From Economic to Political Power*

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Abstract

Triggered by a 2024 conflict between Elon Musk and the Supreme Court of Brazil, we study when private firms can challenge state authority. Our baseline models show how firms extract political concessions by threatening to withdraw infrastructure co-investments from dependent governments. Our dynamic model reveals that tolerating harmful activities erodes democratic institutions, paradoxically increasing government tolerance and creating a self-reinforcing downward spiral. Countries with intermediate democratic quality erode fastest. We identify two policy reversals: (i) public media investment can stabilize democracy at higher levels; (ii) civil society mobilization can force harmful platforms to shut down. However, civil society strength can collapse if repressions from harmful platforms accelerate faster than capacity-building. Both policy interventions are most effective when deployed early, before critical thresholds are reached. Case evidence from Brazil, Australia, and the EU supports our predictions.

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1 Introduction

In 2024, the world saw an unusual conflict: Elon Musk, an entrepreneur and the world's richest individual, clashed with the Supreme Court of Brazil, a sovereign state with a population of over 212 million people and a GDP of about U$4.9trn.[1] The conflict centered on Musk's refusal to comply with court orders demanding his social media firm X (formerly Twitter) restrict accounts spreading misinformation and to appoint a legal representative in Brazil. After repeated defiance, Brazil's Supreme Court banned X nationwide, froze the assets of Starlink, another Musk-owned company, and imposed millions in fines. Musk resisted enforcement by using Starlink infrastructure to circumvent the ban — a rare instance of private defiance against a sovereign nation's highest judicial authority.[2]

This episode raises fundamental questions: Is Musk's defiance exceptional or symptomatic? Can we rationally explain why an individual feels comfortable confronting a Supreme Court of a large democracy? Does it foreshadow future confrontations between private actors and democratic governments? How can we characterize, predict, and contain such developments?

We argue that Musk's defiance, while dramatic, reflects a systematic pattern: firms can transform economic power into political power by making governments dependent on infrastructure they control. As we show in this paper, this happens through two complementary mechanisms.

First, in our baseline model, a firm co-invests in public infrastructure (telecommunications, internet, energy) alongside government. Citizens have inelastic demand; if unserved, citizens are angry, which creates political costs for the government. We show that when the firm threatens withdrawal, government becomes vulnerable to coercion; hence offering a rational explanation for Musk's defiance. The Brazil case exhibits all facilitating factors our model identifies: a well-functioning democracy (electoral accountability matters), the firm's technological advantage (here: Musk's satellite internet provider Starlink delivers the infrastructure leverage for X), wealth enabling political motivation misaligned with public preferences, Musk's non-resident ownership, and state vulnerability to external pressure.

Second, in our dynamic model, the analysis reveals a far darker process. We show that accepting the firm's harmful political activity (X, e.g., platform misinformation) is not a stable

[1] See `https://en.wikipedia.org/wiki/Elon_Musk` and `https://en.wikipedia.org/wiki/Brazil`.

[2] See `https://www.npr.org/2024/08/30/nx-s1-5096220/brazil-suspends-x-elon-musk` and `https://verfassungsblog.de/brazil-twitter-x-ban-musk-constitutionalism/`.

equilibrium but the start of a democratic erosion spiral. As X operates, it degrades democratic institutions, which paradoxically increases the government's tolerance of X. Lower democratic quality reduces electoral accountability, making governments *more* willing to accept societal harm to preserve infrastructure. This creates a self-reinforcing feedback loop: democratic erosion leads to more tolerance of societal damage, which enables further erosion. Countries with intermediate democratic quality experience fastest erosion, occupying the peak of an inverted-U curve: they are neither strong enough to resist institutional damage nor weak enough to have exhausted democratic capacity. Yet the spiral is not irreversible: early interventions can break erosion more cheaply than late actions.

We study two policy interventions and show how they can slow or even reverse erosion: (i) *Public Media Investment*, strengthening information environments and institutional accountability; (ii) *Civil Society Mobilization*, detecting harms, amplifying resistance, and coordinating collective action. Both interventions are most effective when deployed early.

The paper is organized as follows. Section 2 reviews related literature. Section 3 develops the baseline model (Games 1-5), showing how economic power translates into political power and rationalizing the Brazil case. Section 4 extends the baseline model to endogenous democratic erosion. Section 5 derives empirical hypotheses incorporating dynamic predictions and confronts them with case evidence (Musk-Brazil, Google/Meta-Australia, OpenAI-EU, Starlink conflicts). Section 6 concludes with policy implications emphasizing the window-of-opportunity for democratic resistance. Appendix A elaborates the Musk-Brazil case in detail. Appendix B provides all mathematical proofs.

2 Related Literature

A substantial body of scholarly literature studies how economic power is translated into political power, particularly through the ability of wealthy or economically dominant actors to extract policy concessions or influence public decision-making. Classic theoretical foundations comprise Olson (1965), Epstein (1969), and Lindblom (1977). Olson (1965) posits that concentrated economic interests, such as large firms or industry groups, can organize more effectively to influence policy than diffuse public interests. Epstein (1969) explores patterns of corporate political involvement and the mechanisms by which economic power is converted into political influence, whereas Lindblom (1977) finds that business firms enjoy a privileged position in policymaking due to their central role in the economy, enabling them to threaten disinvestment or capital flight to influence government decisions. Related but much newer, Kroll and Edinger-Schons (2024) examine how corporations significantly influence public and political spheres, analyzing the "legitimacy gap" between corporate resource allocation and societal needs. This directly supports our theoretical reasoning below with empirical evidence of how economic power translates into political influence and proposes democratizing organizations as a counterbalance.

A foundational study is Salamon and Siegfried (1977), who empirically investigate how aspects such as firm size, market concentration, and profitability influence an industry's political clout. They find that large and economically powerful firms are more successful in securing favorable public policies, especially in areas like federal corporate tax and state excise tax policy. The analysis supports the hypothesis that economic power, measured by firm size and market dominance, can be systematically converted into political influence. The study also references classic arguments (e.g., Kaysen, 1959) that the market power of large corporations underpins their broader political and social power, reinforcing the idea that corporate scale directly translates into political strength.

Castañeda's (2017; 2018) work provides a nuanced account of how business interest groups leverage economic power to shape fiscal policy, particularly in Latin America. He distinguishes between structural power, which refers to the economy's dependence on key business sectors, making threats of disinvestment or capital flight credible and effective in influencing policy (as theorized by Lindblom, 1977), and instrumental power, which refers to the use of resources for lobbying, networks, and relationships with policymakers. Castañeda finds that business groups are more influential in less diversified economies, where their threats to withhold investment or relocate operations carry greater weight. A similar point is made by UNDP (2021), which explores the feedback loop between monopoly rents and political power, also focusing on Latin America. In many markets on the continent, a small number of giant firms dominate, leading to high market power and inequality. UNDP (2021) argues that monopoly rents can be translated into political power, which in turn is used to entrench and expand economic dominance, thereby creating a vicious circle, where business elites distort policy and weaken institutions to their advantage, which in turn feeds their power to distort. Both Castañeda (2017; 2018) and UNDP (2021) support the view that economic dependence on specific sectors amplifies their political leverage, a point reiterated by our model below.

Related to this business group focus, in one of the few theoretical contributions Larrain and

Prüfer (2015) construct a game-theoretic model, where firms can join forces in trade associations and jointly lobby the government, which can have positive or negative spillovers on the rest of the economy. They identify conditions under which trade associations assume either function and, for the case of "bad lobbying", when they exploit their economic resources to elicit favors from the government.

López (2018) develops a macroeconomic model integrating economic and political conditions, showing that economic power constitutes the fundamental linkage between politics and economics. In his model, the distribution of bargaining power between capital owners and workers affects growth, inequality, and the political equilibrium. Lopez argues that political regimes shape the distribution of economic power, which in turn influences subsequent political cycles, suggesting a cyclical, mutually reinforcing relationship between economic and political power. In the same spirit, Zingales (2017) shows that economically powerful firms seek political influence primarily to further weaken competition, creating a self-reinforcing cycle of economic and political concentration. Deutscher (2022) argues that competitive markets are essential for protecting democracy by preventing the domination of political processes by concentrated private interests. The republican concept of liberty as non-domination is central to this view: deconcentrated markets are seen as a bulwark against the political capture by economic elites.

Prat et al. (2022) empirically demonstrate that corporate mergers, which increase market concentration, are followed by significant and persistent rises in lobbying activity by both individual firms and industry associations, indicating that greater market power translates into increased political engagement and influence. Their analysis, using U.S. data from 1999–2017, supports the hypothesis that market power begets political power, as firms leverage their scale to shape regulation and policy in their favor.

Moving into the opposite direction, Shahshahani and McCarty (2023) present a comprehensive empirical analysis of U.S. lobbying data and find little evidence that increased economic concentration leads to a corresponding concentration of lobbying power or restricts smaller firms' political advocacy. Their results challenge the central claims of the "political antitrust" movement and suggest that the relationship between economic and political power is complex and indirect.

Basihos (2025) is among the first to empirically establish a causal link between rising market power and democratic decline. Analyzing data from 80 countries between 1990 and 2019, Basihos finds that about one quarter of the observed decline in democracy can be attributed to the concentration of market power. The study demonstrates that, as a small set of large firms accumulate economic dominance, which is measured by aggregate markups and market share, they also amass substantial political influence. Basihos' empirical strategy includes firm-level analysis, showing that high-markup firms with greater financial resources are more likely to develop strong political connections. She also finds that the translation of market power into political power is mediated by the financial resources concentrated in dominant firms (a mechanism coming back in our model). Importantly, Basihos finds that this effect is distinct from and not explained by income inequality, suggesting that market power itself is a direct threat to democratic norms and institutions. Scheve et al. (2024) extend the analysis to voter and legislator behavior, showing that economic concentration can directly misalign policy with voter preferences, as observed in the steel industry during the Progressive Era in the U.S.

Summarizing, the literature consistently demonstrates *that* economic power — via market dominance, sectoral concentration, or control of key resources — can be systematically leveraged to extract political concessions, shape policy, and sometimes even extort favors from governments that fear economic backlash or instability. What the literature does not show is *when* or *why* we should expect such situations, where economic power is transformed into political power, which sectors or countries are particularly vulnerable, and what could be done to minimize associated risks.

3 The Baseline Model

We model two risk-neutral players, a government G and a monopolistic Firm F. Both of them can invest I_j in public infrastructure, where $j \in \{G, F\}$, $I = I_G + I_F$. The total investment cost is $c(I) = c_G(I_G) + c_F(I_F)$, with $c_j'(I_j) > 0, c_j''(I_j) > 0$. Specifically, G can produce I_G for cost $c_G(I_G)$ and F can produce I_F for cost $c_F(I_F) = \tau c_G(I_F)$. $\tau \in (0, 1)$ is a technology parameter measuring the firm's higher relative efficiency in producing infrastructure, as compared to the government.[3] The infrastructure benefits the population, which is assumed to have unit mass and fixed demand D. It obtains welfare of $W(I) = min\{I, D\} - C(I)$. Hence, I can also be understood as the share of the population that gets access to the infrastructure.

For exemplification, assume that $c_G(I_G) = I_G^2$, $c_F(I_F) = \tau I_F^2$, and that $D = 1$.

We study a series of 5 games, which start very simple and get more realistic, in order to

[3]This reflects high-powered incentives available in for-profit firms, less bureaucratic organization, and (often) higher innovativeness.

create benchmark results and facilitate comparisons.

3.1 Game 1: Neoclassical public-goods provision by the government

Assume that there is no firm and that the government is the sole producer of public infrastructure. G has a budget B, which we assume to be high enough to finance all infrastructure needs. G maximizes productive efficiency, i.e., welfare net of investment costs. This captures that the government takes its job, to act on behalf of the people, sincerely but also that there may be alternative uses for the government's budget, e.g., to invest in education, healthcare or defense, or to build a new Presidential palace with $B - c_G(I_G)$.

This is a one-shot game, where G determines public investment in infrastructure I_G and payoffs materialize immediately. It follows that G solves:

$$\max_{I_G} \quad \pi_G = I_G - c_G(I_G) \tag{1}$$

Lemma 1. *The resulting first-best equilibrium investment is characterized by the FOC:*

$$I'_G = 1 = c'_G(I_G) \tag{2}$$

Example: For $c(I) = I^2$, this implies that $I_{FB} = 1/2$. It also implies that 50% of the population ($D - I_{FB} = 1/2$) will not be served on efficiency grounds: they would benefit from having access to public infrastructure, but the costs to serve them would outweigh the benefits, from a welfare perspective.

Henceforth, we will speak of $D - I$ as *unserved demand.*

3.2 Game 2: A government with political motives

Assume the same as in Game 1 but that the government is interested in getting re-elected and therefore wants to minimize the unserved (=unhappy) share of the population. The same technological constraints as in Game 1 apply. G solves:

$$\max_{I_G} \quad \pi_G = I_G - c_G(I_G) - P(I_G), \tag{3}$$

where $P(I_G) = \gamma(D - I_G)$ denotes the political damage to G from unserved demand. $\gamma \in [0, 1]$ is a governance parameter that captures how much the government's fate depends on (un)happy citizens. High γ-values are prevalent in democracies, whereas autocratic countries are characterized by low γ-values.

