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NONPROFITS AND THE SCOPE OF GOVERNMENT: THEORY AND AN APPLICATION TO THE HEALTH SECTOR

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ABSTRACT

Nonprofits supply many tax-financed services like healthcare and education. Yet nonprofits are absent from the canonical property rights theory of ownership. Extending the government "make or buy" decision to nonprofits and ex post frictions based on contracts as reference points suggests that contracting out to a nonprofit can be optimal when "mission" alignment credibly signals adherence to the spirit and not just the letter of the contract in unforeseen contingencies. The model sheds light on differential nonprofit presence across the spectrum of basic services, as illustrated by an application to the health sector.

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Nonprofits are important suppliers of myriad services, including healthcare, education, and other tax-financed services. In the high-income countries of the Organization for Economic Cooperation and Development (OECD), for example, the share of inpatient beds in private not-for-profit hospitals ranges from negligible (United Kingdom, Canada, Chile) to dominant (the Netherlands, Belgium, the United States; Figure 1 Panel A). Nonprofit hospitals retained the majority share of US inpatient beds as care shifted out of hospitals (Panel B). The role of not-for-profit providers including non-governmental organizations (NGOs) has expanded even in economies with little tradition of nonprofits and in health sectors dominated by government provision; in China, for example, the private nonprofit share of hospital beds increased 6-fold from 2% in 2007 to over 12% by 2021 (Figure 1 Panel C). As countries strive for universal health coverage (UHC), providing tax-financed access for low-income citizens has often involved contracting out to private providers in both high-income settings (e.g., US Medicaid) and in emerging markets, such as India's Pradhan Mantri Jan Arogya Yojana (PM-JAY) health insurance program. Moreover, the nonprofit share appears to differ systematically across health services with varying degrees of contractability, from pharmaceutical innovation to nursing homes to population health services.

In education, despite great heterogeneity across countries and regions, the non-government share of service delivery on average follows a "U" shape with the level of education: high percent private enrollment for pre-primary education, (much) lower for compulsory schooling, and high again for tertiary education—often nonprofit. As for health services, this pattern seems to reflect a positive correlation between tax financing and government in-house provision or contracting out to nonprofits, with countries arrayed at different points on the "make or buy" continuum according to the path-dependent cost-benefit trade-offs involved in contracting out educational services. But there is only mild correlation between ownership shares of hospitals and schools in a given country.[1]

What explains these patterns of contracting out? Do they reflect considerations that approximate socially optimal alternatives for supply of services that differ in contractibility of cost, quality, and access? Market failures and the corresponding need to assure solidarity and access (such as for services with positive externalities) can usually be addressed with public financing. But should tax-financed services be provided by government employees, private for-profit firms, or private not-for-profit organizations? That is the focus of this paper.

If a purchaser could write and enforce a complete long-term contract for the desired service under all possible scenarios, ownership would not matter because all providers would deliver the same access, cost, and quality. However, virtually universally we see that population health services and medical care for active military personnel are not only publicly financed but also provided by government employees, whereas pharmacies and dentists are overwhelmingly non-government and often for-profit, even in socialist or post-transition economies (e.g., Viet Nam, eastern Europe). Why does contracting out bus transportation enhance efficiency (Jerch, Kahn, and Li 2017), but contracting out ambulance transportation increase mortality (Knutsson and Tyrefors 2022)? The scope for quality shaving—reducing cost in ways that damage

[1] See Appendix Table 2. The correlation between private share of hospital beds and educational enrollment in private institutions across OECD countries ranges from 0.31 for pre-primary education to 0.15 for secondary and tertiary education enrollment, to 0.12 for primary education, using 2016-2019 averages (UNESCO statistics, various years). Thus, a country or locality with high private shares in health services does not necessarily have high private shares in education services (especially in the compulsory schooling years), and vice versa. Educational data also illustrate that government-dominated health sectors need not correspond to government-dominated schools—indeed, Hong Kong's preschools are virtually entirely private, whereas less than half of US pre-primary enrollment is private.

noncontractible quality—appears especially salient for some services. Moreover, assuring access is critical, and at the root of public financing for such services.[2]

The goals of assuring access while innovating to reduce cost and improve quality cannot be fully pre-specified for all contingencies, especially for long-term contracts underpinning provision of complex services. The Covid-19 pandemic is one recent, vivid, and large-scale example. Since any government purchaser "cannot fully anticipate, describe, stipulate, regulate and enforce exactly what it wants" (Shleifer 1998, p. 137), the purchasing agency and the private contractor or government employee must fill in contractual gaps when adapting to new circumstances.

Governments seeking to assure resilient, equitable supply of basic services may be especially worried about noncontractible dimensions of quality. Any quality shaving by a supplier may naturally lead to frictions in the ongoing contractual relationship, and/or reduce the likelihood of renewing contracts in future years. Yet nonprofits and ex post frictions are absent from the canonical property rights theory of the government "make or buy" decision by Hart, Shleifer and Vishny (1997 [HSV97]). Modeling government provision compared to private for-profit provision, HSV97 focus on noncontractible ex ante investments in cost and quality when excessive cost reduction may damage noncontractible quality, abstracting from competition, supply assurance motives, and ex post frictions.

[2] The Desired Countercyclical Rating (DCR) developed by Exley, Lehr and Terry (2022) provides one indicative proxy for the social welfare of guaranteed access. According to this metric, the spectrum of "tasks" undertaken by healthcare organizations ranges from high DCR for crisis mental health hotlines (9), community clinics (19), and psychiatric hospitals (21), to least priority for pharmacies (295) and medical research for allergies (477). Health services that fall in between—indicating middling DCR and thus some need for supply assurance and often some tax financing—include hospitals (52), emergency medical services (58), public health (64), nursing homes (98), skilled nursing facilities (115), blood banks (158), and organ and tissue banks (230).

This paper extends HSV97 to nonprofits, adds access as a third key goal, and incorporates ex post frictions based on contracts as reference points (Hart and Moore 2008 [HM08], Hart 2009), thereby avoiding the Maskin and Tirole (1999) fundamental critique of incomplete contract theory. Building on the venerable tradition of health economists' focus on nonprofits (Arrow 1963, Newhouse 1970) and recent contract theory incorporating social norms (Frydlinger and Hart 2023 [FH23]), we model private nonprofits as balancing margin and mission by placing non-negative weight on social benefit (Ellis and McGuire 1986).[3]

The model rationalizes patterns of differential nonprofit presence across the spectrum of basic services, compared to vertical integration under government provision or contracting out to private for-profit providers. Nonprofit provision is optimal when preferences are sufficiently aligned with social welfare so that nonprofit status provides a credible signal of adherence to the spirit and not just the letter of the contract under unforeseen contingencies. Government purchasers leery of nonprofit aims that diverge from desired outcomes (e.g., prosyletizing) may eschew nonprofits for tax-financed services or relegate them to a supplementary role.[4] Moreover, consistent with recent empirical evidence (Chan, Card, and Taylor 2023, Duggan et al. 2023), the theory predicts that contracting out is an imperfect substitute for direct government provision to assure access for populations especially vulnerable to quality shaving. For-profits are efficient when cost-reduction innovation imposes little damage from quality shaving and minimal expected loss from compromised access in a crisis.

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[3] Arrow (1963) discusses possible explanations for the "overwhelming predominance of nonprofit over proprietary hospitals," including the possibility "that the association of profit-making with the supply of medical services arouses suspicion and antagonism on the part of patients and referring physicians" (p.950).

[4] For a discussion of secular educational institutions (comparing approaches in the US and China), see chapter 6 of Eggleston, Donahue and Zeckhauser (2021).

Since the reference point interpretation of contracts rests upon agreement under somewhat competitive conditions (Hart and Moore 2008), our incorporation of that framework re-introduces competition as an important consideration shaping the trade-offs inherent to the contracting out decision. The framework may help to clarify when ex ante competition strengthens the case for contracting out, since the same concerns that give rise to public financing—public goods, externalities, and selection against nonprofitable consumers—often exacerbate quality shaving on noncontractible dimensions of quality that consumers also cannot readily observe.[5]

HM08 point out the limitations of the property rights framework for understanding the internal dynamics of organizations. Ex post frictions can be important in many vertically-integrated service contexts, as has been documented recently in empirical studies of government service supply, including the impact of aggrievement or lack of mission alignment (Spenkuch, Teso, and Xu 2023) or of differential power (Schwab and Singh 2023).[6]

The application to the health sector compiles data on health service delivery globally by ownership form, drawing on a range of administrative and survey data sources, to frame a series of questions that theory can help shed light upon, from the well-known to the less obvious. Across commuting zones in the United States, for example, nonprofits dominate for hospitals, but for-profits dominate for nursing homes, with the nonprofit bedshare of both services *increasing* with community income decile, unlike government and for-profit market share (Figure 2 Panel A). In large emerging markets, there is relatively little correlation between

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[5] Depending on assumptions about reservation utility of supplier(s), the theory can capture some of the contracting implications of ex ante competition—either within a single ownership form such as the UK National Health Service (Gaynor, Moreno-Serra, and Propper 2013) or spillovers between ownership forms at a market level.

[6] For example, by exploiting presidential transitions as a source of "within-bureaucrat" variation in political alignment, Spenkuch, Teso, and Xu (2023) find greater cost overruns and delays in government procurement contracts overseen by government employees misaligned with political leadership. Schwab and Singh (2023) study how differences in military rank shape patient-physician interactions within the military health system.

regional per capita income and private share of hospital beds (Figure 2 Panel B for PRC provinces and Indian states). For low-resource settings, Demographic and Health Survey (DHS) data from over 1.7 million survey respondents across 40 low-income countries shows that compared to households of medium wealth, those with the least wealth choose treatment at private providers more often—indeed, at rates comparable to far wealthier households (Figure 2 Panel C).

