not surprising. As mentioned in Section 2.2, the three official measures of land price vastly underestimate their market values. Given this fact, the judicial yield rate should be high enough so that the judicial rent (i.e., the compensation to the plaintiff) can approximate the market rent. This, however, is not the case. Consequently, the judicial rent is also substantially lower than the market rent. Indeed, among the 568 observations with observed court-adjudicated rent, only 57 (10%) of them have the percentage of court-adjudicated rent to the estimated market rent greater than 100%; while 499 (88%) of the 568 observations have the value of the percentage smaller than 80%. (See Figure 3 for the distribution of the percentage of judicial rent divided by

[45] A majority of plaintiffs used self-assessed DLV as the measure of land value to claim compensation. The few observations whose percentages are higher than 60% in Figure 2 are those in which the plaintiff used ACLV.

market rent.) Given this and the fact that courts usually do not grant the yield rate claimed by the plaintiff, most judges do not appear to set judicial yield rates so that the court-adjudicated rents would approximate the market rents.[46]

6.2 Anchoring Effects

The estimation results for the structural model are reported in Table 4. The three columns show the results for equations (1), (2), and (3), respectively. The values of the three ρ's reported in Table 4 are all statistically significant, which indicates that the errors terms in (1) – (3) are mutually correlated. Therefore, the endogeneity problem caused by unobserved information that we mentioned in Section 4.1 does exist. It is important to note that the sign of ρ_{13} is *negative*. This implies that the unobservables actually cause the excess judicial rate and excess plaintiff claim rate to go in the *opposite* direction. As mentioned earlier, a possible concern in our methodology is that there might be certain unobservable information in the error terms which is correlated with the plaintiff claim rate and the judicial yield rate in the same direction, so that a positive relationship between excess judicial yield rate and the excess plaintiff claim rate might only reflect this unobservable information, rather than anchoring. However, our data show otherwise: The unobservable information embodied in the error terms is such that it affects the judicial yield rate and the plaintiff claim rate in the opposite directions. Given that ρ_{13} is negative, the estimated anchoring effect is actually greater, rather than weakened or disappears, when the impact of the unobserved information is

[46] Actually, most, if not all, legal professionals in Taiwan would not be surprised by this result. However, systematic under-assessment of rents has serious economic implications. Low court-adjudicated rents would induce potential land users to prefer trespassing to bargaining, as trespassing saves bargaining costs, prevents delays, and reduces the paid rent. The trespassers can even count on the possibility of lack of enforcement. This does not necessarily mean that the aforementioned court practice is inefficient, however. Judges may have "subsidized" the defendants because they view land as a precious resource that should not be left idle. By giving plaintiffs compensation below market rent, courts give landowners incentives to monitor their own land and to make use of it more diligently. We thank Justin Suk for this point.

controlled for.

In the first column, the coefficient of excess plaintiff claim rate is 0.576, and is statistically significant at the 0.1% level. This provides strong evidence for the anchoring effect: All else equal, a 1% increase in the plaintiff's claimed rate will increase the judicial yield rate by 0.58%. The second column of Table 4 shows that the defendants are more likely to contest the plaintiffs' claim rates when they hire lawyers and when the number of defendants is greater, results that are quite reasonable. Moreover, the plaintiff's claim rate is lower when the target of dispute is arable land and when the plaintiff is a government agency. The former is quite reasonable due to the 8% cap; the latter is also expected, because it is common practice for government agencies, when suing as the plaintiff, to ask for 5%, which is below the average (8%) of plaintiffs' claims.[47] The 5% is a focal point for government agencies because when public land is leased to private parties, administrative bylaws stipulate a flat 5% yield rate.

The result that ρ_{13} is negative is counter-intuitive, and begs the answer of why this is so. By looking more into the details of the data, we find that it is mainly caused by the fact that the judges were unwilling to fully reward the plaintiffs whose claims sell at the caps (i.e., 10%; 8% for arables). We do not know why is so, but an obvious explanation is that there were many plaintiffs who, in the eyes of the judges, over-claimed. This is a reasonable guess because, as explained earlier, the plaintiffs' claim is an upper-bound for the judgement. Therefore, many plaintiffs might claim more than they should to avoid "regret". Indeed, as can be seen from Table A4 in the Appendix, ρ_{13} ceases to be significant when claims on the caps are dropped from the regression, despite that γ_1 continues to be significantly negative. This also has the implication that,

[47] In our data, the government agency requests a 5% yield rate when they are the plaintiff in 56% of the observations, whereas when the plaintiff is not a government agency, only 8% of the time is 5% claimed. See Panel C of Table 1.

if we exclude cases that are over-claimed, there is actually no unobserved information that causes correlation between the excess judicial rate and the excess claim rate. This is consistent with the argument in Section 7.2 in the follows.

The three-judge panel dummy, though having a positive coefficient, does not have a statistically significant impact on the judicial yield rate. Table 4 also shows that when the defendant contests the yield rate, the excess judicial yield rate declines by 4.2%, and the difference is statistically significant at the 0.1% level. It is noteworthy that the impact of counterclaim is quite substantial. For instance, if in a case the market yield rate is 3% and the excess plaintiff claim rate is 10%, the excess judicial claim yield rate will on average be 0.576*(0.1-0.03)=0.040 if the defendant does not contest the rate (see column (1) in Table 4). If the defendant offers a counterclaim, the excess judicial yield rate is reduced by 0.042, completely offsetting the anchoring effect created by the plaintiff's over-claiming. Since the plaintiffs over-claimed by no more than 7 percentage points in about 82% of the observations, in most cases the defendants' explicit counterclaims could more than cancel out the plaintiffs' excess claim rate. It is noteworthy that although 31% of the defendants countered the plaintiffs' claims, only in 68 cases (i.e., 12%) of these cases did the defendants provide a countering yield rate at all.

This result, however, raises the question that if counter-claims always reduce judicial rate, why does not every defendant counter? There are two reasons for this. First, since the defendants are more likely to counter-claim when they hire lawyer, there seems to be a tradeoff between hiring a lawyer (which is costly) to reduce judicial and saving the lawyer's cost by paying a higher rate. Second, and perhaps more importantly, counter-claims are concerned with the defendants' defense strategy. They can either counter-claim, or opt for the more risky strategy of denying wrong-doing completely. The latter is more likely to result in an all-or-nothing outcome, while the former only

attempts to reduce judicial rate. As explained earlier, our data exclude cases in which the plaintiffs lose completely. Therefore, the regression result only shows the benefit of counter-claim but not that of claiming the possession to be legal.

All told, if we do not look into the background of the judges, then the judicial yield rate is positively correlated with the plaintiff claim rate after controlling for the difference in the land's market value and the unobservables, clear evidence of anchoring. Also, counter-claims significantly reduce the excess judicial yield rate, while having three-judge panels is not significantly different from single-judge panels. In Section 6.3, however, we show that the picture will substantially change when the experience of the judges is taken into consideration.

6.3 The Effect of Judicial Experience

In this subsection, we further investigate whether the judge's experience alters the anchoring effect as identified in the previous subsection. The psychological literature has found conflicting results regarding the role of experience in alleviating the anchoring effect (Furnham and Boo 2011; Alevy et al. (2015)). Wilson et al. (1996), for example, found that knowledgeable people are less influenced by anchors. By contrast, Englich, Mussweiler, and Strack (2006), Mussweiler and Strack (1999), Northcraft and Neale (1987) and Mussweiler and Strack (2000) have found that experts also suffered from anchoring effects.[48]

We matched our data with another dataset which contained the total number of civil cases rendered by every judge in our dispute data, and used this number as a proxy for the judge's experience. We chose to use the number of rendered cases rather than

[48] In a recent article, Smith et al. (2013, p. 105) also point out that if experiments use "moderate anchors" (for instance, the differences between high anchors and low anchors are small, or the anchor does not deviate a lot from the true value), the difference between more knowledgeable and less knowledgeable participants will be hard to detect or non-existent. Nonetheless, in four experiments in which extreme anchors were used, the effect of knowledge was more pronounced.

years on the bench to measure judicial experience for two major reasons. First, annual productivity of judges varies, and we believe that judges learn from handling real cases, not from simply serving as judges. Second, some judges, at some point in their career, may serve as administrators and have a lighter caseload, and some judges are assigned to handle, say, civil enforcement matters such as auctions of foreclosed properties. In these circumstances, although the judges gain experience under the years-of-experience measure, they do not gain experience as court judges. The number-of-cases measure is therefore a better measure.[49]

For simplicity, regardless of whether a judge handles a case alone or on a three-judge panel, the number of cases rendered is increased by one. In a panel, the three judges have different experience. We used the experience of the most experienced judge in the panel to represent the judicial experience for the cases handled by three-judge panels, because the most experienced judge was assigned to assist the junior judges and was usually the most influential. Judges in our sample had on average about 11 years of experience on the bench (the 25th percentile is 8 years whereas the 75th percentile is 13 years). The median of rendered cases is 865. The summary statistics are reported in Table 5.

We divided the observations into two groups according to the judges' experience. The group of more (less) experienced judges contained those whose numbers of cases rendered were more (less) than the median. A case rendered by a three-judge panel was in the less (more) experience group if the experience count of the most experienced judge was less (greater) than the median.[50] Thus defined, the number of cases whose

[49] The data source for the judicial experience is a leading text mining and legal service provider in Taiwan, http://www.pingluweb.com. We are deeply indebted to its then-CEO, David Juang, for providing us with the data. As the major focus of PingLu Web is on attorneys, they only download and index cases in which at least one party was represented by attorneys. As cases are randomly assigned to judges and we only use the number of rendered cases as a relative (not absolute) measure of judges' experience, our result should still hold were we able to get a complete measurement of judges' experience.

[50] Our classification implies that, for the cases rendered by a panel in the less experienced group, all

judges were experienced (inexperienced) was 291 (286). The number of different judges in the experienced (inexperienced) group was 147 (178). Among the 51 three-judge panel cases, 11 were handled by three inexperienced judges, and 40 by a panel with at least one experienced judge. We then ran equations (1) – (3) for each of the groups.