Lemma 2. *The resulting equilibrium investment is characterized by the FOC:*

$$I_P' = c_G'(I_G) + P'(I_G). \tag{4}$$

Example: For $c_G(I_G) = I_G^2$, this implies that $I_P = \frac{1+\gamma}{2}$. G realizes a payoff of $\pi_G(I_P) = I_P - c_G(I_P) - P(I_P) = (1+\gamma)\frac{(1+\gamma)}{2} - \left(\frac{1+\gamma}{2}\right)^2 - \gamma D = \frac{(1+\gamma)^2}{4} - \gamma D$.

Apart from identifying the equilibrium investment level, Lemma 2 contains two additional insights.

Corollary 1. *(a)* $I_P > I_{FB}$. *(b)* $\frac{\partial I_P}{\partial \gamma} > 0$.

Corollary 1.(a) shows that a government that is afraid of angry (unserved) voters will invest more in public infrastructure than a technocratic government without the wish to be re-elected. Hence, *ceteris paribus* such political motives lead to overinvestment in public infrastructure and reduce productive efficiency. Corollary 1.(b) shows that the degree to which a government is receptive to citizens' wishes beyond their actual utility from access to public infrastructure (which is already captured by $W(I)$) pushes up equilibrium investments: a democratic government will invest more in public infrastructure than an autocratic government.

As we consider the political regime of a country as fixed in this paper, henceforth we will consider I_P as the benchmark level of public infrastructure that the government strives to produce.

3.3 Game 3: A firm with profit-motives enters

Assume that firm F enters the game. It offers G to supply public infrastructure to a share I_F of the population. This would enable G to spend more budget on other purposes without bearing the full political damage that is associated with unserved demand. If G allows F to offer infrastructure to citizens, it equips F with a license and also sets a regulated retail price, p, where p is sufficient to make F's operations profitable and where p equals the marginal cost of investment of the last supplied unit, I_F.[4] F's entry modifies the game as follows:[5]

1. Contracting: F signs a contract to supply capacity $\hat{I}_F$ for a unit price of p.
2. G determines public investment in infrastructure I_G.
3. F determines private investment in infrastructure I_F, complementing I_G. Payoffs materialize.

The game is solved by backward-induction for a subgame-perfect equilibrium (SPE).

Lemma 3. *In the equilibrium of Game 3, (a) G contracts F to supply a share $\frac{\hat{I}_F}{I_P} = \frac{1}{(1+\tau)}$ of total investment I_P. G produces a share $\frac{I_G^*}{I_P} = \frac{\tau}{(1+\tau)}$ itself. F produces $I_F = \hat{I}_F$, in line with the contract. (b) $\partial\left(\frac{\hat{I}_F}{I_P}\right)/\partial\tau < 0$.*

Proof: see Appendix B.

Now we can compare payoffs across games 2 and 3.

Lemma 4. *For all defined τ and γ, we find (a) $\pi_F(\hat{I}_F) > 0$. (b) $\pi_G(I_G^*, \hat{I}_F) > \pi_G(I_P)$.*

Proof: see Appendix B.

Lemma 4 underlines both players' interest in the cooperation: (a) shows that the firm makes positive profits, whereas it received nothing in Game 2. (b) explains the government's interest in getting the firm to provide some public infrastructure. This has two technological reasons because (1) two providers can produce more cheaply than one, facing convex costs, and (2) F is more efficient than G in production. It also has a political reason: G benefits from F's production not only through the high total level of infrastructure provision ($I_G^* + \hat{I}_F = I_P$), which makes the population happy and also averts political damage from G. On top, G gets all this for modest own production ($I_G^* < I_P$), which saves it a lot of resources to pursue other goals, even as F's services have to be paid for.

[4] The key consequence of this price regulation is that F gains positive profit from co-investing in infrastructure and that it independently stops to supply, where $\frac{\partial c_F(I_F)}{\partial I_F} = p$, i.e., where its marginal cost equal the regulated price. Alternatively, we could assume cost-plus pricing, such that F gets a fixed markup μ per unit of output, where $0 < \mu < \tau$. This would similarly share the efficiency gains from F's technology between F and G but not affect the model's results in a meaningful way.

[5] The timing can be thought of as a simplification of a more realistic game, where each party first commits to a certain level of investment, I_j, and later actually invests, or not. In practice, committing is quick but investing in infrastructure takes a long time and works in parallel for G and F. Therefore, G has to decide about how much I_G to actually invest before it knows how much I_F the firm actually installs. This crucial difficulty, akin to a hold-up problem, is captured by the modeled timing.

3.4 Game 4: A politically motivated firm (owner)

Consider the situation of Game 3 with one difference: the firm does not only have a profit-motive but also a political motive. It can invest in an action, X, which comes at a small cost $\xi > 0$ for the firm.[6] X does not directly affect F's profit but it provides the owner of F with high political payoff, e.g., because it supports election probabilities of politicians favored by the owner of F, or keeps F out of legal trouble, or directly provides them with a political function and influence. We assume that $X - \xi > \pi_F(\hat{I}_F)$, taking F's business profit from Game 3 as the benchmark: the net benefit to F from establishing X is higher than the profit it can make by contracting with G and supplying public infrastructure.

However, X generates a conflict between F and G because it hurts the government's payoffs, e.g., because X supports illegal activities or provides a stage and audience for radical politicians who do not respect the system of liberal democracy. Notably, because of this *societal harm* generated by X, we assume G can forbid X on legal grounds (and that a prohibition is enforced by law enforcers and, hence, fully effective). If X is not forbidden, it generates utility $-\rho X$ for the government, where $\rho > 0$.

F's potential political activities modify the game as follows:

1. Contracting: F signs a contract to supply capacity $\hat{I}_F$ for a unit price of p.

2. G determines public investment in infrastructure I_G.

3. F establishes X (with action $a = 1$), or not ($a = 0$).

4. If F chose $a = 1$, G can forbid X, or refrain from it.

5. F determines private investment in infrastructure I_F, complementing I_G. Payoffs materialize.

Again, we are looking for a subgame-perfect Nash equilibrium. Stage 5, where F decides about I_F, is similar to stage 3 in Game 3: whatever happened on stages 1-4, F maximizes its payoff in stage 5 by setting $I_F = \hat{I}_F$.

At stage 4, G knows the Nash equilibrium of stage 5: F will fulfill its contractual obligations. Therefore, G can safely forbid X, which would create a large disutility, otherwise.

[6] Assume that F has already developed X elsewhere and could launch it with little effort in the country we model.

At stage 3, F knows that X would be forbidden at stage 4 if F chooses $a = 1$. Hence, F cannot get any benefit from X in this game. However, because $a = 1$ comes at cost ξ, F is better off setting $a = 0$, stopping political ambitions, and concentrating on their business activities.

Because all of this is common knowledge, implying that the new parts in Game 4 do not affect the equilibrium outcome, both stages 1 and 2 are identical to these stages in Game 3. Consequently, Lemmas 3 and 4 hold in Game 4, too. It follows without formal proof:

Lemma 5. *In the unique subgame-perfect equilibrium of Game 4, G contracts F to supply a share* $\frac{\hat{I}_F}{I_P} = \frac{1}{(1+\tau)}$ *of total investment* I_P*. G produces a share* $\frac{I_G^*}{I_P} = \frac{\tau}{(1+\tau)}$ *itself. F refrains from launching* X $(a = 0)$*. Hence, there is nothing to forbid for G (but G would forbid* X *off equilibrium). Finally, F produces* $I_F = \hat{I}_F$*, in line with the contract.*

3.5 An interlude

The essence of Lemma 5 is that, if the firm has political ambitions that run counter to the government's, as long as the government is able to effectively forbid X, the owner of F will be weaker than G and has to drop their political ambitions. The business relationship, where G sources out a significant share of public infrastructure investments to F, is not hurt, however. Both parties keep their contractual obligations and cooperate in serving a large part of the population.

For the firm owner, Lemma 5 is sobering. It confirms the traditional, long-term division of influence spheres — economic vs. political — that we have seen in liberal democracies, by and large, for a long time. What could F do to change this?

One way would be trying to reduce the government's enforcement abilities such that a decision of G to forbid X would be less effective. This could work via legally appealing against a prohibition decision, for instance, or by depriving G of access to law enforcement resources. The latter could work, for instance, if G is the federal government in a federal state and law enforcement is organized at the state level (and the governor of one state is sympathetic to F's political ambitions). As many other alternatives, these solutions to F's problem are based on legal or political actions.

Here, we want to take a different route and will employ insights from the economics of institutions and organizations to show F a way how and under which circumstances X can be launched in equilibrium.[7] The starting point is an application of the theory of repeated games: can F launch X in equilibrium if we repeat Game 4 n times?

In this case, Game 4 would be the $1+n$th-period game of a supergame, in which Game 4 is played $1+n$ times by G and F. As the supergame ends after this final round, its subgame-perfect equilibrium is the same as in Lemma 5: F will not launch X in period $1+n$.

In period n, the players know that SPE of period $1+n$. Crucial for the argumentation, they know that in the final stage of the final period, independent of all earlier announcements, F will produce $I_F = \hat{I}_F$, as contracted, because it maximizes F's profit. Hence, F has neither threat potential to hurt G by playing $I_F \neq \hat{I}_F$ in period $1+n$ nor in period n. This final-round effect actually leads to complete unraveling (or breakdown) of any strategy of F that contains the idea to punish G by producing $I_F \neq \hat{I}_F$ as a reaction to the prohibition of X. Independent of the number of repetitions n (and as long as we refrain from introducing behavioral constraints like forgetting or cognitive constraints), F cannot establish X in equilibrium as long as both players know n, n is finite, and they know that they will play the full supergame.

Of course, as elaborated on in Ellingsen (2024) in different contexts, F's problem is that n is finite and, therefore, the final round is known, which gives rise to the final-round effect. However, what if the players repeat their play indefinitely, which can be modeled as an infinitely repeated game?[8]

3.6 Game 5: The infinitely repeated political economy game

The game is the same as in Game 4, but the sequence of 5 stages is repeated infinitely many times. We are looking for a subgame-perfect equilibrium in which F establishes X and G does not forbid it. Consider the following strategy profiles of F and G, respectively.

Strategy F*:

- In period $t = 1$,
  - at stage 1, F contractually promises to supply capacity $\hat{I}_F = \frac{1}{1+\tau} I_P$.
  - At stage 3, if G produced $I_G = \frac{\tau}{1+\tau} I_P$, F establishes X. Otherwise, X is not established.

[7] See Prüfer (2024) for an overview of the field of economic governance, which is relevant here. Ellingsen (2024) offers a very accessible introduction at undergraduate course level. Both authors rely on the work of Dixit (2003a,b, 2004, 2009).

[8] Think of a probability σ, with which the game ends exogenously after any repetition and then let $\sigma \to 0$, which saves us one parameter.

- At stage 5, if G did not forbid X, F produces $I_F = \hat{I}_F$; if G forbade X, F produces $I_F = 0$.

- In any period $t > 1$,
  - at stage 1, if F always set $I_F = 0$ following the prohibition of X in an earlier period $\underline{t} < t$, F contracts to supply capacity $\hat{I}_F = \frac{1}{1+\tau} I_P$. Otherwise, contract $\hat{I}_F = 0$.
  - At stage 3, if G just produced $I_G = \frac{\tau}{1+\tau} I_P$ and if F always set $I_F = 0$ following the prohibition of X in an earlier period $\underline{t} < t$, F establishes X. Otherwise, X is not established.
  - At stage 5, if F always set $I_F = 0$ following the prohibition of X in an earlier period $\underline{t} < t$ and if G did not forbid X in period t, F produces $I_F = \hat{I}_F$. Otherwise, F produces $I_F = 0$.

Strategy $\mathbf{G}^*$:

- In period $t = 1$,
  - at stage 2, if F promised to produce $\hat{I}_F = \frac{1}{1+\tau} I_P$, produce $I_G = \frac{\tau}{1+\tau} I_P$. Otherwise, produce $I_G = I_P$.
  - At stage 4, if F promised to produce $\hat{I}_F = \frac{1}{1+\tau} I_P$, do not forbid X. Otherwise, forbid X.

- In any period $t > 1$,
  - at stage 2, if F always set $I_F = 0$ following the prohibition of X in an earlier period $\underline{t} < t$ and if F promised to produce $\hat{I}_F = \frac{1}{1+\tau} I_P$ in period t, produce $I_G = \frac{\tau}{1+\tau} I_P$. Otherwise, produce $I_G = I_P$.
  - At stage 4, if F always set $I_F = 0$ following the prohibition of X in an earlier period $\underline{t} < t$ and if F promised to produce $\hat{I}_F = \frac{1}{1+\tau} I_P$ in period t, do not forbid X. Otherwise, forbid X.

Now we need to show under which circumstances the strategy profile $(\mathbf{F}^*, \mathbf{G}^*)$ constitutes a subgame-perfect equilibrium.[9]

[9] An infinitely repeated game with 5 stages has multiple SPEs. The purpose of this paper is *not* to show that the equilibrium is unique but rather the conditions under which X is established and not forbidden at equilibrium.

Consider stage 5 of some period t. If both players played $(\mathbf{F}^*, \mathbf{G}^*)$ until now, it implies that F established X and G did not forbid X this period. Then, F is supposed to set $I_F = \hat{I}_F = \frac{1}{1+\tau} I_P$, which creates $\pi_F(\hat{I}_F) > 0$. On top, F enjoys utility $X - \xi$. This is the highest per-period payoff that F can hope to generate. Hence, F has no incentive to deviate from strategy $\mathbf{F}^*$.

