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Bride Price, Circumstance-Contingent Repayment, and Marital Investment in China: A Two-Stage Investment and Nash Bargaining Model

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Abstract

This paper develops a two-stage investment-and-bargaining model of marital behavior under circumstance-contingent bride-price repayment in China. In Stage 1, spouses simultaneously choose relationship-specific investments in a non-cooperative game. In Stage 2, after investments and the legally relevant state are realized, they divide marital surplus according to a generalized Nash bargaining solution with divorce as the fixed disagreement outcome. Under the benchmark legal-state mapping, the legal rule shifts the wife's investment incentives directly because observable consequences of her investment can affect anticipated repayment and hence her future disagreement payoff; the husband's own investment condition contains no analogous direct legal-return term. Under a quadratic-linear specification, the best-response slopes have the sign of the technological interaction parameter, so technological complementarity generates strategic complementarity and technological substitutability generates strategic substitutability. A larger bride price, as a partial effect holding the anticipated repayment schedule fixed, or a steeper circumstance-contingent schedule shifts the wife's best response outward. The husband's equilibrium investment then rises under strategic complementarity and falls under strategic substitutability. Within the maintained agreement, affine-branch, positive-determinant, and strict-interiority regime, the quadratic-linear model has a unique Stage-1 Nash equilibrium, and the legal return can reduce, eliminate, or reverse the wife's direct marginal hold-up wedge. The analysis illustrates how a legal rule affecting a future disagreement payoff can reshape pre-bargaining strategies.

Keywords: applied game theory; Nash bargaining; non-cooperative investment game; strategic complements; strategic substitutes; bride price; China

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1. Introduction

Many relationships combine two strategic problems that occur at different times. Parties first make costly, relationship-specific investments and later bargain over the surplus those investments create. Because investment is sunk before bargaining, each party generally captures only part of its marginal productive return, creating the familiar possibility of hold-up and underinvestment. At the same time, institutions that change the payoff available when bargaining fails can alter investment incentives before bargaining occurs. This paper studies that interaction in a marital setting in which a legal repayment rule changes a spouse's future disagreement payoff.

The institutional application is bride-price repayment in contemporary China. Bride price (caili) is a pre-marital transfer from the groom's side to the bride's side, but its ultimate allocation need not be fixed once the transfer is made. Under the national legal framework, the amount retained or repaid after relationship dissolution can depend on legally relevant post-marital circumstances. In this paper, "circumstance-contingent" means contingent on such post-marital circumstances, including factors such as cohabitation and child-rearing. The paper asks a game-theoretic question: *how does a circumstance-contingent legal rule that changes a future disagreement payoff affect equilibrium pre-bargaining investment, and how are those effects transmitted between spouses through strategic interaction?*

The model has two stages. In Stage 1, the spouses simultaneously choose relationship-specific investments non-cooperatively. In Stage 2, after investments and the legally relevant state are realized, the spouses divide marital surplus according to a generalized Nash bargaining solution, taking divorce as the disagreement outcome. The timing is essential. Investment is a strategic choice before bargaining, while the disagreement point is fixed when the bargaining solution is determined. Thus, the model combines a Stage-1 Nash equilibrium in investment with a Stage-2 Nash bargaining solution; these are distinct game-theoretic objects (Nash, 1951, 1953, 1950).

Relation to Existing Investment-and-Bargaining Models

The two-stage structure itself is not new. A broad hold-up literature studies sunk investment followed by bargaining or renegotiation, where investors may fail to appropriate the full marginal return to relationship-specific actions (Che & Hausch, 1999; Grout, 1984). A related strand in incomplete contracting analyzes bilateral agreements in which parties invest irreversibly and then incur costs to renegotiate ex post sharing (Hausken & Schwartz, 2012). Like the hold-up literature, it highlights the tension between sunk investment and later distribution, but it does not study marital investment, divorce fallbacks, or circumstance-contingent legal transfers. In family economics, Konrad and Lommerud (2000) explicitly analyze non-cooperative investment before subsequent Nash bargaining within the family. More generally, household bargaining models emphasize individual disagreement payoffs and bargaining weights as determinants of allocation (Browning et al., 2014; Chiappori & Mazzocco, 2017; Manser & Brown, 1980; McElroy & Horney, 1981). The present paper, therefore, does not claim novelty from combining pre-bargaining investment with a later Nash bargaining stage.

Nor is the general proposition that divorce law can affect marital investment new. Wickelgren (2009) shows that divorce rules can alter incentives for noncontractible marital investments, while Rainer (2007) studies how rules governing asset division at divorce shape ex ante relationship and marital-asset investment. These studies establish that legal rules governing relationship dissolution can feed back into behavior before dissolution. The present paper studies a narrower institutional mechanism: repayment of a pre-marital bride-price transfer is anticipated to vary with legally relevant post-marital circumstances, thereby changing the divorce disagreement payoff associated with the realized legal state.

The investment taxonomy also requires care. Che and Hausch (1999) distinguish selfish investments from cooperative investments according to who directly receives the productive benefit. In the present reduced form, each spouse's investment enters aggregate marital surplus $A(q_f, q_m)$, so the model does not separately identify the pre-bargaining recipient of each unit of productive benefit. The wife's investment additionally has a private disagreement-payoff effect through the benchmark legal-state mapping. It is, therefore, best viewed here as a relationship-specific investment with both a joint-surplus effect and, under the benchmark mapping, a private legal-return effect rather than as a pure example of either investment category.

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Against this literature, the paper's contribution is deliberately narrower. It introduces an anticipated, continuously circumstance-contingent bride-price repayment schedule into the divorce disagreement payoff; under the benchmark legal-state mapping, the wife's action directly shifts that anticipated payoff and hence her Stage-1 best response. The induced response of the husband's investment is then transmitted through strategic complementarity or substitutability in the quadratic-linear specification. The contribution, therefore, lies in the legal source of state dependence, the bride-price application, and the signable reaction-function spillover—not in the standard Stage-2 Nash bargaining solution itself.

The Chinese bride-price setting provides a concrete institutional source of that state dependence. Article 1042 of the Civil Code supplies a general prohibition on extracting property through marriage, while the Supreme People's Court's 2024 Provisions provide the operational framework for identifying betrothal gifts and determining whether and how much must be returned. The national rule does not mechanically condition repayment on ordinary domestic labor. Courts consider a contextual set of circumstances, including cohabitation, pregnancy and childbirth, child-rearing, actual use of the bride price, dowry, the amount transferred, fault, and local custom (Supreme People's Court, 2023, 2024; Supreme People's Procuratorate, 2020). The model, therefore, treats the wife's chosen investment as only one potential source of observable circumstances within a broader legal state.

The paper also relates to the literature on bride price and marriage-market conditions in China. Bride price can serve as compensation to the bride's parents, a pre-mortem inheritance, a subsidy to the new household, or a marker of family status (Anderson, 2007; Brown et al., 2011; Chen & Pan, 2023; Fei, 2012; Wang, 2025; Xiong & Mu, 2009; Yan, 1996). Skewed sex ratios and status competition are frequently associated with high marital payments (Jiang & Sánchez-Barricarte, 2012; Wei et al., 2017). Recent work also links education and other relative resources to intra-household bargaining power (Li, 2026). This literature generally treats bride price as a pre-marital transfer rather than as a transfer whose eventual allocation can depend on post-marital circumstances. Related work outside the Chinese post-marital setting shows that the expected level of bride price can affect earlier parental investment incentives: Ashraf et al. (2020) find that bride-price customs can raise incentives to educate daughters when education increases the expected marriage payment. That pre-marital level channel is distinct from the present paper's post-marital repayment-slope mechanism. On the legal side, Wan (2024), using more than 100,000 court decisions, documents that repayment outcomes reflect multiple legal and social factors rather than a single mechanical criterion, while Guo (2024) places bride-price disputes within the broader development of Chinese marriage and family law.

The contribution is threefold. First, relative to existing investment-and-bargaining models, the paper introduces an anticipated circumstance-contingent repayment schedule for a pre-marital transfer into the future divorce disagreement payoff. Under the benchmark legal-state mapping, the repayment rule shifts the wife's best response directly because her action affects the repayment-relevant state; the husband's own action has no corresponding direct legal effect in the benchmark. The husband's equilibrium investment may nevertheless change indirectly through strategic interaction. Under the quadratic-linear specification, technological complementarity implies strategic complementarity, while technological substitutability implies strategic substitutability.

Second, the paper makes an institutional contribution by representing Chinese bride-price repayment as an anticipated circumstance-contingent transfer rather than as a completed pre-marital transfer. The legal rule can matter before divorce because forward-looking spouses anticipate how the realized legal state would affect the disagreement payoff if bargaining later fails.

Third, the paper links this legal-return channel to the conventional investment hold-up wedge. The wife's private marginal return contains both her bargaining share of productive surplus and, under the benchmark mapping, the marginal effect of her action on her anticipated disagreement payoff. In the technologically separable case, this legal return can reduce, exactly offset, or reverse her direct marginal hold-up wedge. With technological interaction, the full equilibrium effect also depends on the induced response of the husband's investment.

The central strategic mechanism can be summarized in best-response terms. A larger bride price, holding the anticipated repayment schedule fixed, or a steeper circumstance-contingent repayment schedule shifts the wife's best response toward greater investment in the benchmark. The husband's best response does not shift directly. If investments are strategic complements, he responds by investing more; if they are strategic substitutes, he responds by investing less. This best-response transmission is the paper's main game-theoretic comparative-static mechanism.

The remainder of the paper is organized as follows. Section 2 describes the Chinese bride-price repayment framework and maps it into the model. Section 3 develops the two-stage investment-and-bargaining game, derives best responses and the Nash equilibrium, and studies comparative statics. Section 4 discusses the game-theoretic and economic implications and presents empirical implications. Section 5 states limitations. Section 6 concludes. The Appendix A provides proofs.

