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# Judicial Pragmatism under Stability Pressure: The Functional Equivalence of Compensation and Forgiveness in Chinese Appellate Capital Sentencing

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**Judicial Pragmatism under Stability Pressure: The Functional Equivalence of Compensation and Forgiveness in Chinese Appellate Capital Sentencing**

**Abstract** This study investigates the pragmatic governance logic underlying capital sentencing in China, specifically focusing on the functional equivalence of financial compensation and victim forgiveness. Utilizing a comprehensive dataset of second-instance intentional homicide verdicts since 2011, we employ binary logistic and linear regression models with two-way fixed effects to analyze sentencing disparities. Our findings reveal a tiered sentencing logic: while the "compensation-plus-forgiveness" bundle yields the maximum leniency, financial compensation alone and victim forgiveness alone demonstrate statistically equivalent effects in mitigating death sentences. This "equivalence" challenges traditional restorative justice paradigms that prioritize emotional repair(King, 2008; Mok & Wong, 2013). Instead, we argue that under the dual pressures of stability maintenance (weiwen) and bureaucratic performance evaluation, Chinese judges pragmatically utilize these tools to hedge against the risk of petitioning (xinfang). Ultimately, capital sentencing in China has evolved into a sophisticated socio-legal exchange where judicial leniency is traded for the cessation of litigation, reflecting a shift from pure legalism to a governance-oriented judicial pragmatism.

**Keywords:**, Criminal Reconciliation; Homicide Sentencing; Victim Compensation; Letter of Forgiveness; Judicial Pragmatism; Stability Maintenance

## 1. Introduction

The sentencing process in capital cases is frequently regarded as the most opaque "black box" within the judicial system. According to the principle of *legally prescribed punishment*, capital sentencing should be strictly determined by legal statutes; yet, in practice, phenomena such as "pecuniary reparations in exchange for leniency" and "settlement for life" persist. Determining whether strict legal rules or extra-legal social factors dominate capital sentencing remains a central challenge in sentencing research. As a paradigmatic case of authoritarian legality, China offers a unique vantage point for examining this puzzle. Here, judges must not only adjudicate between life and death but also navigate a delicate balance between legalism and the imperative of sociopolitical stability maintenance.

Following the Fourth Plenum of the 18th Party Congress, China initiated a "trial-centered" judicial reform. This reform attempted to shift the center of gravity in criminal justice from the investigation-centric dossier system to substantive courtroom adjudication, aiming to constrain judicial discretion through procedural justice and return sentencing to the rule of law. However, has this reform truly reshaped the decision-making logic of the courts, particularly that of appellate judges who hold the power of life and death? Utilizing a dataset of second-instance verdicts for intentional homicide from Provincial High People's Courts collected via the *PKU Law* database, this study empirically examines the influence of atypical legal circumstances—

specifically economic compensation and victim forgiveness—on capital sentencing in the reform era.

Focusing on second-instance cases at China's Provincial High People's Courts holds distinct theoretical value. Under China's *Criminal Procedure Law*, first-instance trials for cases potentially involving life imprisonment or the death penalty are heard by Intermediate People's Courts. This implies that defendants entering the High Court for appeal are positioned precariously on the edge of capital punishment. Crucially, given that the basic facts established in the first instance are rarely overturned, new sentencing circumstances—such as compensation and forgiveness—often become the sole variables for defense. As the gatekeepers of the "kill fewer, kill carefully" criminal policy, High Courts face immense pressure in exercising their discretion through sentence commutation. This makes the second-instance trial an ideal window for observing how courts negotiate the tension between law and politics.

Addressing potential controversies regarding data sources, our data selection possesses a unique, irreproducible systemic advantage. As the world's largest retainer of the death penalty, China's capital punishment practices have long been shrouded in secrecy and are frequently viewed by scholars as deeply intertwined with political control (Johnson & Zimring, 2009; Miao, 2013). However, the launch of *China Judgements Online* (CJO) created a "Golden Window" of judicial transparency, particularly prior to the mass retraction of documents in 2021. This window constitutes the primary rationale for our 2011–2021 study period. Although the subsequent tightening of data access may obscure the most recent trends, the "stability maintenance logic" observed during this period of peak transparency constitutes a critical institutional baseline. In the current environment of reduced transparency, this pragmatic logic of "penal exchange" is likely to be more, not less, prevalent than during the period of open disclosure.

Furthermore, while we acknowledge that publicly available court documents may suffer from selection bias (Liebman et al., 2020), this bias arguably strengthens the robustness of our conclusions. If "stability maintenance instrumentalism" and the "functional equivalence" between compensation and forgiveness remain pervasive even within these highly scrutinized, transparent, and relatively standardized cases, we can reasonably infer that such pragmatic logic plays an even more dominant role in the "dark figure" of cases that remain unpublished due to high sensitivity or procedural irregularities. Consequently, the empirical findings of this study constitute, in effect, a conservative lower bound for the impact of extra-legal factors on capital sentencing.

## 2. Literature Review

### 2.1 Sentencing Research: Legal and Extra-Legal Factors

Scholarly inquiry into criminal sentencing is extensive, spanning legal statutes, policy frameworks, institutional organizations, and socio-economic contexts(Hagan & Bumiller, 1983). Early research predominantly focused on the dichotomy between legal factors and extra-legal factors. On one hand, scholars sought to determine the extent to which legal rules and policies dictate sentencing outcomes (Berger, 1976; Crow &

Bales, 2006), emphasizing the need for precise measurement of legally relevant variables such as offense severity and criminal history (Klepper et al., 1983; Kleck, 1985; Steffensmeier & Demuth, 2001). On the other hand, research has increasingly revealed that substantial judicial discretion persists within legal frameworks, allowing extra-legal factors—including race, gender, age, and socioeconomic status (SES)—to influence adjudicative outcomes.

A robust body of literature indicates that defendants' socio-demographic characteristics often interact to shape sentencing. Factors such as age, gender, and race/ethnicity do not operate in isolation but are intertwined (Spohn, 2000; Ulmer, 2012). The impact of race, for instance, may vary depending on the defendant's gender, age, class, offense type, criminal history, and local context (Ulmer, 2011). Furthermore, wealth and SES are critical determinants(Anderson & Heaton, 2012; Xin & Cai, 2020). Defendants with greater economic resources hold advantages in retaining private counsel and securing bail, which can indirectly lead to more lenient sentences (Reitler et al., 2013; Bagaric, 2014). However, disentangling the specific effects of SES from race remains a methodological challenge due to data limitations.

As the field has matured, scholars have recognized that sentencing is not merely an individual decision but a social process embedded within specific organizational and societal contexts (Ulmer, 2012). The "Focal Concerns" theory posits that judges, operating under bounded rationality, make decisions based on three core concerns: blameworthiness, protection of the community, and practical constraints and consequences (Steffensmeier & Demuth, 2001). "Practical constraints" encompass organizational factors such as caseload pressure and judicial resources. Consequently, the court's internal "workgroup culture," informal norms, and external environment (e.g., political climate, crime rates) act as practical constraints that profoundly shape final judgments (Johnson, 2006). Similarly, Hall (1997) and King et al. (2010) highlight how variations among courtroom actors influence the implementation of sentencing policies, while Haynes (2011) demonstrates that regional contexts and local criminal justice resources significantly impact sentencing outcomes.