These patterns highlight the importance of considering the private sector's role in providing access to services of differential contractability, even though we would not expect these figures to mirror the theoretical predictions for at least two reasons. The theory focuses in publicly-financed services, whereas these patterns also reflect private financing. Moreover, the theory is normative; the costs and benefits of nonprofits compared to other ownership forms vary depending on the context and are shaped by the path-dependent development of local organizational ecologies that may deviate substantially from optimality.

We contribute to three literatures. First, the model of nonprofits contributes to the literature on the proper scope of government by providing a simple framework for assessing optimal service provision comparing the three key ownership forms, building on HSV97.[7] Our nonprofit model utilizes the HM08 assumption of only partially contractable "trade" (service provision) ex post, with some "mission" alignment helping to mitigate deadweight loss from perfunctory instead of consummate performance. To model supply assurance, we draw on HM08's discussion of uncertainty about the nature of the service, and especially the application of the reference point framework to "guiding principles" (FH23) to model abnormal states of

[7] Oliver Hart has also recently discussed not-for-profit firms as potential options for prison contracting and related issues; see minute 30 of "Nobel Memorial Prize-Winning Economist, Oliver Hart | Full Address and Q&A, Oxford Union" of 2022 (available at https://youtu.be/TfAhL1PtkFw) and related discussion in Hart (2021) and "The Legacy of 'The Proper Scope of Government'" (https://youtu.be/g9JRhGpXC2Y?si=ffde5YStY1cLL3ZD).

high cost or changed value (i.e., when the nature of the service needs to be modified to meet new circumstances, like a pandemic). As in HM08, an employment contract—in this case, government in-house provision—has the advantage of flexibility ex post, with efficient adjustment to high-cost and changed-value states. While including both ex ante and ex post frictions might seem "too cluttered," it allows nesting of different services and their characteristics within a single coherent model of the make-or-buy decision. Fruitful extensions could incorporate incentive contracts (rather than a single fixed price), more detailed models of ex ante competition, and related issues.[8]

We also contribute to the literature on nonprofits. Healthcare service providers constitute some of the most economically significant organizations in the nonprofit sector globally. For example, nonprofit healthcare organizations account for the majority of revenues and expenses (about 60%) of the entire US nonprofit sector, despite on average having negative operating margins (Horwitz 2020). A simple model of nonprofits aligned with the historical evolution and social science literature on nonprofits providing community services (Starr 1982, Stevens 1989, Rosenberg 2023) is integrated within the HSV97 theory of the proper scope of government, focusing on noncontractible quality. That nonprofits are less prone to quality-shaving than for-profit firms is a recurring theme in the nonprofit literature; Weisbrod (1989) for example posits that nonprofits' non-distribution constraint weakens the incentive "to 'chisel'—to provide lower quality than was promised" (p.543). Our model of N is most closely akin to theories emphasizing the importance of mission (or what Ghatak (2020) refers to as the "mission-integrity problem") and how mission alignment interacts with incentives and productivity (Besley and Ghatak 2005).

[8] The framework is also related to, but distinct from, the economics of public-private partnerships (Hart 2003, Iossa and Martimort 2015).

Francois (2003) develops a related theory of differential nonprofit alignment with social benefit, through directly caring about clients' outcomes. Our model abstracts from the "micro-model" of nonprofits, in the sense that it does not specify whether the mission alignment of N stems from the combination of a non-distribution constraint with a selfish manager, or a self-selected manager with pro-social objectives (who also could be attracted to government service or even to some hybrid and proprietary firms with aligned objectives; Cassar and Meier 2018). By explicitly partitioning nonprofit "mission" into parts that align with the government and parts that conflict with or aggrieve the government, our model captures a range of empirically relevant cases such as the backlash against foreign-sponsored NGOs (Dupuy and Prakash 2020), prevalence of nonprofit advocacy and community mobilization (Suárez 2020), "preference discretion" (Donahue and Zeckhauser 2011), or nonprofits role in monitoring corrupt, predatory, or discriminatory government agencies and procurement processes.

Finally, we contribute to the health economics literature on mixed ownership markets—bringing together evidence from low- and middle-income countries as well as high-income settings. Given the prevalence of nonprofits in the health sector, much theoretical work by health economists focuses on private nonprofit providers and how they differ from for-profit firms. We build upon the strand of this literature that posits not-for-profits have an objective function that differs from pure profit maximization. Examples include objectives such as maximizing quality, quantity and/or prestige (Newhouse 1970); helping to fulfill demand for local public goods or meet unmet need (Frank and Salkever 1991); or maximizing the well-being of specific important constituencies, such as the medical staff (Pauly and Redisch 1973). Other theories place emphasis on ownership form as an organizational *choice* to be bound by a nondistribution constraint to signal less incentive to skimp on noncontractible quality or otherwise subvert patient and community trust (Hansmann 1980; Glaeser and Shleifer 2001). Still other theoretical frameworks emphasize regulation and tax policies, positing that firms differ in their ability to benefit from a given ownership form (David 2004).

We model nonprofits as pursuing a mission as well as net revenue, allowing for variation in alignment between the nonprofit's mission and that of the government purchaser. As Malani, Philipson, and David (2003) point out, although unfortunately empirical studies rarely allow sharp differentiation between theories, the weight of evidence appears to support that "the distinctive behavior of not-for-profit firms can be explained by the altruistic motives of these firms' principals" (Malani, Philipson and David 2003, p.182). Integrating this model into the HSV97 canonical theory of the "make-or-buy" decision helps to rationalize empirical results about the behavior of different organizational forms in many settings, as summarized in the application to the health sector.

The paper is organized as follows. The next section presents the model of nonprofits and equilibrium choices of cost reduction, quality innovation, and access assurance by for-profit, nonprofit, and government providers. Section III compares the three ownership forms, and Section IV applies the framework to the health sector. Finally, Section V concludes. The appendix gives details about related literature, HSV97's assumptions, our model of the abnormal state, and the data.

I. Modeling the Government "Make or Buy" Decision

A government purchaser (Gov), seeking to assure access to a tax-financed service for a defined population, chooses a single manager M of a facility (e.g., clinic, hospital) through a somewhat competitive procurement process. Consider three possible contracting arrangements, $M \in \{F, N, G\}$: contracting out to a private for-profit provider (F) or a private not-for-profit provider (N), or in-house provision through a government employee (G). The latter represents vertical integration of public financing and public delivery; F or N ownership denotes privatization, or public procurement of the service from private suppliers.

At Date 0, Gov and M negotiate a long-term contract specifying that M will provide basic benefits B_o for price P_o. But the contract is incomplete and there is some uncertainty about the normal state at Date 1, or if a crisis might occur. Gov and M view the Date 0 contract as a reference point, defining their sense of entitlements. Following HM08, assume that a party cooperates when perceived to be treated fairly, but feels aggrieved otherwise; aggrievement of amount A imposes a psychic cost θA which can be transferred back to the other party by withholding noncontractible helpful actions, where $0 < \theta \leq 1$. The party withholding cooperation neither gains nor loses (significantly) from this performance shading, which constitutes a deadweight loss (HM08). To pin down the item that would cause the most conflict ex post, the parties agree on a single price P_o for the basic service each period of the contract (e.g., annual budget for facility operations). After Date 0, the parties are somewhat "locked in" to each other and competition plays much less of a role.

M can make noncontractible investments that lead to blueprints or ideas for innovations to reduce costs or improve quality, denoted respectively e and i, that only the facility owner can approve. The cost of such effort is $e + i$. Some uncertainty is resolved just before Date 1; Gov and M may renegotiate the contract to modify the service before it is supplied to consumers at Date 1.

With (high) probability $(1 - \pi)$ at Date 1+ the normal state continues. However, with (small) probability π, one of two abnormal states occurs. The probability of a "high-cost" state is ε_c, and the independent probability of a "changed-value" state is ε_v, where $\varepsilon_c + \varepsilon_v = 1$. To adjust the service for these abnormal circumstances, G or M may grant efficiency-enhancing concessions.

In sum, the timeline is as follows:

Timeline

Date 0: Parties meet, choose ownership structure, and write incomplete contract for basic service; Date 0 contract serves as reference point for feelings of entitlement.

Date ½: M invests effort in cost and quality innovations, e and i.

Date 1-: Some uncertainty resolved; contract may be renegotiated for modified service.

Date 1: Parties choose helpful actions (both contractible and noncontractible); service provided.

Date 1+: Normal state continues with probability $(1-\pi)$; however, with (small) probability π, Abnormal state arises, either high-cost state (ε_c) or changed-value state (ε_v); G or M may grant efficiency-enhancing concessions.

Assumptions

The basic assumptions of the production technology follow those of HSV97 (see Appendix B): Quality innovation raises quality but may increase costs. Assume $\beta'(i) > 0$: the costs associated with quality innovation reduce, but never fully offset, the value of improved quality. Also assume decreasing marginal net benefits of quality innovations, $\beta'' < 0$, that never become negative, $\beta'(\infty) = 0$.

Cost reduction effort reduces costs by $c(e) \geq 0$, but may also damage non-contractible quality; this *quality shaving* reduces surplus by $-b(e) \leq 0$. Assume $c' - b' \geq 0$, meaning that quality shaving does not offset the decrease in costs.