It is important to emphasize that the assignment of civil cases to judges is random. Therefore, there should be no systematic difference in case characteristics between the experienced and the less experienced judge groups. The *t*-tests (reported in Table A1) show that there is no statistically significantly difference between the two groups in land characteristic except land value. Senior judges tend to receive cases with higher-value land. This is mainly because land values in more developed regions (those in strata 1 and 2) are higher, and senior judges tend to serve on the bench of the more developed regions. There is a simple reason for this. In Taiwan, judges can apply for transfer to other districts, and senior judges have priority when vacancy appears. Similar to Japan (Ramseyer and Rasmusen, 1997, 2001), most judges prefer, apply for transfer, and move to, large cities. A simple OLS model regressing on land value, with a strata dummy variable and a dummy on whether the judge has above-median experience, shows however that the latter is statistically insignificant. In any case, the land value is controlled in our structural model.

Table 6A reports the regression result for the more experienced group, and Table 6B for the less experienced group.[51] The strength of anchoring varies greatly by judicial experience. The plaintiff's excess claimed rate significantly affects the excess judicial yield rate *only* for the less experienced group. Moreover, this effect is much

three judges have experience counts less than the median.

[51] In Table 6B, the coefficient of the number of defendants in equation (2) is insignificant. However, the lawyer dummy variables in equation (1) are all insignificant and can be removed. Technically speaking, whether defendants hire attorneys now qualifies as an instrumental variable, and the system is still identifiable. For comparison to other tables, we still keep the lawyer dummy variables in equation (1).

stronger than when we do not control for experience (0.918, against 0.576 in Table 4). Table 6A and Table 6B both show that the defendant's contesting the yield rate has a significant effect on the judicial yield rate, but the magnitude of this neutralizing effect is smaller for the group of less experienced judges. That is, for the less experienced judges, the anchoring effect created by plaintiffs' excess claims is stronger, and defendants' counterclaims chip away less of the anchoring effect.

Regarding the three-judge panel, Table 6A and Table 6B again demonstrate that the judges' experience matters. In the less experienced group, the interaction term of the three-judge dummy and plaintiff claim rate is statistically significant, and the size of the coefficient is large. The positive sign implies that, when all the judges on the panel are relatively inexperienced, the anchoring effect is exacerbated. In particular, Table 6B shows that a 1-percent point increase in the excess plaintiff claim rate will increase the excess judicial yield rate by 0.672 percent. In this group, the group polarization effect appears to outweigh the potential benefits brought by group deliberation. In the more experienced group, the influence of the three-judge panel is again insignificant. The three-judge cases, however, differ from others not only in the number of judges, but also in composition (three-judge panels must have at least one junior judge, and the two relatively senior judges were not randomly assigned). They also account for only 8.8% of the cases. Therefore, we should not place too much emphasis on their effect on the judicial rate. Rather, it should be regarded as one piece of supporting evidence for the importance of experience.[52]

All told, our results suggest that the experienced judges seem to be assured of how much the yield rate should be, and are not affected by the plaintiff's claim or whether they serve on a three-judge panel. On the other hand, the less experienced judges are

[52] We thank JJ Prescott for this point.

influenced by the plaintiffs' claims. This result is consistent with the field experiment result in Alvey et al. (2015). Moreover, anchoring is exacerbated when a panel consists of three less-experienced judges. These results not only are substantial evidence for anchoring, but also point out experience as an important factor in reducing, or even eliminating, the anchoring effect.

7. DISCUSSION AND CONCLUSION

In this section, we discuss in details several possible concerns that might arise regarding our methodology and data.

7.1 Concentration of the Plaintiff Claim Rates

The concentration of claimed rates (non-arable at 10%, arable at 8%, and 5% for government plaintiffs) in our data raises doubt as to whether our main results are driven by variations in land and plaintiff types, rather than variation in the claimed rate itself. This doubt can be answered in two ways.

First, and perhaps more importantly, although the claimed rates are highly concentrated, the excess plaintiff claim rates (claims minus the market rates) are not. In fact, the Pearson correlation between the plaintiff's claimed rate and the excess claimed rate is not high (r=0.6). Since the main thrust of the empirical model is based on excess rates, what we need is variations in excess claimed rates and excess judicial rates. In Figures 4 and 5, we plot the distributions of the excess judicial yield rates and excess plaintiff claim rates. Figures A1 and A2 plot the same distributions for cases in which the plaintiffs are government. All four figures exhibit substantial variation, with distributions resembling a bell-shaped normal distribution.

Second, the distribution of claimed rates and judicial rates are not as clustered as they seem. We can see from Panel D of Table 1 that, although 62.6% (38.9%) of the

plaintiffs claim 10% (8%) for the non-arable (arable) land, there is still reasonable variation in each category. Panel C shows even greater variation based on the plaintiff's type (government and non-government). Regarding the judicial yield rate, although, e.g., 22.2% of the arable land has the value 8% (see Panel F of Table 1), the distributions are reasonably dispersed, and this is true for non-arable, too. Therefore, anchoring as shown in Tables 4 and 6 is not caused by dispute characteristics (e.g., private versus government) or land characteristics (e.g., arable versus non-arable), but by the difference in the rates beyond what is captured by the market yield rate.

On a slightly more theoretical level, the main reason that cases with the judicial rate at the cap might produce an illusive correlation, which is not anchoring, is as follows. The plaintiff, for example, believes that the yield rate should be 15%. But given the cap, she can only claim 10%. The judge, on the other hand, (correctly) believes that the yield rate is only 12%. Again, given the cap, he awards 10%. If there are many cases like this (either the 8% or 10% cap category), then we will have a lot of cases in which the judges award exactly what the plaintiffs claim, not because the judge is influenced by the claim (12% is lower than 15%, and 12% is the correct judgment), but because they both fall at the cap.

However, this is not the case in our data. In our data, if the claimed rate is strictly lower than the cap, the probability that the judicial yield rate equals the claimed rate is much higher than when the claim rate falls at the cap. For non-arable land, 350 plaintiffs claimed 10% but only 63 were awarded so. For arable, 7 plaintiffs claimed 8% (and 4, defying the rule, claimed 10%). Only 4 were awarded 8% (all to the plaintiffs claiming 8%). Moreover, the average percentage of judicial yield rate to claimed rate, when claims are strictly less than the cap, is 0.91 for non-arable, and is 0.81 for arable. On the other hand, if the plaintiffs claimed rates are at the cap, then the percentage is 0.62 for non-arable, and 0.72 for the arable (see Table A3). Clearly, the judges did not award

more, and in fact awarded far less for non-arable (which accounts for 97% of all cases), for cases whose claims are at the cap than cases that are strictly less. These statistics clearly point out that the presence of cases whose claims are at the cap is not the reason that produces the correlation between the excess plaintiff claim rate and the excess judicial rate. On the contrary, as explained in Section 6.2, this is exactly the reason why ρ_{13} is negative. Also, in Taiwan, the plaintiffs have to pay 1% of the claim as trial fees upfront when they make formal claims in the court. The fact that the judge has a much higher probability of awarding a lower rate than the claim, combined with the 1% trial fee, explains why the plaintiffs do not always ask for the maximum possible rates, even though the latter might seem a dominant strategy.

To further explore the at-the-cap concern, we run several regressions as a robustness check. First, Table A4 reports the results of the model's main regression, but deletes the cases in which the claim rates are 10% (8%) for non-arable (arable) land. That is, we delete the cases in which the plaintiffs' claims are at the caps. Table A5 is for the similar regression, but deleting the cases in which the claim rate and the judicial rate are both 10%. Table A6 deletes the cases in which the claimed rates equal the judicial rates (but not necessarily 10% or 8%). Table A7 deletes the cases in which the claim rates equal the judicial rates in the junior judges group. As can be seen from the four tables, none of the original results is altered.

7.2 Information Conveyed by the Plaintiff's Claim Beyond the Market Yield Rate

A reasonable concern might be raised, that the correlation between the excess plaintiff claim rate and the excess judicial rate might be caused by certain information (beyond the market yield rate, which we have controlled for in the regression) in the plaintiff's claim. If this is true, this correlation simply reflects this information, rather

than the anchoring effect.

It is absolutely correct that the plaintiff's claims provide information: Depending on where the lands are located and the degree of local development, some land parcels have higher yield rates (so the plaintiffs claim more) and some lower (so the plaintiffs claim less). In other words, the plaintiff's claim must to a certain extent reflect the land's market yield rate. Accordingly, we did not assume that the plaintiff's claim is irrelevant information for judicial decision making. What is assumed is that, in our data, the plaintiff's claim carries little verifiable information beyond what is already captured by the market yield rate. Therefore, the reason why we subtract the market yield rates from the plaintiff's claims (and the judicial rates) is not to control for any "soft" information such as plaintiffs' subjective values (or the possible noisy signal contained in the claim), but to control for the heterogeneity in the land's market yield rate. If we did not subtract this, the reason for the correlation between the claimed rate and the judicial rate would be trivial.

The real question, then, is whether the plaintiff's claim (after the subtraction) conveys information for the judge to follow. In our data, an overwhelming majority of the judges did not quote the plaintiffs' reasoning in setting the judicial yield rate, simply because there is almost none. As shown in Table A2, in an overwhelming majority of the cases (512/577), the plaintiffs directly asked for the rates without even mentioning the conditions of the lands. In the very few cases (5.6%, 32/577) in which the plaintiffs provided specific reasoning, and the judges quoted them in their judgments, the typical statement is as follows (the authors' translation):

> *The land in dispute is near the tourist area Land of Oast, Nanshan Fude Temple, and Nanshijiao Market. The area is prosperous. Defendants built a two-story building of reinforced concrete and brick, and had used over 330 square meters, an area that is full of*

economic value. So we ask to calculate the unjust enrichment that is equivalent to the rent based on the annual yield rate of 10% multiplied by the Announced Current Land Value.