2. Institutional Setting: Bride-Price Repayment in China

2.1. Bride Price as a Legal Institution

The bride price (caili) originates in the Chinese betrothal-gift tradition and historically formed part of the "Three Letters and Six Etiquettes" marriage ritual. As a customary marriage payment, it has carried several meanings: compensation to the bride's family, confirmation of the intended marriage, a transfer to the newly formed household, and a public signal of family capacity or status (Chen & Pan, 2023; Fei, 2012; Wan, 2024). These meanings differ across rural and urban settings and across families (Wang, 2025; Xiong & Mu, 2009; Yan, 1996).

The Civil Code does not establish a numerical repayment formula. Article 1042 prohibits arranged and mercenary marriage and the exaction of property through marriage (Supreme People's Procuratorate, 2020). The provision supplies the governing principle, but it does not imply that every customary betrothal gift is unlawful or that every gift must be returned. Bride-price disputes, therefore, require more specific judicial rules concerning the identification of betrothal gifts, the parties to the dispute, and the circumstances relevant to repayment.

The post-marital legal consequence distinguishes bride price from a completed, one-time transfer. Although the amount B is fixed before marriage in the model, its allocation after divorce can depend on facts realized during the relationship. This institutional feature creates a channel from marital circumstances to the disagreement payoffs used in household bargaining. The paper models that channel; it does not treat the legal rule itself as endogenously chosen.

2.2. Repayment Disputes and the National Judicial Framework

The Supreme People's Court's *Provisions on Several Issues Concerning the Application of Law in the Trial of Cases Involving Disputes over Betrothal Gifts* (Fa Shi [2024] No. 1; "2024 Provisions") were issued on 18 January 2024 and took effect on 1 February 2024. They provide nationally applicable rules for the scope of betrothal gifts, litigation parties, and repayment decisions (Supreme People's Court, 2024). The Civil Code and the 2024 Provisions,

therefore, perform different functions: the former supplies the general principle, while the latter supplies the operational doctrine.

2.2.1. Scope of Betrothal Gifts

Article 3 of the 2024 Provisions directs courts to consider the purpose of the transfer, local custom, timing and manner of transfer, value, and the identities of the transferor and recipient. Modest gifts on special occasions and ordinary expenditures made to maintain the relationship are not treated as betrothal gifts. This distinction matters because the model's B is the legally cognizable bride-price transfer, not every payment made during courtship.

2.2.2. Parties and Family Payment Flows

Article 4 distinguishes betrothal-property disputes from divorce proceedings. Parents who actually paid or received the property may be joined in betrothal-property litigation, whereas a request for repayment made within divorce proceedings remains between the spouses (Supreme People's Court, 2024). Social practice may, therefore, involve four family actors even when the divorce case formally involves two spouses. A four-player model is unnecessary for the paper's contribution, but the reduction must be explicit. The benchmark, therefore, imputes family-side bride-price gains and losses to the corresponding spouse. The husband-side family's payment is imputed to the husband's payoff, while bride-side retention is imputed to the wife's payoff. This amounts to a complete pass-through, or unitary-interest, assumption within each family side: one yuan retained by the bride side changes the wife's benchmark payoff by one yuan, and one yuan borne by the husband side changes the husband's benchmark payoff by one yuan. This is an accounting and preference normalization, not a claim that the spouses are necessarily the legal owners or physical recipients of every yuan transferred. D denotes the dowry controlled by the wife. The benchmark disagreement payoffs use the anticipated repayment $\phi(r_f)B$ as the expected transfer from the bride side to the husband side if bargaining fails and divorce follows. If a dispute reaches adjudication, the realized court-ordered transfer is $\widetilde{\phi}B$. A robustness calculation below relaxes complete family-side pass-through.

2.2.3. Repayment Rules and Legally Relevant Circumstances

Articles 5 and 6 center the inquiry on registration, cohabitation, and the realized purpose of the transfer. When the parties registered and cohabited, repayment is generally not supported. If cohabitation was short and the transfer was excessive, however, a court may determine whether and how much must be returned by considering the actual use of the bride price, dowry, the amount transferred, cohabitation and reproductive circumstances, and fault. Where the parties cohabited without registration, the same contextual factors remain relevant rather than triggering an automatic full return (Supreme People's Court, 2023, 2024).

2.3. Legal-to-Model Translation

The institutional facts and the reduced-form assumptions used in the game are distinct. The legal materials establish that repayment may depend on a contextual set of post-marital circumstances; they do not imply a continuous legal-state index, a monotone response to any particular spouse's action, or a wife-only channel. The benchmark model adds those structures deliberately in order to isolate one tractable incentive mechanism. In particular, it treats q_f as a productive action chosen by the wife whose observable consequences may enter a broader legal state, holds other legally relevant facts fixed in z, and imposes sign restrictions on the mapping from the action to the state and from the state to anticipated repayment. The comparative statics below are conditional on these modeling assumptions rather than statements of legal doctrine.

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Table 1 summarizes the institutional-to-model mapping and the status of each object in the benchmark.

Table 1. Institutional factors and benchmark model objects.

Institutional/Model Object	Symbol	Model Status	Information Status in Benchmark
Bride-price amount	B	Predetermined Stage-0 transfer	Observed and fixed when Stage 1 begins; deterministic
Dowry controlled by the wife	D	Predetermined Stage-0 transfer	Observed and fixed when Stage 1 begins; deterministic
Wife's relationship-specific investment	q_f	Chosen by the wife at Stage 1	Strategic action; observed before Stage-2 bargaining; deterministic choice
Husband's relationship-specific investment	q_m	Chosen by the husband at Stage 1	Strategic action; observed before Stage-2 bargaining; excluded from the legal-state mapping in the benchmark
Other legally relevant facts, including cohabitation duration, use of funds, dowry, fault, and local custom	z	Exogenous/fixed in the benchmark comparative statics	Treated as fixed and common knowledge in the benchmark
Broader legally relevant post-marital state	$r_f = h(q_f; z)$	Endogenous reduced-form state	Observed before Stage-2 bargaining; deterministic conditional on (q_f, z) in the benchmark
Anticipated repayment ratio	$\phi(r_f) = E[\widetilde{\phi} \mid r_f]$	Expected court-ordered ratio used in disagreement payoffs	Common-knowledge conditional mean; $\widetilde{\phi}$ is realized only if bargaining fails and adjudication occurs

The variable q_f denotes the intensity of a relationship-specific investment chosen by the wife at Stage 1. Observable consequences of that investment may form one component of the broader legally relevant state $r_f = h(q_f; z)$. For example, investment in childcare may generate observable child-rearing circumstances that enter the court's broader contextual assessment. The model does not treat cohabitation duration, pregnancy, childbirth, use of the bride price, dowry, fault, local custom, or other legally relevant facts as unilateral investment choices by the wife. Such facts are represented in z or, where appropriate, as outcomes outside the benchmark action channel.

The anticipated repayment ratio is the expected court-ordered ratio, written as $\phi(r_f) \equiv E[\widetilde{\phi} \mid r_f]$, where $\widetilde{\phi}$ denotes the realized repayment ratio if bargaining fails, divorce follows, and the dispute reaches adjudication. This reduced form accommodates judicial discretion, evidentiary uncertainty, and heterogeneity across courts (Wan, 2024). The benchmark, therefore, distinguishes three layers: institutional facts determine which circumstances may be legally relevant; the model maps a chosen action and other facts into the state r_f and the comparative statics follow from the sign and functional-form restrictions imposed on that mapping.

3. The Investment-and-Bargaining Game

3.1. Game Form, Timing, Strategies, and Assumptions

There are two spouses, indexed by $i \in \{f, m\}$. Before marriage, the husband-side family pays bride price $B > 0$ and the bride-side family provides dowry $D > 0$. During the relationship, the spouses make relationship-specific investments q_f and q_m. The strategy sets are $q_i \in [0, \bar{q}_i]$. These sets are nonempty, compact, and convex; with Assumption 2, they satisfy the conditions for the existence of a Stage-1 Nash equilibrium.

The investments are made before the bargaining stage. Each spouse bears a sunk cost $C_i(q_i) = p_i q_i + G_i(q_i)$. The term $p_i q_i$ is the monetary expenditure associated with the investment, while $G_i(q_i)$ is non-monetary time, effort, or disutility. This separation removes cost double-counting. The costs are paid at Stage 1 and are, therefore, sunk when the Stage-2 bargain occurs.

$$C_i(q_i) = p_i q_i + G_i(q_i), \qquad C_i'(q_i) > 0, \qquad C_i''(q_i) \geq 0. \tag{1}$$

The investments generate aggregate marital surplus $A(q_f, q_m)$. On the feasible investment set, we assume $A_i > 0$ and $A_{ii} \leq 0$. The cross-partial A_{fm} may be positive or negative. A positive cross-partial means that the investments are technological complements in household production; a negative cross-partial means that they are technological substitutes. No claim about strategic complementarity is made until best responses are derived.

Information, beliefs, and legal risk.

Before Stage 1, the spouses observe B, D, and the benchmark vector z, and the functions governing household production, investment costs, the legal-state mapping, and the conditional distribution of court outcomes are common knowledge. The spouses simultaneously choose q_f and q_m with this information. Conditional on (q_f, z), the benchmark state $r_f = h(q_f; z)$ is deterministic and is observed by both spouses before Stage-2 bargaining. If bargaining fails and formal divorce leads to adjudication, the realized repayment ratio $\widetilde{\phi}$ is stochastic. Its conditional distribution given r_f is common knowledge, and $\phi(r_f) = E[\widetilde{\phi} \mid r_f]$ is the anticipated repayment ratio used when the spouses evaluate the divorce disagreement outcome. The spouses are assumed risk-neutral with respect to monetary transfers, so the expected court-ordered ratio multiplied by B is sufficient for the benchmark disagreement payoffs. Under a unilateral deviation in q_f, z and the conditional court-response mapping are held fixed; the deviation changes the anticipated repayment ratio only through its effect on r_f.