Gov's reference payoff is $B_o - P_o$. In other words, the purchaser feels entitled to B_o for price P_o. M's reference payoff is $P_o - C_o$. For M, P_o represents compensation for supplying the basic service only. M feels entitled to additional payment for any service modifications or exogenous cost increases beyond those specified in the Date 0 contract for B_o, including value created by e and i. This expectation of M does not in principle conflict with the expectations of the purchaser. However, Gov does feel aggrieved relative to the Date 0 reference point if M damages noncontractible quality such that realized benefits are $B_o - b(e)$, lower than the expected B_o.

A government employee (G) may feel entitled to a larger share of the surplus generated from cost and quality innovations than the employer (Gov) feels is appropriate or fair. We follow HSV97 in assuming government employees retain fraction λ of their innovation, where $0 < \lambda \leq 1$, perhaps because part of their ideas become public information and are not embodied in human capital. Parameter λ captures the weakness of G incentives. We add the potential aggrievement and shading that arise ex post when M feels entitled to share $\lambda^M \geq \lambda$ of the innovation surplus, because of self-serving biases.

A simple model of not-for-profit private ownership

We define nonprofits as having objectives beyond net revenue, $P - C$. This N "mission" encompasses social benefit B and other aims that Gov does not share, denoted Z.

Let α reflect the alignment of N's preferences with those of Gov, where $0 \leq \alpha \leq 1$ and for simplicity, $Z(\alpha) \equiv (1-\alpha)Z_o$ with $Z_o \geq 0$. "True" nonprofits place non-negative weight α on B, as used in modeling nonprofit hospitals or physician agency for patients (Newhouse 1970;

Ellis and McGuire 1986); N's additional aim Z_o (such as religion), not included within B, receives complementary weight in the "mission" component of N's objective function:

$$U_N = \underbrace{(P_o - C_o + c(e) - e - i)}_{\text{"Margin"}} + \underbrace{(\alpha\mathrm{B} + (1-\alpha)Z_o)}_{\text{"Mission"}}$$

The larger α, the more N's objectives align with B; perfect alignment arises when $\alpha = 1$. The smaller α, the more N's objectives focus on Z_o and profit; if α and Z_o are both small, then N is effectively "for-profit in disguise."

Unless a nonprofit characterized by $\alpha = 1$ is available, Gov faces a trade-off between the unwanted mission Z_o and the alignment of preferences αB that N delivers. In other words, Gov wishes to purchase B, not Z_o; but with N ownership, some Z_o comes bundled with B unless $\alpha = 1$. (If Gov's B does not faithfully reflect social benefit, then N could constitute a better agent for social welfare.)

Default payoffs in the normal state

In the absence of renegotiation, in the first instance (i.e., following HSV97 and pre-aggrievement shading), F implements cost reduction innovations but no quality improvements. G renegotiates over the fraction λ of innovation surplus that Gov cannot appropriate. Since N is private with full residual control rights over the facility, N implements cost control innovations. Depending on α, N partially internalizes the quality-shaving damage from cost control, as well as some consumer benefits from quality innovation. Accordingly, even in the absence of renegotiation N typically chooses to invest in some quality innovation, denoted $i_\alpha \geq 0$ (Appendix (2)).

Equilibrium under private ownership

In the Date 1 equilibrium, G and M may renegotiate to implement innovations, and each party decides whether to withhold noncontractible helpful actions when the modified service is supplied. If ex post frictions are not too severe, renegotiation takes the form of Nash bargaining over the incremental surplus relative to the default payoffs, with P_0 chosen to allocate surplus according to Date 0 relative bargaining power [HSV97], informed by market competition and external reference points [HM08]. There is symmetric information about innovations, costs, benefits, and nonprofits' objective functions, although there may not exist N along the entire continuum of α. Gov may specify that suppliers must be nonprofit, but Gov cannot force alignment of objectives such $\alpha = 1$.

Outcomes may deviate from maximum surplus for at least two reasons: (1) distortions in ex ante noncontractible investments (HSV97); and/or (2) because the parties' differing perceptions of reference points generate frictions at Date 1, as in HM08 and Hart (2009). Ex post deadweight losses arise from aggrievement and the associated withdrawal of helpful actions; these ex post frictions are noncontractible, cannot be negotiated around with side payments, and are accordingly not subject to the Maskin-Tirole mechanism critique of incomplete contracts.

For-profit provision

As in HSV97 (summarized in Appendix B), F chooses e and i while ignoring $-b(e)$ and anticipating half the surplus from renegotiation for quality innovation, leading to over-investment in cost reduction and under-investment in quality innovation relative to first-best ($e_F > e^*$, $i_F < i^*$; see Figure 3). Here we add ex post frictions from Gov aggrievement because

F damages noncontractible quality; if these frictions are sufficiently large, renegotiation may not even take place ($i_F = 0$).

Specifically, Gov feels aggrieved by F quality shaving ($e_F > e^*$) which damages noncontractible quality ($B_o - b(e)$). Gov aggrievement is exacerbated by M demanding additional payment for quality innovations—even though their benefits might merely restore quality to the Date 0 contracted level.[9] This aggrievement is natural; M agreed in the Date 0 contract to provide quality B_o for payment P_o , but has deviated from the spirit of the contract by delivering observably inferior quality, $B_o - b(e)$. Moreover, in Gov's view, M has the audacity to demand additional payment for quality, which resembles extortion. Feeling aggrieved, Gov withholds noncontractible helpful actions from M (e.g., delaying payments) in proportion to M's quality shaving, leading to a deadweight loss of $L_F(\theta)$ =$\theta[b(e_F) - b(e^*)]$.

Thus under F ownership, the parties' payoffs are:

$$U_F^{Gov} = B_o - b(e_F) - P_o + \frac{\beta(i_F)}{2}$$

$$U_F = P_o - C_o - e_F - i_F + c(e_F) + \frac{\beta(i_F)}{2} - \theta[b(e_F) - b(e^*)]$$

From F's point of view, cost control and its associated quality shaving seems justified and should have been the anticipated result at Date 0 when Gov chose a for-profit provider.

Nonprofit provision

N resembles F in having full control rights over implementing innovations in the facility and modifying noncontractible dimensions of the service to reduce costs. N resembles G in

[9] For example, Gov pays more than P_o to raise quality but ends up only receiving $B_o$if $B(e,i) = B_o$ $\{when\ B(i) = b(e)\}$, where $\beta(i) \equiv B(i) - m(i)$, see Appendix B.

having muted incentives for (excessive) cost reduction, because N partially internalizes the negative quality implications of cost control:

$$-\alpha b'(e_{\mathrm{N}}) + c'(e_{\mathrm{N}}) = 1 \tag{1}$$

N chooses a preferred way of providing the basic service, including staffing and other aspects of service provision. However, to the extent that N inherently cares about quality ($\alpha > 0$), e_{N} is closer to efficient.

Renegotiation (if it occurs) takes place over quality innovation. Rationally anticipating renegotiation with 50:50 split of quality innovation surplus leads N to choose i_{N} according to the following first order condition[10] (Figure 3):

$$\left(\frac{1+\alpha}{2}\right)\beta'(i_{\mathrm{N}}) = 1 \tag{2}$$

If N places no weight on B ($\alpha = 0$), N's first order condition (2) and hence choice of quality is identical to that of F and inefficiently low. When $0 < \alpha < 1$ (that is, N partially internalizes the adverse effects of cost control), anticipation of renegotiation improves N's incentives for quality innovation. Naturally, if N's objectives perfectly align with social benefit ($\alpha = 1$), N's choice of cost and quality innovation efforts will align with the first-best efficiency benchmark. More generally, N's direct utility from providing the service leads to efforts more aligned with the social optimum than those of F, though falling short when $\alpha < 1$.

To the extent that N over-invests in cost control (when $e_{\mathrm{N}} > e^*$ in (1)) that damages noncontractible quality ($B_o - b(e_{\mathrm{N}})$), Gov feels aggrieved. This aggrievement may be compounded by (a) N renegotiating for additional payment for quality innovations (as for F); and by (b) N using the contract to further 'mission' Z that Gov does not consider socially valuable.

[10] In the renegotiation N receives at least as much as F (perhaps because of external reference points); and at maximum ($\alpha = 1$), N chooses i^*, that is, according to the same first-order condition as the efficiency benchmark, HSV97 (3).

For simplicity, we use the same aggrievement parameter θ for this resentment of N's non-sanctioned actions: θZ. For large problems of misalignment, contracting with N could be extremely inefficient, prompting Gov to avoid N to prevent such an outcome.

Gov withholds noncontractible helpful actions proportional to total aggrievement, leading to deadweight loss $L_N(\alpha)$. Thus, the parties' payoffs are:

$$U_N^{Gov} = B_o - P_o - b(e_N) + \left(\frac{1+\alpha}{2}\right)\beta(i_N) \quad (3)$$

$$U_N = P_o - C_o + Z(\alpha) + \alpha[B_o - b(e_N)] + \left(\frac{1+\alpha}{2}\right)\beta(i_N) + c(e_N) - e_N - i_N - L_N(\alpha) \quad (4)$$

Contracting out to N leads to performance shading of magnitude $L_N(\alpha) = \theta[b(e_N) - b(e^*) + Z(\alpha)]$. This $L_N(\alpha)$ deadweight loss trades off two factors: N comes bundled with its unwanted mission Z; but quality shaving $b(e_{\mathrm{N}})$ will typically be lower than under F because N partially takes account of quality damage. Moreover, and just like F, N's incentive for excessive cost cutting is dampened to the extent that N can foresee that such behavior will sour the relationship and cause Gov to withhold helpful actions ex post.

