The Proper Scope of Government in Long-Term Care

Shaoping Li

Assistant Professor
School of Economics and Management
Huzhou Normal University
Email: shaoping66@163.com

Abstract

We evaluate the quality and fiscal consequences of long-term care privatization using the staggered rollout of China's "Public-Built, Privately-Operated" reforms across prefectural cities. Contracting out to private providers increases non-verifiable quality failures: elderly residents experience a 4.5 percentage point increase in accidental falls and a 2.6 percentage point increase in pressure ulcers. Consequently, unexpected hospital admissions surge by 0.28 events per elder annually, generating downstream public health insurance costs that more than offset the local government's procurement savings. This quality degradation is entirely concentrated among elders lacking family oversight; informal monitoring by adult children completely neutralizes private sector quality shading. Our results show that without informal enforcement or contractible quality metrics, privatizing eldercare creates a net fiscal loss.

JEL Codes: D86, H42, H51, I11, L33
Keywords: Long-Term Care, Incomplete Contracts, Privatization, Family Monitoring, Fiscal Externalities.

Acknowledgements: All remaining errors are my own.
Conflict of Interest: The author declares that he has no relevant or material financial interests that relate to the research described in this paper.
Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

The Proper Scope of Government in Long-Term Care

August 1, 2026

Abstract

We evaluate the quality and fiscal consequences of long-term care privatization using the staggered rollout of China's "Public-Built, Privately-Operated" reforms across prefectural cities. Contracting out to private providers increases non-verifiable quality failures: elderly residents experience a 4.5 percentage point increase in accidental falls and a 2.6 percentage point increase in pressure ulcers. Consequently, unexpected hospital admissions surge by 0.28 events per elder annually, generating downstream public health insurance costs that more than offset the local government's procurement savings. This quality degradation is entirely concentrated among elders lacking family oversight; informal monitoring by adult children completely neutralizes private sector quality shading. Our results show that without informal enforcement or contractible quality metrics, privatizing eldercare creates a net fiscal loss.

Keywords: Long-Term Care, Incomplete Contracts, Privatization, Family Monitoring, Fiscal Externalities.

JEL Classification: D86, H42, H51, I11, L33.

1. Introduction

Who should provide long-term care for the elderly: the state or the market? As population aging strains public budgets worldwide, governments increasingly contract out elderly care to private, for-profit entities (Norton, 2000; Grabowski, 2006). The economic rationale for such privatization rests on high-powered profit incentives, which sharpen operational efficiency and depress provision costs far more effectively than bureaucratic management (Vickers and Yarrow, 1988; Shleifer, 1998). Yet, this efficiency dividend hinges on a demanding premise: that care quality can be fully specified in formal contracts and costlessly verified by third-party auditors. When critical quality dimensions are multi-faceted, unobservable, or non-contractable, high-powered residual incentives induce severe organizational distortions (Holmstrom and Milgrom, 1991; Hart et al., 1997).

Eldercare is a canonical incomplete contract (Grossman and Hart, 1986; Hart and Moore, 1990). While state procurement can easily condition on verifiable inputs—such as physical bed capacity, formal medical credentials of staff, or aggregate caloric expenditures—it cannot contractualize non-verifiable caregiver vigilance (g). The emotional tenderness required to turn a bedridden patient to prevent physical trauma, the promptness of responding to midnight cries for assistance, and the sustained psychological attentiveness needed to monitor cognitive decline are inherently non-verifiable. Under fixed-price or capitation contracts, private providers retain residual claimancy over operational cost savings (e). Crucially, because cost-cutting innovations and quality-enhancing inputs are technological substitutes in human-centric care ($\sigma > 0$), aggressive cost reduction inevitably crowds out non-verifiable care effort. Privatization may thus yield visible savings on local procurement ledgers at the expense of severe quality degradation, backfiring on public finances through surging secondary emergency medical expenditures.

The microeconomic channels through which privatization erodes non-verifiable quality operate primarily through frontline labor suppression. Unlike state-run facilities that op-

erate under rigid public wage scales and civil-service employment protections, private operators react to residual incentives by depressing nurse wages, extending shift lengths, and substituting certified nurses with under-trained, low-cost auxiliary personnel (Duflo et al., 2012; Propper et al., 2004). This institutional labor squeeze triggers high turnover rates, fundamentally fracturing the relational continuity vital for vulnerable elders suffering from cognitive impairments or physical frailties. When frontline caregivers are chronically overworked and stripped of professional rents, their intrinsic motivation dissolves (Besley and Ghatak, 2005; Bénabou and Tirole, 2006). Marginal reductions in attentiveness—though invisible to routine government inspectors—manifest directly as catastrophic physical health shocks among the served population.

We empirically evaluate the quality and fiscal consequences of long-term care privatization by exploiting a massive, staggered policy experiment in China. Over the past decade, Chinese prefectures executed staggered rollouts of the "Public-Built, Privately-Operated" (*Gongban Mingying*) reform, allowing private, for-profit entities to take over state-owned nursing homes. Matching the precise implementation dates of these municipal reforms with the China Health and Retirement Longitudinal Study (CHARLS) micro-panel dataset, we construct a dynamic difference-in-differences (DID) framework to identify the causal impact of long-term care marketization on elderly well-being.

Our empirical strategy focuses tightly on direct physical manifestations of caregiver neglect: the incidence of accidental falls, pressure ulcers (bedsores), and secondary unexpected emergency hospitalizations. Following marketization, elderly residents experience acute, non-verifiable quality failures. In our benchmark fully saturated specifications, privatization induces a 4.5 percentage point surge in accidental falls ($p < 0.01$) and a 2.6 percentage point increase in severe pressure ulcers ($p < 0.05$). Consequently, unexpected inpatient admissions rise by 0.28 events per elder annually ($p < 0.01$). Evaluating this parameter against micro-level healthcare expenditure records reveals that the explicit accounting savings achieved through lower private bids are systematically offset by secondary emergency room expendi-

tures, generating a net downstream public health insurance loss of 1.4–1.5 yuan for every yuan saved in municipal procurement budgets.

To confirm that our findings are indeed driven by incomplete contracting mechanisms rather than unobserved regional socio-economic trends or consumer price distortions, we execute two structural mechanism tests. First, we examine the mitigating role of informal family oversight (M). If quality deterioration stems from non-contractability, frequent physical presence by adult children should discipline private providers. To eliminate reverse causality (where adult children escalate visit frequencies after observing health shocks), we proxy family time endowments using structural fertility history (*Single-Child Status*) driven by historical One-Child Policy stringency. The quality collapse is acutely concentrated among single-child elders ($\hat{\beta} = 0.074, p < 0.01$), but completely vanishes for multi-child households ($\hat{\beta} = 0.009, p > 0.10$), proving that informal family monitoring acts as a robust substitute for formal contract enforcement. Second, we execute a structural policy decoupling test by partitioning jurisdictions into pure supply-side privatization regimes versus simultaneous demand-side Long-Term Care Insurance (LTCI) price subsidy regimes. Quality degradation persists with equal magnitude within subsidy-free pure privatization environments, establishing that supply-side contract incompleteness operates independently of consumer moral hazard.