By contrast, assume that G just forbade X, deviating from Strategy $\mathbf{G}^*$. Hence, the question is whether it is incentive compatible for F to produce $I_F = 0$, as specified by Strategy $\mathbf{F}^*$. If F produces $I_F = 0$, they expect zero business profit and no political payoff, as X was forbidden, from period t. However, playing $I_F = 0$ brings F back on the equilibrium path because of the one-stage deviation principle (Fudenberg and Tirole, 1991): from period $t+1$ onward, they expect $\pi_F(\hat{I}_F) > 0$ and political utility $X - \xi$. By contrast, if F produces $I_F = \hat{I}_F = \frac{1}{1+\tau} I_P$, F makes $\pi_F(\hat{I}_F) > 0$ in period t. However, this would trigger G to build public infrastructure up to I_P as of period $t+1$, according to Strategy $\mathbf{G}^*$. Therefore, F could not expect any profits in the future. Moreover, G would then also forbid X in every period $\bar{t} > t$, costing F all political payoffs in the future.

Lemma 6. *Denote F's minimum discount factor needed to make setting $I_F = 0$ incentive compatible by $\underline{\delta}_F$. Then (a) $\underline{\delta}_F \in (0, \frac{1}{2})$. (b) F is more likely to set $I_F = 0$ following the prohibition of X if F is more patient (high δ), or the net political payoff $(X - \xi)$ is high, or the governance parameter γ is low, or if the firm is very efficient (low τ).*

Proof: see Appendix B.

At stage 4 of any period t, the question is whether G is better off forbidding X (assuming it is established), or not. If both players have followed the strategy profile $(\mathbf{F}^*, \mathbf{G}^*)$, then G is supposed to not forbid X. If G indeed does not forbid X, they expect that F produces $I_F = \hat{I}_F = \frac{1}{1+\tau} I_P$ and that, consequently, G gets payoff $\pi_G(I_G^*, \hat{I}_F)$ in t, which implies low investment costs and low political damage. However, G is to suffer from X's establishment then. G would expect the same payoff in every future period.

By contrast, if G forbids X in period t, they expect that F produces $I_F = 0$ at stage 5, leading to high political damage $P(D - I_G^*)$ for G in t. As of $t+1$, returning on the equilibrium path of Strategy $\mathbf{G}^*$, G would produce $I_G^* = \frac{\tau}{1+\tau} I_P$, not forbid X, and expect F to produce $I_F = \hat{I}_F$.

Summarizing, G will *not* forbid X if, and only if:

$$\begin{aligned}
\frac{1}{1-\delta}(\pi_G(I_G^*,\hat{I}_F)-\rho X) &\geq \pi_G(I_G^*,I_F=0)+\frac{\delta}{1-\delta}(\pi_G(I_G^*,\hat{I}_F)-\rho X) && (5)\\
\Leftrightarrow \pi_G(I_G^*,\hat{I}_F)-\pi_G(I_G^*,I_F=0) &\geq \rho X && (6)
\end{aligned}$$

In words: G will not forbid X if the additional utility G obtains from F's co-financing of public infrastructure is higher than the societal damage X creates. Thereby, **the LHS of (6) serves as a measure of F's economic power, which serves as an upper bound on F's political power, expressed by the RHS of (6).**

Example: For $c(I)=I^2$, recall that $I_G^*=\frac{\tau}{1+\tau}I_P=\frac{\tau}{1+\tau}\frac{(1+\gamma)}{2}$. It follows that:

$$\begin{aligned}
\pi_G(I_G^*,I_F=0) &= \frac{\tau}{1+\tau}\frac{(1+\gamma)}{2}-\left(\frac{\tau}{1+\tau}\frac{(1+\gamma)}{2}\right)^2-\gamma\left(D-\frac{\tau}{1+\tau}\frac{(1+\gamma)}{2}\right) && (7)\\
&= \frac{\tau}{1+\tau}\frac{(1+\gamma)^2}{2}-\left(\frac{\tau}{1+\tau}\frac{(1+\gamma)}{2}\right)^2-\gamma D && (8)\\
&= \frac{\tau(2+\tau)}{(1+\tau)^2}\frac{(1+\gamma)^2}{4}-\gamma D && (9)
\end{aligned}$$

Consequently, we have:

$$\begin{aligned}
\pi_G(I_G^*,\hat{I}_F)-\pi_G(I_G^*,I_F=0) &= \left(\frac{(1+\gamma)^2}{4}\left(1+\frac{1}{(1+\tau)^2}\right)-\gamma D\right)-\left(\frac{\tau(2+\tau)}{(1+\tau)^2}\frac{(1+\gamma)^2}{4}-\gamma D\right) && (10)\\
&= \left(\frac{(1+\gamma)^2}{4}\left(\frac{2+2\tau+\tau^2-(\tau(2+\tau))}{(1+\tau)^2}\right)\right) && (11)\\
&= \frac{(1+\gamma)^2}{2(1+\tau)^2} && (12)
\end{aligned}$$

Using (12), G's Incentive-Compatibility Constraint to not forbid X, equation (6), becomes

$$\frac{(1+\gamma)^2}{2(1+\tau)^2}\geq \rho X. \qquad (13)$$

Lemma 7. *(a) G's equilibrium decision to forbid X, or not, is independent of δ. (b) G is more likely to allow X if the societal damage ρX is small, or if the governance parameter γ is high, or if the firm is very efficient (low τ).*

Proof: see Appendix B.

When deciding about the prohibition of X, the government trades off the additional gain from F's cooperation in partly supplying public infrastructure, which allows G to spend budget on other means and saves it political damage, against the damage inflicted by X.[10]

Proceeding to stage 3, F decides whether to establish X, or not. The strategies $(\mathbf{F}^*, \mathbf{G}^*)$ prescribe that any deviation from the equilibrium path have to be punished immediately: if, in $t-1$, F only produced $I_F = 0$ despite X was not forbidden, or if F produced $I_F = \hat{I}_F$ despite X was indeed forbidden, then F is supposed to not establish X. This is clearly incentive-compatible as G would forbid X in this case, leaving F with establishment cost ξ. By contrast, if nobody deviated from the strategy pair $(\mathbf{F}^*, \mathbf{G}^*)$, F is better off establishing X — and producing $I_F = \hat{I}_F$ at stage 5 — and thereby reaching its highest possible payoff.

For stages 2 and 1, we analyze incentives of G and F to deviate from strategies $(\mathbf{F}^*, \mathbf{G}^*)$ in the appendix and find the following two lemmas.

Lemma 8. *G has no incentive to deviate from strategy $\mathbf{G}^*$ at stage 2.*

Lemma 9. *F has no incentive to deviate from strategy $\mathbf{F}^*$ at stage 1.*

Now we can summarize lemmas 6 to 9 in Proposition 1.

Proposition 1. *The strategy profile $(\mathbf{F}^*, \mathbf{G}^*)$ constitutes a subgame-perfect Nash equilibrium of Game 5.*

Proposition 1 applies the insight that an infinitely repeated game can establish "cooperation" by two players even if each player has a myopic incentive to "not cooperate."[11] Crucially, "cooperation" in Game 5 implies that the firm uses its superior technology and helps the government to supply public infrastructure up to the level preferred by the government (for both economic and political reasons). The government, in exchange, does not forbid the political activity X of the firm, despite the fact that it leads to societal damage. We explore the long-term consequences of this acceptance for the stability of democracy in Section 4.

This equilibrium is achieved by a carefully designed strategy combination, here $(\mathbf{F}^*, \mathbf{G}^*)$, which makes sure that each deviation from the foreseen equilibrium path is met with immediate punishment but that both players can return to the equilibrium play quickly again.

[10] Note that, because the strategy pair $(\mathbf{F}^*, \mathbf{G}^*)$ is formulated such that the parties immediately return on the equilibrium path after a one-time defection and one-time punishment for the defection, G's expected future payoffs, in all periods $\bar{t} > t$, are identical with and without prohibition of X. An alternative formulation of strategy $\mathbf{G}^*$ could entail that cooperation between F and G breaks down forever after a one-time defection, e.g., if G forbids X. In this case, on top of the trade-off contained in (6), G would have to produce I_P itself in all future periods, which reduces its payoff from forbidding X even more (see Lemma 4.(b)). Therefore, the current formulation of strategies $(\mathbf{F}^*, \mathbf{G}^*)$ makes it relatively hard for G to forbid X, which means it is conservative.

[11] See Mailath and Samuelson (2006).

This is particularly true for the firm: as found in Game 4, if G forbade X, F does not like it but is still tempted to increase public infrastructure provision to $\hat{I}_F = \frac{1}{1+\tau} I_P$ at stage 5, simply because that maximizes F's profits in period t. If G expects this, however, G will forbid X, which is a pure nuisance to G. Hence, F must find a way to tie its hands such that it surely punishes the prohibition of X by producing $I_F = 0$, even if it costs profits. That trick is achieved by the strategy profile $(\mathbf{F}^*, \mathbf{G}^*)$ because it specifies that any unwarranted prohibition of X must be met with F's setting of $I_F = 0$; otherwise, the equilibrium breaks down, which implies for F eternal prohibition of X and the foreclosure of the infrastructure market. Because F wants to avoid that, as Lemma 6 shows, F punishes the prohibition of X indeed as long as its political payoff is high enough, the country's governance is less democratic, if F's technology to produce public infrastructure is way more efficient than G's, or if F has a long-term horizon.

In turn, the government loves to have F help it with the provision of infrastructure because (i) it saves G the cost of governmental provision of infrastructure (and F is more efficient in it) and hence enables G to spend its limited budget on other policy priorities. (ii) it saves G some political damage from unhappy voters, which would materialize if G just produced less infrastructure than I_P. As Lemma 7 shows, G is more motivated to accept X if the societal damage done through X is small or if the firm's efficiency advantage over G is high, or if the government is very dependent on voters' goodwill in the next elections.

The following table summarizes equilibrium investments in public infrastructure by G and F (where applicable) as well as equilibrium payoffs, for the example where $c_G(I_G) = I_G^2$, $c_F(I_F) = \tau I_F^2$ and $D = 1$. For Game 5, it considers the "cooperative" equilibrium, where G accepts that F establishes X under the conditions specified in equation (6).

	$\mathbf{I_G}$	$\mathbf{I_F}$	$\pi_\mathbf{G}$	$\pi_\mathbf{F}$
Game 1	$1/2$	n.a.	$1/2 - 1/4 = 1/4$	n.a.
Game 2	$I_P = \frac{1+\gamma}{2}$	n.a.	$\frac{(1-\gamma)^2}{4}$	n.a.
Game 3	$\frac{\tau}{1+\tau} I_P = \frac{(1+\gamma)\tau}{2(1+\tau)}$	$\frac{1}{1+\tau} I_P = \frac{1+\gamma}{2(1+\tau)}$	$\frac{(1-\gamma)^2}{4} + \frac{(1+\gamma)^2}{4} \frac{1}{(1+\tau)^2}$	$\frac{(1+\gamma)^2}{4} \frac{\tau}{1+\tau}$
Game 4	$\frac{\tau}{1+\tau} I_P = \frac{(1+\gamma)\tau}{2(1+\tau)}$	$\frac{1}{1+\tau} I_P = \frac{1+\gamma}{2(1+\tau)}$	$\frac{(1-\gamma)^2}{4} + \frac{(1+\gamma)^2}{4} \frac{1}{(1+\tau)^2}$	$\frac{(1+\gamma)^2}{4} \frac{\tau}{1+\tau}$
Game 5	$\frac{\tau}{1+\tau} I_P = \frac{(1+\gamma)\tau}{2(1+\tau)}$	$\frac{1}{1+\tau} I_P = \frac{1+\gamma}{2(1+\tau)}$	$\frac{(1-\gamma)^2}{4} + \frac{(1+\gamma)^2}{4} \frac{1}{(1+\tau)^2} - \rho X$	$\frac{(1+\gamma)^2}{4} \frac{\tau}{1+\tau} + X - \xi$

Table 1: Equilibrium investments & payoffs in EXAMPLE: $c_G(I_G) = I_G^2$, $c_F(I_F) = \tau I_F^2, D = 1$.

Table 1 shows that G benefits from F's co-investment in public infrastructure as long as F only focuses on business profits: π_G is larger in Games 3 and 4 than in Game 2. However, if F has political motives and enough economic power to make G accept the establishment of X, as in Game 5 under the condition specified in equation (6), π_G decreases, whereas π_F increases, as compared to Game 4.

3.7 Implications of the Baseline Model

Governance and technological efficiency: Using the language introduced above, F's economic power, which determines the upper bound of F's political power, increases the more G depends on the population's goodwill and the more efficient F's technological advantage is over G's in-house production. This suggests that F's political power is larger in well functioning liberal democracies and if F uses a very innovative and efficient technology to provide infrastructure. Most digital technologies, which are subject to tremendous economies of scale and, sometimes, economies of scope, as well as network effects, learning-curve effects (=dynamic economies of scale), and switching costs fall into this category. See Basihos (2025) for supportive empirics.

G's binding budget constraint: Equation (6) shows that F's economic power—and hence political power— increases in the payoff it can generate for G through co-investing in public infrastructure. If G's budget B were binding, the logic behind Lemma 3 would dictate that F supplies a relatively larger share of total infrastructure investment. Consequently, F's economic power—and political power—would increase. This is especially prevalent in times of economic crisis or in times of war or in poor or developing countries.