For the benchmark mechanism, on the relevant feasible range we impose

$$r_f = h(q_f; z), \qquad h_q(q_f; z) > 0, \qquad 0 \leq \phi(r_f) \leq 1, \qquad \phi_r(r_f) < 0. \tag{2}$$

The restrictions $h_q > 0$ and $\phi_r < 0$ are modeling assumptions with empirical content, not implications of Chinese law. The first says that, holding z fixed, a marginal increase in the wife's chosen investment moves the observable legal state in a direction associated with stronger retention-relevant circumstances. It may fail if the investment is not observable, is not legally salient, or generates circumstances with an ambiguous legal interpretation. The second says that, conditional on the state, a higher value of r_f lowers the anticipated repayment ratio. It may fail if judicial responses are locally flat, non-monotone, threshold-based, or attach a different sign to the relevant circumstance. No global curvature restriction is imposed on ϕ. These benchmark signs isolate the legal-return channel analyzed below. A bilateral legal-state extension after Proposition 1 relaxes the wife-only mapping and shows how the first-order conditions change when the husband's action is also legally salient.

Table 2 summarizes the timing, information, and court-outcome branch in the benchmark model.

Investments are sunk before the bargaining allocation is determined. Consequently, the legal state induced by the Stage-1 action is anticipated when investment is chosen and is observed and fixed when Stage-2 bargaining occurs. The court outcome itself is not realized inside the bargaining problem: $\widetilde{\phi}$ is realized only on the divorce/adjudication branch after bargaining failure. Thus, the Stage-2 disagreement point is an expected divorce payoff conditional on the observed state, rather than a court decision chosen or revised

during Nash bargaining. The two-stage structure is a reduced-form representation of one investment–renegotiation cycle within an ongoing marriage; it does not imply that real household bargaining occurs only once.

Table 2. Timing, information, and the court-outcome branch in the benchmark model.

Stage 0	Stage 1	State Formation	Stage 2	If Bargaining Fails
Families transfer B and D; benchmark primitives and beliefs are common knowledge.	Spouses simultaneously choose sunk investments q_f and q_m.	The state $r_f = h(q_f; z)$ is realized and observed; the anticipated ratio is $\phi(r_f) = E[\widetilde{\phi} \mid r_f]$.	Given the fixed state, spouses divide marital surplus using the generalized Nash bargaining solution.	Formal divorce follows; if adjudicated, $\widetilde{\phi}$ is realized and the court-ordered repayment is $\widetilde{\phi}B$.

Two uses of the term "Nash" appear in the model. The Stage-1 outcome is a Nash equilibrium of the non-cooperative investment game, whereas the Stage-2 allocation is a generalized Nash bargaining solution conditional on the realized disagreement point.

3.2. Stage 2: Nash Bargaining with a Fixed Disagreement Point

Accounting baseline.

Benchmark payoffs are measured relative to the parties' economic positions immediately before the Stage-0 bride-price transfer. Under this ex-ante baseline, if divorce occurs after an anticipated repayment $\phi(r_f)B$, the bride side has retained $[1 - \phi(r_f)]B$ relative to its pre-transfer position and the husband side has borne the same net amount. The bride price is, therefore, a transfer between the two spouse-aligned family sides and does not add to aggregate marital resources. Dowry is treated differently: D is a transfer from the bride-side family into the marital household that is controlled by the wife, with no offsetting loss assigned to the husband. It, therefore, enters both marital resources and the wife's divorce payoff.

The same model can be written using a Stage-2 post-transfer baseline. Define $\widehat{V}_f = V_f + B$ and $\widehat{V}_m = V_m - B$, which absorb the initial bride-price receipt and payment into the two outside-option constants. The disagreement payoffs can then be written as $\widehat{V}_f - \phi(r_f)B + D$ and $\widehat{V}_m + \phi(r_f)B$. These expressions are algebraically identical to Equations (4) and (5) below. Thus the choice of payoff baseline changes only constants; it does not change the legal-return derivative or the investment comparative statics.

Given the realized investment profile $q = (q_f, q_m)$, the total resource available if the marriage continues is

$$M(q_f, q_m) = Y_f + Y_m + D + A(q_f, q_m), \tag{3}$$

where Y_f and Y_m are exogenous resources available during marriage. Consistent with the accounting convention above, dowry enters total marital resources as an external contribution to the marital household, whereas bride price is a transfer between the two spouse-aligned family sides and, therefore, nets to zero in aggregate marital resources. The productive effect of the investments is summarized by $A(q_f, q_m)$.

If bargaining breaks down, formal divorce follows. Any court-ordered repayment is then realized on that branch. Because the spouses are risk-neutral over the monetary transfer, the disagreement values entering the Stage-2 Nash problem are the expected divorce payoffs conditional on the observed state r_f. The wife and husband, therefore, have disagreement payoffs, respectively,

$$d_f(q_f) = V_f + [1 - \phi(r_f)]B + D, \tag{4}$$

$$d_m(q_f) = V_m - [1 - \phi(r_f)]B. \tag{5}$$

The outside-option terms V_f and V_m include the utility of living separately and any remarriage opportunities, excluding the bride-price transfer represented explicitly in Equations (4) and (5). Because the Stage-1 costs are sunk, they are omitted from both continuation values at Stage 2 and are subtracted from the spouses' Stage-1 objectives below. Throughout the paper, $\phi(r_f)$ denotes the anticipated repayment ratio (equivalently, the expected court-ordered ratio conditional on r_f), whereas $\widetilde{\phi}$ denotes the realized repayment ratio on the adjudication branch.

Choice of disagreement point.

Using formal divorce as the disagreement outcome is a modeling choice tailored to the legal mechanism studied here. Bride-price repayment becomes operative when the relationship dissolves and a repayment claim is adjudicated, so divorce is the fallback state in which the circumstance-contingent legal transfer enters payoffs most directly. This differs from household-bargaining models that use a non-cooperative allocation within an intact marriage, such as the separate-spheres formulation of Lundberg and Pollak (1993). If bargaining breakdown leads first to an intra-marriage fallback and formal divorce follows only with an exogenous probability $\rho \in [0, 1]$, the bride-price component of the expected disagreement payoff is scaled by ρ. Holding ρ fixed, the wife's direct legal-return term is correspondingly attenuated to $-\rho\phi_r h_q B$ but retains the same sign. If the probability of divorce depends on investments or on the legal state, additional derivative terms arise and the benchmark comparative statics need not carry over unchanged. Likewise, if the legal regime changes the bargaining weight β rather than only the divorce payoff, law also changes the spouses' shares of productive surplus. The benchmark isolates the disagreement-payoff channel by holding β fixed.

The gains from agreement are feasible when the aggregate marital surplus is positive:

$$\begin{aligned} W(q_f, q_m) &= M(q_f, q_m) - d_f(q_f) - d_m(q_f) \\ &= Y_f + Y_m - V_f - V_m + A(q_f, q_m). \end{aligned} \tag{6}$$

Assumption 1. *For every feasible investment profile, $W > 0$. This ensures that agreement is individually rational after any unilateral Stage-1 deviation.*

Notice that the repayment ratio cancels from total surplus: it changes the distribution of divorce payoffs but does not create or destroy resources in the benchmark model.

Following the generalized Nash bargaining approach (Nash, 1953, 1950), let β be the wife's bargaining weight, with $\beta \in (0, 1)$. The Stage-2 allocation solves

$$\begin{aligned} \max_{u_f, u_m} \quad & [u_f - d_f(q_f)]^{\beta} [u_m - d_m(q_f)]^{1-\beta} \\ \text{s.t.} \quad & u_f + u_m = M(q_f, q_m), \\ & u_i \geq d_i. \end{aligned} \tag{7}$$

The unique solution is

$$u_f^N = d_f(q_f) + \beta W(q_f, q_m), \qquad u_m^N = d_m(q_f) + (1 - \beta) W(q_f, q_m). \tag{8}$$

Equation (8) has the standard interpretation: each spouse receives the fixed disagreement payoff plus a share of the gains from agreement. The legally contingent repayment rule affects the wife's negotiated payoff because it changes d_f after the investment has been realized; it does not alter the validity of the Stage-2 Nash problem.

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Lemma 1. *Holding the realized investments fixed, D and the bride-price transfer redistribute payoff levels but do not change the aggregate gain from marriage W. In particular, D enters both marital resources and the wife's divorce payoff and, therefore, cancels from the gains from agreement. Likewise, the retained bride-price amount enters the two disagreement payoffs with opposite signs:*

$$[1 - \phi(r_f)]B - [1 - \phi(r_f)]B = 0.$$

It, therefore, also cancels from aggregate gains.

Proof. Substitution of Equations (3)–(5) yields Equation (6). The dowry term D cancels between M and d_f, while the bride-price terms cancel between d_f and d_m. The payoff-level effect of a change in B at fixed investments is

$$\left.\frac{\partial u_f^N}{\partial B}\right|_q = 1 - \phi(r_f), \qquad \left.\frac{\partial u_m^N}{\partial B}\right|_q = -[1 - \phi(r_f)]. \tag{9}$$

The lemma states partial effects at fixed investments. Total effects of the bride price also include the investment responses derived below. □

The exact cancellation in Lemma 1 is a benchmark pure-transfer result. It assumes that court-ordered repayment is transferred without litigation costs, enforcement losses, delay costs, or third-party retention. If dissolution or enforcement destroys resources, those costs would enter the disagreement surplus and the repayment rule could affect aggregate gains as well as their distribution.

3.3. Stage 1: The Non-Cooperative Investment Game

Anticipating the Stage-2 Nash bargaining solution, each spouse chooses a Stage-1 investment non-cooperatively. The continuation payoffs net of sunk investment costs are

$$\Pi_f(q_f, q_m) = u_f^N - C_f(q_f), \qquad \Pi_m(q_f, q_m) = u_m^N - C_m(q_m). \tag{10}$$

Using Equations (6) and (8), these objectives can be written as

$$\Pi_f = V_f + [1 - \phi(h(q_f; z))]B + D + \beta[K + A(q_f, q_m)] - C_f(q_f), \tag{11}$$

$$\Pi_m = V_m - [1 - \phi(h(q_f; z))]B + (1 - \beta)[K + A(q_f, q_m)] - C_m(q_m), \tag{12}$$

where

$$K = Y_f + Y_m - V_f - V_m.$$

The wife internalizes the way her investment changes her own disagreement payoff through the legally relevant state. She does not internalize the corresponding reduction in the husband's disagreement payoff. The husband chooses q_m and, therefore, has no direct legal derivative in his own first-order condition. Nevertheless, his optimal investment can respond indirectly to the wife's choice whenever the two investments interact in household production. The Stage-1 game, therefore, separates a *direct legal channel*, which shifts the wife's incentives, from a *strategic interaction channel*, which transmits that shift to the husband's behavior.