Within this focus on "practical constraints" and "judicial efficiency," Restorative Justice theory offers a distinct perspective. With the rise of the victim rights movement (Carrington & Nicholson, 1983), victim forgiveness has gained weight as a mitigating circumstance. Existing studies generally interpret this through two lenses: one focuses on material compensation, often cynically summarized as "buying a lighter sentence" (Trevaskes, 2015), linking it to political and policy imperatives; the other focuses on victim forgiveness within the framework of restorative justice and victim participation (Erez & Rogers, 1999; Peng, 2024). This theoretical conflation makes it difficult to discern the judge's true rationale: is leniency granted because compensation restores justice, or because monetary settlement satisfies the court's organizational need for efficiency? This ambiguity is particularly pronounced in high-stakes capital cases.

### 2.1.2 Capital Sentencing in Comparative Perspective

Research on capital sentencing has established a solid foundation. Early studies examined legal determinants such as crime method, defendant age, and remorse (Kirchmeier, 1998; Kleinert, 2006), while others investigated extra-legal disparities based on race, gender, and religion (Phillips, 2008; Gross & Mauro, 1984; Miller & Hayward, 2008). The influence of jury composition—specifically gender, race, and experience—has also been a focal point (Tomsich & Gover, 2014; Barnett & Davis, 2004).

Institutional pressure is another critical variable. Blume and Eisenberg (Blume and Eisenberg, 1999) found that U.S. judges, facing electoral pressure, tend to be more punitive in capital cases, suggesting that case selection is politically influenced. This prompts a theoretical inquiry: in jurisdictions without judicial elections, do political or institutional pressures still condition capital sentencing through alternative mechanisms?

Unlike the U.S., Chinese judges do not face electoral pressure but are subject to intense performance evaluations centered on "maintaining social stability" (weiwen). This offers a unique Eastern context for testing the "political pressure" hypothesis (Dai, 2010). Although China's "compensation for forgiveness" mechanism bears traces of restorative justice and resonates with Confucian emphasis on harmony (Johnstone & Ness, 2007; Zhe, 2013), in the pragmatic realm of capital sentencing, it functions primarily as a mechanism to defuse social conflict and alleviate stability-maintenance pressure (Ng & He, 2014). In this context, compensation is not merely material restitution but a signal of remorse. When this signal is accepted by the victim's family through "forgiveness," the court simultaneously resolves the victims' material needs and achieves the governance goal of "closing the case and settling the matter" (anjie shiliao). If U.S. judges may impose more death sentences to secure votes, Chinese judges may lean towards "compensation" to impose fewer death sentences to ensure stability. This renders "economic capacity" a sensitive yet unavoidable extra-legal factor in Chinese capital sentencing. Thus, the compensation-forgiveness system in China is not simply a matter of "money for life" but a governance tool embedded in the objective of conflict resolution.

Intentional homicide, given its extreme severity, serves as the optimal sample for examining the efficacy of compensation and forgiveness. Previous studies on China have noted the pivotal role of these factors in capital cases (Trevaskes, 2013; Miao, 2013), particularly in the critical determination between "immediate execution" and "death sentence with a two-year reprieve" (suspended death sentence). However, the practice of "leniency for compensation" in serious violent crimes remains highly controversial (Sun, 2010). The core contradiction lies in the legal text: the Criminal Procedure Law stipulates that "criminal reconciliation" procedures apply primarily to minor or negligent crimes, explicitly excluding serious felonies like intentional homicide. Yet, in practice, courts frequently grant leniency to defendants who secure forgiveness through active compensation.

This divergence between judicial practice and statutory prohibition has sparked intense debate. Some scholars argue that while compensation in homicide cases exceeds the

statutory scope of criminal reconciliation, it aligns with the fundamental criminal policy of "tempering justice with mercy" (kuanyan xiangji) and reflects practical wisdom in restoring social relations (Chen, 2005; Huang, 2007; You & Tang, 2009). Conversely, critics argue that this practice transgresses legal boundaries, erodes the principle of legally prescribed punishment, and distorts the essence of reconciliation due to uncontrollable factors (Liang, 2010; Trevaskes, 2015).

Despite extensive discussion, significant empirical gaps remain. First, most studies treat "compensation and forgiveness" as a composite concept, failing to isolate their marginal effects (Peng, 2024). This obscures the distinct governance logics behind them: is leniency driven by the emotional restoration of social relations (forgiveness) or the stability-maintenance function of monetary transfer (compensation)? Second, existing analyses often focus on a binary outcome, overlooking the multi-layered nature of capital sentencing where compensation may impact the qualitative decision (life vs. death) differently than the quantitative decision (immediate execution vs. reprieve). Finally, many studies rely on case studies or cross-sectional data from single regions, lacking systematic testing. Crucially, they often ignore endogeneity issues in case selection (Blume & Eisenberg, 1999); without addressing potential selection bias, it is difficult to determine whether leniency stems from the compensation itself or from unobserved case characteristics.

To bridge these gaps, this study constructs a unique quantitative dataset of second-instance intentional homicide verdicts from High People’s Courts since 2011. We focus specifically on the appellate stage not only because it is the final gatekeeper of life and death but also because appellate modifications offer a clearer view of the independent influence of extra-legal factors.

Based on this sample, we test the following core hypotheses:

**H1 (Independent Effect of Economic Compensation):** Controlling for other variables, the act of economic compensation by the defendant significantly reduces the probability of immediate execution, even in the absence of victim forgiveness.

**H2 (Dominance of Stability Logic):** Since both compensation and forgiveness function as stability maintenance tools, the suppressive effects of "compensation only (without forgiveness)" and "forgiveness only (without compensation)" on death sentences are statistically indistinguishable (or show minimal difference).

**H3 (Cumulative Effect):** Controlling for legal and extra-legal factors, the combination of "compensation and forgiveness" exerts the most significant suppressive effect on immediate execution compared to either "compensation only" or "forgiveness only."

## 3. Research Methodology and Model Specification

To rigorously identify and robustly estimate the independent effect of "compensation and forgiveness" on sentencing in intentional homicide cases, this study employs a stratified analytical strategy combining "qualitative eligibility" with "quantitative discretion." Given the complexity of judicial decision-making and potential

endogeneity issues—such as selection bias among litigants—a single regression model is often insufficient to capture the heterogeneous logic between the *decision to grant leniency* (the extensive margin) and the *magnitude of leniency* (the intensive margin). Consequently, this paper constructs dual dependent variables and utilizes multiple econometric models for cross-validation to ensure the robustness of the findings.

First, at the qualitative level, we examine the impact of core variables on the "eligibility for sentence reduction." Although the outcomes of second-instance judgments formally present as an ordinal scale, preliminary tests indicated that the data failed the strict proportional odds assumption required for Ordered Logit models. This suggests that the marginal effects of factors like "compensation and forgiveness" are not constant across different penalty thresholds. Following robust empirical practices, we define the dependent variable as a binary outcome ("whether a reduction was granted") and employ a Binary Logistic Regression (Binary Logit) as the baseline model. This approach avoids model specification bias and accurately identifies the key determinants enabling defendants to cross the "threshold" of leniency.