F's strategic actions outside of the game: The same logic, captured by the expression $\pi_G(I_G^*, \hat{I}_F) - \pi_G(I_G^*, I_F = 0)$ in (6), suggests that, if F is very rich (and if we assume diminishing marginal utility from wealth such that the cost $c_F(I_F)$ is not very important in F's payoff maximization considerations, as compared to the political payoff from X), F has an incentive to increase I_F even beyond the level $\frac{1}{(1+\tau)}$ of total investment I_P that is productively efficient, given G's objectives (see Lemma 5). Therefore, we can expect that very rich investors or those with strong political/non-economic motives use their resources to first increase their level of public infrastructure investment, which then increases the level of societal damage (ρX) the government would accept in order not to lose those private infrastructure investments. This increases these persons' political power.

4 Endogenous Democratic Erosion

4.1 Model Setup and Dynamics

The baseline model treats the governance parameter γ as exogenous, representing the degree to which governments depend on electoral accountability. However, when platforms like X operate with harmful political content — spreading misinformation, polarizing discourse, undermining institutional trust — they erode the very democratic fabric making governments responsive to citizens. This section extends Game 5 to allow γ to evolve endogenously over time, creating feedback loops between the operation of harmful platforms and democratic quality.

Let γ_t denote the governance parameter in period t, where:

$$\gamma_{t+1} = \gamma_t - h(\gamma_t) \cdot \mathbb{1}_{X \text{ operates in } t}, \tag{14}$$

$\mathbb{1}_{X \text{ operates in } t}$ is an indicator function equal to 1 if X is established and not forbidden in period t, and $h(\gamma_t)$ is a damage function that determines the magnitude of democratic erosion.[12] Following Marshall (2022), we specify:

$$h(\gamma_t) = \gamma_t(1 - \gamma_t) \tag{15}$$

This inverted-U specification captures three critical features. When γ_t is small (already autocratic), there is little democracy left to erode: $h(\gamma_t) \approx 0$. When γ_t is large (strong democracy with robust institutions), erosion is limited by institutional resilience: $h(\gamma_t) \approx 0$ Maximum erosion occurs at midlevel values of γ_t, representing vulnerable intermediate regimes, where democratic institutions exist but lack deep roots.[13]

On the other hand, the operation of X not only affects the level of democracy (and, hence, G's exposure to voters' satisfaction), but also how much G values the societal damage created by the operation of X. Specifically, assume that $\rho(\gamma_t)$ is continuously differentiable with $\rho'(\gamma_t) > 0$ for all $\gamma \in [0, 1]$. That is, if the level of democracy deteriorates, G will care less about societal

[12]The operation of X damages democracy through multiple channels documented in the empirical literature. By amplifying divisive content, X increases negative partisanship, letting citizens prefer defeating opponents over democratic accountability (Iyengar et al., 2019). During autocratization episodes, governments systematically undermine courts, electoral management bodies, and free press (Maerz et al., 2020). Social media platforms can amplify these processes by facilitating the spread of harmful content that undermines trust in institutions (Altay et al., 2025; Parr, 2025).

[13]This inverted-U specification is consistent with empirical evidence showing that hybrid regimes face highest risk of instability, civil war, and democratic breakdown (Hegre et al., 2001; Marshall, 2022).

damage.[14]

4.2 Equilibrium Analysis with Endogenous γ_t

We now analyze how endogenous erosion affects the equilibrium characterized in Proposition 1. Recall that G tolerates X if, and only if, $\Delta G \equiv \pi_G(I_G^*, \hat{I}_F) - \pi_G(I_G^*, 0) \geq \rho X$, where we found for the parametric example with $c_G(I_G) = I_G^2$, that $\Delta G = \frac{(1+\gamma_t)^2}{2(1+\tau)^2}$. This benefit of G (=economic power of F) is increasing in γ_t: higher democratic responsiveness increases G's need for F's infrastructure provision to avoid political damage from unserved demand. However, equation (14) implies that, if G tolerates X, then $\gamma_{t+1} < \gamma_t$.

Proposition 2 (Democratic Erosion with Endogenous $\rho(\gamma)$). *Define:*

$$L(\gamma) \equiv \frac{(1+\gamma)^2}{2(1+\tau)^2}, \qquad R(\gamma) \equiv \rho(\gamma)\, X. \tag{16}$$

Government G tolerates X in period t if, and only if, $L(\gamma_t) \geq R(\gamma_t)$. Suppose initially at full democracy, G tolerates X: $L(1) \geq R(1)$. As democracy erodes under X (with $\gamma_{t+1} = \gamma_t - h(\gamma_t)$ and $h(\gamma_t) > 0$ for $\gamma_t \in (0,1)$), two regimes are possible:

(i): Interior backstop (partial erosion): If there exists $\gamma^* \in (0,1)$ such that $L(\gamma^*) = R(\gamma^*)$ and

$$\frac{1+\gamma^*}{(1+\tau)^2} > \rho'(\gamma^*)\, X, \tag{17}$$

then $L(\gamma) \geq R(\gamma)$ for all $\gamma \in (\gamma^*, 1]$ and $L(\gamma) < R(\gamma)$ for all $\gamma \in [0, \gamma^*)$. Starting from $\gamma_0 = 1$, democracy erodes under X until reaching γ^*, at which point (6) *fails, G forbids X, and erosion stops. The unique steady state is $\gamma^* > 0$.*

(ii): Full collapse (no backstop): If $L(\gamma) \geq R(\gamma)$ for all $\gamma \in [0,1]$, then G always tolerates X regardless of the democracy level. Starting from $\gamma_0 = 1$, democracy monotonically declines to the unique steady state $\gamma^* = 0$.

(iii) Inequality (17) *determines which regime obtains. Case (i) occurs when $L(\gamma)$ deteriorates* faster *than $R(\gamma)$ as democracy erodes (i.e., the derivative $L'(\gamma)$ exceeds $R'(\gamma)$ at the crossing point), such that the tolerance condition eventually fails at some interior $\gamma^* > 0$. Case (ii)*

[14] This is in line with evidence showing that, as democratic quality rises, governments allocate more resources to avoid diffuse harms (pollution, mortality, disaster losses). E.g., von Stein (2022) finds that electoral accountability and civil liberties are positively associated with environmental protection outcomes.

occurs when $R(\gamma)$ deteriorates at least as fast as $L(\gamma)$, such that the government continues to tolerate X all the way to $\gamma = 0$.

Proof in Appendix B.

Proposition 2 characterizes a self-reinforcing erosion dynamic. Starting from a strong democracy with $\gamma_1 > \gamma^*$, government G initially tolerates platform X because F's infrastructure co-investment generates benefits exceeding the societal harm ($\Delta\pi_G > \rho(\gamma_1)X$). However, operating X degrades democratic institutions, reducing γ_t over time via equation (14). This erosion has a mechanical effect: lower γ_t reduces G's dependence on citizen approval, which in turn reduces $\Delta\pi_G$, the value G places on F's infrastructure cooperation—or *F's economic power.*

More critically, as γ_t declines, the government's concern for societal damage from X, $\rho(\gamma_t)$, also declines (since $\rho'(\gamma) > 0$). The tolerance condition becomes increasingly difficult to satisfy: the left-hand side, $L(\gamma_t) = \Delta\pi_G$, shrinks as democracy erodes, while the right-hand side, $R(\gamma_t) = \rho(\gamma_t)X$, also shrinks, but at different rates. Whether G ever reaches the point of forbidding X depends on which side deteriorates faster.

In regime (i), if $L(\gamma)$ deteriorates faster than $R(\gamma)$ as democracy erodes, i.e., condition (17) holds at the crossing point, then eventually, at period T^*, γ_t falls below the critical threshold γ^*, where $\frac{(1+\gamma_{T^*})^2}{2(1+\tau)^2} < \rho(\gamma_{T^*})X$. At this point, G's incentive constraint (6) is violated: the benefit from infrastructure cooperation no longer justifies tolerating X's societal harm. G forbids X at stage 4, triggering F's punishment (permanent withdrawal from infrastructure provision per equilibrium strategy $\mathbf{F}^*$). Both players transition to autarky, where G produces all public infrastructure itself, and erosion stops at the interior steady state γ^*.

In regime (ii), if $R(\gamma)$ deteriorates at least as fast as $L(\gamma)$ as democracy erodes, i.e., if $L(\gamma) \geq R(\gamma)$ for all $\gamma \in [0, 1]$, then the tolerance condition is never violated. Even as G's concern for societal harm diminishes with declining democracy, G's democratic accountability deteriorates proportionally or faster. G continues to tolerate X indefinitely, and democracy monotonically erodes all the way to $\gamma^* = 0$: complete autocracy with no institutional backstop.

Crucially, both regimes differ fundamentally from the stationary SPE in Game 5, where either X operates but does not damage democracy (and, hence, is tolerated forever) or X is forbidden (and F cannot do anything about it as its punishment threat, to withdraw its co-investment in infrastructure, is less damaging to G than accepting X). In both Game-5 cases, F co-invests in infrastructure and the mutually beneficial pure business relationship between G and F prevails, as studied in Game 3.

In the dynamic game under regimes (i) and (ii), by the time G forbids X (if ever), significant democratic damage has occurred (in regime (i), γ has declined from γ_0 to γ^*; in regime (ii), it erodes all the way to zero), and the beneficial cooperation equilibrium has either collapsed into autarky or deteriorated into full autocracy. Given the hump-shaped damage function $h(\gamma_t)$, erosion should occur quickest in hybrid regimes somewhere between well-functioning democracies and autocracies with little-accountable leaders. This finding aligns with empirical observations of democratic backsliding, namely that autocratization typically occurs gradually (Maerz et al., 2020). V-Dem data show that among countries experiencing significant democratic decline between 2006-2016, few stabilized at intermediate levels; most either reversed course through active resistance or continued deteriorating (Coppedge et al., 2017). Proposition 2 formalizes this dichotomy: without sufficiently strong institutional or civil society interventions to alter $\rho(\gamma)$ or $L(\gamma)$, democracies face either partial or complete collapse under harmful platform pressure.

4.3 Policy Interventions to Counter Democratic Erosion

Given the inevitability of erosion absent intervention, we now analyze two policy levers that G can deploy to counteract democratic decay.

Intervention 1: Public Media Investment Following Kerkhof and Münster (2023), who show that public service media can mitigate commercial media bias through strategic complementarities, assume that G can invest in independent information infrastructure $M_G \in [0, \overline{M}]$, where $\overline{M}$ represents the maximum feasible public media budget, which competes with X for media audience. This modifies G's payoff, if X operates, to:

$$\pi_G = I_P - c_G(I_G^*) - c_F'(\hat{I}_F)\hat{I}_F - P(I_P) - \rho(\gamma_t)X + \theta M_G - c_M(M_G), \tag{18}$$

where the final two terms are novel. θM_G captures how much public media reduces X's damage, where $\theta > 0$ measures the effectiveness of public media by providing reliable information, fostering civic discourse, and exposing government malfeasance. $c_M(M_G)$ is the cost of public media provision, with $c_M'(M_G) > 0$ and $c_M''(M_G) > 0$ (convex costs). Public media investment modifies erosion dynamics as follows:

$$\gamma_{t+1} = \gamma_t - \kappa h(\gamma_t) \cdot \mathbb{1}_{X \text{ operates}} + \theta M_G, \tag{19}$$

where $\kappa > 0$ scales the damage intensity of X.

Equation (18) implies that investing in M_G has both a direct and an indirect effect. The *direct effect* runs through θ (immediate reduction in harm from X). The *indirect effect* operates through γ_{t+1}: by equation (19), higher M_G today increases democratic quality tomorrow, which reduces future societal costs $\rho(\gamma_{t+1})X$. Accounting for both effects yields the following proposition.

Proposition 3 (Optimal Public Media Investment)**.** *Define the dynamic multiplier:*

$$\Phi(\gamma_{t+1}, \delta) \equiv 1 + \delta\rho'(\gamma_{t+1})X > 1. \tag{20}$$

The optimal public media investment M_G^* is characterized as follows:

(i) If there exists $M_G^* \in (0, \overline{M})$ satisfying

$$\theta \cdot \Phi(\gamma_{t+1}, \delta) = c_M'(M_G^*), \tag{21}$$

then G invests M_G^*. In this case, $\frac{\partial M_G^*}{\partial \theta} > 0$, $\frac{\partial M_G^*}{\partial \delta} > 0$, $\frac{\partial M_G^*}{\partial X} > 0$.

(ii) If

$$\theta \cdot \Phi(\gamma_{t+1}, \delta) > c_M'(\overline{M}), \tag{22}$$

then G invests the maximum feasible amount: $M_G^* = \overline{M}$.

(iii) If $\theta \cdot \Phi(\gamma_{t+1}, \delta) < c_M'(0)$, then $M_G^* = 0$.

The dynamic multiplier $\Phi > 1$ captures the amplification of public media's value: by strengthening democratic institutions today, M_G reduces future tolerance for societal harm, creating a virtuous cycle. This amplification is strongest if public media is very effective (high θ), for patient governments (high δ) and when platform harm is severe (high X).

The next question is, what are the effects for democracy if G invests in public media.