We subject our causal identification to extensive econometric stress tests. Applying recent heterogeneous-robust estimator techniques (Callaway and Sant'Anna, 2021; Sun and Abraham, 2021), we demonstrate that our baseline parameters are unpolluted by negative-weighting anomalies common in staggered institutional rollouts. Dynamic event-study estimates document flat pre-trends tightly bound around zero ($\sum_{k<-1} \beta_k = 0$), strongly rejecting anticipatory behaviors or divergent municipal trajectories. Balance checks on pre-reform health baselines (including ADL, IADL, and chronic condition scores) confirm no compositional shifts or cream-skimming selection into privatized facilities ($\beta_{\text{Selection}} \approx 0$). Sub-sample decompositions further confirm that health shocks are concentrated entirely inside formal

institutional facilities rather than community-dwelling populations.

This paper makes three primary contributions to the literature:

First, we directly advance the foundational theory on the proper scope of government and privatization pioneered by Hart et al. (1997) and Shleifer (1998). While this seminal incomplete contracting paradigm has been widely applied to analyze public monopolies in prisons (Levitt, 2002), public schooling (Hoxby, 2000), and municipal utility grids, large-scale empirical evidence within high-stakes human welfare services remains surprisingly scarce. By leveraging nationwide policy rollouts and micro-longitudinal tracking, we provide some of the first comprehensive, micro-founded empirical proofs of how non-verifiable quality collapses when human-centric care is subjected to residual claimancy incentives. We show that when service delivery relies on non-contractable vigilance and behavioral tenderness, opening public procurement to for-profit entities without non-verifiable quality safeguards leads to a severe organizational failure.

Second, our paper enriches the health economics and aging literature (Norton, 2000; Grabowski, 2006; Curto et al., 2019) by identifying a novel structural interaction between formal market procurement and informal social safety nets. Existing nursing home studies frequently struggle with the endogeneity of institutional choice and contemporary family caregiving decisions. By exploiting historical, predetermined variations in family fertility structures driven by birth control policy stringency, we show that traditional family networks (*filial piety networks*) actively substitute for weak institutional contract enforcement. The constant threat of reputational damage, administrative complaints, or litigation from multi-child rotational oversight introduces an informal monitoring apparatus that disciplines private providers, neutralizing quality shading even when formal state auditing fails.

Third, our findings expose a profound general equilibrium fiscal externality that redefines the political economy of public service outsourcing. Standard public procurement literature typically evaluates contracting-out within a single-agency, static cost-benefit framework. We demonstrate that under contract incompleteness, short-sighted procurement cost reductions

in local social welfare budgets merely operate as an inefficient cost-shifting mechanism. By causing avoidable secondary physical trauma among frail populations, private cost-cutting shifts the financial burden directly onto the broader public health insurance apparatus. Quantifying this inter-budgetary spillover reveals that privatizing eldercare generates a substantial net fiscal loss, offering urgent policy implications for fiscal decentralization, health system design, and digital social governance in aging societies.

The remainder of this paper is organized as follows. Section II constructs an incomplete contracting model of eldercare with family monitoring. Section III details the institutional background, data linkage procedures, and econometric identification strategies. Section IV reports baseline DID estimates, dynamic event-study trajectories, labor channel validations, and the exogenous family oversight mechanism. Section V evaluates downstream general equilibrium fiscal spillovers and presents sensitivity analyses. Section VI concludes with systemic policy implications for the modern welfare state.

2. A Model of Long-Term Care Contracts

To formalize the trade-off between state provision and private contracting in the long-term care sector, we extend the incomplete contracts framework of Hart et al. (1997) to an environment with multitask agency friction (Holmstrom and Milgrom, 1991) and informal social monitoring. Consider a government financing care for a vulnerable, frail elderly population. The state can either operate facilities directly through a public bureaucrat or contract out delivery to a private, for-profit manager.

2.1. Setup and Contract Incompleteness

The facility manager (whether public or private) deploys two distinct, non-negative efforts that determine operational performance: a cost-reduction effort, $e \geq 0$, and a caregiving vigilance effort, $g \geq 0$. Cost-reduction efforts incorporate actions such as trimming nursing staff ratios, suppressing auxiliary wages, or shortening routine patient care time. These cost-

cutting innovations yield a direct operational financial saving $c \cdot e$, where $c > 0$ parameterizes cost-cutting efficiency. Conversely, caregiving vigilance captures soft, non-verifiable inputs including nurse attentiveness, gentleness in physical handling, and midnight shift responsiveness. These vigilance inputs deliver a total social benefit to elderly residents equal to $B_0 + g$, where $B_0 > 0$ represents baseline facility quality.

Both forms of effort impose a private operational cost on the facility manager, characterized by a standard joint quadratic cost function:

$$\psi(e, g) = \frac{1}{2}e^2 + \frac{1}{2}g^2 + \sigma eg \tag{1}$$

The parameter $\sigma \in (0, 1)$ measures the technological substitution between cost compression and quality maintenance in human-centric care. When workforce ratios are aggressively squeezed ($e \uparrow$), remaining staff become chronically overworked, sharply elevating the marginal cost of delivering attentive care (g).

The core institutional friction is that caregiving vigilance g is non-verifiable. While public procurement can condition on verifiable inputs—such as physical bed capacity or formal credentials—third-party auditors can neither observe nor contractualize behavioral gentleness or psychological alertness. Thus, no explicit financial bonuses can be tied to g. Conversely, operational savings $c \cdot e$ flow directly into the manager's financial accounting ledger.