Assumption 2. *Each Stage-1 payoff is continuous in both investments and concave in the spouse's own investment on a nonempty, compact, and convex strategy set. Where first-order conditions are used to characterize an interior choice, the payoff is strictly concave in that spouse's own investment.*

Under Assumption 2, standard existence results for concave games imply that the general Stage-1 game has at least one Nash equilibrium (Debreu, 1952; Fan, 1952; Glicksberg, 1952). This is an existence result only: it does not imply that the equilibrium is unique or interior. Uniqueness and the closed-form interior characterization below are properties of the quadratic-linear affine-branch specification under additional restrictions.

Proposition 1 (Asymmetric legal-return condition)**.** *At an interior investment equilibrium* $q^* = (q_f^*, q_m^*)$*, the wife's and husband's first-order conditions are*

$$\beta A_f(q_f^*, q_m^*) - C_f'(q_f^*) - \phi_r(r_f)h_q(q_f^*; z)B = 0, \tag{13}$$

$$(1-\beta)A_m(q_f^*, q_m^*) - C_m'(q_m^*) = 0. \tag{14}$$

Because $\phi_r < 0$*,* $h_q > 0$*, and* $B > 0$*, the direct legal-return term satisfies*

$$-\phi_r(r_f)h_q(q_f; z)B > 0. \tag{15}$$

Thus, under the benchmark state mapping and sign restrictions in Equation (2), the circumstance-contingent repayment rule increases the wife's private marginal return to her pre-bargaining investment. No analogous direct term appears in the husband's own condition in this benchmark. Proposition 1 does not, by itself, determine the husband's investment response or either spouse's welfare.

Proof. Differentiate Equation (11) with respect to q_f and Equation (12) with respect to q_m. Since $\partial d_f/\partial q_f = -\phi_r h_q B$ and $\partial W/\partial q_i = A_i$, the derivatives are exactly Equations (13) and (14). The derivative in Equation (13) is taken in the Stage-1 investment game, before the Stage-2 bargaining state is fixed. □

Robustness to bilateral legal-state salience.

The wife-only mapping $r_f = h(q_f; z)$ is a benchmark restriction, not a claim that only the wife's behavior can ever matter legally. To make this explicit, suppose instead that the common legal state depends on both spouses' actions,

$$r = h(q_f, q_m; z), \qquad h_f \equiv \frac{\partial h}{\partial q_f}, \qquad h_m \equiv \frac{\partial h}{\partial q_m}, \tag{16}$$

while the anticipated repayment ratio remains $\phi(r)$ and the complete-pass-through accounting of the benchmark is retained. Because the bride-price transfer still enters the two disagreement payoffs with opposite signs, it continues to cancel from aggregate gains from agreement. The interior Stage-1 first-order conditions become

$$\beta A_f - C_f' - \phi_r h_f B = 0, \qquad (1-\beta)A_m - C_m' + \phi_r h_m B = 0. \tag{17}$$

The first expression generalizes the wife's direct legal-return term. The second shows that the husband's action also acquires a direct legal component whenever $h_m \neq 0$. If $h_m > 0$ and $\phi_r < 0$, an increase in the husband's action moves the legal state in the same retention-favoring direction and reduces his anticipated recovery, so the direct term $\phi_r h_m B$ lowers his private marginal return. If instead $h_m < 0$, the sign is reversed. The benchmark is recovered by setting $h_f = h_q > 0$ and $h_m = 0$. Thus, the paper's wife-specific direct effect is a transparent special case of a more general bilateral legal-state mapping; the sign and presence of each spouse's direct legal term depend on how that spouse's action enters the legally relevant state.

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Robustness to incomplete family-side pass-through.

The benchmark imputes the full family-side bride-price gain or loss to the corresponding spouse. To relax that assumption, let $\alpha_f \in [0,1]$ denote the fraction of bride-side retention internalized in the wife's payoff and $\alpha_m \in [0,1]$ the fraction of the husband-side net loss internalized in the husband's payoff. The disagreement payoffs become

$$d_f^{\alpha} = V_f + \alpha_f[1-\phi(r_f)]B + D, \qquad d_m^{\alpha} = V_m - \alpha_m[1-\phi(r_f)]B. \tag{18}$$

Because the generalized Nash solution remains $u_f = d_f^{\alpha} + \beta(M - d_f^{\alpha} - d_m^{\alpha})$, the wife's Stage-1 marginal condition is

$$\beta A_f - C_f' - \left[(1-\beta)\alpha_f + \beta\alpha_m\right]\phi_r h_q B = 0, \tag{19}$$

while the husband's own first-order condition remains $(1-\beta)A_m - C_m' = 0$ under the benchmark state mapping $r_f = h(q_f; z)$. Thus the legal-return coefficient is a bargaining-share-weighted combination of the two pass-through rates. Setting $\alpha_f = \alpha_m = 1$ recovers Proposition 1. Partial pass-through generally attenuates the direct legal return. If $\alpha_f \neq \alpha_m$, bride-price retention no longer cancels exactly from the two spouses' gains from agreement because part of the family-side gain or loss accrues to actors outside the two-player bargaining problem. The extension, therefore, identifies precisely where the benchmark's complete-pass-through normalization matters without requiring parents to become strategic players.

The asymmetric structure of Equations (13) and (14) also permits a direct marginal-incentive comparison. Consider a hypothetical planner who maximizes net marital production $A(q_f, q_m) - C_f(q_f) - C_m(q_m)$ under maintained agreement and the benchmark pure-transfer accounting. The associated benchmark conditions are $A_f = C_f'$ and $A_m = C_m'$. This planner problem is used only as a diagnostic for investment incentives; it is not a welfare function for the legal regime. In particular, it omits divorce probabilities, litigation and enforcement costs, parental utilities, children, distributional objectives, and any independent social value attached to the repayment rule.

The wife's private condition (13) differs from this benchmark in two respects. First, she captures only a fraction β of the marginal productive return A_f, leaving the conventional direct hold-up wedge $(1-\beta)A_f$. Second, she receives the legal term $-\phi_r(r_f)h_q(q_f; z)B > 0$ from increasing legally salient investment. Holding the husband's investment q_m fixed, the comparison between these two terms identifies the wife's direct marginal investment wedge:

1. If $(1-\beta)A_f > -\phi_r(r_f)h_q(q_f; z)B$, the legal term reduces but does not eliminate the wife's direct marginal hold-up wedge; holding q_m fixed, her investment remains below the corresponding planner benchmark.
2. If $(1-\beta)A_f = -\phi_r(r_f)h_q(q_f; z)B$, the legal term eliminates the wife's direct marginal wedge at that investment profile.
3. If $(1-\beta)A_f < -\phi_r(r_f)h_q(q_f; z)B$, the legal term reverses the wife's direct marginal wedge; holding q_m fixed, her investment lies above the corresponding planner benchmark.

These statements do not rank repayment regimes by social welfare. They also rely on the maintained interpretation of q_f as productive relationship-specific investment: every marginal unit of q_f raises marital production through $A_f > 0$. If legally salient actions instead include costly signaling, evidence production, or other behavior undertaken primarily to influence a future court outcome, a larger legal return need not represent an improvement in productive investment incentives.

3.4. Quadratic-Linear Game: Best Responses and Equilibrium

To obtain determinate comparative statics, let aggregate household production be quadratic:

$$A(q_f, q_m) = a_f q_f + a_m q_m - \frac{1}{2} b_f q_f^2 - \frac{1}{2} b_m q_m^2 + \gamma q_f q_m, \tag{20}$$

where $b_i > 0$ and $A_{fm} = \gamma$. Hence $\gamma > 0$ represents technological complementarity and $\gamma < 0$ technological substitutability. Parameters and strategy bounds are chosen so that the positive-marginal-product condition maintained in Section 3.1 holds throughout the feasible set. Investment costs are

$$C_i(q_i) = p_i q_i + \frac{1}{2} g_i q_i^2, \qquad p_i > 0, \qquad g_i > 0. \tag{21}$$

For the closed-form quadratic-linear analysis, we approximate the benchmark legal mapping by a linear schedule on the relevant interior interval and truncate it outside that interval. This is a local reduced-form approximation to spouses' anticipated judicial response, not a literal formula used by Chinese courts:

$$h(q_f; z) = q_f + z, \qquad \phi(r_f) = \min\{1, \max\{0, \bar{\phi} - \kappa r_f\}\}, \qquad \kappa > 0. \tag{22}$$

The closed-form analysis below applies when every feasible value of the wife's investment remains strictly inside the affine portion of the repayment schedule:

$$0 < \bar{\phi} - \kappa(q_f + z) < 1 \qquad \text{for all } q_f \in [0, \bar{q}_f]. \tag{23}$$

Because $\kappa > 0$, this restriction is equivalent to the two endpoint inequalities

$$\bar{\phi} - \kappa(\bar{q}_f + z) > 0, \qquad \bar{\phi} - \kappa z < 1. \tag{24}$$

The truncation guarantees a legally meaningful repayment ratio between zero and one. Equations (23) and (24) ensure that every feasible unilateral deviation remains on the same affine branch with constant slope $-\kappa$; no feasible deviation reaches either truncation kink.