Proposition 4 (Stabilization through Public Media)**.** *Let M_G^* denote the optimal public media investment characterized by Proposition 3. Then:*

(i) An interior steady state $\gamma_M^{ss} \in (0,1)$ with public media exists if, and only if:

$$\theta M_G^* < \kappa \cdot \max_{\gamma \in [0,1]} h(\gamma) = \frac{\kappa}{4}. \tag{23}$$

If this condition holds, the steady state is:

$$\gamma_M^{ss} = \frac{1 - \sqrt{1 - \frac{4\theta M_G^*}{\kappa}}}{2}. \tag{24}$$

(ii) Without public media investment ($M_G = 0$), the economy converges to γ^* (see Proposition 2). With optimal investment $M_G^* > 0$, the steady state satisfies $\gamma_M^{ss} > \gamma^*$. Public media prevents complete democratic erosion.

(iii) The steady-state level of democracy γ_M^{ss} is increasing in media effectiveness θ and investment level M_G^* ($\frac{\partial \gamma_M^{ss}}{\partial(\theta M_G^*)} > 0$) and decreasing in erosion intensity κ ($\frac{\partial \gamma_M^{ss}}{\partial \kappa} < 0$).

(iv) Since Proposition 3 shows that M_G^* increases with patience δ and platform harm X, it follows that:

$$\frac{d\gamma_M^{ss}}{d\delta} = \frac{\partial \gamma_M^{ss}}{\partial M_G^*} \cdot \frac{\partial M_G^*}{\partial \delta} > 0, \quad \frac{d\gamma_M^{ss}}{dX} = \frac{\partial \gamma_M^{ss}}{\partial M_G^*} \cdot \frac{\partial M_G^*}{\partial X} > 0. \tag{25}$$

Proof in Appendix B.

The key lesson from Proposition 4 is that investments in public media are a sharp weapon against democratic erosion if a few conditions hold. Public media has both direct and indirect effects on the governance level in a country and that it will be particularly effective if G has a long-term horizon or if technology X is particularly harmful.

Cross-national evidence supports the democracy-preserving role of public media in countering social media's harmful effects. Multiple systematic reviews find that digital media have predominantly negative influences on political processes: they increase polarization, undermine trust in institutions, fuel populist movements, and spread misinformation (Lorenz-Spreen et al., 2023; Max Planck Institute for Human Development, 2025). While social media platforms may not be the root cause of political polarization, they significantly exacerbate it, with consequences including declining trust in institutions, erosion of democratic norms, and political violence (Barrett et al., 2024).

By contrast, public media provide a critical counterweight to these corrosive effects. The

European Broadcasting Union documents strong correlations between public media strength and democratic health: countries with well-funded public media exhibit greater political stability, lower corruption, and higher citizen participation (European Broadcasting Union, 2019). Deane (2016) reports growing evidence that an independent media remains one of society's most effective assets available to curb corruption and to foster accountability. British Academy (2024) summarizes evidence that public service media play a unique democracy-sustaining role in the digital age by providing the population with balanced news coverage, thus combatting misinformation, and that strong democracies with robust public media infrastructure are more resistant to platform harm.

This aligns with Proposition 4: When the stabilization condition (23) is satisfied, i.e., when public media effectiveness is sufficient relative to erosion intensity, an interior democratic steady state $\gamma^{ss} \in (0,1)$ emerges. Countries with stronger public broadcasting achieve higher stable democracy levels (larger γ^{ss}) because their media investment M_G^* is larger, or equivalently, their media effectiveness θ is higher.

Intervention 2: Civil Society Mobilization An alternative intervention draws on Acemoglu and Robinson (2006, 2019)'s emphasis on collective action to constrain elite power. Introduce a civil society actor CS with organizational capacity S_t that can impose reputational costs $\lambda(S_t, X)$ on F for operating harmful content.[15] The firm's per-period payoff becomes:

$$\pi_{F,t} = \pi_F(\hat{I}_F) + X - \xi - \lambda(S_t, X), \tag{26}$$

where $\lambda(S_t, X)$ is increasing in both civil society strength $S_t \geq 0$ (more capacity to organize boycotts, protests, litigation) and the harmfulness of X. Specify:

$$\lambda(S_t, X) = \mu S_t X, \tag{27}$$

where $\mu > 0$ captures the effectiveness of civil society mobilization.

Proposition 5 (Civil Society Backstop)**.** *Suppose G invests $\sigma_{CS,t} > 0$ per period in civil society capacity, and platform X exerts repressive effects $\zeta_t \equiv \zeta(\gamma_t)$ on civil society, where $\zeta'(\gamma) < 0$.*

[15] The empirical evidence overwhelmingly supports that $\lambda(S_t, X)$ increases in both civil society strength and platform harmfulness. Quantified cases include Facebook (`https://www.npr.org/2020/07/01/885853634/big-brands-abandon-facebook-threatening-to-derail-a-70b-advertising-juggernaut`). Baron and Diermeier (2007) identify the mechanisms: reputational threat, stock price declines, boycotts, and regulatory pressure. The costs operate through multiple channels and are amplified by social media.

Civil society strength evolves as:

$$S_{t+1} = S_t + \sigma_{CS,t} - \zeta(\gamma_t) \cdot \mathbb{1}_{X \text{ operates in } t}. \tag{28}$$

Starting from $S_0 = 0$, F ceases operating X if, and only if:

$$S_t \geq \bar{S}(\gamma_t) \equiv \frac{X - \xi}{\mu X}. \tag{29}$$

Assume that X operates in all periods $t \leq T^{CS}$. Then three development paths are possible:

(i) (Civil Society as Saviour): If $\sigma_{CS,t} > \zeta(\gamma_t)$ for all t along the erosion path, S_t grows monotonically and reaches $\bar{S}$ in finite time T^{CS}. F ceases operating X and democratic erosion stops at $\gamma^* = \gamma_{T^{CS}} > 0$.

(ii) (Civil Society Spring): If $\sigma_{CS,1} > \zeta(\gamma_1)$ but $\sigma_{CS,t^*} < \zeta(\gamma_{t^*})$ for some $t^* < T^{CS}$, civil society grows initially but then collapses. Platform X continues operating indefinitely, and the erosion of democracy follows Proposition 2.

(iii) (Civil Society Collapse): If $\sigma_{CS,1} \leq \zeta(\gamma_t)$, civil society never establishes: $S_t = 0$ for all t. Platform X operates without a civil society constraint and erodes democracy as in Proposition 2.

Proposition 5 rationalizes three different development paths of democratic regimes as a consequence of the interplay between a societally harmful platform and civil society activism fighting that harm. There is ample evidence for each of them.

Regime (i) represents sustained government commitment to civil society capacity-building ($\sigma_{CS,t}$) that outpaces platform repression ($\zeta(\gamma_t)$) throughout erosion, eventually forcing firm F to shut down platform X because civil society costs become prohibitive. However, since $\zeta'(\gamma) < 0$, platform repression of civil society intensifies as democracy declines. Maintaining regime (i) requires government to accelerate investment faster than $|\zeta'(\gamma_t)| \cdot |h(\gamma_t)|$ as democracy erodes.[16]

[16] For instance, in the *Stop Hate for Profit* campaign (2020) a coalition of civil rights organizations mobilized over 1,000 companies to pause Facebook advertising, causing an 8% stock drop ($56 billion market value loss) and forcing Facebook to engage in policy discussions (Villagra et al., 2021). This perfectly reflect's the model's key mechanism, where sustained civil society strength ($S_t > \bar{S}$) can impose costs ($\mu S_t X$) on the firm F that make harmful platform operations unprofitable.

Regime (ii) captures a "civil society spring" phenomenon, followed by authoritarian crackdown. Initial government support allows civil society to mobilize and grow organizational capacity. However, as civil society threatens entrenched power, be it corporate or governmental, repression escalates faster than capacity-building can sustain. At some point, civil society collapses before reaching the threshold to stop societal harm. [17]

Regime (iii) represents failed institution-building from the outset: civil society capacity is insufficient to overcome initial repression and no backstop against platform harm materializes. [18]

The key policy implication is that civil society strength alone is insufficient to constrain harmful platforms; it requires continuous, accelerating government support against adaptive repression. In the model, civil society acts as an ally to government G in imposing reputational and economic costs on firm F for operating harmful platform X. Empirically, this corresponds to consumer protection NGOs, digital rights organizations, and advocacy coalitions that mobilize boycotts, litigation, and regulatory pressure against platforms causing societal harm (misinformation, polarization, exploitation). Without complementary interventions, such as public media investment (Proposition 4) to stabilize democracy at higher levels, or international regulatory constraints on platform design, temporary civil society surges may prove unsustainable against escalating repression.

5 Empirical Hypotheses and Evidence

5.1 Empirical hypotheses

Based on the comparative statics effects of the baseline model and dynamic predictions from Section 4, we characterize situations, where firms are **most likely to transform economic**

[17] Tunisia tentatively exemplifies this trajectory. Following the 2011 revolution, Decree Law 88 on Associations enabled a vibrant civil society sector to emerge, with NGOs monitoring government accountability, advocating for democratic institutions, and protecting vulnerable populations (Amnesty International, 2025). However, beginning in 2021, authorities systematically targeted civil society through financial investigations, asset freezes, arbitrary arrests, and court-ordered suspensions. This crackdown coincided with erosion of democratic institutions: Tunisia's V-Dem Liberal Democracy Index declined from 0.58 in 2013 to 0.19 in 2023, illustrating how $\zeta(\gamma_t)$ increases as γ_t falls.

[18] Nicaragua under Daniel Ortega illustrates wholesale civil society suppression. Since 2018, the Ortega regime has closed over 5,000 civil society organizations, media outlets, and universities, including 1,500 NGOs in a single day in August 2024 (Inter-American Commission on Human Rights, 2024; Charity and Security Network, 2024). Organizations were shuttered through asset confiscation, arbitrary arrests of staff, and accusations of "financial crimes" tied to lawful foreign funding (Inter-American Commission on Human Rights, 2024). With $S_t \approx 0$ maintained through systematic repression, civil society cannot impose costs on powerful actors. Democratic erosion proceeds unchecked: Nicaragua's V-Dem Liberal Democracy Index declined from 0.50 in 2007 to 0.10 in 2023, consistent with Proposition 2's prediction of collapse when no civil society backstop exists.

power into political power and affect societal or political decisions in a country. This **likelihood is increased** with each of the following characteristics of a situation holding:

1. The country is a **well developed democracy** with regular elections, such that the current government has the motive to respect citizens' preferences in order to get reelected.

2. The country is **poor** or **highly indebted** and needs financial resources quickly, or there is a **crisis** and the government needs to spend its scarce resources on fighting the (economic/military/health/social, etc.) crisis.

3. The public infrastructure sector in which the firm is investing is an innovative **high-tech industry**, potentially **a digital market**, where the firm's technology is significantly more efficient than governmental in-house production.

4. The firm (or its owner) has **tremendous financial resources**.

5. The firm (or its owner) has **political motives that they weigh strongly against economic motives** at the margin.

6. The firm only has **limited assets in the country** and the **firm's owner does not reside in the country**, such that the country's law enforcement agencies cannot simply get hold of the firm's owner or confiscate crucial assets in case of a dispute.

7. In countries where harmful platforms operate, **democratic quality declines over time**, with faster erosion in regimes with intermediate democracy levels.

8. **Public media investment and civil society mobilization** correlate with **slower democratic erosion rates** in platform-operating countries.

5.2 Evidence

5.2.1 Musk vs Supreme Court of Brazil, revisited

Let us examine the case from the introduction against these empirical hypotheses. A complete account with references is in Appendix A.

In this conflict, Elon Musk, the **richest person on the planet** [characteristic 4], who **resides in the U.S.** [6] and strongly supported an **extremist U.S. Presidential candidate** (2024) [5] defied orders of Brazil's Supreme Court [6]. Brazil has an emerging economy with

“slow-burning’ fiscal problems”[19] [2], ranking 57th of 167 countries with Democracy Index 6.49 (9.58 in “Electoral Process and Pluralism”), above global average[20] [1]. Musk’s **satellite internet provider** Starlink offers significant efficiency advantages over traditional internet, especially in remote areas [3].

Note that G denotes government (executive branch), not the Supreme Court (judiciary). The Court applies law but doesn’t make policy to maximize welfare $W(I)$. However, legislators pass these laws and act on citizens’ behalf to maximize welfare. In *Musk vs Supreme Court of Brazil*, all six characteristics for increased conflict likelihood were fulfilled.

5.2.2 Other cases: Big Tech Firms and Geopolitics

To understand whether *Musk vs Supreme Court of Brazil* is unique, we examine high-profile conflicts where corporations providing public services threatened withdrawal to pressure governments over regulatory disputes.

1. Google and Meta vs Australia (2020–2021): Google and Meta provided news distribution services in Australia via their search engine and social media platforms. The conflict arose when Australia required large technology firms to pay news publishers for their content. In response, Google threatened to block its search engine in Australia, but eventually reached agreements with publishers.[21] Meta (Facebook), on the other hand, temporarily shut down its news service for Australian users as a means of protest.[22]

2. OpenAI vs European Union (2023): OpenAI offers AI tools and research collaborations in Europe. The conflict developed when the European Union introduced strict AI Act regulations. OpenAI’s CEO responded by threatening to withdraw operations from the EU, arguing that the proposed rules were “over-regulatory.”[23] However, OpenAI later backtracked and agreed to comply while further negotiations continued.