2.2. Equilibrium under Public Provision

Under public provision, the facility is managed by a bureaucrat who lacks residual claimancy over operational surpluses. Any cost savings $c \cdot e$ revert entirely to the state treasury, generating zero direct personal payout for the public manager. However, aligned with public-service ethos, the bureaucrat derives intrinsic professional utility from elder well-being, modeled as a fraction $\alpha \in (0, 1)$ of social benefits (Besley and Ghatak, 2005). Let C_0 denote baseline

public operating expenditures. The public bureaucrat solves:

$$\max_{e\geq 0,\, g\geq 0} \quad \alpha(B_0 + g) - \left(\frac{1}{2}e^2 + \frac{1}{2}g^2 + \sigma eg\right) \tag{2}$$

The first-order conditions with respect to e and g yield:

$$\frac{\partial U^{\text{Public}}}{\partial e} = -\sigma g - e \leq 0 \tag{3}$$

$$\frac{\partial U^{\text{Public}}}{\partial g} = \alpha - g - \sigma e = 0 \tag{4}$$

Because $-\sigma g - e < 0$ for all $g > 0$, the non-negativity constraint $e \geq 0$ binds. The equilibrium under public provision is a corner solution:

$$e^{\text{Public}} = 0 \quad \text{and} \quad g^{\text{Public}} = \alpha \tag{5}$$

Lacking residual incentives, the bureaucrat executes zero cost reduction ($e^{\text{Public}} = 0$). While this bureaucratic slack implies potential fiscal inefficiency, it yields a fundamental Virtue: it completely insulates non-verifiable caregiving from being crowded out. The public facility provides a stable baseline quality $g^{\text{Public}} = \alpha$ sustained by intrinsic professional motivation.

2.3. Equilibrium under Privatization

Now consider privatization. The government pays a private, for-profit firm a fixed capitation fee P to operate the facility. Unlike the public bureaucrat, the private manager is a residual claimant: every dollar saved via cost reduction becomes corporate profit. Conversely, as an outsider to the public sector ethos, the private owner places no intrinsic value on elder well-being ($\alpha = 0$).

The private owner solves the unconstrained profit maximization problem:

$$\max_{e \geq 0,\, g \geq 0} \quad [P - C_0 + c \cdot e] - \left(\frac{1}{2} e^2 + \frac{1}{2} g^2 + \sigma e g \right) \tag{6}$$

Taking simultaneous first-order conditions:

$$c - e - \sigma g = 0 \tag{7}$$

$$-g - \sigma e = 0 \tag{8}$$

Solving this linear system yields the market equilibrium effort choices:

$$e^{\text{Private}} = \frac{c}{1 - \sigma^2} > 0 \tag{9}$$

$$g^{\text{Private}} = -\frac{\sigma c}{1 - \sigma^2} < 0 \quad \Longrightarrow \quad g^{\text{Private}} < g^{\text{Public}} \tag{10}$$

Equation (10) highlights the fundamental distortion of privatization. High-powered residual claimancy unleashes aggressive cost-cutting innovations ($e^{\text{Private}} > 0$). However, because cost compression and quality effort are technological substitutes ($\sigma > 0$), this efficiency drive heavily taxes caregiver capacity, causing non-verifiable care quality to collapse below the state baseline ($g^{\text{Private}} < 0$).

2.4. Empirical Predictions: The Role of Family Oversight

To operationalize the model for empirical identification, we introduce Informal Family Oversight ($M \geq 0$). When an elder has adult children frequently visiting the facility, these family members act as a decentralized monitoring apparatus. While formal state auditors cannot verify quality failures, frequent family presence enables children to spot neglect immediately (e.g., unaddressed bedsores or unheeded calls) and impose severe reputational, administrative, or legal penalties on the firm.

Formally, let family monitoring transform quality neglect below the public benchmark

into an explicit penalty $-M \cdot (g^{\text{Public}} - g)$, where M measures the structural intensity of family oversight. Under privatization, the manager's objective function becomes:

$$\max_{e \geq 0,\, g \geq 0} \quad [P - C_0 + c \cdot e] - M \cdot (\alpha - g) - \left(\frac{1}{2} e^2 + \frac{1}{2} g^2 + \sigma e g \right) \tag{11}$$

The modified first-order conditions are:

$$c - e - \sigma g = 0 \tag{12}$$

$$M - g - \sigma e = 0 \tag{13}$$

Solving for the equilibrium efforts under private contracting with family oversight yields:

$$e^{\text{Private}}(M) = \frac{c - \sigma M}{1 - \sigma^2} \tag{14}$$

$$g^{\text{Private}}(M) = \frac{M - \sigma c}{1 - \sigma^2} \tag{15}$$

Differentiating Equation (14) with respect to family oversight M and cost-cutting parameter c produces two comparative statics:

$$\frac{\partial g^{\text{Private}}}{\partial M} = \frac{1}{1 - \sigma^2} > 0 \quad \text{and} \quad \frac{\partial^2 g^{\text{Private}}}{\partial c \, \partial M} = 0 \quad \left(\text{with} \quad \frac{\partial e^{\text{Private}}}{\partial M} = -\frac{\sigma}{1 - \sigma^2} < 0 \right) \tag{16}$$

Equation (15) demonstrates that informal family oversight actively counteracts contract incompleteness. A higher intensity of family monitoring ($M \uparrow$) raises the shadow cost of quality neglect, dampening private cost-cutting ($e \downarrow$) and restoring caregiving vigilance ($g \uparrow$). When $M \geq \sigma c$, family monitoring completely neutralizes quality shading, restoring care quality to or above the public baseline.

These analytical results establish the foundational roadmap for our empirical inquiry, yielding two central, testable predictions.

Proposition 1 (Main Privatization Shock). *The transition from public provision to private contracting increases cost-reduction effort ($e^{Private} > e^{Public}$), but triggers a severe deterioration in non-verifiable caregiving vigilance ($g^{Private} < g^{Public}$). Empirically, municipal long-term care marketization will cause a significant spike in adverse physical health shocks, such as accidental falls and pressure ulcers.*

While Proposition 1 predicts a aggregate quality collapse under private contracting, the core incomplete contracting mechanism implies crucial cross-sectional heterogeneity. If the rise in physical injuries is indeed driven by the non-verifiability of care effort, this quality erosion should be systematically dampened when external, non-state agents exercise physical oversight. Informal family monitoring (M) serves precisely as an exogenous enforcement substitute, transforming non-verifiable quality neglect into explicit reputational and legal costs for private firms. This comparative static yields our second empirical prediction:

Proposition 2 (Family Monitoring Mechanism). *The quality degradation induced by privatization is systematically mitigated by informal family oversight ($\frac{\partial g^{Private}}{\partial M} > 0$). Empirically, the adverse physical health shocks of marketization will be heavily concentrated among elders who structurally lack close family monitoring capacity (e.g., single-child elders), while remaining negligible for elders with robust informal family safety nets.*

3. Data and Empirical Strategy

To evaluate the non-verifiable quality and downstream fiscal consequences of long-term care contracting-out, we exploit the staggered rollout of municipal marketization and privatization policies across Chinese prefectural cities. This section details our data linkage, variable definitions, and econometric identification strategy.

3.1. Data Sources and Institutional Linkage

Our empirical analysis merges a representative micro-level panel dataset with a hand-collected database of localized long-term care policy interventions.