The written judgment is as follows (the authors' translation):

The land is zoned as a general agricultural district, and residential use of it is permitted. The nearest convenience store and Hsin-Nan Elementary School are about 2 km away. In front of the land in dispute is a 12-meter-wide road; across the road are retaining walls and the Spring-Autumn Cemetery.

There are inspection transcripts, photographs, the New Taipei City urban planning zoning certificate, and land registration record that can prove that the defendants used the building site and gained economic value and other benefits.

The plaintiffs' claim that the amount of unjust enrichment should be calculated based on the annual yield rate of 10% multiplied by the Announced Current Land Value is disproportionately high. This court hereby decides that a reduction to an annual yield rate of 5% is appropriate.

As can be seen, the plaintiff's claim is rather casual, and to the extent that she provides meaningful reasoning regarding how she claims the yield rate, her statement does not go much beyond what can already be computed from the market yield rate. Note that we do not argue that the plaintiff's claims provide no information beyond market information in general. We only contend that this is the case for the type of litigation in our data. The reason why almost all the plaintiffs did not spend much effort in providing strong and solid reasoning in claiming the yield rate in Taiwan, we believe, is that the fact that the plots have been unlawfully trespassed for a certain period of time reflects the reality that the land owners did not have much to do with the lands. In fact, they would have received nothing from the lands if not for the trespassing. The judge's

opinions also reflect this: Figure 3 shows that an overwhelming majority of the judicial rents are much lower than the corresponding market rents of the lands. What they wanted in claiming compensation is either to expel the trespasser or/and to ask for compensation which looks almost like a windfall to them. This is exactly the reason why we believe that unlawful possession of lands in Taiwan, rather than other types of litigation, is ideal for investigating the anchoring effect.

7.3 The Potential Effect of Government Plaintiffs

Judges in Taiwan are tenured career judges who do not rely on local or central governments for funding or other resources. Thus, judges should not have political concerns (i.e. retaliation by the administrative branch) when determining judicial yield rates. Nonetheless, it is reasonable to conjecture that judges may trust government plaintiffs more for various reasons. To rule out this potential trust effect, in Table A10, we report the SEM results excluding government plaintiff cases. The main results are the same. In addition, if we merely compare the judicial yield rates by plaintiff type, as Panel E of Table 1 shows, the government plaintiffs are not inclined to receive higher judicial yield rates, though it should be noted that this is partly due to the fact that government plaintiffs less frequently claim 10%.

7.4 The Effect of Available Objective Market Data

One may contend that there is an alternative explanation to our findings, namely, experienced judges are not affected by plaintiffs' claims because they tend to disregard evidence and adjudicate according to their own rule of thumb such as always awarding 5%. We take advantage of an exogenous event to test this alternative explanation.[53] As

[53] We have excluded the 40 post-August-2012 observations and re-run the SEM. As Table A8 shows, the results are essentially the same.

aforementioned, since August 2012, market transaction data have been available to the public. Should senior judges disregard objective evidence, the new possibility of referencing market data should not affect their decisions. As shown in Table 6A, the "after August 2012" dummy variable in the senior judge regression model has an expected negative sign and is statistically significant at the 5% level. This suggests that after the market data became available, senior judges deviated *less* from market yield rate. That is, experienced judges appeared to take into account market data and were affected less by plaintiffs' claims.[54] By contrast, Table 6B shows that data availability does not affect less experienced judges. In other words, the senior judges deviated less from the market yield rate once market value data became available, but not the junior judges. There is thus no evidence that senior judges are more likely to follow a rule of thumb. We view this as consistent with our story that senior judges are less subject to bias, as they are also quicker to respond to objective information.

Also, there are 20 judges in our data that render judgments in 5 or more observations. We checked their judicial yield rates and found that none of them always award the same yield rate. The standard deviation of the judicial yield rate is 0.228 for experienced judges, and is 0.204 for the inexperienced judges. The standard deviation of the judicial yield rate is even greater for the experienced judges than for the inexperienced judges. Also, the variance ratio test shows that the two standard deviations are not significantly different at the 5% level (though significantly different at the 10% level). In any case, we do not find evidence that the senior judges are anchored by their past judgments. The finding that senior judges, but not junior judges, deviated less from market yield rate once market value data became available should also be convincing evidence

[54] Since there are only 40 post-2012 observations, if we further add an interaction term of the dummy variable and the excess plaintiffs' claimed rates, both the dummy variable and the interaction term have the expected negative signs but neither is statistically significant, probably due to lack of degrees of freedom. The results are reported in Table A9.

against the conjecture that senior judges disregard objective evidence and stick to a fixed rate.

7.5 The Correlation between the Judge's Experience and the Value of Land

Table A1 shows that the unit land value is higher for the experienced judge than for the less experienced judge. As is explained earlier, this is due to the fact that the senior judges are more likely to be serving in the urban areas. Moreover, the defendants are more likely to contest yield rates when the values of land, and therefore compensation, are higher. In a word, the more experienced judges are more likely to handle cases in which the defendants have contested. Given our result that judicial rate is lower when the defendant contests, it raises the concern of whether our result, that more experienced judges are not subject to an anchoring effect, is really due to experience, or simply because cases they handle are more likely to be contested.

Given that the defendants contest rates in 31.2% of the cases, the most reasonable way to address this concern is to delete the cases which are contested. We report the regression results in Tables A11 and A12. As can be seen from the tables, our results are almost identical to those in Tables 6A and 6B.

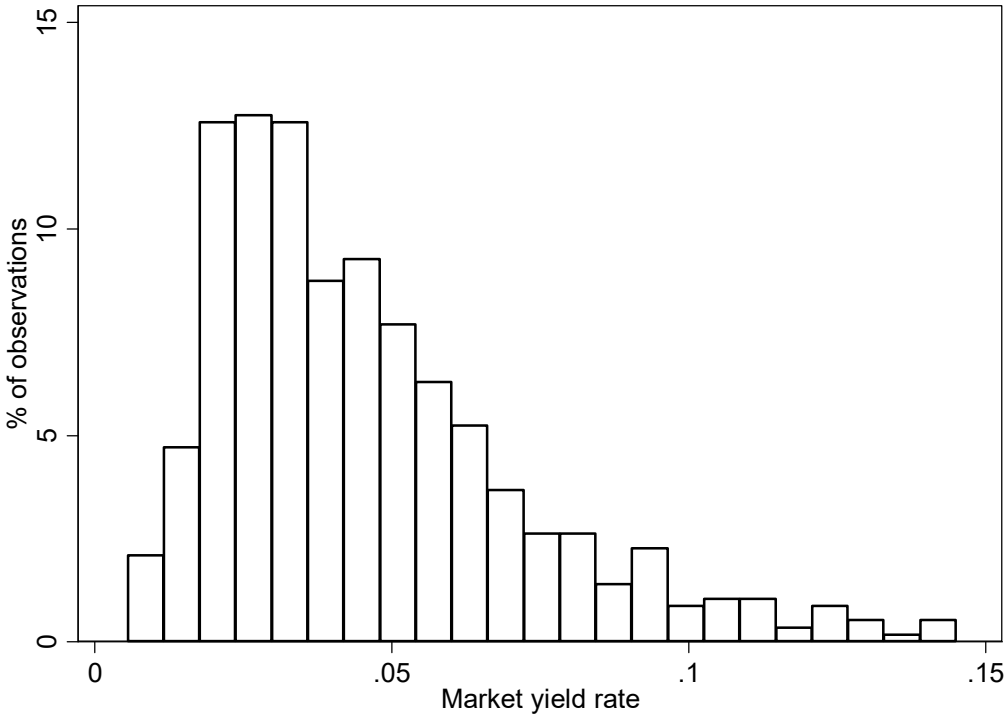
7.6 Summary

The anchoring effect in judicial decision-making has been confirmed in numerous experiments, and yet our study is the first to identify such an effect in real-world litigations with large-scale data. As Teichman and Zamir (2014) point out, research on judicial decision-making has long ignored the behavioral perspective. It is high time for theorists to take seriously judges' fallibility when setting numbers — and even determining legal standards (Teichman, Feldman, and Schurr 2014) — and for empiricists to deepen the understanding of judgment heuristics by looking at data

generated from actual legal disputes.

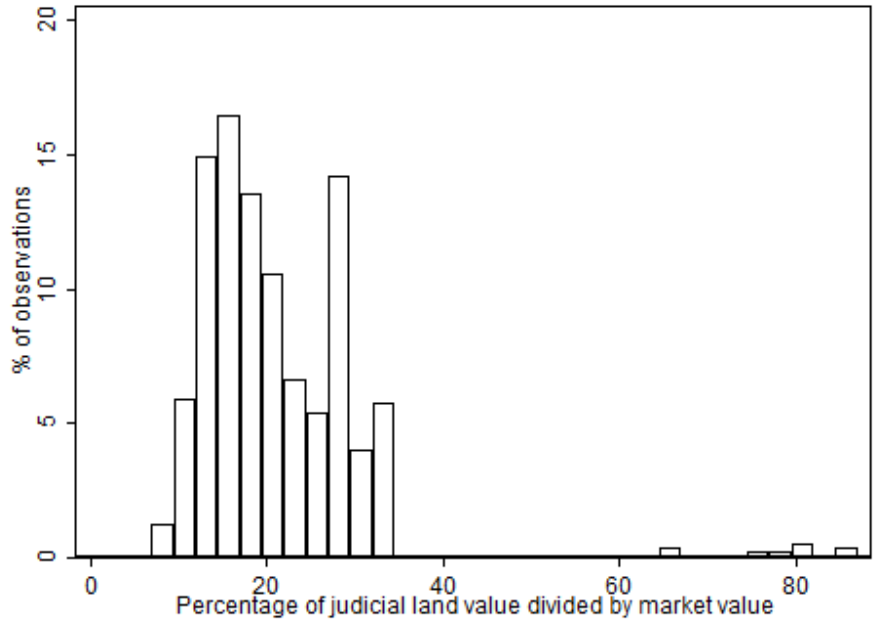
In this article, we provide evidence of the anchoring effect in judicial decision–making by using data of the unjust enrichment cases involving unlawful possession of land in Taiwan. The inexperienced judges are strongly influenced by the anchoring effect. Specifically, for the less-experienced judge, the plaintiff yield rate has a positive impact on the judicial yield rate, while the defendant's counterclaim reduces this impact. Furthermore, three-judge panels exacerbate this effect when all three judges on the panel are less experienced. In contrast, for more experienced judges, while defendant counterclaims bring down the courts' deviation from the market yield rate, plaintiffs' excess claims do not influence the judgements, and a panel with at least one experienced judge appears to prevent group polarization from materializing. These results not only provide direct evidence for the anchoring effect, but also show that it mainly fall on the less-experienced judges. More experienced judges do not suffer from anchoring. As such, experience serves as a powerful debiaser against anchoring.