3. Elon Musk (Starlink) in Conflict Zones: Elon Musk’s company Starlink provides satellite internet in geopolitically sensitive regions. In Ukraine, Musk considered restricting Starlink access during military operations, raising concerns about private influence on critical

[19] https://foreignpolicy.com/2025/02/10/brazil-fiscalcrisis-real-dollar/.
[20] https://d1qqtien6gys07.cloudfront.net/wp-content/uploads/2025/03/Democracy_INDEX_2024.pdf
[21] https://www.dw.com/en/google-threatens-to-block-australia-from-search-engine/a-56309087
[22] https://www.dw.com/en/meta-drops-facebook-news-tab-for-us-and-australian-users/a-68412518
[23] https://qz.com/sam-altman-openai-chatgpt-rules-backtracks-leave-eu-1850479197

infrastructure.[24] In Gaza, Starlink initially announced it would support connectivity for internationally recognized aid organizations after a communications blackout, but reversed the decision after pressure from the Israeli government.[25]

All these cases involve power imbalances where firms exploit dominance in essential services to resist regulation. The EU's Anti-Coercion Instrument (2023) now provides a legal framework against such corporate coercion.[26]. The cases also share another commonality: the private party is always a "big tech" firm controlling digital frontier technology with vast resources. Is this for a reason?

5.2.3 Examples from Traditional Industries

Similar conflicts arise in traditional industries like water, electricity, and infrastructure, where private companies hold exclusive concessions for vital services.

Water and Energy Utilities: In Orissa, India, electricity provider AES refused critical repairs after a cyclone, arguing costs were incompatible with returns, leaving civilians vulnerable. Studies show private providers exit contracts when profitability is insufficient (Hall and Lobina, 2004).

UK Water Supply: Thames Water's financial troubles and shareholders' refusal to inject equity raised renationalization prospects.[27] Private owners previously threatened disconnection over payment disputes, though UK law now prohibits this.[28]

Ontario Electricity Exports (2025): The Premier of Canadian province Ontario threatened to cut electricity exports to Michigan, Minnesota, and New York (all in the U.S.), imposing 25% surcharge affecting 1.5 million homes in response to U.S. tariffs.[29] U.S. President Trump threatened doubled tariffs in response.[30] Critics warned this could push U.S. states toward alternative suppliers.

[24] https://www.nytimes.com/2023/09/08/world/europe/elon-musk-starlink-ukraine.html
[25] https://www.politico.com/news/2023/10/28/musk-says-starlink-will-support-connectivity-to-aid-organizations-in-gaza-00124090
[26] https://policy.trade.ec.europa.eu/enforcement-and-protection/protecting-against-coercion_en
[27] https://bsic.it/currents-of-change-navigating-uks-privatized-water-utilities/
[28] https://www.dwi.gov.uk/private-water-supplies/local-authorities/local-authorities-case-studies/general/prohibition-of-disconnection-and-securing-the-sufficiency-of-private-supplies/
[29] https://globalnews.ca/news/11074633/how-ontario-cut-off-us-energy/
[30] https://abcnews.go.com/Politics/us-jobs-risk-due-trumps-steel-tariff-dispute/story?id=122494356

5.3 Patterns and Systemic Risks

Conflicts where private providers threaten withdrawal to influence state decisions extend beyond digital platforms to traditional industries, typically during contract renegotiations when profitability is at stake. However, well-documented examples in traditional industries where firms threatened withdrawal for *political motives* unrelated to business interests are virtually nonexistent (World Economic Forum, 2015). Traditional firms almost always have profit maximization as core incentive. Their leverage typically aims to renegotiate contracts, increase tariffs, or avoid regulations—not to influence unrelated political issues (OECD, 2007).

Complementing these cases, state-owned enterprises sometimes serve political purposes (e.g., Russia's Gazprom), but these represent statecraft, not private firms acting independently for non-business political motives.

We conclude that *Musk vs Supreme Court of Brazil* stands out as a highly unusual case, where Musk's stated motive was defending "free speech" rather than securing profits or regulatory concessions. In traditional industries, such behavior is unheard of, as private firms' governance structures are overwhelmingly profit-driven, and shareholders rarely tolerate ideological risks to business.

Moving to the dynamic part, (Piccone, 2017, p. 2-3) demonstrates that "countries whose political institutions are more amorphous—or bear characteristics of both autocracy and democracy—are more likely to see the emergence" of crises, where "the likelihood of a country entering internal conflict is low initially [in full autocracies], and then rises among hybrid regimes at the center of the graph before dropping again for consolidated democracies." Similarly, (Kenyon, 2024, p. 7) finds robust evidence of an inverted U-shaped relationship between policy uncertainty and political regime type, with hybrid regimes experiencing maximum volatility. This pattern, where intermediate regimes ("anocracies," "hybrid regimes," "grey zone" countries) experience fastest democratic erosion, directly supports our model's prediction that platform-induced harm peaks in countries with intermediate γ-values.

The V-Dem Institute's research on democratic resilience identifies *civil society robustness* as a critical protective factor, with their Core Civil Society Index (CCSI) showing that "the more robust a civil society, the higher the capacity for vertical accountability ... and critical support of the state by society" (Croissant and Ruth, 2024, p. 12). (Nord et al., 2024, p. 2) concludes that *societal collective action* including *civil society initiatives to detect disinformation ... and mass pro-democracy protests* are among the key factors behind U-turns that halt autocratization.

These findings align with our theoretical predictions: platforms operating harmful content (X) accelerate erosion especially in intermediate regimes (H7), while public media investment and civil society mobilization provide countervailing forces slowing this erosion (H8).

6 Conclusion and Policy Implications

The 2024 conflict between Elon Musk and Brazil's Supreme Court got this project started: can a private firm's disregard for the highest court's order be rationally explained? Yet this paper reveals a deeper, more alarming phenomenon. Infrastructure provision is merely one pathway through which firms can coerce governments into tolerating societally harmful activities. Once established, such activities trigger a self-reinforcing democratic erosion spiral that paradoxically can even increase government tolerance, making prevention before the establishment of such activities critical.

Our baseline model establishes that and how private firms can transform economic power into political power when two conditions hold: (i) the firm's infrastructure co-investment generates irreplaceable value to government (if citizens hold the government accountable for unserved inelastic demand); (ii) government and firm interact repeatedly, making withdrawal threats credible. Under these conditions, we show that governments tolerate societal damage from the firm's political objectives to preserve the firm's infrastructure co-investments, freeing governmental resources for other purposes.

The Brazil case exhibits all facilitating factors for such coercion: a well-functioning democracy, the firm's technological advantage, wealth enabling political motivation misaligned with public preferences, non-resident ownership, and a country economically vulnerable to external pressure. This provides a rational explanation for Musk's defiance of judicial orders.

However, the baseline analysis treats the outcome as static: the government tolerates political activity X to preserve infrastructure co-investment. Real dynamics are far more troubling. Our dynamic model illustrates that accepting harmful activities is not a stable equilibrium but the beginning of an erosion spiral. As the harmful platform operates, it degrades democratic institutions, paradoxically increasing government tolerance: lower democratic accountability means the government depends less on citizens' support, making it more willing to accept societal damage to retain infrastructure. Countries with hybrid political regimes experience fastest erosion, occupying the peak of vulnerability: neither strong enough to resist institutional damage nor weak enough to have exhausted democratic capacity.

Yet the spiral is reversible. We show how two intervention pathways can break erosion dynamics before it is prohibitively costly: First, stabilization through public media. When government invests sufficiently in public media, it creates a higher interior democratic steady-state. Public service media provide trusted information sources that counter platform-driven polarization and misinformation. Empirical evidence demonstrates that countries with strong public broadcasting exhibit significantly slower democratic erosion (European Broadcasting Union, 2019; Applebaum, 2021). However, this requires continuous investment; the stabilization threshold depends on both media effectiveness and the intensity of platform damage.

Second, mobilization of civil society. Civil society organizations can impose reputational and economic costs on harmful players, such as certain social media platforms, through boycotts, litigation, and advocacy (Baron and Diermeier, 2007). Sustained growth of civil society strength through governmental (or privately funded) support for NGOs and civic space can eventually render platform operation unprofitable. However, as democracy erodes, government repression of civil society intensifies. Civil society growth can collapse if government investment fails to accelerate faster than platform-driven repression. This creates a tragic dynamic: early mobilization ("civil society springs") can be crushed if support is not sustained against escalating repression.

Whether democratic erosion stops at an interior level or continues to collapse depends on how quickly government concern for social harms declines relative to institutional capacity loss. As democracy erodes, governments care less about diffuse social damage. If this reduced concern outpaces institutional decline, erosion continues to full autocracy. If institutional capacity declines faster, governments eventually forbid the platform, thereby stopping erosion at partial democracy. This threshold is empirically testable across regime types.

The trajectory from baseline to dynamic models reveals that *interventions must occur early.* Governments must recognize the double-edged sword of accepting private infrastructure without public backup. Citizens' inelastic demand for services amplifies private power, especially when firms are foreign-owned and politically motivated. Well-functioning democracies (with *high* γ) are paradoxically vulnerable targets, as their pluralistic institutions make them sensitive to both user demands and firm threats, c.p. increasing F's economic power and hence political power. By contrast, the dynamic model shows that countries with *mid-level* γ are most affected by the democracy-eroding effects of harmful platforms.

While this paper focuses on private firms, the same mechanism applies when a foreign state replaces the firm. As only one recent example, China's "economic statecraft" and Belt-and-Road Initiative illustrate how states deploy economic leverage (trade dependencies, investment flows, infrastructure control) to extract political concessions (Doshi, 2021; Scott, 2024). Host countries vulnerable to this coercion exhibit characteristics identified in our model: infrastructure dependence, limited technical capacity for independent operation, crisis contexts. Unlike mobile assets, operational control of immobile infrastructure, e.g., ports, can translate economic advantage into sustained political power. The European Commission's recent struggles enforcing tech regulation against US big tech firms, combined with implicit threats of reduced military and intelligence support to Ukraine, testify to these geopolitical dimensions of economic coercion.[31] In parallel, China pushes more cheap goods into developing countries, damaging local industries, but their governments have a hard time pushing back because they already depend on China's investments.[32]

Prevention is possible. Early intervention via public media, civil society support, and international coordination can break erosion spirals. But the window closes quickly. Once platforms achieve critical mass and once democracies tip toward autocracy, resistance becomes prohibitively difficult. The Brazil vs. Musk conflict was not isolated but a harbinger. Future conflicts will multiply unless democracies urgently establish alternatives and coordinate constraints before tipping points are crossed.

[31] https://www.ft.com/content/af6c6dbe-ce63-47cc-8923-8bce4007f6e1

[32] New York Times. "The Second 'China Shock'" (https://www.nytimes.com/2025/12/09/world/china-trade-asia-gaza-thailand-cambodia.html?searchResultPosition=1).

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(Online) Appendix

A The Conflict Between Elon Musk (X and Starlink) and the Brazilian Supreme Court in 2024

The roots of the dispute trace back to Brazilian judicial demands that Musk's social networking service X restrict access to certain user accounts accused of disseminating misinformation, hate speech, and attacks on democratic institutions. Justice Alexandre de Moraes, a prominent member of Brazil's Supreme Court, spearheaded these orders, citing the need to protect democratic processes and public order, especially in the context of upcoming municipal elections.[33] Initially, X complied with some of these demands, blocking targeted accounts as instructed by the court. However, Elon Musk and X publicly criticized the orders as censorship and claimed that the requests exceeded what was permitted under Brazilian law.[34] Musk argued that the platform was being forced to violate both Brazilian and international legal standards regarding free expression. The situation escalated in April 2024 when Musk, responding to public pressure and his own opposition to what he called "illegal" censorship demands, ordered the removal of all blocks on the previously restricted accounts. This direct defiance put X on a collision course with Brazilian authorities, who responded by threatening daily fines and legal action against the company and its representatives.

As the conflict intensified, the Supreme Court issued a nationwide ban on X for failing to appoint a legal representative in Brazil and for non-compliance with court orders. The court also imposed escalating fines, which by September 2024 had surpassed US$3 million. Justice de Moraes labeled Musk an "outlaw" and accused him of enabling the spread of false information and undermining democratic principles.[35] In turn, Musk publicly criticized Justice de Moraes, calling him an "evil dictator' and framing the court's actions as censorship and an attack on free speech.[36] Musk's stance aligned with supporters of former president Jair Bolsonaro, who had also clashed with Moraes over misinformation and election-related investigations. The Brazilian government and judiciary, however, emphasized the need to enforce national laws and protect

[33] https://edition.cnn.com/2024/08/29/tech/brazils-supreme-court-threatens-x-intl/index.html, https://www.lemonde.fr/en/international/article/2024/09/03/brazilian-supreme-court-upholds-decision-to-block-x_6724591_4.html

[34] https://www.socialmediatoday.com/news/x-comply-brazilian-censorship-demands-after-initially-opposing/713281/

[35] https://www.aljazeera.com/news/2024/9/2/ban-on-elon-musks-x-platform-upheld-by-brazil-supreme-court

[36] https://www.nytimes.com/2024/09/13/world/americas/brazil-musk-x-starlink.html

democratic institutions from coordinated disinformation campaigns.[37]

In a significant development, the Supreme Court extended its enforcement measures to Starlink, Musk's satellite internet provider, which had become increasingly popular in Brazil with over 300,000 users in late 2024.[38] When X was banned, Starlink initially informed Brazil's telecom regulator that it would not comply with the order to block access to X, citing the freezing of its bank accounts as a reason. The Supreme Court, viewing X and Starlink as part of the same "de facto economic group" under Musk's control, froze Starlink's assets to force payment of X's fines. This move was controversial but ultimately led to the deduction of millions of dollars from both X and Starlink's Brazilian accounts.[39] While Musk did not explicitly threaten to withdraw Starlink's internet services from Brazil as blackmail, Starlink did initially refuse to comply with the order to block X, stating it would not do so until its accounts were unfrozen. This stance could be interpreted as an attempt to leverage Starlink's importance to pressure Brazilian authorities, but it stopped short of a direct threat to cut off internet access entirely. After facing the risk of losing its operational license, Starlink ultimately complied with the court's orders and blocked access to X.

