An Economic Model of The French Revolution[1]

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July 7th, 2025

ABSTRACT: We offer a new economic perspective on the French Revolution by analyzing how an elite commitment problem and trade policy shaped revolutionary dynamics. We develop a complete-information game-theoretic model in which revolution can occur on the equilibrium path. By formalizing the interaction between democratization and trade policy, our model explains when revolution may occur with some probability. Unlike models with incomplete information, where revolutions may be mistakes, our approach shows that revolution occurs only when it is beneficial for the rest of society. Paradoxically, we show that revolution could occur only because there was sufficient trust in the Ancien Régime.

KEYWORDS. Commitment problem, mixed strategies, revolution, social conflict, trade policy.

JEL CLASSIFICATION NUMBERS: D30, D74, F11, F13, P16.

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[1]This paper is dedicated to Myrna Wooders, who was PhD advisor to the second author, with grateful thanks for her ongoing guidance and support. For useful comments and conversations about this paper, we would like to thank Myrna, Nizar Allouch, Sylvain Barde, Sascha Becker, Amrita Dhillon, Eckhard Janeba, Beata Javorcik, Todd Kaplan, Simone Meraglia, and Isleide Zissimos, as well as our editor, a referee, and seminar/conference participants at Exeter, Kent, and PET Lyon. We, the authors, take responsibility for any errors this paper may contain.

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1. Introduction

The French Revolution, which started on July 14th, 1789, is one of the most studied and influential events in human history. It has given rise to extensive literatures in history, philosophy, political science, sociology, and countless other fields. Its influence extends beyond academia, inspiring great works of art, such as The Death of Marat by Jacques-Louis David (1793), and novels such as *A Tale of Two Cities* by Charles Dickens (1859), which explores the consequences of political instability and rapid institutional change during the Revolution and its aftermath. That Dickens's novel has been adapted for stage and screen testifies to the Revolution's enduring hold on popular culture. Yet despite this immense intellectual and cultural legacy, the French Revolution has attracted relatively little attention from economists.

This lack of engagement by economists is not surprising. The early literature, and its influence on popular culture to this day, has been grounded in Marxist traditions, conceptualizing the Revolution as a class struggle between the aristocracy and the bourgeoisie, over the shift from feudalism to capitalism (Lefebvre 1939, Soboul 1958, Moore 1966). This approach, which emphasizes socio-economic groups as primary actors, puts it at odds with the approach in mainstream economics, which has always been grounded in (classical) liberal principles of individual rationality.

More recently, a revisionist literature on the French revolution has emerged across disciplines, including economics, that is based on liberal principles. This literature identifies pre-revolutionary France not as feudal but as a dictatorship of the elite. It goes on to argue that the French Revolution should be seen first and foremost not as an economic shift from feudalism to capitalism, but instead as a political explosion of liberal demands by those outside the elite, or 'rest of society', henceforth referred to as ROS (Cobban 1954, Furet 1981, Wallerstein 1990). This view aligns directly with the 'threat of revolution hypothesis,' that a dictatorship extends the franchise to the ROS to resolve the threat of revolution (Acemoglu and Robinson 2000, 2006).

The purpose of the present paper is to use an established complete-information, two-sector, two-factor, general equilibrium model to characterize the French Revolution in terms of the outcome of a Markov Perfect Equilibrium (MPE). We will assess both the assumptions and the predictions of this model against stylized facts that have been established in the revisionist literature. This 'case study' approach is unconventional in theoretical economics, which usually seeks frameworks of maximum generality, yielding insights of the broadest and deepest reach. An economic-theory-based case-study approach to the French Revolution is warranted for two reasons. First, it enables us to emphasize features of the Revolution highlighted by the revisionist literature, while downplaying aspects associated with earlier Marxist interpretations, such as the role of the bourgeoisie. Second, since we know more about the French Revolution than any other, it gives us a concrete reference point in economic theory against which general theories of revolution can be compared.

The model we will use is that of Zissimos (2017). It combines Acemoglu and Robinson's (2000, henceforth referred to as AR) model of the form of government - dictatorship or democracy - with Mayer's (1984) two-sector, two-factor Heckscher-Ohlin (H-O) model of international trade and trade policy. The key feature of AR's model is that the ruling elite face a commitment problem when confronted with the threat of revolution by the ROS. The elite must make transfers over time to resolve the threat of revolution. However, it is common knowledge that the threat of revolution may dissipate, and thus so will the credibility of any promise to continue to make transfers. Hence they face a commitment problem. The elite resolve the commitment problem by extending the franchise, in doing so transferring to the ROS control over taxation, in order to make a credible commitment to ongoing transfers over time.