Our model allows for the case of N bidding a lower price than a for-profit supplier, given non-monetary benefits from supplying the service. It is also straightforward to study the theoretical implications of hypotheses about how competition and ownership mix shape behavior (e.g., Hansmann 1979) by making N's reservation utility and/or α depend on competitiveness of Date 0 provider markets.

Equilibrium under government ownership

In the absence of renegotiation, Gov can appropriate fraction $(1 - \lambda)$ of G's innovation efforts, implemented at cost, by (threatening to) fire G and hire a new employee-manager. The reference point of the initial employment contract creates differences in sense of entitlement. G resents the threat of firing and the appropriation of innovations efforts, and may have self-serving biases, thinking his or her own role more critical than it may have been. Accordingly, although Gov can renegotiate with G to implement innovations (splitting the fraction λ of innovation surplus 50:50), G feels entitled to $\lambda^G > \lambda$, where $\lambda^G \leq 1$. G may recognize that as an employee, part of the innovation accrues to the employer, but feels entitled to a larger fraction of surplus than the employer offers, namely $\left(\frac{\lambda^G}{2}\right)\left(-b(e_G) + c(e_G) + \beta(i_G)\right)$. This difference leads to G's feelings of aggrievement. We follow HM08 in assuming G imposes shading costs on Gov (i.e., withholds some noncontractible helpful actions) equal to fraction θ of aggrievement, resulting in deadweight loss $L(\lambda^G) = \theta\left[\left(\frac{\lambda^G-\lambda}{2}\right)\left(-b(e_G) + c(e_G) + \beta(i_G)\right)\right]$. Thus, under government provision, the parties' payoffs are

$$U_G^{Gov} = B_o - P_o + \left(-b(e_G) + c(e_G) + \beta(i_G)\right)\left[\left(1 - \frac{\lambda}{2}\right) - \theta\left(\frac{\lambda^G-\lambda}{2}\right)\right] \qquad (5)$$

$$U_G = P_o - C_o - e_G - i_G + \frac{\lambda}{2}\left(-b(e_G) + c(e_G) + \beta(i_G)\right) \qquad \text{[HSV97 (11)]}$$

G chooses e and i to maximize U_G. As in HSV97, when $\lambda < 1$, G receives less than half the surplus from implementing innovations, leading to muted incentives for cost reduction or quality improvement (Figure 3). Accordingly, government vertical integration leads to the same outcomes as in HSV97, net of deadweight loss from manager aggrievement arising from self-biased views about contributions to innovation surplus. (The latter $L(\lambda^G)$ term disappears as λ^G decreases to λ, making (5) identical to HSV97 (10)).

Access: supply assurance in abnormal states

As an employee, G follows Gov's directions in abnormal states. However, an independent contractor need not. When contracting out, frictions in the normal state spill over to shape efficiency in state A, which displaces the normal state at Date 1+ with probability π. Recall that State A is either "high cost" or "changed value", with probability ε_c and ε_v, respectively; these probabilities are assumed to be independent, with $\varepsilon_c + \varepsilon_v = 1$.

We follow FH23 in assuming that if either party feels "well treated" in the normal state, they are more likely to grant an efficiency-enhancing concession, i.e., renegotiate to state-contingent service provision that is painful to them but delivers overall higher surplus.

Assume that in the high-cost state, the probability Gov makes such a concession, γ^G, is a decreasing function of the provider's quality-shaving, $-b(e_M)$, which has left the relationship somewhat soured: $0 \leq \gamma^G(e_M) \leq 1$, with $\frac{\partial \gamma^G(e_M)}{\partial e_M} < 0$. Without the concession, a private provider may default on service provision (see appendix for details). In other words, Gov aggrievement engendered by M quality shaving—adhering more to the letter than the spirit of the contract—leads Gov to impose a harder budget constraint in M, the more M shaved on quality.

The changed-value A state represents a pandemic or similar crisis. The value of the service is much higher if it is modified to fit the new circumstances, although this modification may be costly for M to make. If the facility is privately owned, M may grant a concession to Gov to modify the service, with the probability of such a concession depending on preference alignment: $0 \leq \gamma^M(\alpha) \leq 1$, with $\frac{\partial \gamma^M(\alpha)}{\partial \alpha} > 0$. The greater α, the more likely M internalizes the value of modifying the service and grants a concession to Gov to do so. Conversely, the lower α, the more likely M will "hold up" Gov in the changed-value crisis and refuse to supply the modified service.

Optimally resilient access $S^*(A)$ arises when A state adjustment is frictionless because both parties agree to efficient concessions:

$$S^G(A) = S^*(A) > S^N(A) \geq S^F(A), \text{ where } S^N(A) = S^F(A) \text{ iff } \alpha = 0. \tag{6}$$

The expected surplus under each ownership form is as follows:

$$S_F = B_o - C_o - e_F - i_F - b(e_F) + c(e_F) + \beta(i_F) - \theta[b(e_F) - b(e^*)] + \pi S^F(A) \tag{7}$$

$$S_N = (1+\alpha)\big(B_o - b(e_N) + \beta(i_N)\big) + (1-\theta)Z(\alpha) - C_o - e_N - i_N + c(e_N)$$

$$-\theta[b(e_N) - b(e^*)] + \pi S^N(A) \tag{8}$$

$$S_G = B_o - C_o - e_G - i_G + \left(1 - \theta\left(\frac{\lambda^G - \lambda}{2}\right)\right)[-b(e_G) + c(e_G) + \beta(i_G)] + \pi S^*(A) \tag{9}$$

Figure 3 illustrates the outcomes.

First-best efficiency benchmark

With a complete long-term contract fully specifying the modified service at Date 1 and the needed service or payment adjustments in state A, Gov and M would choose e and i to maximize the innovation surplus while eliminating deadweight losses from performance shading in the normal state and from adjustments in abnormal high-cost or changed-value states.

$$\max_{e,i,\gamma^G,\gamma^M}\left\{\underbrace{-b(e) + c(e) + \beta(i) - e - i}_{S(e,i)} - L(e,i|\theta) + \pi \mathrm{S}(\gamma^G, \gamma^M|A)\right\} \tag{10}$$

Optimal choice of ex ante investments [HSV97 (2) and (3)] yields maximum innovation surplus $S^*(e^*, i^*)$ (Figure 3). Because efforts are efficient, there is no aggrievement or performance shading: $L(e^*, i^*|\theta) = 0$. Optimal concessions $\gamma^{G*} = \gamma^{M*} = 1$ minimize inefficiency in state A, yielding the highest expected surplus, $\pi S^*(A)$.

In sum, benchmark efficiency involves optimal ex ante investments and ex post adjustments, yielding maximum total surplus $S^*(e^*, i^*) + \pi S^*(A)$.

II. Comparing Ownership Structures

This extended HSV97 model highlights that each of the three ownership forms exhibits a comparative advantage with respect to one of three primary goals: G assures access, F promotes innovative cost control, and N often cares about (noncontractible) quality. Whether the optimal ownership structure involves contracting out to N depends on the highest available α, i.e., whether there is a nonprofit supplier with sufficiently aligned preferences. The following extensions of HSV97 propositions make these comparative advantages more precise.

Proposition 1. $e_F \geq e_N \geq e^*$, with $e_F = e_N(\alpha = 0) > e^*$ and $e_F > e_N(\alpha = 1) = e^*$.

$i_F \leq i_N \leq i^*$, with $i_F = i_N(\alpha = 0) < i^*$ and $i_F < i_N(\alpha = 1) = i^*$.

Comparing (1) with HSV97 (7) and (2) with HSV (8) shows that depending on α, N chooses innovations "in between" those of F and the social optimum (Figure 3). Comparing (1) and (2) to HSV97 (2) and (3) shows that the nonprofit equilibrium converges to first-best as α increases to 1.

Proposition 2: $e_G < e^* \leq e_N \leq e_F$, $i_G \leq i_F \leq i_N \leq i^*$ (with $i_G < i_F$ unless $\lambda = 1$, and $i_G < i_N$ unless $\lambda = 1$ and $\alpha = 0$).

Proposition 3: Contracting out dominates government in-house provision when

(1) damage to noncontractible quality is trivial, limiting ex post frictions ($\theta[b(e_M) - b(e^*)]$) and therefore softening the budget constraint in high-cost abnormal states to

assure access ($\gamma^G(e_M) \to 1$). Replace $-b(e)$ with $-\phi b(e)$ with $\phi > 0$; for ϕ sufficiently small, F>G; for sufficiently large α, N>F.

(2) both damage to noncontractible quality and surplus from cost reduction innovations are approximately zero. Replace $-b(e)$ with $-\phi b(e)$ and replace $c(e)$ with $\tau c(e)$ where $\phi, \tau > 0$; for ϕ and τ sufficiently small, and $\lambda < 1$, F>G; for sufficiently large α, N>F.

(3) guaranteeing access is not a concern. Replace π with $\tau\pi$ with $\tau > 0$; for sufficiently small τ, such that A state is unlikely and S(A) is unimportant, and for sufficiency small λ and/or sufficiently large frictions from G aggrievement ($\lambda^G - \lambda$), then contracting-out is optimal (F>G). For sufficiently large α, N>F>G.

Proposition 4: Government in-house provision dominates contracting out when

(1) social gains from cost reduction innovations converge to zero and α is sufficiently small. Let $b(e) \equiv c(e) - \rho d(e)$ with $\rho > 0$; for sufficiently small ρ and λ sufficiently close to 1 (implying small $\lambda^G - \lambda$), then government provision is more efficient than contracting out to F. If α is sufficiently small, G also dominates N.