Second, at the quantitative level, we convert the penalties into specific imprisonment terms and construct "years of sentence reduction" (sentence_reduction) as a second dependent variable. For this continuous variable, we employ a Multiple Linear Regression (OLS) model to estimate the magnitude of leniency.

It is worth noting that to overcome omitted variable bias, both stages of the model incorporate two-way fixed effects for province and year. By controlling for unobserved inter-regional judicial disparities and macro-level policy shifts over time, the model effectively isolates environmental noise, ensuring that the estimated coefficients for "compensation and forgiveness" reflect their net effects.

Finally, to specifically address the endogeneity concern that "cases selecting compensation and forgiveness may inherently be prone to lighter sentences," we further employ Propensity Score Matching (PSM). This method simulates a quasi-experimental environment to test whether the net effect persists after controlling for observable case characteristics. Additionally, a Placebo Test is conducted to rule out the potential interference of unobserved random factors. Through this triangulation of models, this study aims to provide a logically rigorous and robust chain of empirical evidence regarding the sentencing effects of "compensation and forgiveness" in intentional homicide cases.

### 3.1 Data Source and Sample Selection

The data for this study are derived from criminal verdicts on intentional homicide cases in China since 2011, sourced from the *PKULaw* (Beida Fabao) database. To construct a high-quality quantitative dataset and ensure rigorous causal inference, we applied a strict sample selection strategy:

1. Focus on Second-Instance Cases To precisely capture the independent influence of "compensation and forgiveness" at the critical discretion stage and control for confounding factors like offense severity, we restricted the sample to cases adjudicated

by High People's Courts in the second instance (including retrials). Under China's Criminal Procedure Law, cases reviewed by High Courts are typically felonies with potential capital punishment. Furthermore, based on the principle of prohibiting double evaluation, appellate modification decisions—especially when factual findings remain unchanged from the first instance—allow for a clearer isolation of the marginal effects of extra-legal factors like "compensation and forgiveness."

2. Exclusion of Joint Crimes To eliminate complex interference arising from the allocation of responsibility between principal and accessory offenders, we excluded all cases involving two or more perpetrators, retaining only single-offender samples. This ensures that variations in sentencing are attributable to the case facts and compensation circumstances themselves, rather than the defendant's hierarchical status within a criminal group.

3. Data Cleaning and Time Window The initial retrieval yielded 2,204 cases with clear fatalities dating from 2010. After excluding incidental civil actions and cases with missing key variables, we obtained a final valid sample of 1,067 cases. It is important to note that due to the small sample size in 2010, observations from that year were merged into the 2011 cohort to ensure the stability of the "year fixed effects" estimation in subsequent regression analyses.

### 3.2 Variable Definitions and Measurement

#### 3.2.1 Dependent Variables

To examine sentencing effects from both qualitative and quantitative dimensions, two distinct dependent variables were constructed. First, to measure the ordinal change in penalty severity, we assigned values to penalties from the first and second instances based on the *Criminal Law of the PRC* and judicial practice, creating a six-point ordinal scale: "0" = Fixed-term imprisonment of <10 years; "1" = Fixed-term imprisonment of 10–15 years; "2" = Life imprisonment; "3" = Death sentence with a two-year reprieve (suspended death); "4" = Suspended death with restrictions on commutation; "5" = Immediate execution.

Based on this scale, the primary dependent variable for qualitative analysis, sentence_change, is defined as the difference between the "first-instance penalty level" and the "second-instance penalty level." This is dichotomized into two categories: "0" indicates no reduction or an increase (difference $\leq 0$), and "1" indicates a reduction (difference $> 0$). This binary classification captures substantive discretionary adjustments while avoiding estimation instability caused by sparse data in certain outcome categories.

For the quantitative estimation model, the dependent variable is sentence_reduction, measuring the magnitude of leniency. It is defined as "the imputed term of the final sentence minus the imputed term of the original sentence." To incorporate special penalties like life imprisonment and death sentences into a comparable sequence, we followed existing literature (Bai Jianjun, 2009) and the *Provisions of the Supreme People's Court on Case Handling Procedures for Commutation and Parole*, applying

the following conversion standards: Immediate execution = 40 years; Suspended death with restriction = 32 years; Suspended death = 30 years; Life imprisonment = 24 years; Fixed-term imprisonment = actual years sentenced.

### 3.2.2 Core Independent and Control Variables

The core independent variable, compforgive, is a categorical variable measuring different combinations of "compensation" and "forgiveness": "1 = No Compensation/No Forgiveness"; "2 = Compensation/No Forgiveness"; "3 = Compensation/Forgiveness"; and "4 = No Compensation/Forgiveness." In the regression models, this variable is introduced using Stata's factor variable syntax (i.compforgive). This operation automatically sets Category 1 ("No Comp/No Forgive") as the reference group and generates dummy variables for the other three categories, allowing for precise estimation of the independent effect of each scenario relative to the baseline.

Regarding control variables, drawing on prior studies (Chen Xingliang, 2004; Wang, 2017), we included a range of factors covering case facts (e.g., surrender, cruelty of means, victim fault, family disputes), procedural factors (e.g., prosecutorial protest), and the original sentence level (level1_6). Furthermore, to enhance the robustness of the estimates, the model introduces Province Fixed Effects to absorb unobserved systemic regional differences (e.g., local judicial culture, enforcement intensity) and Year Fixed Effects to control for common annual shocks such as judicial policies and public opinion.

### 3.3 Empirical Model Specification

To investigate the qualitative impact of compensation and forgiveness on the judge's decision "whether to grant a reduction," we employ a **Binary Logistic Regression Model**. Given that the Brant Test indicated the inapplicability of ordinal models, and to clearly identify the "entry mechanism" for leniency, we define the dependent variable as a binary outcome. This approach avoids imposing a forced assumption of a linear or parallel progression between different levels of sentence reduction. The model is specified as follows:

$$\text{Logit}[P_{ipt}] = \ln\left(\frac{P_{ipt}}{1-P_{ipt}}\right) = \alpha_1 + \beta_1 \text{CompForgive}_{ipt} + \gamma_1 Controls_{ipt} + \delta_p + \lambda_t + \epsilon_{ipt}$$

Where the subscripts $i$, $p$, and $t$represent the $i$-th case sample adjudicated in the $p$-th province during year $t$. $Reduced_Binary_{ipt}$ is the binary dependent variable, indicating whether a sentence reduction was obtained in the second instance relative to the first instance (1 = Yes, 0 = No). $CompForgive_{ipt}$is the core independent variable, representing the compensation and forgiveness status of case $i$. $Controls_{ipt}$denotes a vector of control variables, primarily comprising factual case determinants such as voluntary surrender (*surrender*), the cruelty of the criminal means (*cruelty_level*), whether the conflict arose from civil/domestic disputes (*fam_dispute*), the existence of victim fault (*victim_fault*), the sentence level in the first instance (*level1_6*), and whether the case involved a prosecutorial protest (*protest*). $\beta_1$and $\gamma_1$are the coefficient

vectors for the independent and control variables, respectively. $\alpha_1$ is the intercept. $\delta_p$ represents Province Fixed Effects, capturing unobserved regional judicial disparities. $\lambda_t$ represents Year Fixed Effects, controlling for annual policy fluctuations. $\epsilon_{it}$ is the random error term. Definitions and descriptive statistics for all variables are presented in Table 1.