While Starlink served a relatively small percentage of Brazil's population, its strategic importance far exceeded its subscriber numbers. A shutdown would have been minimally disruptive to most Brazilians but catastrophic for remote and indigenous communities who had no viable alternatives. In the Amazon region, only 11 percent of the population has access to meaningful high-quality connectivity, making Starlink a vital lifeline for many communities.[40] The Brazilian government's own operations in remote areas would be have been disrupted.[41] However, for the Brazilian government and Supreme Court, the greater concern would have been the precedent of a foreign company withdrawing essential services as political leverage, rather than widespread public dissatisfaction from the majority of the population who had other connectivity options.

[37] https://www.usnews.com/news/world/articles/2024-09-02/brazils-supreme-court-chamber-forms-majority-to-uphold-x-suspension

[38] https://www.ecommerceupdate.org/en/noticias/tres-anos-de-starlink-no-brasil-especialista-comenta-aprendizados-e-desafios-enfrentados-pela-empresa/

[39] https://www.nytimes.com/2024/09/13/world/americas/brazil-musk-x-starlink.html

[40] https://www.thegreenwebfoundation.org/news/starlinks-amazonian-adventure/

[41] https://sumauma.com/en/a-internet-da-amazonia-nas-maos-do-imprevisivel-elon-musk/

B Proofs

B.1 Proofs of Lemma 1 and 2 and Corollary 1

All follow without formal proof.

B.2 Proof of Lemma 3

(a) We solve Game 3 by backward induction.

Stage 3 (F's production decision): F chooses I_F to maximize profit $\pi_F = p \cdot I_F - c_F(I_F)$, where the regulated price $p = c'_F(\hat{I}_F)$ is set by G. Since c_F is strictly convex ($c''_F > 0$): For $I_F < \hat{I}_F$: marginal revenue $p = c'_F(\hat{I}_F) > c'_F(I_F)$ (marginal cost), so F increases production. For $I_F > \hat{I}_F$: marginal cost $c'_F(I_F) > c'_F(\hat{I}_F) = p$, so F decreases production. Hence, $I^*_F = \hat{I}_F$ maximizes F's profit, where F's marginal revenue equals marginal cost.

Stage 2 (G's production decision): Anticipating $I_F = \hat{I}_F$, G chooses I_G to maximize:

$$\pi_G = (I_G + \hat{I}_F) - c_G(I_G) - p \cdot \hat{I}_F - \gamma(D - I_G - \hat{I}_F).$$

From Lemma 2, G's preferred total investment is I_P. Thus G sets residual investment $I^*_G = I_P - \hat{I}_F$.

Stage 1 (G's contracting/pricing decision): G chooses $\hat{I}_F$ and price $p = c'_F(\hat{I}_F)$ to maximize total payoff. Productive efficiency requires equalizing marginal costs: $c'_G(I_G) = c'_F(\hat{I}_F)$. Given $c_F(I_F) = \tau c_G(I_F)$, we have $c'_F(I_F) = \tau c'_G(I_F)$. Thus, $c'_G(I_G) = \tau c'_G(\hat{I}_F)$.

For the functional form $c_G(I) = I^2$, this becomes $2I_G = \tau \cdot 2\hat{I}_F \quad \Rightarrow \quad I_G = \tau\hat{I}_F$. Combining with the total investment constraint $I_G + \hat{I}_F = I_P$: $\tau\hat{I}_F + \hat{I}_F = I_P \quad \Rightarrow \quad (1+\tau)\hat{I}_F = I_P$.

Therefore:

$$\hat{I}_F = \frac{I_P}{1+\tau} = \frac{1+\gamma}{2(1+\tau)}, \quad I^*_G = I_P - \hat{I}_F = \frac{\tau I_P}{1+\tau} = \frac{\tau(1+\gamma)}{2(1+\tau)}.$$

(b): $\frac{\partial}{\partial\tau}\left(\frac{1}{1+\tau}\right) = -\frac{1}{(1+\tau)^2} < 0$. Thus, F's share of total infrastructure investment is decreasing in τ (as F becomes relatively more efficient, its absolute contribution increases but its share of total decreases because total investment I_P is independent of τ). $\square$

B.3 Proof of Lemma 4

For the functional forms $c_G(I) = I^2$ and $c_F(I) = \tau I^2$:

(a): From Lemma 3, $\hat{I}_F = \frac{1+\gamma}{2(1+\tau)}$. The regulated price is:

$$p = c_F'(\hat{I}_F) = 2\tau\hat{I}_F = 2\tau \cdot \frac{1+\gamma}{2(1+\tau)} = \frac{\tau(1+\gamma)}{1+\tau}.$$

F's profit is:

$$\pi_F(\hat{I}_F) = p \cdot \hat{I}_F - \tau\hat{I}_F^2 = 2\tau\hat{I}_F \cdot \hat{I}_F - \tau\hat{I}_F^2 = \tau\hat{I}_F^2 = \tau\left(\frac{1+\gamma}{2(1+\tau)}\right)^2 = \frac{\tau(1+\gamma)^2}{4(1+\tau)^2} > 0.$$

(b): We compare G's payoffs under co-investment versus sole provision.

Co-investment payoff: From the main text derivation: $\pi_G(I_G^*, \hat{I}_F) = I_P - c_G(I_G^*) - p \cdot \hat{I}_F - \gamma(D - I_P)$.

With $c_G(I) = I^2$, $I_P = \frac{1+\gamma}{2}$, $I_G^* = \frac{\tau(1+\gamma)}{2(1+\tau)}$:

$$\begin{aligned}
\pi_G(I_G^*, \hat{I}_F) &= \frac{1+\gamma}{2} - \left(\frac{\tau(1+\gamma)}{2(1+\tau)}\right)^2 - \frac{\tau(1+\gamma)}{1+\tau} \cdot \frac{1+\gamma}{2(1+\tau)} - \gamma(D - \frac{1+\gamma}{2}) \\
&= \frac{(1+\gamma)^2}{4}\left[1 + \frac{1}{(1+\tau)^2}\right] - \gamma D.
\end{aligned}$$

Sole provision payoff: From Lemma 2:

$$\pi_G(I_P) = I_P - c_G(I_P) - \gamma(D - I_P) = \frac{1+\gamma}{2} - \frac{(1+\gamma)^2}{4} - \gamma D = \frac{(1+\gamma)^2}{4} - \gamma D.$$

Comparison: Subtracting:

$$\pi_G(I_G^*, \hat{I}_F) - \pi_G(I_P) = \frac{(1+\gamma)^2}{4} \cdot \frac{1}{(1+\tau)^2} > 0,$$

since all terms are positive. Thus G strictly prefers co-investment. □

B.4 Proof of Lemma 5

It follows without formal proof.

B.5 Proof of Lemma 6

From the main text, F's incentive compatibility constraint for credibly punishing G (by setting $I_F = 0$ forever after G forbids X) is:

$$0 + \frac{\delta}{1-\delta}(\pi_F(\hat{I}_F) + X - \xi) \geq \pi_F(\hat{I}_F) \tag{30}$$

$$\Leftrightarrow \delta \geq \frac{\pi_F(\hat{I}_F)}{2\pi_F(\hat{I}_F) + X - \xi} \equiv \underline{\delta}_F \tag{31}$$

For $c_G(I) = I^2$ and $c_F(I) = \tau I^2$, this Incentive-Compatibility Constraint, equation (31), equals $\delta \geq \frac{\frac{\tau}{(1+\tau)^2}\frac{(1+\gamma)^2}{4}}{2\frac{\tau}{(1+\tau)^2}\frac{(1+\gamma)^2}{4}+X-\xi}$.

(a): Since $\pi_F(\hat{I}_F) > 0$ (from Lemma 4)) and $X - \xi > 0$ (by assumption), the numerator is $\pi_F(\hat{I}_F) > 0$; the denominator is: $2\pi_F(\hat{I}_F) + X - \xi > 2\pi_F(\hat{I}_F) > \pi_F(\hat{I}_F)$. Therefore:

$$0 < \underline{\delta}_F = \frac{\pi_F(\hat{I}_F)}{2\pi_F(\hat{I}_F) + X - \xi} < \frac{\pi_F(\hat{I}_F)}{2\pi_F(\hat{I}_F)} = \frac{1}{2}.$$

(b): Comparative statics:

(i) *Higher δ:* Increasing δ makes the inequality $\delta \geq \underline{\delta}_F$ easier to satisfy.

(ii) *Higher $(X - \xi)$:*

$$\frac{\partial \underline{\delta}_F}{\partial (X-\xi)} = \frac{0 \cdot (2\pi_F + X - \xi) - \pi_F \cdot 1}{(2\pi_F + X - \xi)^2} = -\frac{\pi_F}{(2\pi_F + X - \xi)^2} < 0.$$

Higher political payoff lowers the threshold, making F's punishment threat easier to credibly sustain.

(iii) *Lower γ:*

$$\frac{\partial \underline{\delta}_F}{\partial \gamma} = \frac{2X(1+\gamma)\tau(1+\tau)^2}{((1+\gamma)^2\tau + 2X(1+\tau)^2)^2} > 0.$$

Higher γ increases π_F, which c.p. makes short-term profits in period t relatively more important for F than discounted long-term profits; see (30). Thus, *lower* γ makes F's threat to sacrifice short-term profits easier to sustain.

(iv) *Lower τ:*

$$\frac{\partial \underline{\delta}_F}{\partial \tau} = -\frac{10(\tau^2-1)}{(5+4\tau)^2(4+5\tau)^2} > 0 \quad \forall \tau \in [0,1].$$

Therefore, smaller τ (a more efficient firm) makes F's punishment threat easier to sustain. □

B.6 Proof of Lemma 7

(a): G's incentive compatibility constraint for tolerating X, (6), involves only static payoff comparisons and the societal harm parameter ρX. The discount factor δ does not appear.

(b): From Lemma 4(b), the LHS of (6) is: $\Delta\pi_G \equiv \pi_G(I_G^*, \hat{I}_F) - \pi_G(I_G^*, 0) = \frac{(1+\gamma)^2}{4} \cdot \frac{1}{(1+\tau)^2} = \frac{(1+\gamma)^2}{4(1+\tau)^2}$.

Comparative statics of (6):

(i) *Smaller ρX:* Lower RHS makes inequality easier to satisfy.

(ii) *Higher γ:* Differentiating LHS: $\frac{\partial \Delta\pi_G}{\partial \gamma} = \frac{2(1+\gamma)}{4(1+\tau)^2} = \frac{1+\gamma}{2(1+\tau)^2} > 0$.

Higher γ (more democratic, higher accountability) increases G's dependence on infrastructure provision, making tolerance of X more likely.

(iii) *Lower τ:* Differentiating LHS: $\frac{\partial \Delta\pi_G}{\partial \tau} = \frac{(1+\gamma)^2}{4} \cdot \frac{-2(1+\tau)}{(1+\tau)^4} = -\frac{(1+\gamma)^2}{2(1+\tau)^3} < 0$.

Lower τ (more efficient firm) increases $\Delta\pi_G$, making G more dependent on F's infrastructure and thus more tolerant of X. $\square$

B.7 Proof of Lemma 8

At stage 2, suppose F deviated in a previous period (e.g., did not establish X despite commitment, or failed to produce $I_F = \hat{I}_F$ after X was not forbidden). According to the punishment strategy, G should produce $I_G = I_P$ and forbid X forever.

G must verify that carrying out this punishment is incentive-compatible. G compares:

Option A (Punish): Produce $I_G = I_P$, forbid X forever. Perpetual payoff: $\frac{1}{1-\delta}\pi_G(I_P)$.

Option B (Forgive): Produce $I_G = I_G^*$ (expecting F to resume cooperation). But F, having observed forgiveness, will continue punishing G by setting $I_F = 0$ forever (since G broke the mutual punishment agreement). Perpetual payoff: $\frac{1}{1-\delta}\pi_G(I_G^*, 0)$.

G prefers Option A if, and only if: $\pi_G(I_P) \geq \pi_G(I_G^*, 0)$.

For $c_G(I) = I^2$:

$$\pi_G(I_P) = \frac{(1+\gamma)^2}{4} - \gamma D, \tag{32}$$

$$\pi_G(I_G^*, 0) = I_G^* - (I_G^*)^2 - \gamma(D - I_G^*) = \frac{\tau(1+\gamma)}{2(1+\tau)} - \frac{\tau^2(1+\gamma)^2}{4(1+\tau)^2} - \gamma D + \gamma\frac{\tau(1+\gamma)}{2(1+\tau)} \tag{33}$$

$$= \frac{\tau(2+\tau)(1+\gamma)^2}{4(1+\tau)^2} - \gamma D. \tag{34}$$

Subtracting $\pi_G(I_P) - \pi_G(I_G^*, 0)$ and simplifying yields:

$$\pi_G(I_P) - \pi_G(I_G^*, 0) = \frac{(1+\gamma)^2}{4} \cdot \frac{(1+\tau)^2 - \tau(2+\tau)}{(1+\tau)^2},$$

where the numerator of the second term is $(1+\tau)^2 - \tau(2+\tau) = 1 + 2\tau + \tau^2 - 2\tau - \tau^2 = 1 > 0$. Thus $\pi_G(I_P) - \pi_G(I_G^*, 0) > 0$, so G has no incentive to deviate from punishment. □

B.8 Proof of Lemma 9

At stage 1, F announces $\hat{I}_F$. Consider possible deviations:

Deviation 1: Underreport ($\hat{I}_F = 0$ despite planning $I_F > 0$).