(2) social gains from cost and quality innovations are small. Let $b(e) \equiv c(e) - \rho d(e)$ where $\rho > 0$. Replace $\beta(i)$ by $\tau\beta(i)$, where $\tau > 0$. Then for ρ, τ sufficiently small, public ownership is superior to F. If α is sufficiently small [implying high $Z(\alpha)$, or high Z_o], then government in-house provision also dominates N.

(3) guaranteeing access is a first-order concern. Replace π by $\tau\pi$ with $\tau > 0$; for sufficiently large τ (implying $\tau\pi$S(A) is important) and sufficiently small α, G in-house provision is optimal.

The model replicates the HSV97 result that government provision is optimal if G quality innovations are not too low (thus also limiting ex post frictions), but adds the condition that N does not provide a viable alternative because α is also low. G is also optimal when no aligned N are available and either the social gains from cost and quality innovations are small, or the probability of state A is sufficiently large, or both.

<u>Proposition 5</u>: Costs ($C_o - c(e)$) and access (supply assurance $S(A)$) are always lower, and ex post frictions ($\theta[b(e_F) - b(e^*)]$) generally higher, under for-profit private ownership than government ownership. Quality may be higher or lower under for-profit private ownership. For sufficiently large α, private not-for-profit ownership provides higher quality than F and similar supply assurance as G but at a lower cost.

These extensions of HSV97 propositions underscore the importance of contractability of the service for determining the net benefit of contracting out compared to in-house provision. The following parameterization illustrates the implications of differential contractability. Let $b(e) \equiv c(e) - \rho d(e)$ with $\rho > 0$, $\rho \in \{0, \rho^{max}\}$; ρ proxies for completeness of contracting. The larger ρ, the more complete the contract, the fewer the gaps or unanticipated contingencies, and thus the smaller the wiggle room for the residual owner to decide or fudge. Recall that by assumption quality shaving cannot exceed the value of cost reduction. Since $b(e) \geq 0$, we can define ρ^{max} such that $b(e) = 0$: Define ρ^{max} such that $b(e) = c(e) - \rho^{max} d(e) = 0$. ρ^{max} defines a complete contract with no possibility of quality shaving from excessive cost control. The closer ρ is to ρ^{max}, the more likely for-profit provision is socially optimal, since high-powered incentives for cost innovations are efficient (with vanishing deadweight losses from purchaser aggrievement about quality shaving or ex post disagreement about optimal service supply). But this perfect contractability in the normal state alone is insufficient: G remains optimal if the expected loss from F defaulting on supply in the changed-value state A is high enough. Of course, high contractability [$\rho \rightarrow \rho^{max}$] may also imply low expected loss in A; this may be true because more contingencies are covered in the contract and thus π is low [$\frac{\partial \pi}{\partial \rho} < 0$], and/or because the surplus gained from F efficiency in the normal state outweighs the expected cost of G backstop provision in state A.

III. Application to the Health Sector

Across the spectrum of health services, governments overwhelmingly supply some services (e.g., population health, safety net hospitals), while other tax-financed services are often supplied by private nonprofits (e.g., community hospitals, mental health supports, community health centers) or for-profit firms (e.g., biotechnology innovation, processing medical claims for public insurers). These systematic patterns of ownership by service highlight the role of contractual incompleteness in explaining the organizational ecology of service delivery.

In HSV97, for-profit provision is optimal when cost and quality innovations are important, and government provision is optimal when noncontractible cost reductions have large deleterious effects on quality. Trade-offs are more complicated when both innovations and harm from quality shaving are important, which is common for health services. Our extended model focuses on nonprofits' comparative advantage in this case, pointing to the conjunction of contractual incompleteness with high social value of innovation as the underlying reason for the ubiquity of nonprofits in the health sector.

In this section, we first describe ownership patterns across services and settings, and then summarize empirical evidence related to the theoretical trade-offs highlighted in the model. Of course, there is considerable heterogeneity *within* ownership forms – often more than between the average of each. While the theory abstracts from other dimensions of heterogeneity, the range of parameters for each form (λ for public employees, α for private providers) captures a broad spectrum of behavior for hybrid forms (e.g. Sepper and Nelson 2023) in one tractable model. Examples might include religious nonprofits compared to other nonprofits (Lindrooth and Weisbrod 2007, Ballou and Weisbrod 2003, Gertler and Kuan 2009), or private equity compared to other proprietary providers (Adler et al 2023, Gupta et al. 2023).

Mixed ownership across health services and health systems

Although globally comparable data about ownership is limited for many health services, the share of inpatient beds in proprietary, nonprofit, and government-owned hospitals shows the importance of considering all three ownership forms (Figures 1 and 2). We would not expect current ownership patterns to mirror normative theoretical propositions about tax-financed contracts since they also reflect private financing and local organizational ecologies shaped by path-dependent development. Indeed, the evolution of UHC can be seen as a vast experiment with the make-or-buy decision for health services in low-income countries with large private sectors and disparate nonprofit traditions, although the bulk of empirical work focuses on high-income health sectors.

The health systems of most OECD countries feature UHC with a high share of public financing, especially for inpatient services, with varying degrees of patient choice to self-sort among providers. Thus the "make or buy" decision applies to the pattern of ownership of hospital beds. One way to summarize ownership mix is to calculate an "ownership form concentration index" (MixedOwnHHI) for markets where data on profit status of private providers is available. This variant of a Herfindahl–Hirschman index takes its highest value (10000) when the whole market is served by firms of a single ownership form, and a value of 3333 when providers of all 3 ownership forms compete with equal market share. The most concentrated OECD inpatient markets include those dominated by government provision (the UK and Iceland, 10000; Canada 9868; Lithuania 9797; Slovenia 9782; Hungary 9392) as well as those in which private provision must be nonprofit by statute (Netherlands 10000). Other countries lack a tradition of private nonprofits, so that the market is served by government and for-profit providers (e.g., Canada, Chile, Finland, Ireland, Latvia, Lithuania, Mexico, Slovenia, Turkey). The most "mixed" hospital sectors include Germany (3411) and Colombia (3531), with that of the US slightly more dominated by nonprofits (4430). While inpatient care is itself a highly heterogeneous category and governments may specialize in specific areas (e.g. psychiatric hospitals and safety net hospitals), the differential nonprofit presence suggests their potential role in the health sector even in relatively high-capacity governance settings (high ρ).

Health sectors are not static, and as more systems achieve UHC, both the expanding sectors and contracting ones may diversify ownership forms, to some extent informed by the trade-offs between cost, quality and access highlighted in the model. To over-simplify, economic development often brings increasing contractibility as state capacity to design contracts and enforce regulations improves. Service-specific characteristics shape contracting out even for good state capacity; but high- ρ services can be effectively low- ρ when state capacity is low.

Indeed, as Das and Do (2023) note, many low- and middle-income country governments have promoted insurance-based financing not fully replacing, but rather complementing, "tax-funded, subsidized provision of healthcare through publicly-operated facilities," but with incompleteness of contracts and market failures allowing provider behavioral responses to compromise progress on improving quality. Such behavioral responses are captured in the model by quality shaving when reimbursed a fixed price or budget, and refusing to supply when cost is unusually high; more broadly, the behavioral response could include selecting services and/or patients according to profitability and over-providing high-margin services.

The extent to which private providers serve low-income patients was illustrated in Figure 2 across different services (outpatient, inpatient, long-term care) within and across a broad spectrum of countries. The first panel shows the share of US hospital beds and nursing home beds in a commuting zone (CZ), arrayed according to the household income decile of that CZ Nonprofits dominate for the better-insured service of inpatient care, relative to long-term care. The share of beds in government-owned hospitals decreases with CZ average income (from around 35% of beds in the lowest income decile to about 20% in the highest income decile); the public nursing home bed share is relatively low and stable across income deciles. OwnHHI is most concentrated in high-income communities for hospitals (N-dominated), but in low-income communities for nursing homes (F-dominated).

Figure 2 Panel B shows surprisingly little correlation between local governance capacity and the private share of inpatient provision. In the PRC, provinces with among the highest shares of inpatient admissions to non-government hospitals (almost 30%) include both low-income Guizhou and high-income Jiangsu; and those with the lowest shares (10% or fewer) include both low-income Guangxi and high-income Shanghai. Overall, the private share of Chinese inpatient admissions is weakly negatively correlated (-0.24) with provincial per capita GDP. By contrast in India, where the national private share is much higher (over 60%), there is a slightly positive correlation (0.08) between private share of hospital beds and state per capita income.

The lowest-resource settings may have least ability to mitigate quality shaving and most constrained government capacity, making contracting out to private providers of necessity a starting point for many tax-financed access programs. Figure 2 Panel C depicts the private share of outpatient visits for children suffering from diarrhea (left) or fever and cough (right) in 40 low-income countries included in the Demographic and Health Surveys (Round VII, roughly spanning 2015 to 2020, including India), building on the analyses of Grépin (2016). I show the private share of visits for each decile of the wealth index, normalized to the average wealth index among the DHS countries and with the private shares weighted by the population of each country. Throughout the wealth distribution in these low-income countries, households choose private clinics for outpatient care more often than government clinics. The private share of visits exhibits a bi-modal distribution: households with medium wealth among all DHS countries use private providers less than the wealthy, but also less than households with the least wealth.

The existing ecosystem of providers shapes the net benefit of contracting out as countries put in place UHC, either by expanding public provision to a national health service or expanding subsidized health insurance programs for patients choosing among public and private providers (Das and Do 2023). For example, as both the US and China moved toward UHC in the early 21st century based on extending (subsidized) insurance to the uninsured, the US retained nonprofit dominance even as total beds decreased substantially (Figure 1 Panel B),[11] while China created the new category of private nonprofit as suppliers entered the expanding market (Figure 1 Panel C).