Table 1. Descriptive Statistics of Main Variables

| Variable | | N | Mean | SD | Min | Max |
|---|---|---|---|---|---|---|
| reduced_binary | Sentencing change level | 1,070.000 | 0.668 | 0.471 | 0.000 | 1.000 |
| CompForgive | Compensation–forgiveness status | 1,070.000 | 2.264 | 1.082 | 1.000 | 4.000 |
| surrender | | 1,070.000 | 0.522 | 0.500 | 0.000 | 1.000 |
| cruelty_level | whether the crime was committed with cruelty | 1,070.000 | 0.373 | 0.484 | 0.000 | 1.000 |
| fam dispute | whether the case arose from a private dispute | 1,070.000 | 0.307 | 0.461 | 0.000 | 1.000 |
| victim fault | whether the victim bore contributory fault | 1,070.000 | 0.207 | 0.406 | 0.000 | 1.000 |
| sentence_reduction | Difference in sentence length between trial and appellate judgments (continuous) | 1,070.000 | 6.030 | 5.510 | -30.000 | 30.000 |
| protest | Prosecutorial protest/appeal | 1,070.000 | 0.279 | 0.448 | 0.000 | 1.000 |
| level1 6 | First-instance sentence level | 1,069.000 | 3.376 | 1.452 | 1.000 | 5.000 |

## 4. Empirical Results and Robustness Checks

### 4.1 Baseline Regression Results

While existing literature often employs Ordinary Least Squares (OLS) regression by converting sentence length into a continuous variable (Bushway & Piehl, 2007), this approach overlooks the discrete and non-linear nature of criminal penalties, potentially leading to estimation bias. Wooldredge and Thistlethwaite (2004) attempted to use Hierarchical Linear Modeling (HLM) to address sentencing issues, yet this method still necessitates forcing penalties into continuous or binary forms, resulting in a loss of ordinal information. Theoretically, the Ordered Logit model serves as the standard approach for handling ranked dependent variables. However, our preliminary diagnostic tests revealed that the data failed the strict proportional odds assumption test (Brant Test). This indicates that the marginal effects of factors such as "compensation and forgiveness" differ significantly depending on whether the decision concerns "eligibility for reduction" or the "magnitude of reduction," suggesting that a single ordered model cannot adequately capture this decision-making heterogeneity.

Consequently, to more precisely mirror the "qualitative determination followed by quantitative discretion" logic inherent in second-instance appellate review, this study adopts a "Two-Stage Strategy" in lieu of the traditional ordered model.

The baseline model designates "Compensation and Forgiveness Status" (CompForgive) as the core independent variable. The control vector includes voluntary surrender (surrender), cruelty of the crime (cruelty_level), family/civil disputes (fam_dispute), victim fault (victim_fault), prosecutorial protest (protest), and the first-instance sentence level (level1_6). The dependent variable classifies the verdict outcome into a binary state—"No Reduction/Sentence Increase" versus "Sentence Reduction"—to capture the court's overall propensity for leniency. Furthermore, all models incorporate Two-Way Fixed Effects (Province and Year) to absorb unobserved regional judicial traditions and macro-level fluctuations in criminal policy. The regression results are presented in Table 2.Analyzing the Section Structure

Table 2. The Effect of Compensation–Forgiveness on Sentencing Change

| VARIABLES | Sentence Reduced (Yes=1) |
|---|---|
| Compensation Only | 3.451*** |
| | (0.350) |
| Compensation & Forgiveness | 5.238*** |
| | (0.450) |
| Forgiveness Only | 3.445*** |
| | (0.437) |
| cruelty_level = 1 | -1.224*** |
| | (0.280) |
| fam_dispute = 1 | 0.418 |
| | (0.257) |
| victim_fault = 1 | 0.825** |
| | (0.325) |
| protest = 1 | -2.011*** |
| | (0.328) |
| surrender = 1 | 0.132 |
| | (0.235) |
| Constant | -5.327*** |
| | (0.823) |
| Observations | 1,067 |
| Province FE | Yes |
| Year FE | Yes |
| Pseudo R2 | 0.602 |
| N | 1067 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 reports the baseline regression results. The column "Sentence Reduced" presents the estimates from the Binary Logit model, aimed at identifying the "entry

determinants" for sentence reduction. The results indicate that the coefficient for "Compensation Only" (Comp/No Forgive) is 3.433. Converting this into an Odds Ratio (OR), we find that, holding other variables constant, defendants who provide economic compensation alone have approximately 31 times higher odds of receiving a sentence reduction in the second instance compared to the baseline group ("No Comp/No Forgive"). This result compellingly validates Hypothesis 1: even in the absence of a pardon from the victim's family, pure economic compensation possesses significant independent potency in sentencing. It suggests that within the logic of "stability maintenance" (Weiwen), economic restitution suffices to justify leniency from judges.

Regarding Hypothesis 2 (the dominance of the stability maintenance logic), the regression results offer persuasive support. The analysis reveals a statistical equivalence between "Compensation Only" and "Forgiveness Only" (Wald Test: $\chi^2=0.00, p=0.989$), with both showing significant leniency effects ($p<0.01$). This implies that material compensation and emotional forgiveness possess equal efficacy. This finding challenges and refines classical judicial theories: under the imperative of social stability—provided the goal of "case finality" (An Jie Shi Liao) is achieved—judges do not exhibit a distinct preference for monetary compensation over emotional restoration. In the second-instance stage, material compensation effectively acts as a perfect functional substitute for emotional forgiveness.

The combination of "Compensation and Forgiveness" (Comp/Forgive) yields the strongest leniency effect, with a coefficient of approximately 5.221. Relative to the control group, this increases the odds of reduction by a staggering 185 times. By simultaneously addressing the victim family's survival hardships and emotional grievances, this dual fulfillment cuts off the motivation for petitioning (Shangfang), thereby dissolving social conflict. This achieves both case finality and dispute resolution. Consequently, the "Cumulative Effect" confirmed by Hypothesis 3 is essentially a superposition of stability maintenance gains. This further corroborates that the criminal reconciliation system in China functions, in practice, as a highly efficient mechanism for social risk control: the more thoroughly the risk is eliminated, the more significant the judicial leniency granted.

The regression results for control variables reveal distinct efficacy patterns in appellate sentencing. Aggravating factors such as Prosecutorial Protest and Cruelty of Means exert a strong inhibitory effect, indicating a "bottom line" constraint where extreme cruelty or prosecutorial opposition severely limits judicial discretion regardless of compensation. Conversely, Victim Fault significantly increases the likelihood of leniency, as the victim's shared responsibility legally diminishes the defendant's culpability. In stark contrast, Surrender and Family/Neighbor Disputes—traditionally key mitigating factors—fail to reach statistical significance in the second-instance model. This suggests the leniency value of "Surrender" was likely exhausted in the first instance, while the insignificance of "Family Disputes" exposes an "instrumental alienation" of restorative justice: without visible stability outcomes like compensation or forgiveness, judges are unwilling to bear the risk of modifying sentences even in cases with high reparative potential.