Figure 1 The distribution of market yield rates



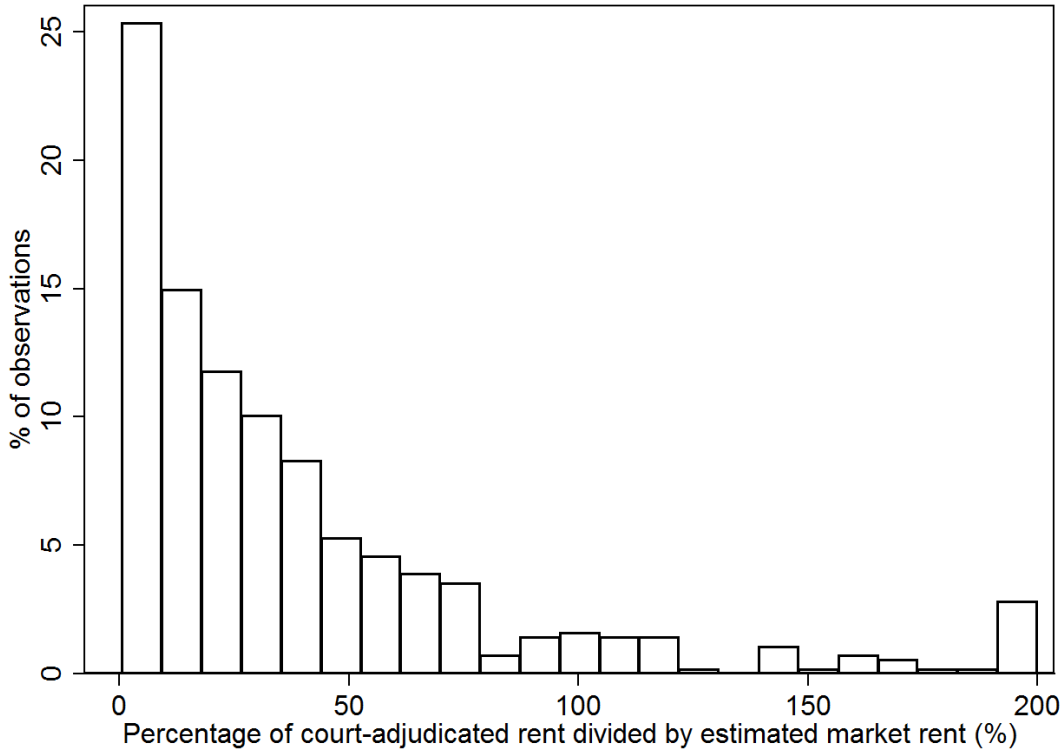
Note: 5 of the 577 observations, with market yield rate>0.15, are omitted from this figure; N=572.

Figure 2 Distribution of judicial land value divided by market value



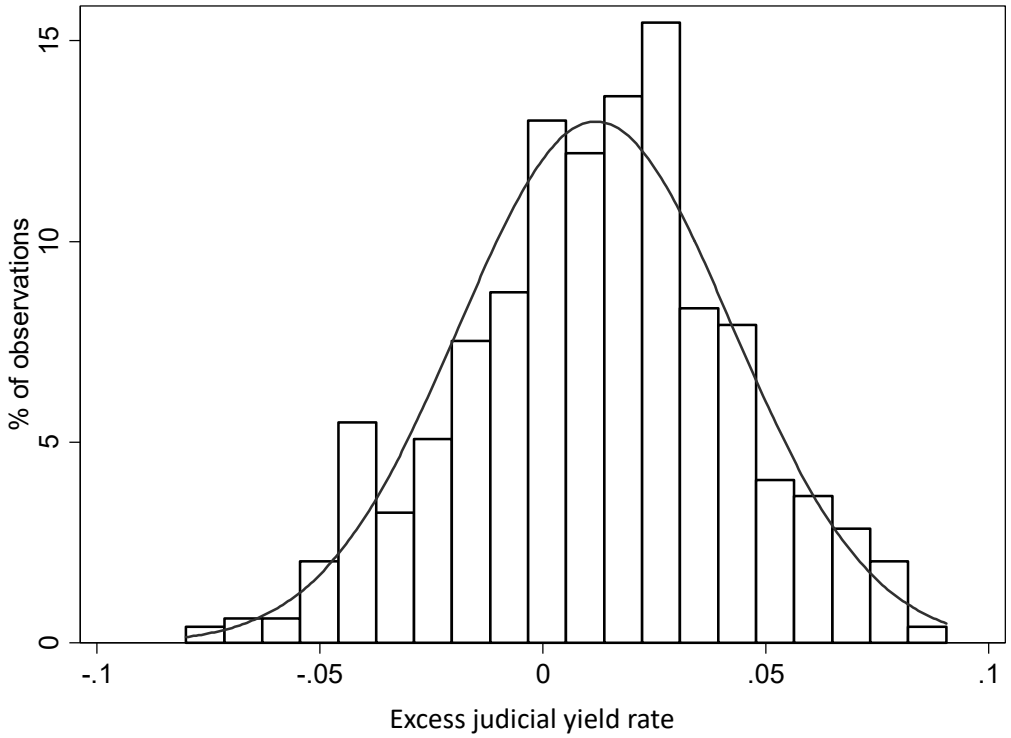
N=577.

Figure 3 Percentages of court-adjudicated rent divided by estimated market rent



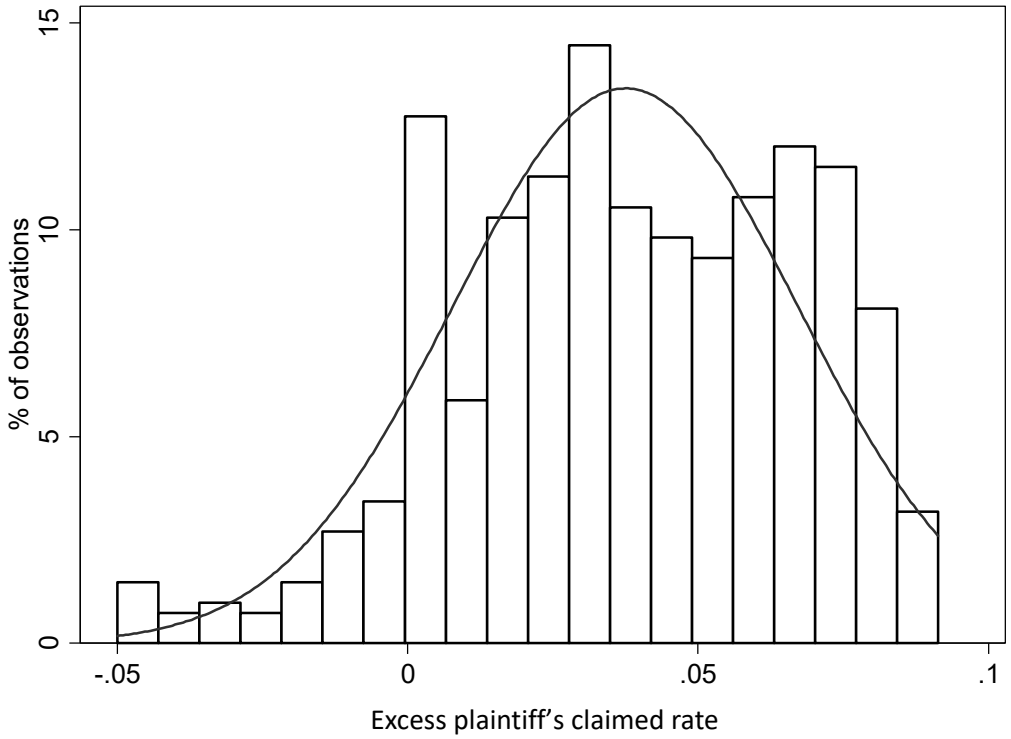
9 out of 577 observations are excluded here due to unclear court-adjudicated rent. For clarity, any percentage greater than 200% is counted as 200%, including 16 observations; N=568.

Figure 4 Distribution of excess judicial yield rate



N=577

Figure 5 Distribution of excess plaintiff claim rate



N=577

Table 1 Summary Statistics of Variables for the Judicial Cases

Panel A: Continuous variables

Variable types and names	Mean	Median	St. Dev.	Min.	Max.
Characteristics of parties					
Plaintiff number	1.6	1	2.5	1	23
Defendant number	2.8	1	5.8	1	63
Land characteristics					
Land area (square meters)	1618.2	90.0	20011.2	0.04	475,498
Unit land value (US dollars per square meter)	26775.9	6673.5	252881.1	16	6,061,912
Estimated encroached time (years)	10.9	5	13.7	0.2	100
Yield rates					
Judicial yield rate (%)	0.06	0.05	0.02	0.01	0.1
Plaintiff claim yield rate (%)	0.08	0.10	0.02	0.015	0.1
Judge Experience					
Judge experience	890.9	865	362.9	115	2282

Panel B: categorical variables

Variable types and names	Percentage
Plaintiff hires lawyer	81.8
Defendant hires lawyer	41.9
Plaintiff is a government agency	37.1
Defendant is a government agency	3.1
Arable land	3.1
Land used commercially	4.3
Three-judge panel	8.8
Defendant claiming types (D)	**100**
Defendant counters the claimed yield rate	31.2
Defendant does not claim any yield rate	68.8
Zoning (ZO)	**100**
Non-urban (agricultural)	8.9
Non-urban (residential)	16.3
Urban (industrial and business)	3.1
Urban (residential)	46.1
Urban (agricultural)	4.7
Urban (other)	20.8
Strata (ST)	**100**
Central business district or industrial and business districts	59.6

Other strata (including growing towns, towns with traditional industries, under-developed towns, and least developed towns)	40.4
Year (YR)	**100**
2004	6.8
2005	8.7
2006	9.4
2007	11.3
2008	8.8
2009	11.1
2010	14.0
2011	14.2
2012	15.8

N=577.