[11] The US MixedOwnHHI has remained relatively constant (4479 in 2019, 4474 in 2010), although the declining G offset by increasing F suggests that supply assurance may have decreased; see Duggan et al. (2023).

Consistent with China's previous Mao-era direct provision, China started the 21st century with much greater ownership concentration in its health sector: China's OwnHHI for hospital beds in 2007 – the earliest data differentiating private hospitals nationally by profit status -- was 8397, with 91% of beds in government hospitals. With the emergence of non-government not-for-profit as well as for-profit hospitals in the reform era, the ownership mix of China's growing inpatient care sector diversified, even as government hospitals continue to dominate the "commanding heights" under social insurance UHC. By 2018, the PRC OwnHHI at 5390 was lower (i.e., more diverse) than that of the mean commuting zone in the US (7665). While it is not surprising that government hospitals remain dominant in China, it may be surprising that for-profits represent about the same share of hospital beds in China and in the US, slightly exceeding the share of the third category (N in China, G in the US).

Illustrating the theoretical propositions

Empirical evidence about cost and quality is mixed, given variation in context (Shen et al. 2007; Eggleston et al. 2008) as part of the overall industrial organization of healthcare markets (Gaynor, Ho and Town 2015). Many studies of ownership focus on the US health sector, where all three forms coexist and compete for patients (Norton and Staiger 1994; Duggan 2000; Sloan 2000; Sloan et al. 2001; Kessler and McClellan 2002; Shen 2002; Rosenau and Linder 2003; David 2009; Bayinder 2012; Dalton and Warren 2016; O'Hanlon et al. 2017).

The nonprofit share of hospital beds does not fully capture the nuanced role of nonprofits in inpatient care. Horwitz and others (e.g. Horwitz and Nichols 2022) document strikingly different inpatient services by ownership: "After hospital and market characteristics are adjusted for, nonprofit hospitals offer relatively unprofitable services more than for-profit hospitals and less than government hospitals. Profitable services typically exhibit the opposite pattern. For-profit hospitals are also more likely to adopt or discontinue services consistent with changes in service profitability than are nonprofits, which in turn are more likely to do so than government hospitals" (Horwitz and Nichols 2022, p.331). These results are consistent with Proposition 1, especially if extended to account for fee-for-service incentives.

That nonprofits may forego net revenue to support their mission has been documented in several health service contexts. For example, religious nonprofits discount hospital sales to other religious nonprofits (Gertler and Kuan 2009); and CEO compensations packages differ (Ballou and Weisbrod 2003). Studying German nonprofit hospitals, Filistrucchi and Prüfer (2019) show systematic differences in managerial strategies linked directly to different religious missions: "Catholic nonprofit hospitals follow a strategy of horizontal diversification and maximization of the number of patients treated. By contrast, Protestant hospitals pursue a strategy of horizontal specialization and focus on vertical differentiation, putting in more sophisticated inputs and producing more complex services" (p.188). Intriguingly, the authors show that these mission-driven managerial differences increase in more competitive hospital markets.

Finkelstein, Gentzkow, and Williams (2016) find a strong correlation between the share of for-profit hospitals and the "place" component of US healthcare utilization. Such geographic differences might suggest that local preferences and contracting context explain nonprofit market shares. Indeed, local governments regularly decide on what services to contract out, shaped by considerations of economic efficiency as well as politics (Levin and Tadelis 2010).

Despite these place effects, the service-level factors highlighted in the theory appear pivotal in shaping ownership mix. For example, Figure 4 depicts the share of beds in not-for-profit facilities across more than 700 US commuting zones, compared to facilities owned by government agencies or by investors. Panels A and B show the ownership shares for community hospital beds and for nursing home beds, respectively. The correlation between the nonprofit share of the two kinds of facility is only mildly positive (0.29; Panel C). Moreover, as noted, the nonprofit bedshare of both services *increases* with community income decile, unlike government and for-profit market shares (Figure 2 Panel A), underscoring that N may not be perfectly aligned with access.

What explains the higher nonprofit share of hospital beds than nursing home beds, and the fact that for-profits provide long-term care for some of the lowest-income communities? Alongside quality-shaving concerns for both services, financing and limited government reimbursement rates, differences in technology and human capital skills may be part of the explanation. The theory highlights the strength of private ownership for ex ante investments, suggesting that for-profit provision is likely to be optimal when the service is highly contractible (high ρ)—which is often also correlated with private financing. But high private financing and for-profit provision may also arise because the service is perceived as "less important" and not worthy of (much) public financing, despite acknowledged limitations on consumer ability to observe and discipline quality. Examples include services perceived to be low-skill, low-tech, 'feminine' and readily supplied at home, including care at the two ends of the lifespan: childcare and elder care.

Yet predictably, quality shaving has become a prime concern among government authorities that are trying to assure access to quality care supports for the disabled and older adults. These concerns have intensified in light of the increasing market share of private equity nursing homes (Gupta et al 2021, Rafiei 2022).[12] Aligned or mission-driven nonprofits can offer an option for private provision with less quality shaving in some contexts. For example, Chou (2002) finds evidence of differences by profit status among nursing homes, and Grabowski and Hirth (2003) similarly find that nonprofits raise the quality of competitors and of the overall long-term care markets in which they operate. While nonprofits may differ from for-profits in many ways that contribute to higher quality, a leading metric and regulatory tool in the industry is staffing ratios (i.e., the number of nurses and certified nurse assistants required per patient). Indeed, studies show that a key mechanism for-profits use to generate savings and profits is skimping on staffing – especially in private equity acquisitions (Gupta et al. 2021).

Hospice is a related end-of-life health service where rapid for-profit entry—increasing five-fold in the US since 2000 (Gruber et al. 2023)—has unsurprisingly proven controversial. For-profit hospices have been shown to be differentially responsive to patient profitability (Lindrooth and Weisbrod 2007). More recently, Gruber et al. (2023) find that by offsetting other expensive care for patients with dementia, for-profit entry into the US hospice industry has saved considerable expenditures for Medicare, the government purchaser. Assuming patients and their families can choose appropriately between regular care and hospice—with its commitment to forego life-saving treatments in favor of palliative care—shifts the interpretation of cost reduction toward a lower risk of socially damaging quality shaving. Cynics might argue that it is predictable to find for-profit entry beneficial when focusing only on spending. But the authors point out that mortality in hospice is not a valid quality metric, since hospice patients elect to

[12] Rafiei (2022) highlights the staffing mechanism—with differentially skilled and mission-driven personnel sorting across providers—when quoting a nurse who refused to drop her standards to accommodate short staffing at a nursing home: “We were told, ‘Either do it or leave.’ ” (p.13).

forego curative treatment at end of life; accordingly, they argue that "policies limiting hospice use including revenue caps and anti-fraud lawsuits are distortionary and deter cost-saving admissions" (Gruber et al. 2023, p.1).

The theory suggests for-profit provision may be optimal when efficiency requires high ex ante investments in innovation, especially when regulation or contracting can mitigate quality shaving. In the health sector, the dominance of for-profits in pharmaceutical and medical device innovation illustrates this prediction. These industries constitute a vital component of the supply chain for tax-financed basic healthcare. Required approval by regulatory authorities like the European Medicines Agency or the US Food and Drug Administration suggest efficacy is contractible, mitigating concerns about quality shaving. Nevertheless, in addition to public financing to encourage desired innovations, some observers call for a nonprofit role in pharmaceutical innovation for essential medications such as antibiotics.[13]

The health sector provides clear evidence for several mechanisms of quality shaving. Although pharmaceutical toxicity and staffing ratios may be contractible, other dimensions of quality such as staff training, experience, and empathy are noncontractible – consistent with the quality-shaving mechanism HSV97 highlights in discussing prisons. Emergency medical transport illustrates how staffing-driven cost savings by for-profit private firms can increase mortality (Knutsson and Tyrefors 2022). Factor substitution toward lower-cost factors of production like drugs also features prominently in services ranging from elderly care (Cawley, Grabowski and Hirth 2006) to the dialysis industry (Eliason et al. 2020), where

[13] See for example the discussion in Nielsen et al. (2019) about development of antibiotics and the successes of the TB Alliance and the Medicines for Malaria Venture.

facilities acquired by a large for-profit chain "converge to the behavior of their new parent companies by increasing patients' doses of highly reimbursed drugs, replacing high-skill nurses with less-skilled technicians, and waitlisting fewer patients for kidney transplants….patients fare worse as a result of these changes" (Eliason et al. 2020, p.221). Proprietary providers also appear to contract-out more services to other for-profits (Dalton and Warren 2016), enlarging the scope for cost reduction at expense of noncontractible quality, akin to "double marginalization."

Health services also show the importance of trust in alleviating contracting frictions. Distrust, soured relationships, and "cold but correct" contracting can damage responsiveness to changing service needs. The COVAX procurement experience during the pandemic arguably illustrates the dynamic of a legacy of distrust leading to inefficient contracting outcomes. "Activating" mission-aligned agreements such as between government and nonprofits can mitigate those frictions, especially if "guiding principles" are codified within the Date 0 governance contract. FH23 describe the experience of a Canadian local government agency purchasing health services from a physician group. The original contract between the Vancouver Island Health Authority and the South Island Hospitalists had not worked well. Adopting a new contract with "guiding principles" helped re-establish trust, enabling flexible response to the COVID-19 crisis and other unforeseen challenges (FH23).