To further elucidate the impact of the key independent variables, we plotted the Predictive Margins based on the Logit model estimates. Figure 1 visually demonstrates the marginal impact of different "Compensation-Forgiveness States" on the final sentencing adjustment, offering a clear comparison of how each state alters the probability of a sentence reduction.

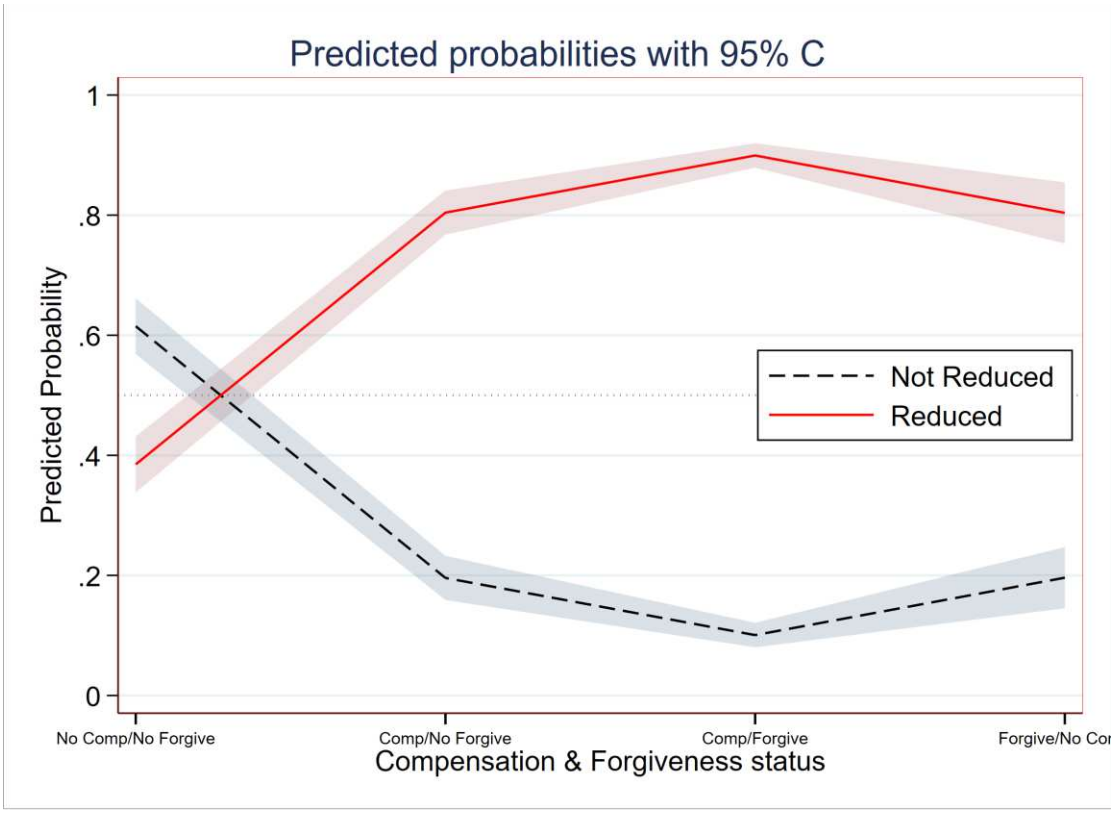



Figure 1. Predicted Probabilities of Two Sentencing Adjustment Outcomes with 95% Confidence Intervals

Figure 1 visualizes the predictive probabilities with 95% confidence intervals, illustrating how the "Compensation-Forgiveness" status impacts sentencing outcomes.In the baseline "No Compensation/No Forgiveness" group, the probability of non-reduction (dashed line, ~60%) significantly exceeds that of reduction (solid line, ~40%), confirming that upholding the original sentence is the default outcome absent restorative actions. However, the introduction of either compensation or forgiveness causes a sharp reversal: the reduction probability rises to over 80%, supporting Hypothesis 1.

Crucially, Figure 1 visually validates Hypothesis 2. The predictive margins for "Compensation Only" and "Forgiveness Only" are nearly identical (both ~0.80), confirming the statistical equivalence observed in the regression results. This underscores that material compensation and emotional forgiveness are functionally homogeneous in eliciting leniency.

Finally, the "Compensation and Forgiveness" group achieves the maximum reduction probability (~90%), minimizing the risk of non-reduction (<10%). This verifies the

cumulative effect proposed in Hypothesis 3. In sum, the visualization corroborates the regression findings: while single factors are effective, "Dual Restoration" maximizes the certainty of sentence modification. The following section will test the robustness of these findings and analyze the magnitude of reductions.

## 5. Robustness Checks

### 5.1 Two-Way Fixed Effects Linear Regression (OLS)

In the primary model, we employed a Binary Logit specification, classifying verdict outcomes into two categories to reveal the qualitative impact of "Compensation and Forgiveness Status." To further verify the robustness of these findings, we converted the ordinal penalty levels into a continuous variable (measured in years) and conducted a robustness check using **Ordinary Least Squares (OLS)**.

Specifically, different types of penalties were standardized into equivalent yearly terms:

Immediate Death Penalty = 40 years;

Suspended Death Penalty with Restrictions on Commutation = 32 years;

Suspended Death Penalty (Standard) = 30 years;

Life Imprisonment = 24 years;

Fixed-term Imprisonment = Actual sentence length.

Based on this conversion, we constructed the following Two-Way Fixed Effects Linear Regression Model:

$$\text{sentence_reduction}_{ipt} = \alpha_2 + \beta_2 \text{CompForgive}_{ipt} + \gamma_2 Controls_{ipt} + \delta_p + \lambda_t + \epsilon_{ipt}$$

In this equation, $Sentence_Reduction_{ipt}$ denotes the continuous dependent variable representing the "years of sentence reduction" for case $i$ in province $p$ during year $t$. $CompForgive_{ipt}$ serves as the core independent variable indicating the status of compensation and forgiveness, while $Controls_{ipt}$ represents the vector of control variables used in this study. To mitigate omitted variable bias, $\delta_p$ captures Province Fixed Effects to absorb time-invariant, province-specific unobserved heterogeneity, and $\theta_t$ captures Year Fixed Effects to control for common shocks specific to a given year that are invariant across provinces (such as nationwide shifts in judicial policy). The coefficient of primary interest is $\beta_2$, which estimates the average marginal effect of "compensation and forgiveness" on the magnitude of sentence reduction after adjusting for all covariates and two-way fixed effects.

To rigorously test the robustness of our findings, we employ a hierarchical regression strategy to systematically introduce control variables. Model (1) includes only the core variable "Compensation-Forgiveness Status" to establish a baseline. Model (2) further controls for factual case characteristics. Model (3) incorporates the sentence level from the first instance to account for baseline severity. Finally, Model (4) builds upon the former specifications by adding the Two-Way Fixed Effects for province and year. The detailed regression results are presented in Table 3.