Panel C: Summary statistics of plaintiffs' claimed rates by plaintiff types

Plaintiffs' claimed rates	Non-government plaintiff	Government plaintiff	Total
1.50%	0	4	4
	(0)	(1.9)	(0.7)
2.00%	1	1	2
	(0.3)	(0.5)	(0.4)
3.00%	1	0	1
	(0.3)	(0)	(0.2)
4.00%	2	0	2
	(0.6)	(0)	(0.4)
5.00%	28	119	147
	(7.7)	(55.6)	(25.5)
5.25%	0	7	7
	(0)	(3.3)	(1.2)
6.00%	12	2	14
	(3.3)	(0.9)	(2.4)
6.25%	1	0	1
	(0.3)	(0)	(0.2)
6.50%	1	0	1
	(0.3)	(0)	(0.2)
7.00%	8	1	9
	(2.2)	(0.5)	(1.6)
8.00%	30	5	35

	(8.3)	(2.3)	(6.1)
10.00%	279	75	354
	(76.9)	(35.1)	(61.4)
Total	363	214	577
	(100)	(100)	(100)

Note: percentages are in parentheses

Panel D: Summary statistics of plaintiffs' claimed rate by land type

Plaintiffs' claimed rate	Non-arable	Arable	Total
1.50%	4	0	4
	(0.7)	(0)	(0.7)
2.00%	1	1	2
	(0.2)	(5.6)	(0.4)
3.00%	1	0	1
	(0.2)	(0.0)	(0.2)
4.00%	1	1	2
	(0.2)	(5.6)	(0.4)
5.00%	143	4	147
	(25.6)	(22.2)	(25.5)
5.25%	7	0	7
	(1.3)	(0.0)	(1.2)
6.00%	14	0	14
	(2.5)	(0)	(2.4)
6.25%	1	0	1
	(0.2)	(0.0)	(0.2)
6.50%	1	0	1
	(0.2)	(0.0)	(0.2)
7.00%	8	1	9
	(1.4)	(5.6)	(1.6)
8.00%	28	7	35
	(5.0)	(38.9)	(6.1)
10.00%	350	4	354
	(62.6)	(22.2)	(61.4)
Total	559	18	577
	(100)	(100)	(100)

Note: percentages are in parentheses

Panel E: Summary statistics of judicial yield rates by plaintiff type

Judicial yield rates	Non-government plaintiff	Government plaintiff	Total
1.00%	3	2	5
	(0.8)	(0.9)	(0.9)
1.50%	0	4	4
	(0)	(1.9)	(0.7)
2.00%	17	10	27
	(4.7)	(4.7)	(4.7)
3.00%	22	24	46
	(6.1)	(11.2)	(8.0)
3.50%	0	2	2
	(0)	(0.9)	(0.4)
4.00%	19	11	30
	(5.2)	(5.1)	(5.2)
4.50%	0	1	1
	(0)	(0.5)	(0.2)
5.00%	105	132	237
	(28.9)	(61.7)	(41.1)
6.00%	50	7	57
	(13.8)	(3.3)	(9.9)
6.25%	3	0	3
	(0.8)	(0)	(0.5)
6.50%	1	0	1
	(0.3)	(0)	(0.2)
7.00%	28	3	31
	(7.7)	(1.4)	(5.4)
8.00%	59	8	67
	(16.3)	(3.7)	(11.6)
9.00%	3	0	3
	(0.8)	(0)	(0.5)
10.00%	53	10	63
	(14.6)	(4.7)	(10.9)
Total	363	214	577
	(100)	(100)	(100)

Note: percentages are in parentheses

Panel F: Summary statistics of judicial yield rates by land type

Judicial yield rates	Non-arable	Arable	Total
1.00%	5	0	5
	(0.9)	(0.0)	(0.9)
1.50%	4	0	4
	(0.7)	(0.0)	(0.7)
2.00%	24	3	27
	(4.3)	(16.7)	(4.7)
3.00%	45	1	46
	(8.1)	(5.6)	(8.0)
3.50%	2	0	2
	(0.4)	(0.0)	(0.4)
4.00%	28	2	30
	(5.0)	(11.1)	(5.2)
4.50%	1	0	1
	(0.2)	(0.0)	(0.2)
5.00%	233	4	237
	(41.7)	(22.2)	(41.1)
6.00%	53	4	57
	(9.5)	(22.2)	(9.9)
6.25%	3	0	3
	(0.5)	(0.0)	(0.5)
6.50%	1	0	1
	(0.2)	(0.0)	(0.2)
7.00%	31	0	31
	(5.6)	(0.0)	(5.4)
8.00%	63	4	67
	(11.3)	(22.2)	(11.6)
9.00%	3	0	3
	(0.5)	(0.0)	(0.5)
10.00%	63	0	63
	(11.3)	(0.0)	(10.9)
Total	559	18	577
	(100)	(100)	(100)

Note: percentages are in parentheses

Table 2 Summary Statistics of Variables Used in the Hedonic Regression Models

Panel A: Continuous variables

Variable types and names	N	Mean	Median	St. Dev.	Min.	Max.
Sale Price	60530	110,258,700	2,900,000	524,863,400	54	5,682,620,000
Rent	364	66268.1	28000	111754.9	333	916094
Land Area (sales)	60530	1471.0	358	4598.1	0.01	411300
Land Area (leases)	364	1066.8	368.3	1768.4	0.67	12072
Number of plot (sales)	60530	1.9	1	2.8	1	88
Number of plot (leases)	364	1.7	1	1.9	1	15

Panel B: categorical variables

Variable types and names	% (in sales)	% (in leases)
Zoning (Z)	**100**	**100**
Non-urban (agricultural—not prime)	9.6	5.2
Non-urban (preserved)	12.5	0.8
Non-urban (industrial)	0.8	0.6
Non-urban (agricultural—prime)	19.5	7.4
Non-urban (residential)	4.4	3.0
Urban (industrial)	1.7	8.5
Urban (residential)	21.0	35.4
Urban (business)	2.2	10.4
Urban (agricultural)	9.5	14.6
Urban (other)	18.8	14.0
Strata (S)	**100**	**100**
1	7.3	11.3
2	15.3	28.3
3	32.1	45.1
4	17.8	10.4
5	19.5	3.9
6	6.5	0.8
7	1.6	0.3
Months (M)	**100**	**100**
Before 2012/8	8.6	0.0
2012/8	15.5	13.7
2012/9	15.1	14.6

2012/10	14.4	20.1
2012/11	15.0	19.5
2012/12	17.9	15.7
2013/1	11.5	10.2
2013/2	2.0	6.3

N=60,530 for sales and 364 for leases.

Table 3 Regression results for estimating market price and market rent

	(1) Lease	(2) Sale
Dependent variable: log of total rent or price		
=1 if stratum 1	1.771***	2.746***
	(0.485)	(0.025)
=1 if stratum 2	1.572***	2.024***
	(0.464)	(0.021)
=1 if stratum 3	1.406**	1.549***
	(0.459)	(0.018)
=1 if stratum 4	1.215**	1.394***
	(0.461)	(0.018)
=1 if stratum 5	0.525	0.424***
	(0.516)	(0.018)
Log of land area	0.584***	0.857***
	(0.048)	(0.003)
Log of number of plot	-0.032	0.053***
	(0.093)	(0.007)
Zoning dummies	Included	Included
Month dummies	Included	Included
Constant	4.687***	7.779***
	(0.739)	(0.088)
Observations	364	60,530
R-squared	0.563	0.730

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table 4 Regression results for estimating the structural model

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.576 ***	(0.111)	22.041 ***	(6.512)		
Defendant counters the claimed yield rate	-0.042 ***	(0.008)				
Three judges (yes=1)	0.003	(0.009)				
Three judges* Excess plaintiff claim yield rate	0.135	(0.201)				
Only plaintiff represented by lawyer(s)	-0.011 *	(0.006)				
Only defendant represented by lawyer(s)	0.006	(0.007)				
Both parties represented by lawyers	0.001	(0.006)				
After August 2012 (yes=1)	-0.014 *	(0.006)				
Land area (logarithm)	0.005 ***	(0.001)	0.203 **	(0.064)	-0.003	(0.002)
Time (logarithm)	-0.002	(0.001)	0.011	(0.051)	-0.003	(0.002)
Judicial land value (logarithm)	0.005 **	(0.002)	0.167 **	(0.061)	-0.001	(0.002)
Commercial use (yes=1)	0.013	(0.008)	0.020	(0.254)	0.010	(0.010)
Plaintiff is a government agency (yes=1)	0.009 +	(0.005)	0.510 *	(0.219)	-0.047 ***	(0.005)
Defendant is a government agency (yes=1)	-0.010	(0.008)	-0.338	(0.342)	0.003	(0.014)
Market yield rate			36.259 ***	(7.032)	0.053	(0.194)
Whether plaintiff hires lawyer			-0.011	(0.169)	0.010 +	(0.005)
Whether defendant hires lawyer			0.704 ***	(0.137)		
Defendant number (logarithm)			0.153 *	(0.066)		
Plaintiff number (logarithm)					0.007	(0.005)
Arable land (yes=1)					-0.024 +	(0.013)
Constant	-0.044 **	(0.016)	-6.111 ***	(0.894)	0.015	(0.030)
Year fixed effects	Included		Included		Included	
Zoning fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.033 ***	(0.002)				
σ_3	0.039 ***	(0.002)				
ρ_{12}	0.714 ***	(0.081)				
ρ_{13}	-0.481 ***	(0.070)				
ρ_{23}	-0.397 *	(0.146)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 577. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table 5 Summary statistics of judge experience