In our framework, Mayer's H-O model allows international trade policy to serve as the mechanism for transfers between the elite and the ROS. This represents a departure from AR, whose model features domestic taxation as the redistributive policy. We believe that using trade policy to make transfers between the elite and the ROS represents a more historically grounded representation (Doyle 2018). Of course, France did have some domestic fiscal capacity at that time, but domestic taxes were used to make transfers within the elite to promote cohesion between its different factions. In contrast, trade taxes were used to redistribute between the elite and ROS. We take within-elite cohesion as given, abstracting from within-elite transfers, and focus exclusively on trade policy.

The Anglo-French Commercial Treaty of 1786, known as the Eden Agreement, represents a key policy event that intensified the economic pressures that led to the Revolution. It locked in free trade between Britain and France, maximizing the returns to the elite on their land through food exports chasing higher prices abroad. However, the ROS were impoverished by this policy since food at home became more expensive as a direct result. Following the logic of AR, but using the policy mechanism of Mayer (1984), the threat of revolution, and ultimately democratization, offered the ROS a way to gain control over trade policy, leading to the end of the Agreement in 1793 and a reduction in food prices.

Also based on the logic of AR, the threat of revolution arises exogenously in our model. We follow the historical literature in arguing that France's involvement in the American War of Independence (1775-1783) significantly exacerbated the financial crisis that France was experiencing during the period, contributing to the conditions that led to the revolution (Doyle 2018). This fiscal strain undermined the monarchy's ability to maintain effective control, especially by limiting its capacity to fund security forces. The diminished capacity to enforce order allowed revolutionary sentiments to flourish. The Storming of the Bastille on July 14, 1789, became a pivotal moment, symbolizing the collapse of royal authority and signaling to the public the vulnerability of the Ancien Régime.

Revolution is characterized in terms of a Markov Perfect Equilibrium (MPE) in mixed strategies. The intuition behind the mixed strategy of this equilibrium is as follows. If, when the elite face the threat of a revolution, they fail to extend the franchise with some probability, at first sight it may seem like the ROS should go ahead with the revolution for sure. But in doing so they incur the cost of revolution, a cost they may be able to avoid if the elite do extend the franchise the next time the threat arises. The elite must democratize with some probability, since the ROS are better off mounting a revolution than forever remaining in the status quo. And the ROS must mount a revolution with some probability, because if they never do so the elite are better off maintaining the status quo. Thus, in equilibrium, both sides randomize: the elite extend the franchise with some probability, and the ROS mount a revolution with some probability.

This characterization reinforces key perspectives of the revisionist literature. Cobban (1954) argues, contrary to the Marxist view, that even after the Revolution France remained predominantly agricultural, and that the Revolution was more of a political upheaval than a social or economic transformation. This, he argues, implies that the extensive costs did not lead to significant societal benefits. But viewed through the lens of our model, if the French people had shown no willingness to mount a revolution then they risked being stuck with the Ancien Régime forever. It is noteworthy that the bourgeoisie play no critical role in our characterization, with the Revolution as a nationwide uprising rather than an event that was driven predominantly from Paris. This too is in line with Cobban (1954), and places emphasis differently to the Marxist view.

Our characterization supports another strand of the revisionist literature, which argues that international trade policy played a key role in the French Revolution. As Doyle (2018) argues, the Eden Agreement liberalized trade across agriculture and manufacturing in both countries. Since France had a comparative advantage over England in the production of food, the opening of both economies brought about by the Eden Agreement raised the price of food in France as more of its food output chased higher prices in England. This was intended to stimulate an increase in production of food in France, and in certain respects it was successful in doing so. However, just as the model would predict, its effect was to raise the price of food in France and this was deeply unpopular with the ROS. The eventual collapse of the Eden agreement in 1793 is also what our model would predict under revolution, as the ROS seized control of government and implemented protectionism. This resulted in more French food output remaining at home and, all else equal, French real wages rising as food prices fell, representing a concrete benefit to ROS as part of the outcome of the Revolution.