Table3 Impact of Compensation and Reconciliation Status on Sentence Reduction

| | (1) sentence_reduction | (2) sentence_reduction | (3) sentence_reduction | (4) sentence_reduction |
|---|---|---|---|---|
| Comp/No Forgive | 5.588*** | 5.277*** | 4.294*** | 4.058*** |
| | (0.390) | (0.387) | (0.363) | (0.378) |
| Comp/Forgive | 6.640*** | 5.994*** | 5.656*** | 5.551*** |
| | (0.385) | (0.408) | (0.357) | (0.344) |
| Forgive/No Comp | 5.145*** | 4.530*** | 4.385*** | 4.322*** |
| | (0.414) | (0.419) | (0.383) | (0.381) |
| surrender=1 | | -0.314 | 0.293 | 0.249 |
| | | (0.278) | (0.235) | (0.233) |
| cruelty_level=1 | | -0.348 | -1.846*** | -1.842*** |
| | | (0.288) | (0.280) | (0.286) |
| fam_dispute=1 | | 0.611** | 0.516** | 0.449* |
| | | (0.303) | (0.245) | (0.249) |
| victim_fault=1 | | 0.286 | 0.981*** | 0.840*** |
| | | (0.387) | (0.318) | (0.318) |
| protest=1 | | -2.588*** | -2.010*** | -1.942*** |
| | | (0.401) | (0.323) | (0.421) |
| Observations (N) | 1081 | 1081 | 1080 | 1069 |
| Adjusted $R^2$ | 0.260 | 0.305 | 0.535 | 0.548 |

Robust standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01.

Models 3 and 4 control for original sentence severity; Model 4 additionally includes province and year fixed effects. Selected coefficients are omitted for brevity.

Table 3 presents the hierarchical regression results examining the magnitude of sentence reduction. The inclusion of control variables progressively enhances the model's explanatory power, culminating in an Adjusted $R^2$ of 0.548 in Model 4. Consistent with previous findings, "Compensation and Forgiveness" exhibits the strongest leniency effect, yielding the highest coefficients across all specifications.

Notably, while the coefficient for "Forgiveness Only" marginally exceeds that of "Compensation Only," the Wald test confirms their statistical indistinguishability ($F=0.60, p=0.4377$). This validates the core hypothesis: judicial discretion treats material restitution and emotional forgiveness as interchangeable stability-maintenance instruments, provided they facilitate effective dispute resolution. Regarding control variables, Cruelty of Means and Prosecutorial Protest significantly inhibit reduction, whereas Victim Fault promotes it. Conversely, Surrender and Family Disputes remain insignificant. These patterns align perfectly with the baseline model.

### 5.2 Endogeneity Test: Propensity Score Matching (PSM)

To address potential selection bias—where cases that "select" compensation and forgiveness might systematically differ in unobserved characteristics from those that do not—we further employ Propensity Score Matching (PSM) to handle this endogeneity.

PSM aims to construct a valid counterfactual framework to simulate a quasi-experimental environment; as noted in sentencing literature, it is an effective method for examining sentencing disparities and creating comparable samples (Ulmer, 2012). Specifically, we define "obtaining any form of compensation or forgiveness" as the treatment variable and use multiple control variables related to case characteristics and defendant behavior (including voluntary surrender, cruelty level, family disputes, victim fault, protest, and first-instance sentence level) as covariates to construct a Logit model for estimating the propensity score of each case. Subsequently, we employ 1:1 Nearest Neighbor Matching with a caliper width of 0.05 to match cases with similar propensity scores, thereby establishing a comparable sample. Through this process, we are able to estimate the Average Treatment Effect on the Treated (ATT) of "compensation and forgiveness" on sentence reduction within a sample where observable characteristics are highly balanced.

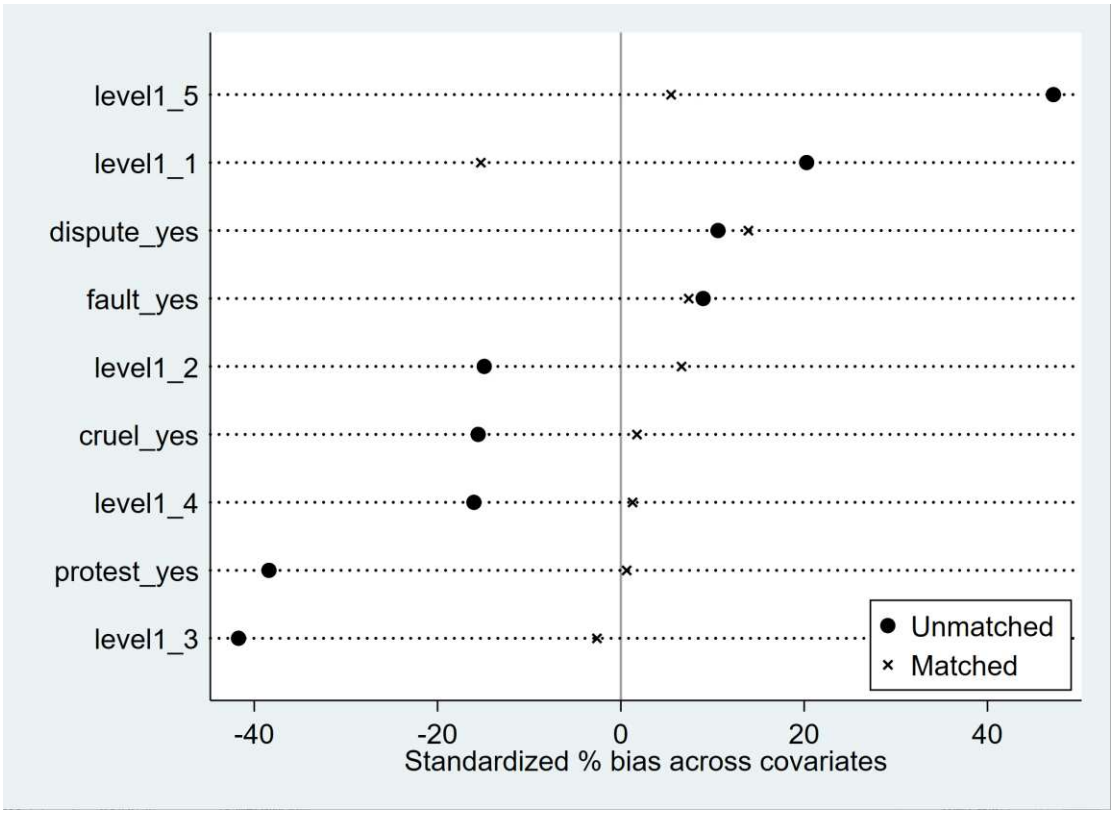



Figure 2. Standardized Bias Plot (Love Plot) Before and After Propensity Score Matching

Figure 2 illustrates the standardized percentage bias across covariates before and after Propensity Score Matching (PSM). As depicted, the unmatched sample (represented by dots) exhibited substantial disparities across multiple dimensions, with bias values deviating significantly from the zero axis. In contrast, post-matching (represented by crosses), the standardized biases for all covariates converged dramatically, with the vast majority falling well within the conventional threshold of ±10%. These visual results are corroborated by statistical metrics: the mean absolute bias decreased from 23.7% to

6.9%, and the Likelihood Ratio (LR) chi-square value dropped precipitously from 151.76 to 21.49. This confirms that the matching procedure effectively eliminated systematic differences in observable characteristics between the treatment and control groups, thereby validating the covariate balance assumption for subsequent causal estimation.