Judge experience (civil cases rendered)	
Observations	577
Mean	890.9
Std	362.9
Min	115
Max	2282
Percentile	
1%	235
5%	329
10%	420
25%	609
50%	865
75%	1155
90%	1405
95%	1516
99%	1675

Table 6 Selective regression results for estimating the structural model, observations divided into two groups based on judicial experience

6A. Judge's experience greater than the sample median

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim rate	0.212	(0.177)	3.495	(15.275)		
Defendant counters the claimed yield rate	-0.040 ***	(0.012)				
Three judges (yes=1)	0.001	(0.013)				
Three judges*Excess plaintiff claim rate	0.066	(0.256)				
Only plaintiff represented by lawyer(s)	-0.014	(0.010)				
Only defendant represented by lawyer(s)	-0.002	(0.012)				
Both parties represented by lawyers	0.001	(0.011)				
After August 2012 (yes=1)	-0.018 *	(0.008)				
Land area (logarithm)	0.009 ***	(0.002)	0.408 ***	(0.104)	0.001	(0.004)
Time (logarithm)	0.001	(0.002)	-0.004	(0.083)	-0.004	(0.003)
Judicial land value (logarithm)	0.005 *	(0.002)	0.256 *	(0.106)	-0.001	(0.003)
Commercial use (yes=1)	0.013	(0.012)	0.610	(0.423)	0.021	(0.019)
Plaintiff is a government agency (yes=1)	-0.002	(0.007)	0.081	(0.368)	-0.047 ***	(0.007)
Defendant is a government agency (yes=1)	-0.009	(0.011)	-0.566	(0.668)	-0.004	(0.031)
Market yield rate			30.422 *	(14.735)	0.192	(0.326)
Whether plaintiff hires lawyer			0.140	(0.263)	0.003	(0.009)
Whether defendant hires lawyer			0.786 ***	(0.212)		
Defendant number (logarithm)			0.302 ***	(0.085)		
Plaintiff number (logarithm)					0.009	(0.008)
Arable land (yes=1)					-0.038	(0.028)
Constant	-0.067 *	(0.029)	-13.054 ***	(2.086)	0.039	(0.054)
Year fixed effects	Included		Included		Included	
Zoning fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.033 ***	(0.003)				
σ_3	0.042 ***	(0.003)				
ρ_{12}	0.663 **	(0.151)				
ρ_{13}	-0.264 *	(0.126)				
ρ_{23}	0.054	(0.339)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 291. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

6B. Judge's experience less than the sample median

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim rate	0.918 ***	(0.154)	33.079 ***	(8.007)		
Defendant counters the claimed yield rate	-0.028 **	(0.010)				
Three judges (yes=1)	0.009	(0.010)				
Three judges*Excess plaintiff claim rate	0.672 *	(0.288)				
Only plaintiff represented by lawyer(s)	-0.005	(0.006)				
Only defendant represented by lawyer(s)	0.008	(0.009)				
Both parties represented by lawyers	-0.001	(0.007)				
After August 2012 (yes=1)	-0.001	(0.009)				
Land area (logarithm)	0.001	(0.002)	0.110	(0.097)	-0.002	(0.003)
Time (logarithm)	-0.005 *	(0.002)	0.056	(0.070)	-0.002	(0.002)
Judicial land value (logarithm)	0.004 +	(0.002)	0.136	(0.091)	-0.000	(0.003)
Commercial use (yes=1)	0.021 *	(0.010)	-0.097	(0.289)	0.003	(0.011)
Plaintiff is a government agency (yes=1)	0.021 **	(0.007)	0.908 **	(0.317)	-0.047 ***	(0.006)
Defendant is a government agency (yes=1)	-0.003	(0.011)	-0.399	(0.424)	0.004	(0.016)
Market yield rate			40.212 ***	(9.301)	0.204	(0.229)
Whether plaintiff hires lawyer			-0.142	(0.205)	0.008	(0.006)
Whether defendant hires lawyer			0.788 ***	(0.223)		
Defendant number (logarithm)			0.078	(0.111)		
Plaintiff number (logarithm)					0.002	(0.006)
Arable land (yes=1)					-0.020	(0.014)
Constant	-0.036 +	(0.022)	-5.434 ***	(1.260)	-0.002	(0.039)
Year fixed effects	Included		Included		Included	
Zoning fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.030 ***	(0.003)				
σ_3	0.034 ***	(0.002)				
ρ_{12}	0.625 **	(0.139)				
ρ_{13}	-0.661 ***	(0.070)				
ρ_{23}	-0.597 **	(0.191)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 286. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

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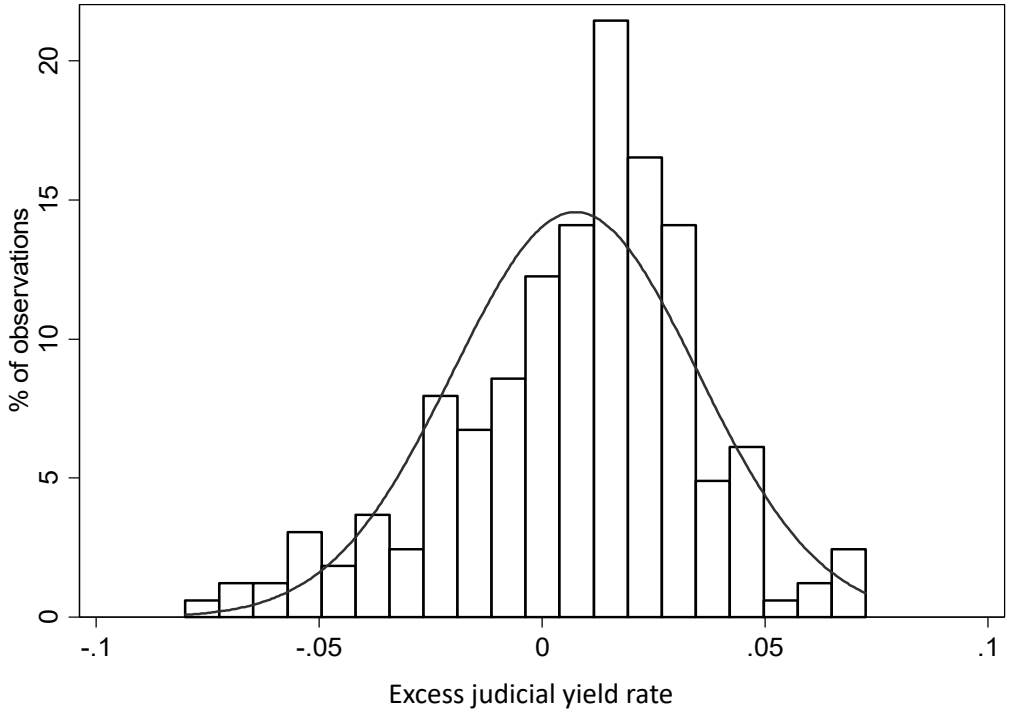
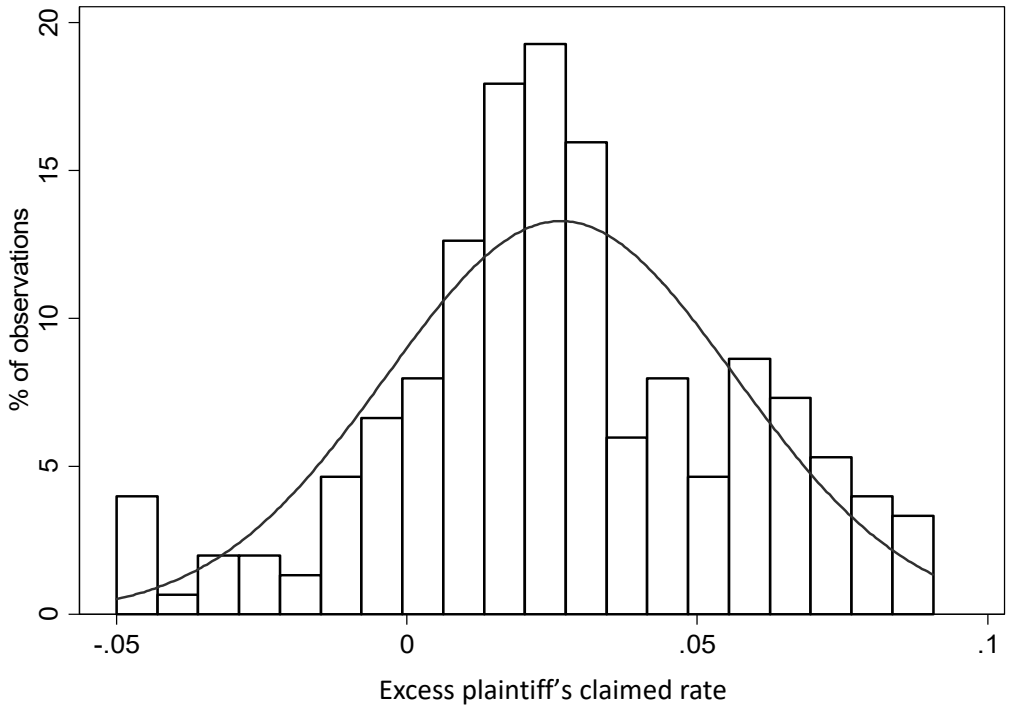
Appendix

Figure A1 Distribution of excess judicial rate when the plaintiff is the government



N=214.

Figure A2 Distribution of excess plaintiff claim rate when the plaintiff is the government



N=214.