Substitution into Equations (13) and (14) gives the linear system

$$\begin{pmatrix} H_f & -\beta\gamma \\ -(1-\beta)\gamma & H_m \end{pmatrix} \begin{pmatrix} q_f^* \\ q_m^* \end{pmatrix} = \begin{pmatrix} R_f \\ R_m \end{pmatrix}, \tag{25}$$

where

$$\begin{aligned} H_f &= \beta b_f + g_f, & H_m &= (1-\beta) b_m + g_m, \\ R_f &= \beta a_f - p_f + \kappa B, & R_m &= (1-\beta) a_m - p_m, \end{aligned} \tag{26}$$

and define

$$\Delta = H_f H_m - \beta(1-\beta)\gamma^2. \tag{27}$$

For interior choices, the two first-order conditions can equivalently be written as best-response functions:

$$BR_f(q_m) = \frac{R_f + \beta\gamma q_m}{H_f}, \qquad BR_m(q_f) = \frac{R_m + (1-\beta)\gamma q_f}{H_m}. \tag{28}$$

Their slopes are

$$\frac{\partial BR_f}{\partial q_m} = \frac{\beta\gamma}{H_f}, \qquad \frac{\partial BR_m}{\partial q_f} = \frac{(1-\beta)\gamma}{H_m}. \tag{29}$$

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Because $H_f > 0$, $H_m > 0$, and $\beta \in (0,1)$, both best-response slopes have the sign of γ. Thus, within the quadratic-linear game, technological complementarity ($\gamma > 0$) also generates strategic complementarity: each spouse's optimal investment rises with the other's. Technological substitutability ($\gamma < 0$) generates strategic substitutability, while $\gamma = 0$ makes the investment decisions strategically independent. Importantly, B and κ enter R_f but not R_m. The legal rule, therefore, shifts the wife's best response directly, whereas any response by the husband arises through the slope of BR_m.

The determinant restriction $\Delta > 0$ has a direct strategic interpretation. Using Equation (29),

$$\left| \frac{\partial BR_f}{\partial q_m} \frac{\partial BR_m}{\partial q_f} \right| = \frac{\beta(1-\beta)\gamma^2}{H_f H_m} < 1 \quad \Longleftrightarrow \quad \Delta > 0. \tag{30}$$

Thus, $\Delta > 0$ rules out excessive feedback between the two reaction functions: a perturbation transmitted from one spouse to the other and back again is attenuated rather than amplified. The same condition yields diagonal strict concavity of an appropriately weighted pseudo-gradient in the sense of Rosen (1965), which provides the uniqueness result below.

Proposition 2 (Existence, uniqueness, and strict interiority)**.** *(a) Existence.Under Assumption 2 and the compact convex strategy sets, the general Stage-1 game has at least one Nash equilibrium.*

(b) Uniqueness in the affine quadratic-linear game. Suppose Assumptions 1 and 2 hold, the affine-branch restrictions in Equations (23) *and* (24) *hold over the full feasible strategy set, and* $\Delta > 0$*. Then the quadratic-linear Stage-1 game has a unique Nash equilibrium on* $[0, \bar{q}_f] \times [0, \bar{q}_m]$*.*

(c) Strict interiority. Suppose, in addition to the conditions in part (b), that the unconstrained stationary candidate satisfies

$$0 < q_f^* < \bar{q}_f, \qquad 0 < q_m^* < \bar{q}_m. \tag{31}$$

Then the unique equilibrium is strictly interior and is given by

$$q_f^* = \frac{H_m R_f + \beta\gamma R_m}{\Delta}, \tag{32}$$

$$q_m^* = \frac{(1-\beta)\gamma R_f + H_f R_m}{\Delta}. \tag{33}$$

Proof. Part (a) follows from Assumption 2 together with the nonempty, compact, and convex strategy sets and the standard existence result for concave games.

For part (b), under the affine-branch restrictions, each payoff is quadratic and strictly concave in the player's own action. Weight the two first-order conditions by $1/\beta$ and $1/(1-\beta)$, respectively. The Jacobian of the weighted pseudo-gradient is symmetric, with negative diagonal entries and determinant $\Delta/[\beta(1-\beta)]$. Hence $\Delta > 0$ makes this Jacobian negative definite. Rosen's diagonal-strict-concavity condition, therefore, holds, so two distinct Nash equilibria cannot coexist (Rosen, 1965). Together with part (a), this establishes uniqueness on the feasible rectangle.

For part (c), the unconstrained stationary point solves the linear system (25). Inverting that system gives Equations (32) and (33). If Equation (31) holds, neither investment constraint binds, so the stationary point is feasible, strictly interior, and is the unique Nash equilibrium. □

The maintained restrictions are jointly feasible rather than merely algebraically compatible. Appendix A.5 provides one numerical parameter vector satisfying positive marginal products on the entire strategy set, positive gains from agreement after every feasible deviation, own-action concavity, the affine-branch restrictions, $\Delta > 0$, and strict interiority.

The quadratic specification also clarifies the direct marginal-incentive comparison from Section 3.3. The wife's marginal production is $A_f = a_f - b_f q_f + \gamma q_m$. When $\gamma \neq 0$, the husband's equilibrium investment moves endogenously, so eliminating the wife's direct wedge does not generally implement the joint planner benchmark. In the technologically separable case $\gamma = 0$, the wife's direct marginal comparison maps directly into whether her equilibrium investment lies below, equals, or exceeds her corresponding planner-benchmark investment. Even then, the husband's investment may remain distorted. These comparisons diagnose investment incentives within the maintained model; they do not constitute a welfare ranking of alternative legal regimes.

3.5. Comparative Statics as Best-Response Shifts

Proposition 3 (Local bride-price and legal-slope effects)**.** *Suppose the maintained agreement condition, the full affine-branch restrictions, $\Delta > 0$, and the strict-interiority condition in Proposition 2 hold. For parameter changes small enough to preserve this regime, the following are local comparative statics. The derivatives with respect to B are partial effects that hold the anticipated repayment schedule $\phi(\cdot)$ fixed:*

$$\frac{\partial q_f^*}{\partial B} = \frac{\kappa H_m}{\Delta} > 0, \qquad \frac{\partial q_m^*}{\partial B} = \frac{\kappa(1-\beta)\gamma}{\Delta}, \tag{34}$$

$$\frac{\partial q_f^*}{\partial \kappa} = \frac{B H_m}{\Delta} > 0, \qquad \frac{\partial q_m^*}{\partial \kappa} = \frac{B(1-\beta)\gamma}{\Delta}, \tag{35}$$

$$\frac{\partial q_f^*}{\partial \bar{\phi}} = \frac{\partial q_m^*}{\partial \bar{\phi}} = 0. \tag{36}$$

The comparative statics have a direct best-response interpretation within the quadratic-linear specification. Holding the anticipated repayment schedule fixed, a larger B increases R_f and shifts BR_f outward; a larger κ does the same by increasing the marginal legal return. Neither change shifts BR_m directly. The husband's equilibrium response, therefore, depends on the slope of his best response. When $\gamma > 0$, BR_m is upward sloping and the outward shift in BR_f raises both investments. When $\gamma < 0$, BR_m is downward sloping and the same legal shift raises the wife's investment but lowers the husband's. When $\gamma = 0$, the husband's choice is unaffected. This mapping from the technological interaction parameter γ to strategic complementarity or substitutability is a property of the maintained quadratic-linear game; it is not asserted as a general result for arbitrary production or legal-state functions. By contrast, the repayment intercept $\bar{\phi}$ changes payoff levels but not either best-response condition as long as the household remains on the same affine, agreement, and interior branch.

Proof. Only R_f depends directly on B or κ within the maintained parameterization. Differentiate Equations (32) and (33), using $\partial R_f / \partial B = \kappa$ and $\partial R_f / \partial \kappa = B$. The intercept $\bar{\phi}$ does not appear in the Stage-1 first-order conditions because its derivative with respect to q_f is zero on the affine branch. These are local derivatives. If a parameter change crosses an investment bound, a repayment-schedule kink, or the agreement boundary, the relevant equilibrium system changes and Equations (34)–(36) need not apply. □

The distinction between the level and slope of the legal rule is important. A high repayment ratio can strongly affect who receives the bride price after divorce without changing investment incentives if the ratio is locally flat. Incentives arise from the circumstance-contingent component, represented by κ, and are magnified by the amount B at stake. Equation (34) isolates this amount-at-stake channel by holding the anticipated repayment schedule fixed. Because the amount transferred may itself enter the court's contextual

assessment, an observed change in B may also change the anticipated repayment schedule. The total derivative with respect to B, therefore, need not have the sign of the partial derivative in Equation (34); the schedule response could attenuate, eliminate, or reverse the amount-at-stake effect. No unconditional sign is claimed for that total effect.

The intercept result in Equation (36) is likewise local. Changing $\bar{\phi}$ leaves marginal incentives unchanged only while the same affine branch and interior agreement regime are preserved. A sufficiently large intercept change can move the household across a truncation kink or alter agreement feasibility, in which case investment behavior may change.

We do not report a signed comparative static for the bargaining weight β. Even in the quadratic-linear model, β enters H_f, H_m, R_f, R_m, both best-response slopes, and Δ. Its effect on either equilibrium investment is, therefore, generally ambiguous without additional parameter restrictions. This is why Table 3 treats β as fixed rather than assigning it a directional effect.

Table 3. Local partial comparative statics in the interior affine-branch quadratic-linear model.

Parameter Change	Wife's Investment	Husband's Investment	Interpretation
Higher bride price B	Increases	Sign of γ	Partial effect holding the anticipated repayment schedule fixed; the wife's best response shifts outward and the husband responds through strategic interaction.
Greater legal sensitivity κ	Increases	Sign of γ	A steeper schedule shifts the wife's best response outward; the husband responds through strategic complementarity or substitutability.
Higher repayment intercept $\bar{\phi}$	No local change	No local change	Within the same affine, agreement, and interior regime, the rule's level redistributes divorce payoffs but does not change marginal incentives.
Higher outside option V_f or V_m	No change	No change	Under transferable utility and fixed bargaining weight, outside-option levels affect payoffs, not investment margins, provided agreement remains individually rational.

Notes: All entries are local effects conditional on continued agreement, the affine repayment branch, $\Delta > 0$, and strict interiority. The B derivative is a partial effect holding the anticipated repayment schedule fixed. The sign-of-γ statements use the quadratic-linear specification.