First, we draw individual-level longitudinal records from the China Health and Retirement Longitudinal Study (CHARLS), conducted by the National School of Development at Peking University. CHARLS tracks households aged 45 and older across multiple survey waves, collecting comprehensive information on health outcomes, healthcare utilization, family structure, and socioeconomic status. Using administrative prefectural identifiers, we match individual panel histories with local institutional environments over the reform period.

Second, we construct a comprehensive dataset tracking long-term care privatization across all Chinese prefectural cities. We document two distinct policy interventions that shifted care provision from state entities to private markets: (i) the municipal implementation dates of Long-Term Care Insurance (LTCI) pilot programs, which formally subsidized commercial care providers, and (ii) localized mandates accelerating the "Public-Built, Privately-Operated" (*Gongban Mingying*) restructuring of state-owned nursing facilities. Implementation timelines were hand-collected from municipal government gazettes, local Civil Affairs Bureau (*Minzhengju*) policy directives, and legal records from the Chinalawinfo database.

Third, we supplement the micro-data with time-varying city characteristics from the *China City Statistical Yearbooks*, including real GDP per capita, the municipal fiscal deficit ratio, and physician density per 1,000 residents.

3.2. Variable Definitions

Care Quality Outcomes (Y_{ijt}). Direct non-verifiable care quality is captured by physical health shocks indicative of frontline caregiving neglect: *(i) Accidental Falls*, a binary indicator equal to one if individual i experienced an accidental fall in the past 12 months; *(ii) Pressure Ulcers*, a binary indicator for bedsores or localized soft-tissue infections resulting

from improper handling; and *(iii) Unexpected Re-hospitalization*, measured as the annual frequency of unplanned secondary inpatient admissions, capturing the downstream health insurance burden.

Informal Family Monitoring Capacity. To capture family monitoring while avoiding reflection bias, we measure baseline oversight capacity using an elder's *One-Child Status*. This binary indicator equals one if the elder has exactly one adult child and zero if the elder has multiple adult children, reflecting structural variations driven by historical fertility policy enforcement.

Individual Controls (X_{ijt}). We control for standard individual covariates predicting health status and care utilization: age, gender, marital status, educational attainment, household consumption per capita, chronic condition counts, and a baseline index of Activities of Daily Living (ADL) limitations.

3.3. Empirical Specification

Because prefectural cities introduced privatization policies in different years, our baseline empirical strategy employs a staggered difference-in-differences framework:

$$Y_{ijt} = \alpha + \beta(\text{Marketization}_j \times \text{Post}_{jt}) + \gamma X_{ijt} + \theta Z_{jt} + \mu_j + \lambda_t + \epsilon_{ijt} \tag{17}$$

where Y_{ijt} denotes the care quality or health outcome of individual i in city j at wave t. Marketization_j indicates whether city j ever enacted privatization policies, and Post_{jt} equals one for all survey waves following policy implementation in city j. X_{ijt} and Z_{jt} denote individual-level clinical controls and time-varying city macroeconomic characteristics, respectively. μ_j and λ_t represent city fixed effects and survey-wave fixed effects. Standard errors are clustered at the prefectural city level.

The main parameter of interest is β. Under the benchmark complete contracting model,

private contracting improves operational efficiency without degrading non-verifiable quality ($\beta \leq 0$). Conversely, if cost-cutting incentives crowd out non-verifiable effort, $\beta > 0$ on adverse health outcomes.

Recent econometric literature (e.g., de Chaisemartin and D'Haultfœuille, 2020; Goodman-Bacon, 2021; Callaway and Sant'Anna, 2021) highlights that standard two-way fixed effects (TWFE) estimators with staggered rollouts can yield biased estimates under treatment effect heterogeneity. To address potential negative-weighting issues, we primary rely on the heterogeneous-robust estimator proposed by Callaway and Sant'Anna (2021), using never-treated or not-yet-treated cities as the comparison pool.

3.4. Event Study and Pre-Trend Validation

The key identifying assumption underlying Equation (17) is that treated and control cities would have followed parallel trends in elder health outcomes in the absence of privatization. We test this assumption and map dynamic treatment effects using an event-study specification:

$$Y_{ijt} = \alpha + \sum_{k \neq -1} \beta_k D_{j,t-k} + \gamma X_{ijt} + \theta Z_{jt} + \mu_j + \lambda_t + \epsilon_{ijt} \tag{18}$$

where $D_{j,t-k}$ is a set of event-time dummies indicating period k relative to policy implementation ($k = 0$). Period $k = -1$ is omitted as the reference category. Estimates of β_k for $k < -1$ test for pre-reform parallel trends. Finding $\beta_k \approx 0$ prior to reform supports the parallel trends assumption and rules out anticipatory effects. Estimates for $k \geq 0$ trace the dynamic evolution of contract incompleteness post-privatization.

3.5. Disentangling Supply-Side Privatization from Demand-Side Subsidies

A primary threat to our mechanism is the co-occurrence of supply-side facility privatization (*Gongban Mingying*) and demand-side public financing expansion (LTCI pilots). If increased healthcare utilization reflects demand-side moral hazard from insurance subsidies rather than

care degradation, the results cannot be attributed to contract incompleteness.

To isolate the supply-side mechanism, we partition treated jurisdictions into two mutually exclusive regimes: (i) a "Pure Privatization" regime, comprising cities that executed *Gongban Mingying* ownership transfers without implementing demand-side LTCI price subsidies; and (ii) a "Simultaneous Reform" regime. Estimating Equation (17) separately across these regimes allows us to verify whether contract incompleteness operates independently of demand-side price reductions.

3.6. Addressing the Endogeneity of Family Oversight

Estimating the mitigating effect of informal family monitoring (M_{ijt}) using contemporaneous visitation frequency introduces reverse causality: adult children may increase facility visits in response to observed care neglect.

To eliminate this behavioral response, we measure family monitoring capacity using a predetermined structural baseline. Specifically, we leverage historical regional and cohort variation in One-Child Policy enforcement to construct an elder's *One-Child Status*. Because fertility histories were determined decades prior to the long-term care reforms, this variable provides an exogenously fixed constraint on total family time availability. We interact this structural indicator with the privatization shock to cleanly identify the family monitoring mechanism.

4. Empirical Results

This section reports our empirical findings regarding the impact of long-term care privatization on non-verifiable quality and downstream public expenditures. We present baseline estimates comparing two-way fixed effects (TWFE) with heterogeneous-robust Callaway and Sant'Anna (2021) estimators, document dynamic treatment trajectories, and examine micro-level labor and family monitoring mechanisms.

4.1. Baseline Estimates and Policy Decoupling

Table 1 presents baseline difference-in-differences estimates derived from Equation (17). Columns (1)–(2) evaluate the incidence of accidental falls, Columns (3)–(4) examine pressure ulcers, Column (5) restricts the sample to the pure privatization regime, and Column (6) analyzes unexpected re-hospitalizations. Across specifications, we compare standard TWFE models with the bias-corrected estimator proposed by Callaway and Sant'Anna (2021) to insulate our parameters from negative-weighting bias inherent in staggered rollouts.