Table 4. Average Treatment Effect on the Treated (ATT) After Propensity Score Matching

| Variable | Treated Group Mean | Control Group Mean | ATT | Standard Error | t-value |
|---|---|---|---|---|---|
| sentence_change_6level | 8.014 | 3.405 | 4.609 | 0.498 | 9.25*** |

Table 4 presents the estimated Average Treatment Effect on the Treated (ATT) after matching. The average sentence reduction for cases in the treatment group is 8.014, which is significantly higher than the 3.405 observed in the matched control group. The resulting ATT is 4.609 with a standard error of 0.498 and a t-statistic of 9.25, indicating significance at the 1% level.

These results demonstrate that, after effectively controlling for selection bias arising from observable case and defendant characteristics, "compensation and forgiveness" continues to yield a statistically significant additional sentence reduction of approximately 4.6 units (equivalent to roughly 0.46 sentencing levels). This provides robust empirical support for the causal inference that compensation and forgiveness possess independent efficacy in sentence mitigation.

### 5.3 Placebo Test

To further verify the validity of our causal identification, we introduce a placebo test as a component of our robustness analysis. The fundamental logic is that if we falsely or "virtually" assign a treatment effect to the key explanatory variable (here, the compensation and forgiveness status) within a sample, we should not observe a significant impact. If the variable remains significant under these conditions, it suggests potential omitted variable bias or model misspecification; conversely, a null result enhances the credibility of the main regression findings. To this end, we constructed a placebo variable, *placebo_comp_state*, using a Random Permutation method. Specifically, we randomly reassigned a "compensation and forgiveness status" value drawn from the full sample to each case in the dataset. To ensure replicability, a random seed was set prior to the operation. Subsequently, using the sub-sample of cases not sentenced to "immediate execution"—the same sample used in our primary quantitative analysis—we re-estimated our most robust linear regression model, replacing the actual *CompForgive* variable with the falsified *placebo_comp_state* variable. The results are reported in Table 5.

Table 5. Placebo Test Results

| VARIABLES | (1)<br>reduced_binary | (2)<br>sentence_reduction |
|---|---|---|
| 2.placebo_comp | -0.015 | 0.175 |
| | (0.198) | (0.367) |
| 3.placebo_comp | 0.044 | 0.410 |
| | (0.171) | (0.307) |
| 4.placebo_comp | 0.271 | 0.742** |
| | (0.192) | (0.323) |
| 1.surrender | -0.002 | 0.155 |
| | (0.135) | (0.253) |
| 1.cruelty_level | -1.312*** | -2.380*** |
| | (0.170) | (0.339) |
| 1.fam_dispute | 0.404 | 0.610* |
| | (0.269) | (0.343) |
| 1.victim_fault | 0.788*** | 1.293*** |
| | (0.191) | (0.334) |
| 1.protest | -1.722*** | -2.883*** |
| | (0.182) | (0.318) |
| Constant | -2.147*** | 0.647 |
| | (0.390) | (0.713) |
| Observations | 1,079 | 1,080 |
| Pseudo R2 | 0.331 | 0.393 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 reports the results of the placebo test, with Column 1 presenting the Logit regression results and Column 2 displaying the linear regression results. As observed, across all regression specifications (corresponding to different levels of sentence change), the regression coefficients for *placebo_comp_state* are statistically insignificant, and the t-values are low, failing to pass conventional significance tests. This indicates that within a sample theoretically unaffected by the "compensation and forgiveness" mechanism, the fictitious treatment variable generated no systematic effects. This null result further corroborates the validity of the identification strategy employed in the main model.

## 6. Heterogeneity Test

In China's judicial practice, the level of regional economic development may exert a moderating effect on the sentence reduction efficacy of "compensation and forgiveness" by influencing the sufficiency of judicial resources, the perceptions of judicial personnel, and the nature of social conflicts. Specifically, two opposing mechanisms may exist. One perspective suggests that in regions with higher per capita GDP and more developed market economies, social relations are more highly "monetized." Consequently, judges may be more inclined to encourage economic compensation to

resolve disputes and repair damages, thereby strengthening the reduction effect (Chen, 2010). Conversely, another perspective argues that in economically developed regions, judicial procedures are more standardized; judges may adhere more strictly to legal statutes and factual evidence to uphold judicial fairness, thereby minimizing the influence of economic factors—such as the defendant's ability to pay—on sentencing (He, 2008; Erie, 2021). To empirically examine this, we introduce a dummy variable for "High Per Capita GDP Region" and its interaction term with "Compensation-Forgiveness Status." Table 6 presents the estimation results side-by-side for models based on both the qualitative dependent variable (*sentence_change*) and the quantitative dependent variable (*sentence_reduction*).

Table 6 Heterogeneity Analysis: Economic Development

| | (1)<br>Logit | (2)<br>OLS |
|---|---|---|
| Comp/No Forgive | 3.238*** | 4.764*** |
| | (7.773) | (6.967) |
| Comp/Forgive | 4.485*** | 6.092*** |
| | (12.625) | (9.309) |
| Forgive/No Comp | 3.340*** | 4.941*** |
| | (5.963) | (9.067) |
| High GDP=1 | 0.449 | 1.229* |
| | (1.276) | (1.873) |
| Comp/No Forgive x High GDP=1 | 0.234 | -1.023 |
| | (0.498) | (-1.241) |
| Comp/Forgive x High GDP=1 | 0.976 | -0.884 |
| | (1.315) | (-1.042) |
| Forgive/No Comp x High GDP=1 | -0.198 | -0.988 |
| | (-0.273) | (-1.593) |
| surrender=1 | 0.128 | 0.249 |
| | (0.819) | (1.189) |
| cruelty_level=1 | -1.280*** | -1.888*** |
| | (-4.487) | (-6.660) |
| fam_dispute=1 | 0.413 | 0.519** |
| | (1.381) | (2.267) |
| victim_fault=1 | 0.769** | 0.933** |
| | (2.273) | (2.281) |
| protest=1 | -1.886*** | -1.974*** |
| | (-8.245) | (-7.283) |
| Constant | -5.379*** | -3.323*** |

| | | |
|---|---|---|
| | (-8.657) | (-3.658) |
| Year Fixed Effects | Yes | Yes |
| Pseudo R2 | 0.583 | |
| Adj R-squared | | 0.538 |
| Observations | 1079 | 1080 |

Robust Standard Errors clustered at province level

*** p<0.01, ** p<0.05, * p<0.1

After controlling for year fixed effects and a vector of confounding variables—including cruelty of means, victim fault, and prosecutorial protest—the coefficients for the interaction terms between the various compensation/forgiveness scenarios and "Regional Economic Development" were found to be statistically insignificant across both Logit and OLS specifications (as indicated by the low t-statistics in Table 6).