3.6. Outside Options, Bargaining Weights, and Regional Interpretation

Proposition 4 (Outside-option neutrality under the benchmark assumptions)**.** *Conditional on the legally relevant state and anticipated repayment schedule, in the quadratic-linear model with transferable utility and a fixed bargaining weight β, the equilibrium investments are independent of the levels of V_f, V_m, and D, for parameter changes that preserve Assumption 1 and the conditions of Proposition 2:*

$$\frac{\partial q_i^*}{\partial V_f} = \frac{\partial q_i^*}{\partial V_m} = \frac{\partial q_i^*}{\partial D} = 0, \qquad i \in \{f, m\}. \tag{37}$$

Proof. These parameters affect the Stage-2 payoff levels in Equation (8), but they do not enter R_f, R_m, H_f, H_m, or Δ. Therefore, they do not enter Equations (32) and (33). This is a local neutrality result within the maintained agreement and interior regime. This neutrality result is conditional on the anticipated repayment schedule. If dowry or outside-option variables also affect the anticipated repayment schedule, the bargaining weight, or the agreement regime, their total effects need not be zero. □

This neutrality result disciplines the regional interpretation. Household-bargaining theory emphasizes that marriage-market conditions and legal rules can act as distribution factors by changing outside options, bargaining power, or the relevant fallback allocation (Chiappori & Mazzocco, 2017; Lundberg & Pollak, 1993). In the Chinese context, local sex ratios and remarriage opportunities may change the spouses' outside options, the equilibrium bride price, or bargaining power (Anderson, 2007; Jiang & Sánchez-Barricarte, 2012; Li, 2026; Yu & Xie, 2015); empirical work also treats dowry as a potential source or proxy of a wife's bargaining position (Brown, 2009). The benchmark model does not prove that a change in $V_f - V_m$ changes investment, because transferable utility and a fixed β make additive outside-option levels neutral at the investment margin. Such an effect requires an additional channel—for example, an endogenous bargaining weight β, a non-transferable utility frontier, an endogenous divorce probability, or a marriage-market determination of B.

The reported derivatives with respect to B should likewise be read as structural partial effects, not as a claim that observed bride-price amounts are exogenous in the marriage market. Bride price, bargaining power, and marriage entry may be jointly related to sex ratios, education, family wealth, and local custom. A causal empirical interpretation of variation in observed B would, therefore, require an identification strategy that separates the amount-at-stake channel from those jointly determined factors. The comparative statics above are conditional on the model's primitives and on continued satisfaction of the agreement, affine-branch, positive-determinant, and strict-interiority restrictions.

Heterogeneity nevertheless arises within the benchmark model. The magnitude of the wife's response depends on κ, H_m, and Δ, while the husband's response depends additionally on the sign and magnitude of γ and the bargaining weight. Households with different technologies, costs, and bargaining arrangements can, therefore, respond differently to the same formal legal rule.

Table 4 summarizes the claims established by the model and those that require additional assumptions.

Table 4. Claims established by the model and claims left outside its scope.

Established in the Model	**Not Established Without Further Assumptions**
Under the benchmark state mapping and sign restrictions, a circumstance-contingent repayment rule raises the wife's marginal return to her pre-bargaining investment.	Effects on fertility, marriage entry, the equilibrium bride price, or overall gender equality.
In response to a larger bride price or greater legal sensitivity, the husband's investment increases under technological complementarity and decreases under technological substitutability.	An unconditional welfare ranking of repayment regimes or a claim that either spouse is always better off.
A uniform legal rule can have heterogeneous investment effects because technologies, costs, and bargaining weights differ.	A direct causal effect of local sex ratios unless they are modeled as changing B, bargaining power, or other primitives.
The legal return alters the wife's direct marginal investment wedge relative to a planner benchmark; in the technologically separable case, this comparison determines whether her equilibrium investment lies below, equals, or exceeds the corresponding planner-benchmark investment.	The model does not identify an optimal repayment schedule or establish that reducing the direct investment wedge raises social welfare.

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4. Game-Theoretic Implications and Legal Interpretation

The model's main game-theoretic feature is the interaction between a state-dependent disagreement payoff and pre-bargaining strategic investment. The legal rule is applied only if the relationship dissolves, yet it affects behavior before bargaining because forward-looking spouses anticipate the disagreement payoff that would prevail after the legal state is realized. The Stage-2 bargaining solution, therefore, feeds back into the Stage-1 non-cooperative game without making the disagreement point endogenous within the bargaining problem itself.

The legal channel is asymmetric in the benchmark specification. The wife's investment can affect the legally relevant state and hence her disagreement payoff, so her best response includes an additional legal return. The husband's own investment does not change the repayment state in the benchmark and, therefore, receives no analogous direct legal term. The bilateral-state extension in Section 3.3 makes clear that this asymmetry is not a general implication of circumstance-contingent law: if the husband's action also enters the legal state, his first-order condition acquires the direct term $\phi_r h_m B$. Within the benchmark, however, once the wife's best response shifts, the husband's response is determined only by strategic interaction. Under $\gamma > 0$, the two best responses are upward sloping and the legal incentive propagates positively across spouses. Under $\gamma < 0$, the husband's best response is downward sloping and his investment moves in the opposite direction. The model, therefore, separates a benchmark direct legal effect from an indirect strategic response.

This interpretation also clarifies the distinction between technological and strategic interaction. In the general model, the sign of the production cross-partial describes technology. In the quadratic-linear specification, the same parameter γ governs the slopes of both best responses, so technological complementarity maps into strategic complementarity and technological substitutability maps into strategic substitutability. The comparative statics with respect to B and κ can, therefore, be read as equilibrium responses to a shift in one player's reaction function.

The model also provides a direct marginal-incentive benchmark. A hypothetical planner maximizing net marital production under maintained agreement chooses investments such that $A_f = C_f'$ and $A_m = C_m'$. Relative to that benchmark, the wife's private condition contains only the bargaining share βA_f of her productive return but also the legal return $-\phi_r h_q B$. Holding the husband's investment fixed, the legal term reduces the wife's direct marginal hold-up wedge when it is smaller than $(1-\beta)A_f$, eliminates that wedge when the two terms are equal, and reverses it when the legal return is larger. In the technologically separable case, this comparison maps directly into whether the wife's equilibrium investment lies below, equals, or exceeds the corresponding planner-benchmark investment. With strategic interaction, correcting the wife's direct wedge does not generally implement the joint planner benchmark because the husband's investment remains distorted and moves endogenously. Moreover, this diagnostic comparison is not a welfare ranking of repayment regimes: the model omits divorce risk, litigation and enforcement costs, parental and child welfare, distributional objectives, and any social value of the legal rule itself. It also assumes that legally salient investment is productive rather than costly signaling or evidence production.

A further implication concerns the distinction between the level and slope of the repayment schedule. The intercept $\bar{\phi}$ determines the distribution of bride-price resources at a given legal state but does not shift marginal investment incentives within the affine regime. The slope κ, by contrast, changes how strongly the disagreement payoff responds to the wife's investment and, therefore, shifts her best response. Two legal environments can consequently have similar average repayment levels but different strategic effects if repayment responds differently to legally relevant circumstances.

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The benchmark neutrality result has a related interpretation. Conditional on the legal state and anticipated repayment schedule, additive changes in V_f, V_m, or D affect payoff levels but not the Stage-1 best responses under transferable utility and a fixed bargaining weight. This is a benchmark neutrality result, not a general prediction that outside options, dowry, remarriage prospects, sex ratios, or divorce law do not matter for strategic investment. Those variables can matter when they shift bargaining power, the anticipated repayment schedule, the relevant disagreement outcome, the probability of divorce, the agreement regime, or investment feasibility.

Empirical Implications

The model suggests three empirically distinct channels that should be separated in any test: an *amount-at-stake channel* operating through B, a *legal-sensitivity channel* operating through the slope of the anticipated repayment schedule, and a *strategic-spillover channel* operating through the husband's response to a shift in the wife's best response. These are different objects. A design that identifies one need not identify the others, and the theory does not imply that ordinary cross-sectional correlations between bride price, marital behavior, and repayment outcomes have a causal interpretation. Evidence from other divorce-law settings shows that legal regimes can affect marriage-specific investment, which supports the broader empirical plausibility of the investment channel but does not by itself identify the bride-price mechanism studied here (Stevenson, 2007). Related evidence that legal recognition of marital contribution can affect marital specialization is provided by Wong (2016), although the mechanism studied here is narrower: it operates through the responsiveness of anticipated bride-price repayment to post-marital circumstances.

For the amount-at-stake channel, the relevant prediction is the partial derivative with respect to B holding the anticipated repayment schedule and the other model primitives fixed. Observed bride-price amounts are unlikely to satisfy that condition automatically: they may be jointly determined with sex ratios, education, family wealth, local custom, bargaining power, and marriage entry, and the amount transferred can itself enter the court's contextual assessment. A credible empirical design would, therefore, require a source of variation in B that is plausibly exogenous to the spouses' post-marital investment incentives, or an explicit identification strategy that conditions on or instruments for the determinants of B and the repayment schedule. This post-marital amount-at-stake mechanism should also be distinguished from the pre-marital channel studied by Ashraf et al. (2020), in which the expected level of bride price can raise parents' incentives to invest in daughters' education. The two mechanisms are complementary but conceptually different.

For the legal-sensitivity channel, κ should be tied to a measurable slope rather than to a vague notion of a "strict" or "generous" legal environment. In the affine benchmark, κ is the magnitude of the response of anticipated repayment to a specified legally relevant circumstance. Empirically, one could estimate the relationship between repayment and a clearly defined circumstance across courts, regions, or periods, while distinguishing changes in the nationally stated rule from variation in implementation. The 2024 Provisions are national; cross-court differences would, therefore, more naturally represent heterogeneity in interpretation, evidentiary practice, or implementation than different formal statutes. Court decisions such as those studied by Wan (2024) are informative about adjudicated disputes, but they create an important selection problem: only disputes that reach litigation are observed, and the ex post decisions in those cases need not reveal the ex ante beliefs of all married couples. Linking case outcomes to surveys, legal-practitioner assessments, or other measures of expected repayment would, therefore, be valuable if the goal is to recover the anticipated schedule that enters Stage 1.