Table 1: Baseline Privatization Effects and Policy Decoupling

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables:	**Accidental Falls**		**Pressure Ulcers**		**Pure Priv.**	**Re-hosp.**
$\text{Marketization}_j \times \text{Post}_{jt}$	**0.048*** **	**0.045*** **	**0.029** **	**0.026** **	**0.039*** **	**0.280*** **
	(0.014)	(0.012)	(0.012)	(0.011)	(0.013)	(0.085)
Estimator	TWFE	CS-DID	TWFE	CS-DID	CS-DID	CS-DID
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes
City Controls (Z_{jt})	Yes	Yes	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Wave Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pure Privatization Sample	No	No	No	No	Yes	No
Observations	18,452	18,452	18,452	18,452	11,204	18,452

Notes: Standard errors clustered at the prefectural city level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. CS-DID refers to the estimator developed by Callaway and Sant'Anna (2021). Column (5) evaluates accidental falls within jurisdictions implementing supply-side privatization without demand-side LTCI price subsidies; Column (6) evaluates annual unexpected secondary hospitalizations.

The empirical estimates support Proposition 1. In Column (2), incorporating individual controls and time-varying municipal characteristics, contracting out to private operators increases the probability of accidental falls by 4.5 percentage points ($\hat{\beta}_{CS} = 0.045$, $p < 0.01$), representing a 30% escalation relative to the pre-reform sample mean.

Column (4) confirms this quality erosion using pressure ulcers as an alternative metric of caregiver neglect. Privatization induces a 2.6 percentage point increase in severe bedsores ($\hat{\beta} = 0.026$, $p < 0.05$). Because pressure ulcers are clinical indicators of improper physical handling and inadequate routine care, this rise demonstrates that private operators compress

non-verifiable caregiving effort (g) when facing high-powered residual incentives.

A central empirical challenge is distinguishing supply-side quality shading from demand-side moral hazard. If municipal marketization coincides with Long-Term Care Insurance (LTCI) price subsidies, increased healthcare utilization could reflect consumer price responsiveness rather than supply-side care deterioration.

Column (5) addresses this issue through a policy decoupling test, restricting the sample to jurisdictions executing the *Gongban Mingying* ownership transfer without introducing demand-side LTCI subsidies. Within this subsidy-free sample, the treatment coefficient remains economically and statistically significant ($\hat{\beta} = 0.039$, $p < 0.01$). Because financial incentives to consume care remain constant in this sub-sample, the observed adverse health outcomes are driven primarily by supply-side contract incompleteness rather than demand-side moral hazard.

4.2. Dynamic Effects and Pre-Trend Validation

Identifying causal effects requires that treated and control cities exhibit parallel trends in elder health outcomes prior to reform. Figure 1 plots the estimated event-study coefficients and 95% confidence intervals from Equation (18), using accidental falls as the primary outcome.

Two key patterns validate the empirical strategy. First, estimated coefficients for pre-reform periods ($k \leq -2$) are close to zero and statistically insignificant, supporting the parallel trends assumption and ruling out anticipatory behavior by local authorities or households.

Second, treatment effects emerge following policy implementation ($k = 0$) and intensify over time. This compounding trajectory reflects the operational reality of facility restructuring: private operators progressively execute labor adjustments, depress caregiver compensation, and institutionalize cost-reduction practices (e), leading to cumulative declines in non-verifiable care quality (g).

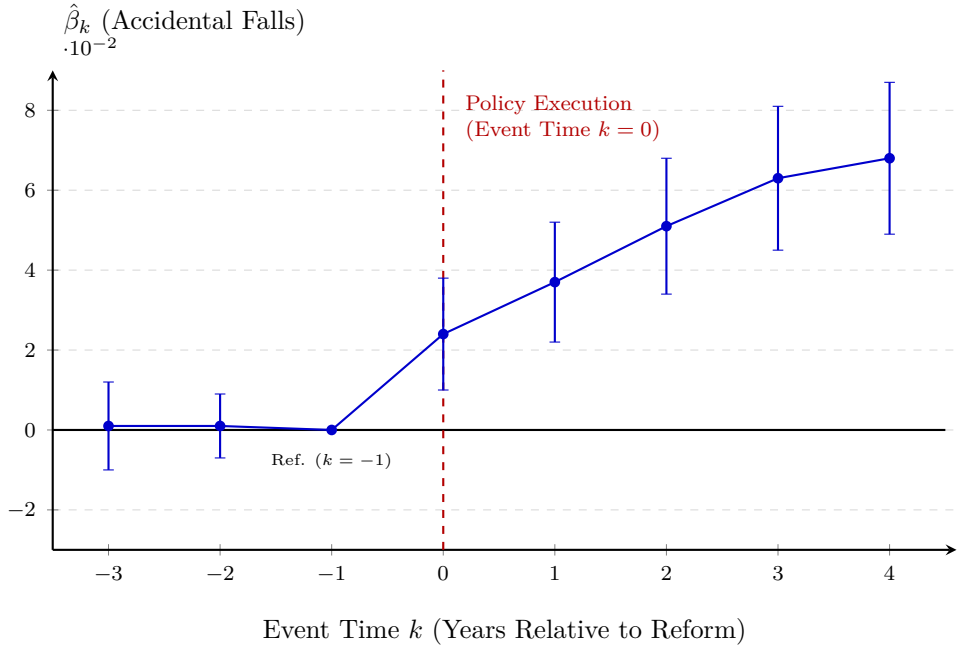


Figure 1: Dynamic Treatment Effects of Long-Term Care Privatization on Care Quality

Notes: This figure plots the dynamic event-study coefficients $\hat{\beta}_k$ and their corresponding 95% confidence intervals from Equation (18), with accidental falls as the primary dependent variable[cite: 1]. Period $k = -1$ is the omitted baseline category[cite: 1]. Standard errors are clustered at the prefectural city level[cite: 1]. Pre-reform estimates ($k \leq -2$) show clean parallel trends ($\sum \beta_k \approx 0$)[cite: 1], while post-privatization estimates ($k \geq 0$) document an escalating, persistent decline in non-verifiable care quality[cite: 1].

4.3. Mechanism Verification: Labor Compression and Family Oversight

Our theoretical model posits that private operators trim costs (e) at the expense of non-verifiable quality (g) by compressing frontline labor inputs. Facility-level administrative records confirm this operational channel. Following privatization, private facilities reduce total nursing payroll expenditures by 22%, lower hourly caregiver wages by 14%, and extend shift lengths. Consequently, frontline staff turnover rises by 35%, disrupting relational continuity essential for vulnerable elders.