The theory suggests that government in-house provision may be most critical for assuring supply for populations extremely vulnerable to quality shaving. Proposition 4 rationalizes the near-universal role of government providers as the backbone of the "safety net" (e.g., Duggan 2000, Popescu et al. 2019). In our model, public provision assures access but with lower quality innovation, consistent with theories of targeting government expenditures through lowering quality to induce consumer self-sorting (Besley and Coate 1991) and/or ‘targeting by ordeal’ (Nichols and Zeckhauser 1982, Finkelstein and Notowidigdo 2019). In Singapore, government hospitals are designed to provide the same technical quality but lower amenity quality—less privacy or air conditioning—in the most subsidized wards (Tan et al. 2021).

Proposition 4 also suggests that government in-house provision is optimal for sufficiently high risk of hold-up (e.g., a crisis like a pandemic or a natural disaster). The model of access underscores the HSV97 discussion of foreign policy, where the risk of hold-up and inefficiency of renegotiation render in-house provision optimal. Indeed, evidence suggests that direct government supply of some services for vulnerable populations is not fully replaceable by contracting out, even to nonprofit providers. For example, Duggan et al. (2023) find that government hospital privatization reduces market-level utilization (access) for Medicaid patients and raises their mortality—despite the fact that nonprofits operate the majority of US hospital beds.

Consider the question of how a government should assure access to health services for active military personnel and Veterans. The characteristics of the service and of the population served shape the net value of in-house provision. For example, studying the military, Frakes, Gruber, and Justicz (2021) find that private provision of childbirth services correlates with higher net benefits (“slightly greater resource intensity, but also notably better outcomes,” p.1). However, for extremely vulnerable populations and arguably a less contractible service—emergency care for Veterans—private care leads to greater mortality and higher resource use: Chan, Card, and Taylor (2023) find that patients as-good-as-randomly allocated by ambulances to public or private emergency treatment experience much lower mortality at Veterans’ Administration hospitals, while spending less.

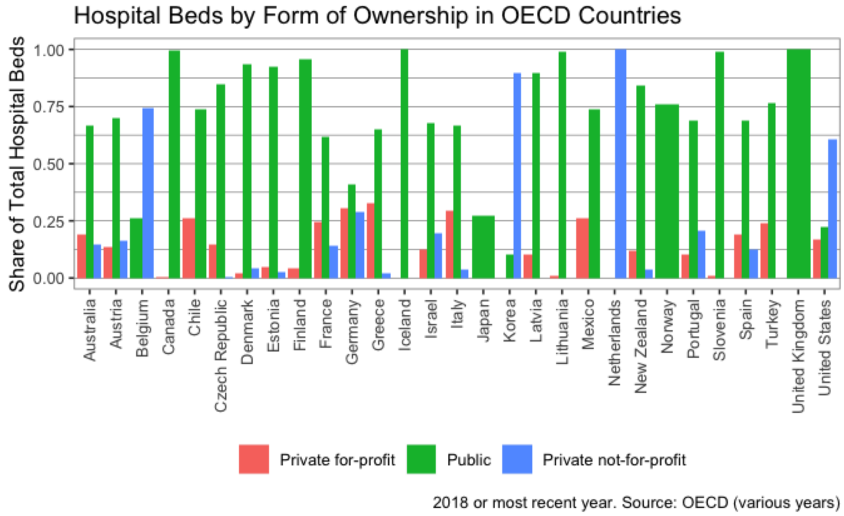
The role of government in assuring emergency access is also consistent with empirical findings of larger patient bills and more risk of "surprise bills" from for-profit ambulance providers, especially private equity firms, compared to government-run services (Adler et al 2023). Supply assurance also aligns with government involvement in research and development, especially during a crisis. For example, studying the COVID-19 response globally, Agarwal and Gaule (2022) find that public research institutions conducted almost three-quarters of all COVID-19 clinical trials.

IV. Conclusion

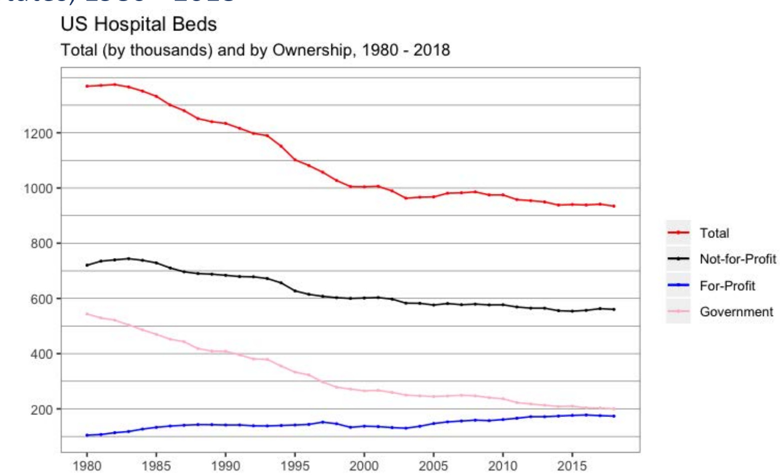
Nonprofits supply many tax-financed services like healthcare and education. When governments seek to assure resilient, equitable supply of such services, quality shaving is often an important consideration—and may naturally lead to ex post inefficiency in long-term contractual relationships. Our extension of HSV97 to nonprofits and ex post frictions provides foundations for characterizing the conditions under which government, for-profit, and nonprofit ownership may each be optimal for assuring cost-effective access to a high-quality tax-financed service. By incorporating ex post frictions through the reference point concept of contracts, we also re-introduce competition in ex ante markets as an important consideration as well as avoid the Maskin and Tirole (1999) fundamental critique of incomplete contract theory. Nonprofit provision is efficient when nonprofit "mission" credibly signals adherence to the spirit and not just the letter of the contract in unforeseen contingencies. Many interesting and empirically important extensions are left to future research, including unbundling ownership from incentives, modeling competition ex ante (selective contracting) and ex post (patient sorting) in more detail, and incorporating path dependent evolution of organizational ecosystems.