The strategic-spillover prediction requires observing both spouses' investments around a source of variation that shifts the wife's legal incentive. Candidate complementary activities might include the wife's childcare effort together with the husband's child-related time or expenditures, while potentially substitutable activities could include spouses' time devoted to overlapping domestic tasks. These classifications should not be imposed mechanically; they require independent evidence about the relevant production cross-partial. To isolate the strategic response from common household shocks, an empirical design would need variation that changes the wife's legally mediated marginal incentive without simultaneously changing the husband's productive environment. The model then predicts a same-direction response by the husband when the relevant investments are strategic complements and an opposite-direction response when they are strategic substitutes.

5. Limitations

The model has several boundaries. First, it studies investment within an existing relationship and does not determine marriage entry, fertility, divorce, or the equilibrium bride price. Second, Stage 2 uses formal divorce as the disagreement outcome because bride-price repayment is tied to relationship dissolution. An alternative separate-spheres or other non-cooperative within-marriage fallback could change the disagreement payoffs and attenuate or remove the immediate bride-price channel at a given bargaining episode. The benchmark also assumes transferable utility and a fixed generalized Nash bargaining weight. Outside options and legal rules would affect investment more directly under non-transferable utility, endogenous bargaining power, or an endogenous probability of relationship dissolution. Third, q_f is a chosen relationship-specific investment, while r_f is a broader legally relevant state. The benchmark assigns the action-dependent legal-state channel to the wife alone. The bilateral-state extension shows how the first-order conditions change when the husband's action is also legally salient, but it does not specify which concrete male or female actions courts actually observe or how they are weighted. Empirical work is, therefore, needed to identify which chosen investments generate legally observable circumstances and to estimate how those circumstances map into anticipated repayment outcomes; the model does not treat cohabitation, pregnancy, childbirth, dowry, fault, and other legal facts as unilateral investment choices by either spouse. The benchmark further assumes that the legally salient action is genuinely productive within the relationship. If parties can instead undertake costly actions primarily to create evidence, influence legal characterization, or improve a future litigation position, the same legal sensitivity could induce signaling rather than productive marital investment.

Fourth, parents are represented through imputed transfers rather than as strategic players. The benchmark assumes complete pass-through of family-side bride-price gains and losses to the corresponding spouse; the partial-pass-through calculation after Proposition 1 shows how the legal-return coefficient changes when this assumption is relaxed, but it still does not model parental bargaining, liquidity, or enforcement strategically. The benchmark also treats repayment as a costless transfer. Litigation costs, enforcement losses, delay, or third-party retention would prevent exact cancellation from the spouses' disagreement surplus. Fifth, judicial uncertainty is summarized by the anticipated repayment ratio $\phi(r_f) = E[\widetilde{\phi} \mid r_f]$, the expected court-ordered ratio conditional on the observed legal state. The benchmark assumes risk neutrality over the monetary bride-price transfer, so higher moments of the court-outcome distribution do not affect investment; with risk aversion, they could. Sixth, the closed-form equilibrium and comparative statics impose condition (23) over the entire feasible wife's investment set; if feasible actions reach a truncation kink, the game must instead be solved piecewise, including the relevant boundary cases. Finally, the model is static. In a repeated setting, the local mechanism should continue

to operate whenever current actions change the anticipated future disagreement payoff through an observable legal state. However, the benchmark comparative statics need not carry over unchanged if legally relevant circumstances accumulate, spouses learn about judicial practice, the probability of formal divorce becomes endogenous, or bargaining power evolves over time. A dynamic extension could model these channels explicitly.

These limitations identify natural extensions of the game rather than conclusions already contained in the benchmark. The current model is deliberately parsimonious: it isolates how a circumstance-contingent disagreement payoff shifts one player's pre-bargaining incentives and how that shift is transmitted through strategic interaction.

6. Conclusions

This paper studies bride-price repayment in China using an applied two-stage game of investment and bargaining. Spouses first choose relationship-specific investments non-cooperatively. After the investments and the associated legal state are realized, they divide marital surplus according to a generalized Nash bargaining solution, with divorce as the fixed disagreement outcome. Because the disagreement payoff is anticipated when investments are chosen but fixed when bargaining occurs, the model shows how a legal rule applied at relationship dissolution can shape pre-bargaining investment incentives.

The main strategic result is asymmetric under the benchmark legal-state mapping. Circumstance-contingent repayment shifts the wife's best response directly because her investment can improve her future disagreement payoff, whereas the husband's own action receives no direct legal-return term in the benchmark. Within the maintained agreement, affine-branch, positive-determinant, and strict-interiority regime of the quadratic-linear game, the legal shift is transmitted to the husband through strategic complementarity or substitutability. A larger bride price has this effect as a partial comparative static holding the anticipated repayment schedule fixed; if the judicial schedule itself changes with B, the total effect is not signed by the model. A steeper repayment schedule raises the wife's investment within the same local regime, while the husband's investment rises under strategic complementarity and falls under strategic substitutability. The model also distinguishes changes in the slope of the legal rule from changes in its intercept: within the affine interior regime, the slope affects investment incentives whereas the intercept redistributes payoffs without shifting investment margins. Crossing a truncation kink or an agreement boundary can invalidate that local neutrality result.

The direct marginal-incentive comparison adds an additional perspective. The legal return can partially offset the wife's conventional hold-up wedge, eliminate her direct marginal wedge, or reverse it. Conditional on the maintained productive-investment interpretation, the slope of the repayment rule may, therefore, improve private investment incentives when the marginal legal return is aligned with the portion of the productive return that the investing spouse does not otherwise appropriate. This is not an optimal-legal-design result: the model does not rank repayment regimes once divorce risk, litigation costs, parental and child welfare, distributional concerns, or strategic evidence production are taken into account.

More broadly, the analysis illustrates a game-theoretic mechanism that extends beyond bride price. Whenever law or another institution makes a future disagreement payoff contingent on a state influenced by earlier strategic actions, the institution can shift pre-bargaining best responses and generate equilibrium effects through strategic interaction. The Chinese bride-price setting provides a concrete application in which that mechanism is both legally grounded and economically consequential.

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Appendix A. Proofs

Appendix A.1. Proof of the Stage-2 Nash Bargaining Solution

Let the spouses' gains above divorce be

$$x = u_f - d_f, \qquad y = u_m - d_m, \qquad x + y = W. \tag{A1}$$

The generalized Nash problem is equivalent to

$$\max_{x,y} \ \beta \log x + (1-\beta)\log y \qquad \text{s.t.} \qquad x + y = W. \tag{A2}$$

The first-order condition for an interior allocation is

$$\frac{\beta}{x} = \frac{1-\beta}{y}. \tag{A3}$$

Together with the resource constraint, this gives

$$x = \beta W, \qquad y = (1-\beta)W. \tag{A4}$$

Substituting back proves Equation (8). Strict concavity of the weighted log objective on the positive orthant gives uniqueness.

Appendix A.2. Proof Details for Proposition 1

From Equations (4) and (6),

$$\frac{\partial d_f}{\partial q_f} = -\phi_r(r_f)h_q(q_f; z)B, \qquad \frac{\partial W}{\partial q_f} = A_f(q_f, q_m). \tag{A5}$$

Therefore, differentiating the Stage-1 continuation payoffs gives

$$\frac{\partial \Pi_f}{\partial q_f} = \beta A_f - C_f' - \phi_r h_q B, \qquad \frac{\partial \Pi_m}{\partial q_m} = (1-\beta)A_m - C_m'. \tag{A6}$$

Setting these derivatives equal to zero yields Equations (13) and (14). The derivative of the disagreement payoff is legitimate because it is taken at Stage 1, before the fixed-state Stage-2 bargaining problem is reached.

Appendix A.3. Derivation for the Bilateral Legal-State Extension

Under $r = h(q_f, q_m; z)$, the complete-pass-through disagreement payoffs are

$$d_f = V_f + [1 - \phi(r)]B + D, \qquad d_m = V_m - [1 - \phi(r)]B. \tag{A7}$$

Because the transfer terms cancel from W, differentiating the Stage-1 objectives yields

$$\frac{\partial \Pi_f}{\partial q_f} = \beta A_f - C_f' - \phi_r h_f B, \qquad \frac{\partial \Pi_m}{\partial q_m} = (1-\beta) A_m - C_m' + \phi_r h_m B, \tag{A8}$$

which gives Equation (17). Setting $h_m = 0$ and $h_f = h_q$ recovers Proposition 1.

Appendix A.4. Proof Details for Proposition 2

Under Equations (20)–(22), the first-order conditions can be rearranged into the best responses in Equation (28), with slopes given by Equation (29). Equivalently, the equilibrium conditions can be written as

$$H_f q_f - \beta\gamma q_m = R_f, \qquad -(1-\beta)\gamma q_f + H_m q_m = R_m. \tag{A9}$$

The coefficient matrix has determinant

$$\det \begin{pmatrix} H_f & -\beta\gamma \\ -(1-\beta)\gamma & H_m \end{pmatrix} = \Delta > 0. \tag{A10}$$

When the determinant is positive, inversion gives

$$\begin{pmatrix} q_f^* \\ q_m^* \end{pmatrix} = \frac{1}{\Delta} \begin{pmatrix} H_m & \beta\gamma \\ (1-\beta)\gamma & H_f \end{pmatrix} \begin{pmatrix} R_f \\ R_m \end{pmatrix}. \tag{A11}$$

The affine-branch restrictions in Equations (23) and (24) keep every feasible deviation on the same quadratic branch. Existence on the compact strategy rectangle follows from Assumption 2. For uniqueness, weight the two first-order conditions by the reciprocals of the bargaining shares. The Jacobian of the resulting weighted pseudo-gradient is symmetric, has negative diagonal entries, and has determinant equal to the determinant in (A10) divided by $\beta(1-\beta)$. Because $\Delta > 0$, this Jacobian is negative definite and Rosen's diagonal-strict-concavity condition holds (Rosen, 1965); hence two distinct equilibria cannot coexist. Inverting (A9) gives (A11). When the stationary point also satisfies the strict-interiority inequalities in Equation (31), the constraints are slack and Equations (32) and (33) give the unique interior equilibrium.