Table A1: The t-tests for the difference in case characteristics between the experienced and less experienced judge groups

Land characteristics	*p*	mean of experienced group	mean of less-experienced group
Panel A: Continuous variables			
Land area (square meters)	0.143	4.658	4.883
Unit land value (US dollars per square meter)	0.000	8.980	8.466
Estimated encroached time (years)	0.914	1.754	1.764
Market yield rate	0.362	0.044	0.046
Panel B: categorical variables			
Plaintiff is a government agency	0.853	37.46%	36.71%
Defendant is a government agency	0.606	2.75%	3.50%
Arable land	0.970	3.09%	3.15%
Land used commercially	0.286	3.44%	5.24%

Note: *p* denotes the *p*-value of the t-test that the means in the two groups are the same.

Table A2: Plaintiffs' reasoning when making yield rate claims

	N	Percent
No reasoning at all	512	88.7
List factors in abstract that courts should consider	33	5.7
List facts to support claims	32	5.6
Total	577	100.0

Table A3: Judicial yield rate / plaintiff's claimed yield rate by whether plaintiffs' claimed

yield rate=upper bound and by land arable or not

Variable types and names	N	Mean	Median	St. Dev.	Min.	Max.
Claimed rates=upper bound	361	0.63	0.6	0.24	0.1	1
arable[a]	11	0.72[a]	0.625	0.26	0.2	1
non-arable	350	0.62	0.6	0.24	0.1	1
Claimed rate < upper bound	216	0.90	1	0.19	0.2	1
arable	7	0.81	0.857	0.23	0.4	1
non-arable	209	0.91	1	0.19	0.2	1

Note: (a) four arable observations with 10% plaintiff claim rate are included. If these observations are excluded, then the sample mean is 0.86 (N=7).

Table A4: Regression results for estimating the structural model, excluding the observations with plaintiff claim rate=10% for non-arable land and =8% for arable land

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	1.031 **	(0.427)	-19.529	(31.094)		
Defendant counters the claimed yield rate	-0.016	(0.088)				
Three judges (yes=1)	-0.013	(0.009)				
Three judges*Excess plaintiff claim yield rate	0.630 +	(0.349)				
Only plaintiff represented by lawyer(s)	-0.005	(0.009)				
Only defendant represented by lawyer(s)	0.008	(0.017)				
Both parties represented by lawyers	0.005	(0.023)				
Land area (logarithm)	-0.007	(0.013)	0.214	(0.190)	0.001	(0.001)
Time (logarithm)	-0.003	(0.005)	0.093	(0.114)	-0.000	(0.001)
Judicial land value (logarithm)	-0.006	(0.004)	0.214	(0.137)	-0.000	(0.001)
Commercial use (yes=1)	0.004	(0.005)	-0.331	(0.729)	-0.003	(0.002)
Plaintiff is a government agency (yes=1)	-0.004	(0.018)	-0.205	(0.375)	-0.012 ***	(0.002)
Defendant is a government agency (yes=1)	0.018 *	(0.008)	0.069	(0.851)	-0.003	(0.004)
Market yield rate			-1.016	(41.658)	0.050	(0.055)
Whether plaintiff hires lawyer			0.214	(0.268)	0.000	(0.002)
Whether defendant hires lawyer			0.532 *	(0.251)		
Defendant number (logarithm)			0.123	(0.365)		
Plaintiff number (logarithm)					0.007 ***	(0.002)
Arable land (yes=1)					-0.021 ***	(0.005)
Constant	0.022	(0.074)	-4.484	(3.749)	-0.044 ***	(0.009)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.028 ***	(0.003)				
σ_3	0.010 ***	(0.001)				
ρ_{12}	0.068	(1.852)				
ρ_{13}	-0.352	(0.306)				
ρ_{23}	0.337	(0.321)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 216. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A5: Regression results for estimating the structural model, excluding the observations with claimed rate = judicial rate=10%.

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.917 ***	(0.107)	-12.168	(27.051)		
Defendant counters the claimed yield rate	-0.015	(0.016)				
Three judges (yes=1)	-0.001	(0.003)				
Three judges*Excess plaintiff claim yield rate	0.203 *	(0.091)				
Only plaintiff represented by lawyer(s)	-0.007 *	(0.003)				
Only defendant represented by lawyer(s)	0.003	(0.005)				
Both parties represented by lawyers	0.000	(0.006)				
After August 2012 (yes=1)	-0.009 **	(0.003)				
Land area (logarithm)	0.002	(0.001)	0.156	(0.114)	-0.001	(0.001)
Time (logarithm)	0.001	(0.001)	-0.041	(0.067)	-0.001	(0.001)
Judicial land value (logarithm)	0.002	(0.001)	0.173 +	(0.104)	-0.000	(0.001)
Commercial use (yes=1)	0.004	(0.004)	-0.009	(0.369)	0.004	(0.004)
Plaintiff is a government agency (yes=1)	0.012 **	(0.004)	-0.322	(0.676)	-0.023 ***	(0.003)
Defendant is a government agency (yes=1)	-0.003	(0.006)	-0.066	(0.361)	0.002	(0.005)
Market yield rate			-0.751	(30.820)	0.046	(0.078)
Whether plaintiff hires lawyer			0.156	(0.237)	0.005 *	(0.003)
Whether defendant hires lawyer			0.709 ***	(0.203)		
Defendant number (logarithm)			0.118	(0.072)		
Plaintiff number (logarithm)					0.004 ***	(0.001)
Arable land (yes=1)					-0.018 ***	(0.005)
Constant	-0.047 ***	(0.014)	-3.061	(3.513)	-0.018	(0.013)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.022 ***	(0.002)				
σ_3	0.019 ***	(0.001)				
ρ_{12}	0.111	(0.825)				
ρ_{13}	-0.698 ***	(0.116)				
ρ_{23}	0.355	(0.521)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 510. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A6: Regression results for estimating the structural model, excluding the observations with claimed rate = judicial rate.

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.869 ***	(0.128)	-21.849	(58.129)		
Defendant counters the claimed yield rate	-0.008	(0.022)				
Three judges (yes=1)	0.003	(0.006)				
Three judges*Excess plaintiff claim yield rate	0.134	(0.113)				
Only plaintiff represented by lawyer(s)	-0.005	(0.004)				
Only defendant represented by lawyer(s)	0.001	(0.008)				
Both parties represented by lawyers	-0.000	(0.007)				
After August 2012 (yes=1)	-0.018 *	(0.008)				
Land area (logarithm)	0.003	(0.002)	0.152	(0.218)	-0.002 +	(0.001)
Time (logarithm)	0.002 *	(0.001)	-0.136	(0.160)	-0.002 **	(0.001)
Judicial land value (logarithm)	0.000	(0.002)	0.247 **	(0.090)	0.001	(0.001)
Commercial use (yes=1)	0.015 ***	(0.004)	0.061	(0.383)	0.001	(0.004)
Plaintiff is a government agency (yes=1)	-0.005 +	(0.003)	-0.154	(0.575)	-0.009 **	(0.003)
Defendant is a government agency (yes=1)	-0.003	(0.006)	-0.198	(0.514)	0.002	(0.003)
Market yield rate			-11.313	(65.723)	-0.038	(0.073)
Whether plaintiff hires lawyer			0.089	(0.291)	0.003	(0.002)
Whether defendant hires lawyer			0.775 **	(0.257)		
Defendant number (logarithm)			0.121	(0.109)		
Plaintiff number (logarithm)					0.003 +	(0.002)
Arable land (yes=1)					-0.017 **	(0.006)
Constant	-0.059 ***	(0.017)	-2.006	(7.504)	0.002	(0.012)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.017 ***	(0.002)				
σ_3	0.013 ***	(0.001)				
ρ_{12}	0.128	(1.114)				
ρ_{13}	-0.411 *	(0.144)				
ρ_{23}	0.299	(0.814)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 350. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A7: Regression results for estimating the structural model, excluding the observations with claimed rate = judicial rate. Junior judge group.

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.866 ***	(0.119)	55.877 ***	(11.323)		
Defendant counters the claimed yield rate	-0.017 +	(0.009)				
Three judges (yes=1)	0.010 +	(0.005)				
Three judges*Excess plaintiff claim yield rate	0.119	(0.263)				
Only plaintiff represented by lawyer(s)	-0.003	(0.004)				
Only defendant represented by lawyer(s)	0.009	(0.007)				
Both parties represented by lawyers	0.004	(0.004)				
After August 2012 (yes=1)	-0.006	(0.006)				
Land area (logarithm)	0.003	(0.002)	0.180	(0.118)	-0.002	(0.002)
Time (logarithm)	0.001	(0.001)	0.013	(0.087)	-0.001	(0.001)
Judicial land value (logarithm)	0.002 +	(0.001)	0.171 +	(0.101)	-0.001	(0.001)
Commercial use (yes=1)	0.017 ***	(0.005)	-0.200	(0.354)	0.001	(0.006)
Plaintiff is a government agency (yes=1)	0.001	(0.004)	0.963 **	(0.315)	-0.016 ***	(0.004)
Defendant is a government agency (yes=1)	-0.003	(0.007)	-0.292	(0.364)	-0.000	(0.005)
Market yield rate			67.620 ***	(14.184)	-0.147	(0.111)
Whether plaintiff hires lawyer			-0.213	(0.251)	0.003	(0.003)
Whether defendant hires lawyer			0.601 *	(0.256)		
Defendant number (logarithm)			0.040	(0.077)		
Plaintiff number (logarithm)					-0.003	(0.002)
Arable land (yes=1)					-0.024 ***	(0.008)
Constant	-0.067 ***	(0.015)	-8.012 ***	(1.565)	0.019	(0.018)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.017 ***	(0.002)				
σ_3	0.014 ***	(0.001)				
ρ_{12}	0.649 ***	(0.105)				
ρ_{13}	-0.423 **	(0.119)				
ρ_{23}	-0.866 *	(0.134)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 167. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A8: Regression results for estimating the structural model, excluding the observations after August 2012.