Figure 1. The Nonprofit Share of Hospital Beds

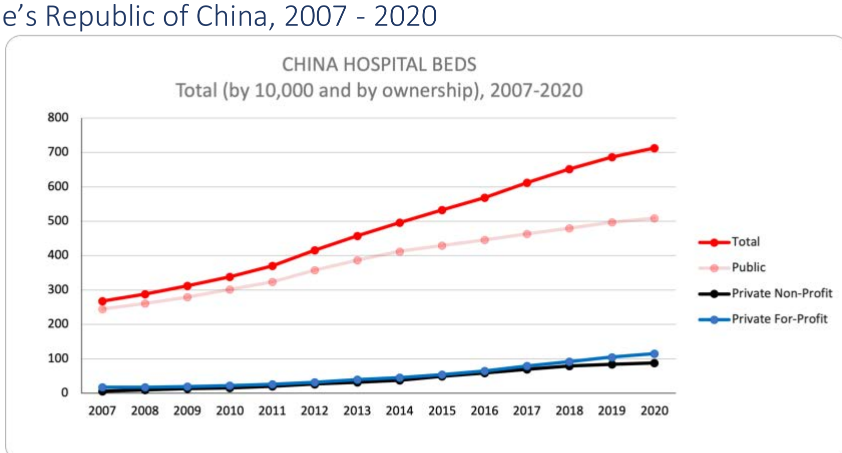
Panel A. OECD countries, 2018



Panel B. United States, 1980 - 2018

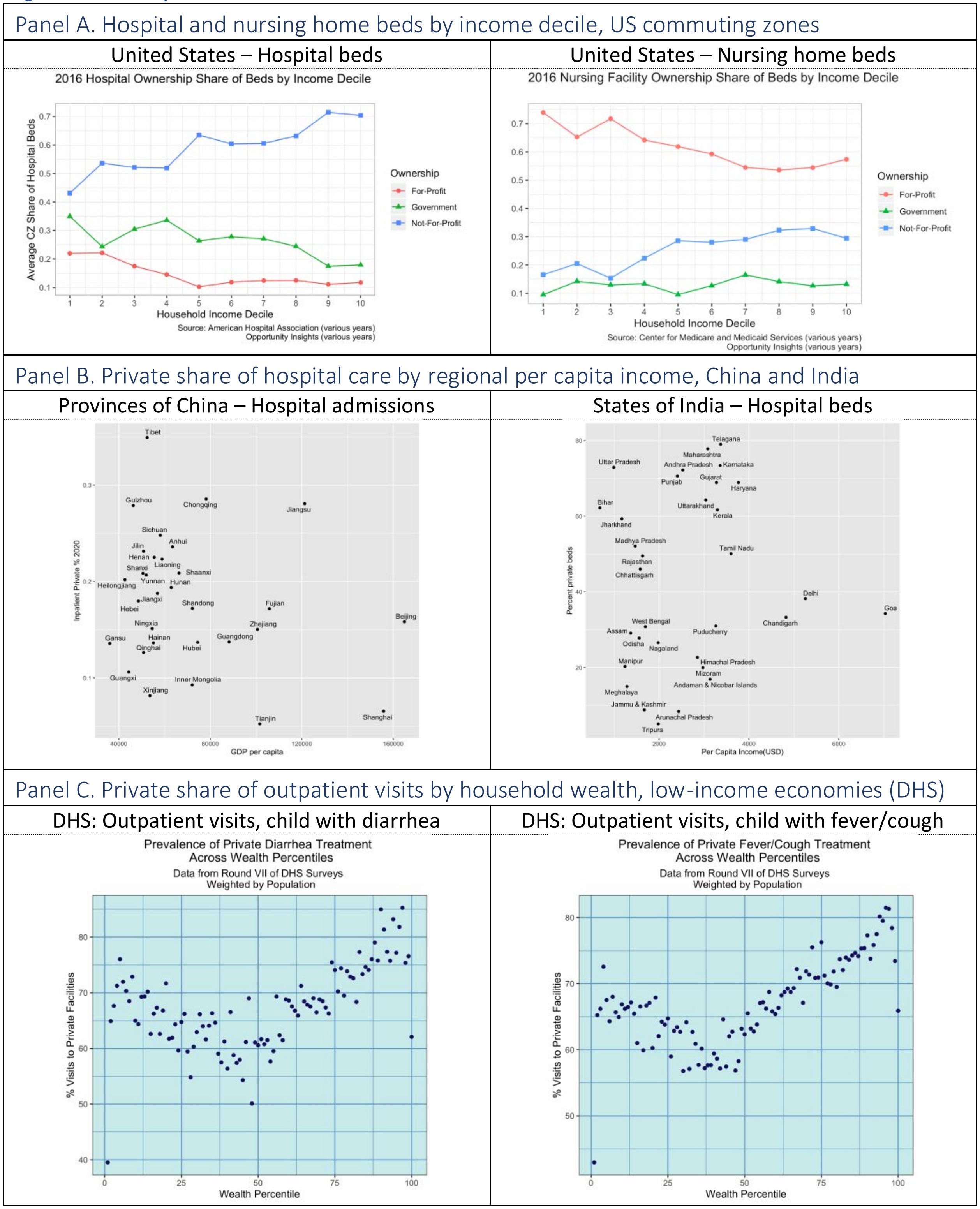


Panel C. People's Republic of China, 2007 - 2020



Sources: Organization for Economic Cooperation and Development (OECD) Health Statistics; American Hospital Association (AHA) annual surveys; PRC health statistical yearbooks (see Appendix D). Note: Some countries do not submit data to the OECD regarding the profit status of non-government hospital beds (e.g. Japan, Norway).

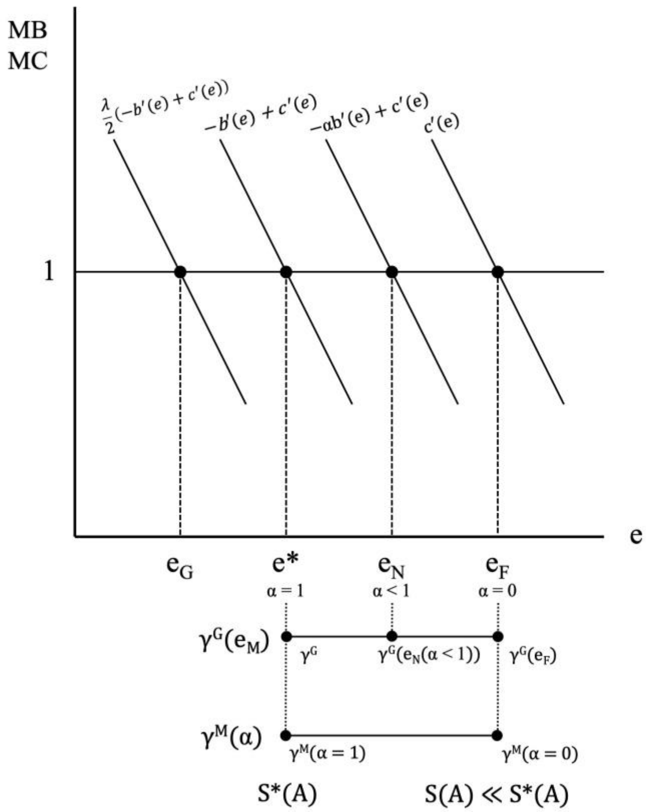
Figure 2. Who provides access in low-income communities?



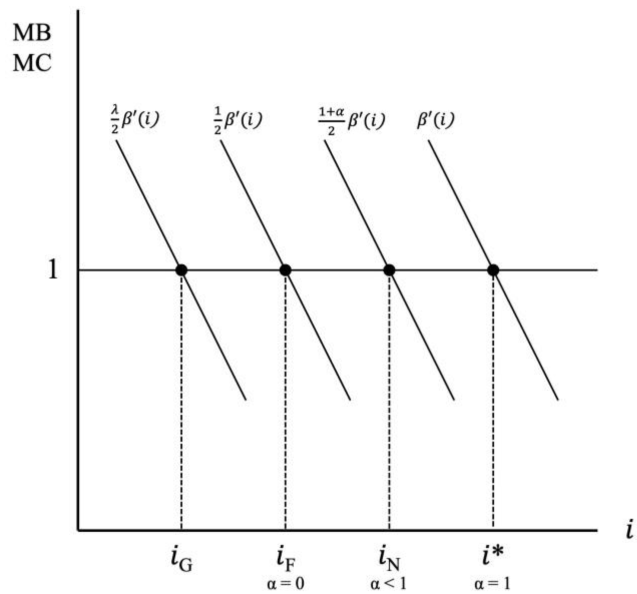
Sources: AHA, Center for Medicare and Medicaid Services (CMS); Kapoor et al. 2020; PRC health statistical yearbooks; Demographic and Health Survey (DHS) data from over 1.7 million survey respondents across 40 countries of DHS Round VII (2015-2020); these countries represent 41% of the global population, and 62.8% of the population of low- and middle-income countries excluding China. See appendix D.

Figure 3. Cost control, quality improvement, and access assurance, by ownership type

Panel A: Cost control innovations e, and aggrievement-impaired concessions in the Abnormal state, γ^G and γ^M



Panel B: Quality improvement innovations i



Panel C: Access assurance: Surplus in the Abnormal state

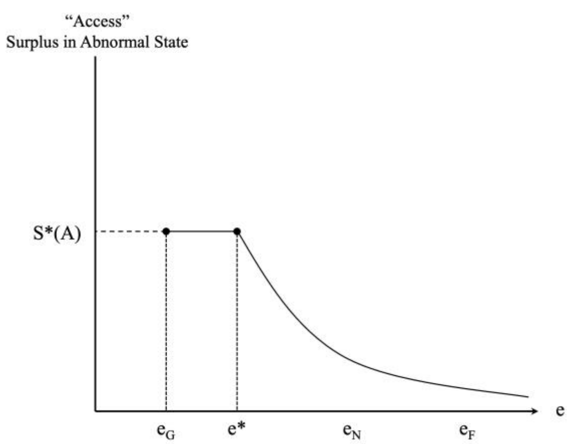
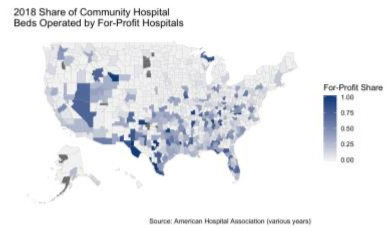


Figure 4. Community Hospital Beds and Nursing Home Beds by Ownership, across U.S. Commuting Zones

Panel A. Community hospital beds by ownership type, US commuting zones, 2018

Government Share

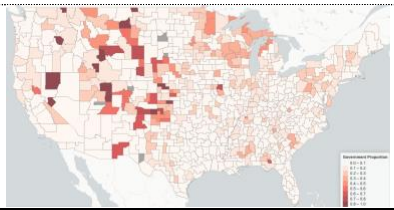
For-Profit Share



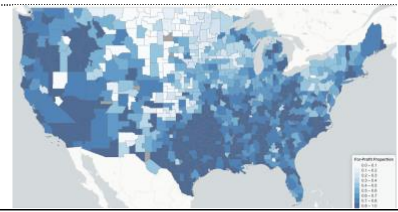
Not-For-Profit share

Panel B. Nursing home beds by ownership type, US commuting zones, 2019

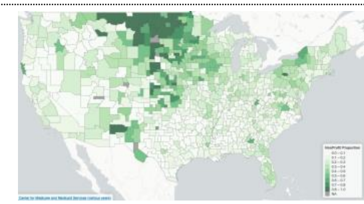
Government Share



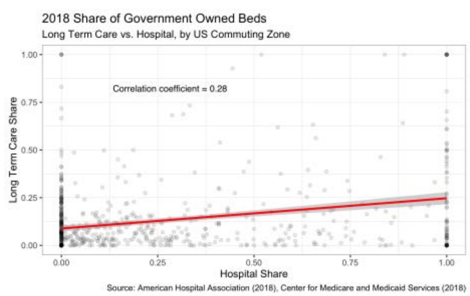
For-Profit Share

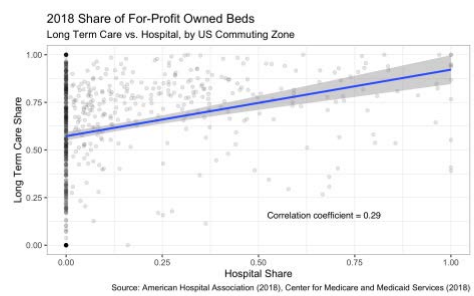


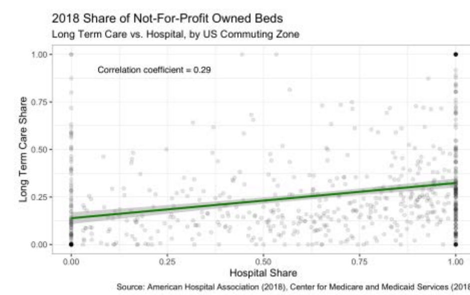
Not-For-Profit Share



Panel C. Correlation between CZ hospital and nursing home bed share, US 2018







Sources: AHA and Center for Medicare and Medicaid Services (CMS); see appendix D.

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