This suggests that while compensation and forgiveness significantly mitigate sentencing outcomes (as evidenced by the robustly positive main effects), the magnitude of this leniency does not vary conditionally on the economic development of the region where the crime occurred. In statistical terms, there is no significant heterogeneity in the application of leniency by judicial organs between economically developed and underdeveloped regions.

This null result effectively addresses fairness concerns regarding the potential for "purchasing leniency" being more accessible or effective in wealthier jurisdictions. It demonstrates that the judicial system maintains a relatively high degree of uniformity and impartiality in its cross-regional practice regarding sentencing mitigation based on restorative justice behaviors.

## 5. Conclusion and Discussion

### 5.1 Summary of Findings

Based on a quantitative analysis of second-instance judgments for intentional homicide since 2011, this study draws three core conclusions:

First, "Compensation combined with Forgiveness" yields the strongest synergistic mitigation effect. Empirical results show that the co-occurrence of active compensation and forgiveness leads to the most substantial sentence reduction. Compared to cases with neither, this scenario results in a net additional reduction of approximately 4.6 years (PSM estimate) to 6.1 years (OLS estimate).

Second, "Compensation Only" and "Forgiveness Only" demonstrate high functional equivalence. After controlling for covariates, the mitigation coefficient for "Forgiveness Only" (OLS ~4.94) is statistically indistinguishable from that of "Compensation Only" (OLS ~4.76). This finding revises the Restorative Justice view that emotional restoration transcends material compensation, suggesting instead that within Chinese sentencing practice, both possess equal exchange value for conflict resolution.

Third, discretionary factors exert a stronger mitigation effect than statutory factors like surrender. The mechanism of "compensation and forgiveness" exhibits distinct step-wise characteristics. Particularly in life-or-death situations, these factors play a decisive role, often facilitating a categorical leap from a suspended death sentence or life imprisonment directly to fixed-term imprisonment (typically involving a 6-10 year reduction), thus exerting a substantial "life-saving" effect.

### 5.2 Theoretical Contributions and Discussion

These findings not only reveal the deep-seated logic behind sentencing in Chinese capital cases but also offer localized revisions to classical Restorative Justice theory.

First, we introduce the concept of "Family-Based Governance," arguing that its essence is a state-led mechanism of "Dual-Directional Stability Maintenance." Classical Restorative Justice emphasizes community-centered dialogue between the individual offender and victim to repair harm and facilitate reintegration (Braithwaite, 2002; Maglione, 2017; Umbreit, 2001). However, in the context of Chinese homicide cases (where the victim is absent), restorative acts evolve into "Proxy Forgiveness." Here, the "Letter of Forgiveness" is not merely an expression of emotional closure; it is a "Contract" between the offender's family (the economic resource provider) and the victim's family (the potential source of instability), mediated by the court (Chen Qi, 2010; Chen Hongjie, 2014). At a deeper level, this family-based logic serves the macro-goal of regime consolidation. Judges accept this "proxy forgiveness" because, in the logic of stability, pacification must be dual-directional: On one hand, compensation pacifies the victim's family, mitigating the risk of petitioning due to "losing both kin and money." On the other hand, the "limit the use of the death penalty" policy preserves the defendant's life, preventing execution from inciting hostility toward judicial power among the defendant's kin, thereby avoiding the creation of new oppositional forces(Martin, & Zhou, 2023).). Thus, "compensation and forgiveness" function as a buffer valve where the judiciary balances the interests of two families to achieve state-level social control.

Second, driven by this stability logic, discretionary factors in capital appeals exert a stronger mitigation effect than statutory factors. Although the *Guiding Opinions on Sentencing* codify formal reduction standards for statutory factors like surrender, these rules alone cannot shoulder the heavy burden of "settling the matter" (*an jie shi liao*). Our findings suggest that "compensation and forgiveness" often breach standard sentencing baselines. The judiciary permits this discretionary factor to practically override the rigidity of statutory law because it offers a more effective governance tool—simultaneously pacifying the victim's side (via interest compensation) and the defendant's side (via life preservation) to achieve substantive social reconciliation. In this context, legal formalism yields to pragmatic governance needs, where political correctness transcends the mechanical application of procedural justice.

Finally, under the dual pressures of bureaucratic evaluation and stability maintenance, capital sentencing has become a tool of judicial governance. The sentencing process effectively responds to the judicial concern of unifying legal and social effects

(Trevaskes, 2007; Trevaskes, 2010). Chinese judicial practice highly values the political and social consequences of judgments (Trevaskes, 2016). A homicide not only tears apart two families but can also trigger broader social conflict. As Zhang and Xia (Zhang & Xia ,2021) note, a key motivation for criminal reconciliation is to maintain stability and reduce collective petitioning. For judges, a "Letter of Forgiveness" signed by the victim's family is the strongest proof of neutralized social conflict. Judges are not merely responding to victim needs but employing "compensation and forgiveness" to achieve macro-governance goals: resolving contradictions, reducing petition risks, and maintaining judicial authority. Furthermore, the functional equivalence between compensation and forgiveness ensures a degree of judicial fairness. Those with economic capital can "purchase" leniency, while those with only social capital (sincere repentance) also have space for "life-saving forgiveness," objectively maintaining "Institutional Resilience" during the transition period. This mechanism ensures that indigent defendants can access survival opportunities through "emotional restoration." This operates not merely to resolve individual cases, but to macroscopically prevent the narrative that "justice is for sale," thereby maximizing regime legitimacy and public trust.

### 5.3 Policy Implications

The findings bear significant implications for China's criminal justice reform. The discovered equivalence between compensation and forgiveness reveals that judicial practice follows a pragmatic logic of stability maintenance rather than simple "money worship." This "law in action" plays a positive role in resolving social conflicts and offers a concrete pathway for the policy of strictly controlling the death penalty. However, the current "equivalence" largely stems from pressure on judges regarding "petition rates" and "case outcomes." A more scientific sentencing evaluation system should be established, placing higher weight on procedural justice than on petition prevention. Reducing "zero petitioning" as a rigid metric would prevent judges from engaging in excessive "sentencing transactions" for the sake of superficial harmony. While encouraging compensation, future reforms must prioritize guiding genuine emotional restoration and social reconciliation.

### 5.4 Limitations and Future Research

This study has certain limitations. First, although we employed PSM and fixed-effects models to mitigate endogeneity, selection bias and reverse causality arising from unobservable factors (e.g., defendant's genuine remorse, defense lawyer competence, judge's personal preferences) cannot be entirely ruled out. Second, the sample relies on judgment documents published by the government, which may carry selection bias and may not reflect the full picture of all cases.

Future research could deepen in two directions: First, qualitative research through fieldwork and interviews with judicial personnel could open the "black box" of sentencing decisions to explore the specific psychological processes of judges when weighing compensation versus forgiveness. Second, as more data becomes available, future studies could attempt to find valid instrumental variables or utilize "quasi-natural

experiments" (such as judicial reforms) to more rigorously identify the causal effects of compensation and forgiveness.

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# Declarations

## Ethics declarations

The authors declare that there is no conflict of interest.


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## Data Availability' statement

Data and do file at https://github.com/sifan1111/Data-files-for-paper.git