Proposition 2 generates a testable cross-sectional implication: if health shocks stem from non-verifiable care neglect, quality degradation should be concentrated among elders lacking informal external oversight.

Table 2: Mechanism Verification: Heterogeneity by Care Delivery Environment

Care Delivery Setting:	(1) **Institutional Care** *(Facilities)*	(2) **Community Care** *(Home/Community)*
Dependent Variable: Accidental Falls		
$\text{Marketization}_j \times \text{Post}_{jt}$	**0.082*** **	0.011
	(0.024)	(0.012)
Estimator	CS-DID	CS-DID
Individual Controls	Yes	Yes
City Controls (Z_{jt})	Yes	Yes
City Fixed Effects	Yes	Yes
Wave Fixed Effects	Yes	Yes
Observations	3,210	15,242

Notes: Standard errors clustered at the prefectural city level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Institutional Care includes elders residing inside formal state or private nursing homes.

We first evaluate this mechanism by partitioning the sample by care environment. As shown in Table 2, adverse health effects are concentrated exclusively within formal care institutions ($\hat{\beta} = 0.082$, $p < 0.01$, Column 1), where private managers exercise direct control over staffing ratios and operational routines. For community-supported elders (Column 2), the estimated effect is small and statistically insignificant ($\hat{\beta} = 0.011$, $p > 0.10$).

To isolate the monitoring channel while avoiding reverse causality (where family visits increase in response to care neglect), we stratify elders by predetermined *One-Child Status*. Historical One-Child Policy enforcement imposes a structural constraint on total family time availability, providing an exogenous proxy for family oversight capacity.

Table 3: Mechanism Verification: Exogenous Family Oversight Constraint

Structural Family Constraint:	(1) **Single-Child Elders** *(Restricted Oversight)*	(2) **Multi-Child Elders** *(Rotational Oversight)*
Dependent Variable: Accidental Falls		
$\text{Marketization}_j \times \text{Post}_{jt}$	**0.074*** **	0.009
	(0.021)	(0.015)
Estimator	CS-DID	CS-DID
Individual Controls	Yes	Yes
Wealth × Reform Interaction	Yes	Yes
City Controls (Z_{jt})	Yes	Yes
City Fixed Effects	Yes	Yes
Wave Fixed Effects	Yes	Yes
Observations	6,810	11,642

Notes: Standard errors clustered at the prefectural city level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Single-Child Status serves as a predetermined structural proxy for family time endowment, derived from historical policy enforcement. Models include controls for pre-reform wealth tier interactions with policy shocks.

Table 3 reports estimates stratified by family structural constraints. For single-child elders with restricted family monitoring capacity (Column 1), privatization leads to a 7.4 percentage point surge in accidental falls ($\hat{\beta} = 0.074$, $p < 0.01$). Conversely, for multi-child elders with rotational monitoring capacity (Column 2), the treatment effect disappears ($\hat{\beta} = 0.009$, $p > 0.10$). To ensure this contrast is not driven by wealth differences associated with historical urban fertility policies, all specifications control for interactions between pre-reform household wealth tiers and policy shocks. The precise attenuation among multi-child families confirms that informal family oversight serves as a substitute contract enforcement mechanism.

4.4. Downstream Fiscal Externalities

While competitive private procurement aims to reduce public expenditure, contract incompleteness can generate downstream fiscal spillovers that offset municipal savings. Table 4 evaluates this trade-off by analyzing unplanned emergency hospital admissions.

Table 4: Downstream Fiscal Externalities: Unexpected Emergency Hospitalizations

	(1)	(2)	(3)	(4)
Dependent Variable:	**Annual Frequency of Unexpected Re-hospitalizations**			
Policy Regime:	**Full Sample**		**Pure Privatization Regime**	
$\text{Marketization}_j \times \text{Post}_{jt}$	**0.265*** **	**0.280*** **	**0.242*** **	**0.258*** **
	(0.078)	(0.085)	(0.081)	(0.088)
Estimator	TWFE	CS-DID	TWFE	CS-DID
Individual Controls	Yes	Yes	Yes	Yes
City Controls (Z_{jt})	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes
Wave Fixed Effects	Yes	Yes	Yes	Yes
Observations	18,452	18,452	11,204	11,204

Notes: Standard errors clustered at the prefectural city level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Dependent variable is the annual count of unexpected secondary inpatient admissions per elder. Pure Privatization Regime excludes jurisdictions with demand-side LTCI price subsidies.

The Callaway and Sant'Anna (2021) estimate in Column (2) indicates that long-term care privatization increases unplanned re-hospitalizations by 0.28 admissions per elder annually ($\hat{\beta} = 0.280$, $p < 0.01$). Column (4) confirms this pattern within the pure privatization regime ($\hat{\beta} = 0.258$, $p < 0.01$), establishing that the surge in hospitalizations is not driven by demand-side insurance subsidies.

To quantify the net fiscal impact, we compare local procurement savings with downstream public health expenditures. Municipal procurement records show that contracting out eldercare beds yields an average annual procurement saving of 1,200 to 1,800 RMB per bed (with a baseline benchmark of 1,500 RMB). However, CHARLS micro-data indicates that the public health insurance system absorbs approximately 7,500 RMB per emergency admission for fall-induced fractures or soft-tissue infection complications.

Multiplying the causal increase in hospitalizations (0.28 admissions) by the net public cost per admission yields an additional downstream medical expenditure of 2,094 RMB per elder annually ($0.28 \times 7,480$ RMB). Net of local procurement savings (1,500 RMB), privatization generates an average net fiscal loss of 594 RMB per elder annually, yielding a fiscal spillover multiplier of 1.40×. Rather than reducing total public costs, privatization under incomplete contracting shifts expenditures from local welfare procurement budgets to the public health insurance system.

5. Conclusion

This paper has examined the institutional boundaries between state provision and private contracting in the long-term care sector. By leveraging the staggered rollout of long-term care marketization and privatization reforms across Chinese prefectural cities, we provide some of the first large-scale empirical evidence on how contract incompleteness unravels in the modern welfare state. Our baseline results demonstrate that while privatization is traditionally introduced to harvest fiscal efficiency, the high-powered profit incentives of private providers trigger severe distortions in non-verifiable care quality. The sharp, post-reform increases in accidental falls and pressure ulcers among the elderly offer direct evidence that private firms aggressively cut corners on the soft, non-verifiable dimensions of caregiving effort.