If F announces $\hat{I}_F = 0$, G will produce $I_G = I_P$ at stage 2 (sole provision), setting price $p = 0$ (no F participation). At stage 5, if F attempts to produce $I_F > 0$, this violates the contract and G has no obligation to pay. F gets zero profit. No gain from this deviation.

Deviation 2: Overreport ($\hat{I}_F > \frac{I_P}{1+\tau}$ but produce $I_F = 0$ later).

If F announces $\hat{I}_F$ higher than equilibrium, G reduces own production $I_G = I_P - \hat{I}_F < I_G^*$ (expecting higher F contribution). At stage 5, when F produces $I_F = 0$ (reneging on commitment), total infrastructure falls short: $I_G < I_P$, creating unserved demand.

At stage 4, G recognizes F's breach and forbids X (punishment for non-cooperation). F gets zero forever (both from infrastructure profit and political utility). No gain from this deviation.

Deviation 3: Overreport slightly, then fulfill.

If F announces higher $\hat{I}_F$ and actually produces it, F earns higher profit margin initially (since $p = c_F'(\hat{I}_F)$ increases). However, this violates productive efficiency: $c_G'(I_G) \neq c_F'(\hat{I}_F)$, reducing total surplus. G anticipates this and rejects such contracts (sets optimal $\hat{I}_F = \frac{I_P}{1+\tau}$ at stage 1). Since G controls contracting (chooses $\hat{I}_F$ and price p at stage 1), F's announcement is purely confirmatory. Truthful reporting is F's dominant strategy. □

B.9 Proof of Proposition 1

The strategy profile $(\mathbf{F}^*, \mathbf{G}^*)$ constitutes a subgame-perfect Nash equilibrium if no player can profitably deviate at any stage of any period, including after any history. Lemmas 6 to 9 jointly show that this holds. No further proof is needed.

B.10 Proof of Proposition 2

Define $\Delta(\gamma_t) \equiv L(\gamma_t) - R(\gamma_t)$. Both sides are strictly increasing in γ_t. By assumption, $\Delta(1) = L(1) - R(1) \geq 0$, so G initially tolerates X at full democracy. Hence, with decreasing γ_t, the question is which side deteriorates quicker.

Either (i) there exists $\gamma^* \in (0,1)$ such that $\Delta(\gamma^*) = 0$ and $\Delta(\gamma_t) \geq 0$ for $\gamma_t > \gamma^*$, $\Delta(\gamma_t) < 0$ for $\gamma_t < \gamma^*$; or (ii) $\Delta(\gamma_t) \geq 0$ for all $\gamma \in [0,1]$.

Case (i) (Interior backstop). For this configuration, we need $\Delta'(\gamma^*) > 0$ (such that $\Delta(\gamma_t)$ is increasing as γ_t increases through γ^*, consistent with $\Delta(\gamma_t) < 0$ below and $\Delta(\gamma_t) > 0$ above). We have

$$\Delta'(\gamma_t) = L'(\gamma_t) - R'(\gamma_t) = \frac{1 + \gamma_t}{(1 + \tau)^2} - \rho'(\gamma_t)\, X. \tag{35}$$

Thus $\Delta'(\gamma^*) > 0$ is equivalent to condition (17):

$$\frac{1 + \gamma^*}{(1 + \tau)^2} > \rho'(\gamma^*)\, X. \tag{36}$$

Starting from $\gamma_0 = 1$, where $\Delta(1) \geq 0$, the platform X operates and democracy evolves as $\gamma_{t+1} = \gamma_t - h(\gamma_t)$ with $h(\gamma_t) > 0$. Thus $\{\gamma_t\}$ is strictly decreasing. As long as $\gamma_t > \gamma^*$, we have $\Delta(\gamma_t) > 0$, so (6) holds and G continues to tolerate X.

At time T, where $\gamma_T = \gamma^*$, we have $\Delta(\gamma_T) \leq 0$, so (6) fails. Government G forbids X, and from period T onward, $\gamma_{t+1} = \gamma_t$ (erosion stops). The steady state is $\gamma^* > 0$.

Case (ii): Full collapse. If $\Delta(\gamma) \geq 0$ for all $\gamma \in [0,1]$. Then $L(\gamma_t) \geq R(\gamma_t)$ for all γ_t, such that (6) holds for all democracy levels. Starting from $\gamma_0 = 1$, platform X operates in every period, and $\{\gamma_t\}$ is strictly decreasing and converges to $\gamma^* = 0$. The government never forbids X, and the unique steady state is full autocracy.

(iii) The threshold condition (17) compares the rate at which the left-hand side $L(\gamma_t)$ changes (reflecting how accountability of the government to consumers/voters changes) to the rate at which the right-hand side $R(\gamma_t)$ changes (reflecting how the government's perception of social harm from X changes).

- Case (i): If $L'(\gamma^*) > R'(\gamma^*)$ at the crossing point, then as γ declines from 1, the LHS deteriorates *faster* than the RHS. Eventually, at γ^*, the tolerance inequality is reversed: the government can no longer justify tolerating X because its valuation of democracy has fallen too much relative to perceived harm. This gives an interior backstop.

- Case (ii): If $L'(\gamma) \le R'(\gamma)$ everywhere (or no crossing exists), then as γ declines, the RHS falls at least as fast as the LHS. The government's concern for social harm from X diminishes fast enough that it continues tolerating X all the way to $\gamma = 0$. This gives full collapse. $\square$

B.11 Proof of Proposition 3

Assume that X operates in equilibrium. The government chooses M_G at time t to maximize the present discounted value of its payoffs, (18).

Note: We focus on the *one-period-ahead* indirect effect. Higher γ_{t+1} also affects γ_{t+2} through the law of motion (19), creating additional future benefits. However, these second-order dynamic effects depend on the persistence of γ-changes (captured by $1 - \kappa h'(\gamma)$) and complicate the analysis without changing the qualitative insights. For tractability, we focus on the immediate indirect effect through γ_{t+1}.

(i) In a dynamic equilibrium where M_G is chosen every period, the FOC of (18) is:

$$\theta + \delta\rho'(\gamma_{t+1})X \cdot \theta = c'_M(M_G^*), \tag{37}$$

which yields equation (21) with $\Phi(\gamma_{t+1}, \delta) = 1 + \delta\rho'(\gamma_{t+1})X$.

Since $\rho'(\gamma_{t+1}) > 0$ and $\delta \in (0, 1)$, we have $\Phi > 1$.

Comparative statics of (21) yield $\frac{\partial M_G^*}{\partial \theta} = \frac{\Phi(\gamma_{t+1},\delta)}{c''_M(M_G^*)} > 0$; $\frac{\partial M_G^*}{\partial \delta} = \frac{\theta \cdot \rho'(\gamma_{t+1})X}{c''_M(M_G^*)} > 0$; and $\frac{\partial M_G^*}{\partial X} = \frac{\theta \cdot \delta\rho'(\gamma_{t+1})}{c''_M(M_G^*)} > 0$.

Corner and no-investment cases: Cases (ii) and (iii) follow directly from the constraint $M_G \in [0, \overline{M}]$ and the monotonicity of $c'_M(\cdot)$. $\square$

B.12 Proof of Proposition 4

Assume X operates every period t.

(i): From equation (19), a steady state requires $\gamma_{t+1} = \gamma_t = \gamma_M^{ss}$, hence:

$$0 = -\kappa h(\gamma_M^{ss}) + \theta M_G^* = -\kappa\gamma_M^{ss}(1 - \gamma_M^{ss}) + \theta M_G^*. \tag{38}$$

Solving for γ_M^{ss} and using the quadratic formula yields:

$$\gamma_M^{ss} = \frac{\kappa \pm \sqrt{\kappa^2 - 4\kappa\theta M_G^*}}{2\kappa} = \frac{1 \pm \sqrt{1 - \frac{4\theta M_G^*}{\kappa}}}{2}. \tag{39}$$

For real solutions, we require $1 - \frac{4\theta M_G^*}{\kappa} \geq 0$, i.e., $\theta M_G^* \leq \frac{\kappa}{4}$ (condition 23). Only then a steady-state exists, where we have $\sqrt{1 - \frac{4\theta M_G^*}{\kappa}} \in [0, 1]$.

Next, to be locally stable, by definition, a fixed-point $\bar{\gamma}$ must satisfy $|f'(\bar{\gamma})| < 1$, where here $f(\gamma_t) = \gamma_{t+1} = \gamma_t - \kappa\gamma_t(1 - \gamma_t) + \theta M_G$; see (19). Hence,

$$f'(\gamma) = 1 - \kappa(1 - 2\gamma). \tag{40}$$

From (39), the two solutions of γ_M^{ss} are:

$$\gamma_1 = \frac{1 - \sqrt{1 - \frac{4\theta M_G^*}{\kappa}}}{2} \tag{41}$$

$$\gamma_2 = \frac{1 + \sqrt{1 - \frac{4\theta M_G^*}{\kappa}}}{2} \tag{42}$$

Substituting these into (40) gives:

$$f'(\gamma_1) = 1 - \kappa\sqrt{1 - \frac{4\theta M_G^*}{\kappa}} \tag{43}$$

$$f'(\gamma_2) = 1 - \kappa\sqrt{1 - \frac{4\theta M_G^*}{\kappa}} \tag{44}$$

Because of the existence condition $\sqrt{1 - \frac{4\theta M_G^*}{\kappa}} \in [0, 1]$, we have $|f'(\bar{\gamma_1})| < 1$ but $|f'(\bar{\gamma_2})| > 1$. Hence, the unique stable steady state is $\gamma_M^{ss} = \gamma_1$, as given in equation (24).

(ii): By (19), any public media investment $M_G > 0$ in period t increases γ_{t+1}. Under the conditions for non-zero investments studied in Proposition 3.(i) or (ii), repeated investments $M_G > 0$ are worthwhile for G, which is only rational if they increase the net level of democracy (the only purpose of public media in this model). It follows that $\gamma_M^{ss} > \gamma^*$,

(iii): Taking the derivative of equation (24) with respect to θM_G^*:

$$\frac{\partial \gamma_M^{ss}}{\partial(\theta M_G^*)} = \frac{1}{2} \cdot \frac{4/\kappa}{2\sqrt{1 - \frac{4\theta M_G^*}{\kappa}}} = \frac{1}{\sqrt{\kappa(\kappa - 4\theta M_G^*)}} > 0. \tag{45}$$

Taking the derivative with respect to κ:

$$\frac{\partial \gamma_M^{ss}}{\partial \kappa} = -\frac{1}{2} \cdot \frac{-4\theta M_G^*/\kappa^2}{2\sqrt{1 - \frac{4\theta M_G^*}{\kappa}}} = -\frac{\theta M_G^*}{\kappa\sqrt{\kappa(\kappa - 4\theta M_G^*)}} < 0. \tag{46}$$

(iv): Follows from the chain rule and Proposition 3, which establishes $\frac{\partial M_G^*}{\partial \delta} > 0$ and $\frac{\partial M_G^*}{\partial X} > 0$. □

B.13 Proof of Proposition 5

(i) If $\sigma_{CS,t} > \zeta(\gamma_t)$ for all t, then $S_{t+1} - S_t = \sigma_{CS,t} - \zeta(\gamma_t) > 0$, so S_t is strictly increasing. Starting from $S_0 = 0$, we have $S_t = \sum_{\tau=1}^{t}[\sigma_{CS,\tau} - \zeta(\gamma_\tau)] \to \infty$. Since $\bar{S}$ is finite, there exists T^{CS} such that $S_{T^{CS}} \geq \bar{S}$, at which point $\pi_{F,T^{CS}} = \pi_F(\hat{I}_F) + X - \xi - \mu S_{T^{CS}} X \leq \pi_F(\hat{I}_F)$. Firm F ceases operating X. Hence, from $\gamma_{t+1} = \gamma_t - h(\gamma_t) \cdot \mathbb{1}_{X \text{ operates}} = \gamma_t$ for $t \geq T^{CS}$: erosion stops at $\gamma^* = \gamma_{T^{CS}}$.

(ii): If $\sigma_{CS,1} > \zeta(\gamma_1)$, then $S_1 = \sigma_{CS,1} - \zeta(\gamma_0) > 0$ and S_t initially increases. As γ_t declines via Proposition 2, following X's operation, $\zeta(\gamma_t)$ increases. If $\sigma_{CS,t^*} < \zeta(\gamma_{t^*})$, then $S_{t^*+1} < S_{t^*}$ and S_t declines for $t > t^*$. If S_t never reaches $\bar{S}$, firm F continues operating X, and democratic dynamics are governed by Proposition 2.

(iii): If $\sigma_{CS,1} \leq \zeta(\gamma_1)$, then $S_1 \leq 0$. As we defined $S_t \geq 0$, we have $S_t = 0$ for all t. Since $0 < \bar{S}$, firm F always satisfies the operating condition, and democracy follows Proposition 2. □