Appendix A.5. A Numerical Feasibility Check

To verify that the maintained restrictions can hold jointly on a nonempty and economically ordinary parameter set, consider

$$\begin{gathered} \beta = 0.5, \quad a_f = a_m = 3, \quad b_f = b_m = 1, \quad g_f = g_m = 1, \\ p_f = p_m = 0.5, \quad \gamma = 0.2, \quad B = 1, \quad \kappa = 0.1, \quad \bar{\phi} = 0.5, \quad z = 0, \\ \bar{q}_f = \bar{q}_m = 2, \quad Y_f = Y_m = 5, \quad V_f = V_m = 1. \end{gathered} \tag{A12}$$

On the full feasible square $[0,2]^2$, the marginal products satisfy $A_f = 3 - q_f + 0.2q_m \geq 1$ and $A_m = 3 - q_m + 0.2q_f \geq 1$. Moreover, $W = 8 + A(q_f, q_m) \geq 8$, so Assumption 1 holds after every feasible unilateral deviation. The repayment schedule satisfies

$\phi(q_f) = 0.5 - 0.1q_f \in [0.3, 0.5]$, so the entire feasible investment interval lies strictly on the affine branch. The own-action curvature terms are $H_f = H_m = 1.5$, and

$$\Delta = 1.5^2 - 0.5(0.5)(0.2)^2 = 2.24 > 0. \tag{A13}$$

Finally, $R_f = 1.1$ and $R_m = 1$, which give

$$q_f^* = 0.78125, \qquad q_m^* = 0.71875. \tag{A14}$$

Both choices lie strictly inside $(0, 2)$. Hence positive marginal products, positive gains from agreement, concavity, the affine-branch restriction, the uniqueness condition, and strict interiority can all be satisfied simultaneously.

Appendix A.6. Proof Details for Proposition 3

The only right-hand-side term affected by the bride price or the legal slope is

$$\frac{\partial R_f}{\partial B} = \kappa, \qquad \frac{\partial R_f}{\partial \kappa} = B, \qquad \frac{\partial R_m}{\partial B} = \frac{\partial R_m}{\partial \kappa} = 0. \tag{A15}$$

Differentiating (A11) yields Equations (34) and (35). The sign of the husband's response is the sign of γ, because $\kappa > 0$, $1 - \beta > 0$, and $\Delta > 0$. The repayment intercept $\bar{\phi}$ does not enter the first-order conditions, proving Equation (36). These derivatives apply locally while the agreement, affine-branch, and strict-interiority conditions remain satisfied.

Appendix A.7. Proof Details for Proposition 4

The outside-option levels V_f and V_m enter only the constant K in the aggregate gains from marriage. Because K is additive and independent of both investments, it disappears when the Stage-1 objectives are differentiated. Likewise, D affects payoff levels but not the derivative of the wife's divorce payoff with respect to q_f. They, therefore, do not appear in Equations (25) and (33), establishing Equation (37) for parameter changes that preserve the maintained agreement and interior regime.

References

Anderson, S. (2007). The economics of dowry and brideprice. *Journal of Economic Perspectives*, *21*(4), 151–174. [CrossRef]

Ashraf, N., Bau, N., Nunn, N., & Voena, A. (2020). Bride price and female education. *Journal of Political Economy*, *128*(2), 591–641. [CrossRef]

Brown, P. H. (2009). Dowry and intrahousehold bargaining: Evidence from China. *Journal of Human Resources*, *44*(1), 25–46. [CrossRef]

Brown, P. H., Bulte, E., & Zhang, X. (2011). Positional spending and status seeking in rural China. *Journal of Development Economics*, *96*(1), 139–149. [CrossRef]

Browning, M., Chiappori, P. A., & Weiss, Y. (2014). *Economics of the family*. Cambridge University Press.

Che, Y.-K., & Hausch, D. B. (1999). Cooperative investments and the value of contracting. *American Economic Review*, *89*(1), 125–147. [CrossRef]

Chen, J., & Pan, W. (2023). Bride price and gender role in rural China. *Heliyon*, *9*(1), e12789. [CrossRef] [PubMed]

Chiappori, P. A., & Mazzocco, M. (2017). Static and intertemporal household decisions. *Journal of Economic Literature*, *55*(3), 985–1045. [CrossRef] [PubMed]

Debreu, G. (1952). A social equilibrium existence theorem. *Proceedings of the National Academy of Sciences USA*, *38*(10), 886–893. [CrossRef] [PubMed]

Fan, K. (1952). Fixed-point and minimax theorems in locally convex topological linear spaces. *Proceedings of the National Academy of Sciences USA*, *38*(2), 121–126. [CrossRef] [PubMed]

Fei, X. (2012). *Peasant life in China*. Peking University Press. (In Chinese)

Glicksberg, I. L. (1952). A further generalization of the Kakutani fixed point theorem, with application to Nash equilibrium points. *Proceedings of the American Mathematical Society*, *3*(1), 170–174. [CrossRef]

Grout, P. A. (1984). Investment and wages in the absence of binding contracts: A Nash bargaining approach. *Econometrica*, *52*(2), 449–460. [CrossRef]

Guo, Q. (2024). Seventy years of marriage and family law in China: Achievements, challenges and prospects. *Asian Journal of Law and Economics*, *15*(3), 379–409. [CrossRef]

Hausken, K., & Schwartz, G. A. (2012). Bilateral contracts with transaction costs. *International Journal of Management and Enterprise Development*, *12*(1), 73–91. [CrossRef]

Jiang, Q., & Sánchez-Barricarte, J. J. (2012). Bride price in China: The obstacle to "bare branches" seeking marriage. *The History of the Family*, *17*(1), 2–15. [CrossRef]

Konrad, K. A., & Lommerud, K. E. (2000). The bargaining family revisited. *Canadian Journal of Economics/Revue Canadienne d'Économique*, *33*(2), 471–487. [CrossRef]

Li, Z. (2026). What if she educates more? Examining the dynamics of intrahousehold bargaining power. *Review of Development Economics*. Advance online publication. [CrossRef]

Lundberg, S., & Pollak, R. A. (1993). Separate spheres bargaining and the marriage market. *Journal of Political Economy*, *101*(6), 988–1010. [CrossRef] [PubMed]

Manser, M., & Brown, M. (1980). Marriage and household decision-making: A bargaining analysis. *International Economic Review*, *21*(1), 31–44. [CrossRef]

McElroy, M. B., & Horney, M. J. (1981). Nash-bargained household decisions: Toward a generalization of the theory of demand. *International Economic Review*, *22*(2), 333–349. [CrossRef]

Nash, J. F. (1951). Non-cooperative games. *Annals of Mathematics*, *54*(2), 286–295. [CrossRef]

Nash, J. F. (1953). Two-person cooperative games. *Econometrica*, *21*(1), 128–140. [CrossRef]

Nash, J. F., Jr. (1950). The bargaining problem. *Econometrica*, *18*(2), 155–162. [CrossRef]

Rainer, H. (2007). Should we write prenuptial contracts? *European Economic Review*, *51*(2), 337–363. [CrossRef]

Rosen, J. B. (1965). Existence and uniqueness of equilibrium points for concave *n*-person games. *Econometrica*, *33*(3), 520–534. [CrossRef]

Stevenson, B. (2007). The impact of divorce laws on marriage-specific capital. *Journal of Labor Economics*, *25*(1), 75–94. [CrossRef]

Supreme People's Court. (2023, December 12). *Typical cases concerning betrothal-gift disputes*. Available online: https://www.court.gov.cn/zixun/xiangqing/419922.html (accessed on 11 July 2026).

Supreme People's Court. (2024, January 18). *Provisions on several issues concerning the application of law in the trial of cases involving disputes over betrothal gifts*. Available online: https://www.court.gov.cn/fabu/xiangqing/423442.html (accessed on 11 July 2026).

Supreme People's Procuratorate. (2020). *Civil code of the People's Republic of China (article 1042)*. Available online: https://www.spp.gov.cn/spp/ssmfdyflvdtpgz/202008/t20200831_478417.shtml (accessed on 11 July 2026).

Wan, Y. (2024). Between money and intimacy: Brideprice, marriage, and women's position in contemporary China. *Demographic Research*, *50*(46), 1353–1386. [CrossRef]

Wang, S. (2025). Marriage payment in Chinese families (1978–2018): Trends, urban-rural differences, and regional patterns. *Journal of Shandong Women's University*, *179*(1) , 105–119. (In Chinese)

Wei, S. J., Zhang, X., & Liu, Y. (2017). Home ownership as status competition: Some theory and evidence. *Journal of Development Economics*, *127*, 169–186. [CrossRef]

Wickelgren, A. L. (2009). Why divorce laws matter: Incentives for noncontractible marital investments under unilateral and consent divorce. *The Journal of Law, Economics, and Organization*, *25*(1), 80–106. [CrossRef]

Wong, H.-P. C. (2016). Credible commitments and marriage: When the homemaker gets her share at divorce. *Journal of Demographic Economics*, *82*(3), 241–279. [CrossRef]

Xiong, F., & Mu, L. (2009). Marital reimbursement, marital subsidization, and mutual affinal benefits: An analysis of countryside marriage-payment practice. *Social Sciences in Xinjiang*, 54–57. (In Chinese)

Yan, Y. (1996). *The flow of gifts: Reciprocity and social networks in a Chinese village*. Stanford University Press.

Yu, J., & Xie, Y. (2015). Changes in the determinants of marriage entry in post-reform urban China. *Demography*, *52*(6), 1869–1892. [CrossRef] [PubMed]

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