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.606 ***	(0.121)	20.944 **	(7.133)		
Defendant counters the claimed yield rate	-0.044 ***	(0.008)				
Three judges (yes=1)	0.000	(0.009)				
Three judges*Excess plaintiff claim yield rate	0.194	(0.204)				
Only plaintiff represented by lawyer(s)	-0.011 +	(0.006)				
Only defendant represented by lawyer(s)	0.007	(0.008)				
Both parties represented by lawyers	0.002	(0.007)				
Land area (logarithm)	0.005 **	(0.002)	0.200 **	(0.068)	-0.002	(0.002)
Time (logarithm)	-0.001	(0.002)	0.036	(0.054)	-0.003 +	(0.002)
Judicial land value (logarithm)	0.004 *	(0.002)	0.150 *	(0.064)	0.000	(0.002)
Commercial use (yes=1)	0.017 +	(0.009)	0.028	(0.268)	0.007	(0.010)
Plaintiff is a government agency (yes=1)	0.011 +	(0.006)	0.467 +	(0.244)	-0.047 ***	(0.005)
Defendant is a government agency (yes=1)	-0.011	(0.008)	-0.338	(0.341)	-0.001	(0.014)
Market yield rate			35.315 ***	(7.387)	0.149	(0.194)
Whether plaintiff hires lawyer			-0.053	(0.172)	0.008	(0.005)
Whether defendant hires lawyer			0.749 ***	(0.146)		
Defendant number (logarithm)			0.197 **	(0.067)		
Plaintiff number (logarithm)					0.013 *	(0.006)
Arable land (yes=1)					-0.021	(0.013)
Constant	-0.041 *	(0.018)	-5.882 ***	(0.930)	0.009	(0.030)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.034 ***	(0.002)				
σ_3	0.038 ***	(0.002)				
ρ_{12}	0.722 ***	(0.082)				
ρ_{13}	-0.504 ***	(0.075)				
ρ_{23}	-0.400 *	(0.160)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 537. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A9: Regression results for estimating the structural model, adding an interaction term of post-August-2012 and plaintiff excess claimed rates.

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim rate	0.581 ***	(0.110)	22.109 ***	(6.510)		
Defendant counters the claimed yield rate	-0.042 ***	(0.008)				
Three judges (yes=1)	0.003	(0.009)				
Three judges* Excess plaintiff claim yield rate	0.135	(0.201)				
Only plaintiff represented by lawyer(s)	-0.011 *	(0.006)				
Only defendant represented by lawyer(s)	0.006	(0.007)				
Both parties represented by lawyers	0.001	(0.006)				
After August 2012 (yes=1)	-0.013	(0.010)				
Excess plaintiff claim rate x After 2012 Aug	-0.039	(0.158)				
Land area (logarithm)	0.005 ***	(0.001)	0.203 **	(0.064)	-0.003	(0.002)
Time (logarithm)	-0.002	(0.001)	0.011	(0.051)	-0.003	(0.002)
Judicial land value (logarithm)	0.005 **	(0.002)	0.166	(0.062)	-0.001	(0.002)
Commercial use (yes=1)	0.013 +	(0.008)	0.020	(0.257)	0.010	(0.010)
Plaintiff is a government agency (yes=1)	0.009 +	(0.005)	0.511	(0.219)	-0.047 ***	(0.005)
Defendant is a government agency (yes=1)	-0.010	(0.008)	-0.337	(0.342)	0.003	(0.014)
Market yield rate			36.310 ***	(7.049)	0.051	(0.193)
Whether plaintiff hires lawyer			-0.012	(0.169)	0.010 +	(0.005)
Whether defendant hires lawyer			0.703 ***	(0.137)		
Defendant number (logarithm)			0.153 *	(0.066)		
Plaintiff number (logarithm)					0.007	(0.005)
Arable land (yes=1)					-0.024	(0.013)
Constant	-0.045 **	(0.016)	-6.113 ***	(0.893)	0.015	(0.030)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.033 ***	(0.002)				
σ_3	0.039 ***	(0.002)				
ρ_{12}	0.713 ***	(0.081)				
ρ_{13}	-0.482 ***	(0.069)				
ρ_{23}	-0.399 *	(0.146)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 577. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A10: Regression results for estimating the structural model, excluding Government Cases.

	Excess judicial yield rate		Defendant counters the claimed yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.526 **	(0.141)	9.985	(11.014)		
Defendant counters the claimed yield rate	-0.029 **	(0.009)				
Three judges (yes=1)	0.005	(0.020)				
Three judges* Excess plaintiff claim yield rate	0.103	(0.340)				
Only plaintiff represented by lawyer(s)	-0.013 *	(0.007)				
Only defendant represented by lawyer(s)	0.003	(0.009)				
Both parties represented by lawyers	-0.004	(0.007)				
After August 2012 (yes=1)	-0.015 +	(0.008)				
Land area (logarithm)	0.006 ***	(0.002)	0.140	(0.095)	-0.007	(0.005)
Time (logarithm)	-0.002	(0.002)	0.040	(0.071)	-0.006 *	(0.003)
Judicial land value (logarithm)	0.004 +	(0.002)	0.186 *	(0.089)	-0.004	(0.005)
Commercial use (yes=1)	0.025 *	(0.010)	0.002	(0.361)	0.037	(0.026)
Market yield rate			15.971	(12.815)	-0.121	(0.358)
Whether plaintiff hires lawyer			-0.032	(0.228)	0.016 +	(0.009)
Whether defendant hires lawyer			0.815 ***	(0.177)		
Defendant number (logarithm)			0.175 +	(0.092)		
Plaintiff number (logarithm)					0.009	(0.007)
Arable land (yes=1)					-0.035 ***	(0.015)
Constant	-0.042 *	(0.020)	-4.555 **	(1.541)	0.082	(0.062)
Year fixed effects	Included		Included		Included	
Zone2 fixed effects	Included		Included		Included	
Strata fixed effect	Included		Included		Included	
σ_1	0.030 ***	(0.002)				
σ_3	0.048 ***	(0.003)				
ρ_{12}	0.546 **	(0.145)				
ρ_{13}	-0.399 ***	(0.102)				
ρ_{23}	-0.182	(0.214)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 345. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2,3. For identification, σ_2 is set to 1.

Table A11: Regression results for estimating the structural model, excluding observations with defendant contesting. Senior judge group.

	Excess judicial yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.253	(0.208)		
Three judges (yes=1)	0.005	(0.019)		
Three judges* Excess plaintiff claim yield rate	-0.093	(0.322)		
Only plaintiffrepresented by lawyer(s)	-0.017 +	(0.010)		
Only defendantrepresented by lawyer(s)	-0.029 *	(0.015)		
Both partiesrepresented by lawyers	-0.017	(0.011)		
After August 2012 (yes=1)	-0.023 *	(0.011)		
Land area (logarithm)	0.011 ***	(0.003)	0.000	(0.004)
Time (logarithm)	-0.001	(0.003)	-0.002	(0.003)
Judicial land value (logarithm)	0.009 *	(0.004)	-0.003	(0.003)
Commercial use (yes=1)	0.018	(0.015)	0.031 +	(0.017)
Plaintiff is a government agency (yes=1)	-0.003	(0.009)	-0.043 ***	(0.008)
Defendant is a government agency (yes=1)	0.011	(0.016)	-0.004	(0.028)
Market yield rate			-0.036	(0.324)
Whether plaintiff hires lawyer			-0.001	(0.010)
Plaintiff number (logarithm)			0.013	(0.008)
Arable land (yes=1)			0.024	(0.026)
Constant	-0.079 *	(0.039)	0.063	(0.052)
Year fixed effects	Included		Included	
Zoning fixed effects	Included		Included	
Strata fixed effect	Included		Included	
σ_1	0.030 ***	(0.003)		
σ_2	0.037 ***	(0.003)		
ρ_{12}	0.273 *	(0.131)		

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 178. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2.

Table A12**:** Regression results for estimating the structural model, excluding

observations with defendant contest. Junior judge group.

	Excess judicial yield rate		Plaintiff 's claimed yield rate	
	Coef.	Std. Err.	Coef.	Std. Err.
Excess plaintiff claim yield rate	0.868 ***	(0.174)		
Three judges (yes=1)	0.051 ***	(0.011)		
Three judges* Excess plaintiff claim yield rate	2.756 ***	(0.346)		
Only plaintiffrepresented by lawyer(s)	-0.002	(0.007)		
Only defendantrepresented by lawyer(s)	0.009	(0.011)		
Both partiesrepresented by lawyers	-0.003	(0.007)		
After August 2012 (yes=1)	-0.006	(0.012)		
Land area (logarithm)	0.002	(0.002)	-0.001	(0.004)
Time (logarithm)	-0.007 **	(0.002)	0.001	(0.003)
Judicial land value (logarithm)	0.006 *	(0.003)	0.001	(0.004)
Commercial use (yes=1)	0.023 +	(0.013)	-0.011	(0.010)
Plaintiff is a government agency (yes=1)	0.027 **	(0.008)	-0.049 ***	(0.007)
Defendant is a government agency (yes=1)	0.002	(0.010)	0.000	(0.017)
Market yield rate			0.225	(0.276)
Whether plaintiff hires lawyer			0.012 +	(0.007)
Plaintiff number (logarithm)			-0.001	(0.005)
Arable land (yes=1)			-0.008	(0.014)
Constant	-0.058 *	(0.027)	-0.021	(0.047)
Year fixed effects	Included		Included	
Zoning fixed effects	Included		Included	
Strata fixed effect	Included		Included	
σ_1	0.028 ***	(0.003)		
σ_2	0.033 ***	(0.003)		
ρ_{12}	-0.670 ***	(0.081)		

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1. The number of observations is 214. ρ_{jk} denotes the correlation of error terms between equations (j) and (k), and σ_k denotes the standard deviation of error terms in equation (k) j,k=1,2.