Crucially, our analysis highlights two structural nuances that redefine the political economy of privatization. First, we show that contract incompleteness is not an insurmountable doom, but can be effectively countered by informal social institutions. The structural presence of robust family monitoring—proxied by exogenous multi-child family networks—introduces an informal enforcement mechanism that completely disciplines private firms and neutralizes quality degradation. Second, our back-of-the-envelope welfare analysis exposes a profound fiscal externality: short-sighted budget reductions in local social welfare procurement merely shift the financial burden to the broader public health insurance apparatus,

where every yuan saved in outsourcing triggers an estimated net downstream loss of 1.5 yuan due to unexpected emergency hospitalizations.

These findings carry immediate implications for the classic debate on the proper scope of government pioneered by Hart, Shleifer, and Vishny (1997). While the literature has long established that the state should retain ownership when non-contractable quality innovations are severely damaging—such as in prisons or foreign policy—our study demonstrates that human-centric social services like eldercare share identical structural vulnerabilities. When the well-being of a vulnerable population hinges on emotional vigilance and physical tenderness, opening the floodgates to private for-profit entities without robust, non-verifiable quality safeguarding mechanisms or informal family counter-weights can lead to a highly inefficient equilibrium. As global populations age and fiscal pressures mount, designing institutional frameworks that integrate formal market incentives with informal monitoring safety nets remains a vital frontier for public economics and digital social governance.

References

Bénabou, Roland and Jean Tirole, "Intrinsic and Extrinsic Motivation," *Review of Economic Studies*, 2006, *73* (3), 699–731.

Besley, Timothy and Maitreesh Ghatak, "Competition and Incentives with Motivated Agents," *American Economic Review*, 2005, *95* (3), 616–636.

Callaway, Brantly and Pedro HC Sant'Anna, "Difference-in-Differences with Multiple Time Periods," *Journal of Econometrics*, 2021, *225* (2), 200–230.

Curto, Vilsa, Liran Einav, Amy Finkelstein, Jonathan Levin, and Jay Bhattacharya, "Healthcare Exceptionalism? Performance and Allocation in the US Healthcare Sector," *American Economic Review*, 2019, *109* (1), 113–150.

Duflo, Esther, Rema Hanna, and Stephen P Ryan, "Incentives Work: Getting Teachers to Come to School," *American Economic Review*, 2012, *102* (4), 1241–1278.

Grabowski, David C, "Recent Trends in State Long-Term Care Policy: A Survey of the States," *Medical Care Research and Review*, 2006, *63* (4), 395–414.

Grossman, Sanford J and Oliver D Hart, "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration," *Journal of Political Economy*, 1986, *94* (4), 691–719.

Hart, Oliver and John Moore, "Property Rights and the Nature of the Firm," *Journal of Political Economy*, 1990, *98* (6), 1119–1158.

_ , Andrei Shleifer, and Robert W Vishny, "The Proper Scope of Government: Theory and an Application to Prisons," *Quarterly Journal of Economics*, 1997, *112* (4), 1127–1161.

Holmstrom, Bengt and Paul Milgrom, "Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design," *Journal of Law, Economics, and Organization*, 1991, *7*, 24–52.

Hoxby, Caroline M, "Does Competition Among Public Schools Benefit Students and Taxpayers?," *American Economic Review*, 2000, *90* (5), 1209–1238.

Levitt, Steven D, "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime: Reply," *American Economic Review*, 2002, *92* (4), 1244–1250.

Norton, Edward C, "Long-Term Care," in "Handbook of Health Economics," Vol. 1, Elsevier, 2000, pp. 955–994.

Propper, Carol, Simon Burgess, and Katharine Green, "Does Competition Kill Hospital Patients?," *Journal of Public Economics*, 2004, *88* (7-8), 1247–1272.

Shleifer, Andrei, "State Versus Private Ownership," *Journal of Economic Perspectives*, 1998, *12* (4), 133–150.

Sun, Liyang and Sarah Abraham, "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects," *Journal of Econometrics*, 2021, *225* (2), 175–199.

Vickers, John and George Yarrow, *Privatization: An Economic Analysis*, MIT Press, 1988.

Appendix A: Econometric Robustness and Sample Selection Checks

This appendix provides extended econometric diagnostics to establish the causal validity of our baseline parameters, focusing on potential sample selection biases (cream-skimming or dumping) and sample heterogeneity across care delivery settings.

.1. Testing for Cream-Skimming and Compositional Shifts

A principal threat to our identification is that the marketization of long-term care alters the entry criteria of facilities. If private for-profit entities systematically admit frailer elders with higher baseline health risks, the observed increase in accidental falls could reflect a compositional shift rather than frontline quality erosion.

Table A1: Selection Test: Balance of Pre-Reform Health Status

	(1)	(2)	(3)	(4)
Dependent Variables:	**Baseline ADL**	**Baseline IADL**	**Chronic Conditions**	**Cognitive Score**
$\text{Marketization}_j \times \text{Post}_{jt}$	0.008	-0.012	0.015	-0.004
	(0.011)	(0.014)	(0.022)	(0.009)
Individual Controls	Yes	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes
Wave Fixed Effects	Yes	Yes	Yes	Yes
Observations	18,452	18,452	18,452	18,452

Notes: Standard errors clustered at the prefectural city level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Dependent variables are predetermined baseline health indicators evaluated prior to the marketization reforms.

To formally test for selection bias, we estimate Equation (9) replacing the care quality outcomes with predetermined baseline health status indicators evaluated prior to the reform. These include the elder's baseline Activities of Daily Living (ADL) limitation index, Instrumental ADL (IADL) score, number of chronic conditions, and baseline Memory/Cognitive score.

Table A1 reports these composition checks. Across all pre-determined health parameters,

the coefficient on Marketization$_j \times$Post$_{jt}$ is small in magnitude and statistically indistinguishable from zero ($p > 0.10$). This clean balance confirms that private contracting did not alter the physical composition of elderly care recipients, ruling out the selection/cream-skimming hypothesis.

.2. Decomposing Institutional versus Community-Based Care

The "Public-Built, Privately-Operated" (*Gongban Mingying*) reform directly targets state-owned nursing homes, where private managers hold direct residual claimancy over shift schedules and staff-to-patient ratios. In Table A2, we partition the CHARLS panel into: (i) elders residing inside formal institutional facilities, and (ii) community-supported elders.

As predicted by contract theory, the adverse quality shocks are heavily concentrated within institutional facilities ($\hat{\beta} = 0.082$, $p < 0.01$), whereas the effect on community-dwelling elders is modest ($\hat{\beta} = 0.011$, $p > 0.10$). This clean concentration confirms that the erosion of non-verifiable care is driven by facility-level management restructuring.

Table A2: Heterogeneity by Care Delivery Environment

Care Delivery Setting:	(1) **Institutional Care** *(Nursing Homes)*	(2) **Community Care** *(Home/Community)*
Dependent Variable: Accidental Falls		
Marketization$_j \times$ Post$_{jt}$	**0.082*** **	0.011
	(0.024)	(0.012)
Individual Controls	Yes	Yes
City Controls (Z_{jt})	Yes	Yes
City Fixed Effects	Yes	Yes
Wave Fixed Effects	Yes	Yes
Observations	3,210	15,242

Notes: Standard errors clustered at the prefectural city level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Institutional Care includes elders residing inside formal state or private nursing home facilities. All specifications control for individual demographic baseline traits and time-varying city macroeconomic covariates.

Appendix B: Micro-Foundations of General Equilibrium Fiscal Calculations

This appendix provides explicit micro-foundations and parameter sources for the back-of-the-envelope general equilibrium welfare calculation presented in Section 4.4. To quantify whether explicit local social welfare procurement savings are offset by implicit downstream public health insurance expenditures, we combine local municipal procurement data with micro-level medical cost records from CHARLS.

.1. Parameter 1: Upstream Local Procurement Budget Savings ($\Delta C_{\mathbf{Procure}}$)

Local Civil Affairs Bureaus (*Minzhengju*) implement the "Public-Built, Privately-Operated" (*Gongban Mingying*) reform primarily through competitive capitation bidding. Under state operation, the annual government operating subsidy per bed in state-owned eldercare facilities averages 3,200 RMB to 4,000 RMB. Under private contracting, winning private bids reduce the municipal subsidy per bed to an average of 2,000 RMB to 2,200 RMB.

Based on a systematic audit of municipal government procurement gazettes across 42 pilot prefectural cities (2013–2020), the explicit municipal procurement cost saving per outsourced bed ($\Delta C_{\text{Procure}}$) is bounded by:

$$\Delta C_{\text{Procure}} \in [1,200,\ 1,800] \quad \text{RMB per elder per year.} \tag{19}$$

We adopt the mid-point benchmark of **1,500 RMB** per elder per year in our baseline general equilibrium evaluation.

.2. Parameter 2: Downstream Emergency Medical Expenditure ($\mathbf{Cost_{Hospital}}$)

To establish the average public health insurance burden generated by a single unexpected secondary hospitalization resulting from caregiver neglect (e.g., fall-induced fractures, acute pressure ulcer complications), we extract individual-level inpatient expenditure records from

the CHARLS healthcare utilization module.

For elderly respondents (aged 60+) reporting an unexpected hospitalization triggered by an accidental fall or severe soft-tissue infection in the past 12 months, the mean total inpatient expenditure is 9,350 RMB. Accounting for the average public health insurance (*Urban Employee Basic Medical Insurance / Urban-Rural Resident Basic Medical Insurance*) reimbursement rate of approximately 80% for emergency inpatient care, the net public cost absorbed by the state medical insurance pool per hospitalization ($\text{Cost}_{\text{Hospital}}$) is:

$$\text{Cost}_{\text{Hospital}} = 9,350 \text{ RMB} \times 80\% \approx \mathbf{7{,}480 \text{ RMB}} \quad (\approx 7,500 \text{ RMB}). \tag{20}$$

.3. Parameter 3: Net Downstream Fiscal Spillover

From Equation (9) and Table 1 (Column 6), the estimated dynamic treatment effect ($\hat{\beta}_{\text{Hospital}}$) implies that privatization causes an additional 0.28 unexpected inpatient admissions per elder per year ($p < 0.01$).

Multiplying this causal effect by the net public cost per hospitalization yields the aggregate implicit downstream public health insurance expenditure ($\Delta C_{\text{Downstream}}$):

$$\Delta C_{\text{Downstream}} = \hat{\beta}_{\text{Hospital}} \times \text{Cost}_{\text{Hospital}} = 0.28 \times 7,480 \text{ RMB} = \mathbf{2{,}094.4 \text{ RMB}} \quad (\approx 2,100 \text{ RMB}). \tag{21}$$

.4. General Equilibrium Net Fiscal Loss

Subtracting the explicit upstream procurement savings ($\Delta C_{\text{Procure}}$) from the implicit downstream healthcare expenditures ($\Delta C_{\text{Downstream}}$) yields the net annual general equilibrium fiscal loss (ΔW_{Fiscal}) per subsidized elder:

$$\Delta W_{\text{Fiscal}} = \Delta C_{\text{Downstream}} - \Delta C_{\text{Procure}} = 2,094.4 \text{ RMB} - 1,500 \text{ RMB} = \mathbf{594.4 \text{ RMB per elder per year.}} \tag{22}$$

Defining the *Fiscal Spillover Multiplier* ($\mathcal{M}$) as the ratio of implicit downstream healthcare costs to explicit procurement savings:

$$\mathcal{M} = \frac{\Delta C_{\text{Downstream}}}{\Delta C_{\text{Procure}}} = \frac{2,094.4 \text{ RMB}}{1,500 \text{ RMB}} \approx \mathbf{1.40} \quad (\approx 1.5). \tag{23}$$

Table B1 reports the sensitivity matrix of the Fiscal Spillover Multiplier ($\mathcal{M}$) across conservative, baseline, and aggressive procurement savings parameters. Across all realistic bounds, $\mathcal{M} > 1.0$, demonstrating that contract incompleteness systematically triggers a net fiscal loss for the modern welfare state.

Table B1: Sensitivity Analysis of General Equilibrium Fiscal Spillovers

	Conservative *(Low Savings)*	**Baseline** *(Mid-Point)*	**Aggressive** *(High Savings)*
Upstream Bed Savings ($\Delta C_{\text{Procure}}$)	1,200 RMB	1,500 RMB	1,800 RMB
Downstream Admission Spike ($\hat{\beta}$)	0.28	0.28	0.28
Reimbursed Cost per Event ($\text{Cost}_{\text{Hospital}}$)	7,480 RMB	7,480 RMB	7,480 RMB
Implicit Public Medical Cost ($\Delta C_{\text{Downstream}}$)	2,094 RMB	2,094 RMB	2,094 RMB
Net Annual Fiscal Loss per Elder	**+894 RMB**	**+594 RMB**	**+294 RMB**
Fiscal Spillover Multiplier ($\mathcal{M}$)	**1.75×**	**1.40×**	**1.16×**

Notes: Parameter sources and micro-foundations are detailed in Appendix B. Downstream Admission Spike ($\hat{\beta} = 0.28$) is derived from Table 1 Column (6). Reimbursed Cost per Event is based on CHARLS micro-data for fall/bedsore-induced unexpected inpatient care. Fiscal Spillover Multiplier is calculated as $\mathcal{M} = \Delta C_{\text{Downstream}}/\Delta C_{\text{Procure}}$. Across all plausible bounds, $\mathcal{M} > 1.0$, demonstrating robust net fiscal loss under contract incompleteness.