While some accounts view the French Revolution of 1789 as a failure, culminating in the violence of the Terreur and the return to authoritarian rule under Napoleon, we adopt a long-run perspective that sees the Revolution as initiating France's eventual transition to a successful democracy. From this vantage point, the Revolution of 1789 marked a critical juncture in the political order. It broke the stranglehold of the Ancien Régime and initiated a political trajectory that, through subsequent upheavals, eventually led to the inclusive democracy France enjoys today. Our framework captures the logic of that initial rupture, and interprets the costs of revolution as part of the price paid to shift the long-run equilibrium path of political institutions. In this sense, the Revolution should not be judged by its immediate aftermath alone, but by the transformation it made possible.

Our first contribution to the literature on the 'threat of revolution hypothesis' is to explore the role of revolution in democratization. For Acemoglu and Robinson (2000, 2006), it is the threat of revolution that drives democratization, with actual revolution itself downplayed. Based on the logic of their argument, empirical research has tested the theory either by relating economic shocks that give rise to a threat of revolution to democratic change (Burke and Leigh 2010, Bruckner and Ciccone 2011, Chaney 2013, Franck 2015, Aidt and Franck 2015, and Aidt and Leon 2015) or by asking whether the proximate cause of democratization could plausibly have been caused by a potential threat of revolution (Berlinski and Dewan 2011, Turner and Zhan 2012, Dasgupta and Ziblatt 2015). Yet the literature on the French Revolution cited above argues that it was revolution itself that was critical in bringing about democratization. Taking our cue from that literature, we focus on the role of revolution in democratization.

Our analysis follows the approach of Acemoglu and Robinson (2017), who are the first to characterize an equilibrium path along which revolution may occur in a complete-information model. However, in that paper they follow their earlier work (Acemoglu and Robinson 2000, 2006) in focusing on the range of the parameter space where the threat of revolution leads directly to democracy. Our approach is distinctive in bringing the occurrence of revolution to the fore. We emphasize that in much of the parameter space, the dictatorship can manage frequently recurring threats of revolution through international trade policy, thereby maintaining the status quo. It is only when a sufficiently large shock, such as the financial crisis faced by the regime of Louis XVI after the American War of Independence, lowers the cost of revolution enough that the country enters a range in which democratization, possibly through revolution, becomes feasible. In this way, our model captures how revolution, and not merely its threat, can play a necessary role in democratic transition, particularly when elite strategies for managing unrest are no longer effective.

Our model offers a deterministic complement to existing models of revolution that are based on incomplete information. In papers such as Buenrostro, Dhillon and Wooders (2007), and Ellis and Fender (2011), revolution may occur even when it is not objectively optimal for the ROS to revolt. In Buenrostro et al. (2007), protestors possess private information about their willingness to protest, and the government, uncertain about the true level of discontent, may preemptively offer concessions to deter unrest, even if widespread protest would not, in fact, materialize. In Ellis and Fender (2011), individuals form beliefs by observing others' actions in an information cascade. There, a revolution may occur when belief thresholds tip even in the absence of any underlying shift in fundamentals. In both models, revolution is driven by beliefs under uncertainty, and the possibility of mistaken uprisings or preemptive concessions is central to the mechanism. In contrast, the present framework is deterministic: revolution occurs if and only if it is actually optimal for the ROS to mount one. The threat of revolution is not probabilistic, nor does it rely on private information or belief updating. Instead, it is a structural feature of the environment, tied to coordination and state variables. This allows for a cleaner separation between high- and low-threat states and provides a deterministic foundation for revolution that complements and contrasts with the incomplete-information literature.

Our second contribution is to explore how one might recover the original equilibrium characterization of Acemoglu and Robinson (2000, 2006) and Zissimos (2017), that revolution does not occur on the equilibrium path, in the current framework where in principle it can. We will show that, surprisingly, it is when we assume that the ROS have no trust in the elite following through on a promise to extend the franchise that revolution cannot happen on the equilibrium path. This is characterized in our context as the ROS assigning a prior of probability zero to the elite extending the franchise in future, having observed them choose not to extend the franchise in the current period while under the threat of revolution. By contrast, it is when the ROS do trust that the elite may extend the franchise peacefully in the future, even though they do not in the current period, that revolution can happen on the equilibrium path.

This insight brings added poignancy to the case of the French Revolution. Historical accounts suggest that even after Louis XVI had been arrested and imprisoned, many citizens remained committed to the idea of a constitutional monarchy. The National Constituent Assembly's decree of July 15, 1791, which reinstated Louis XVI under a constitutional framework (Caiani 2012), reflects this persistent trust. Ironically, it was precisely this trust, rather than its absence, that made a revolutionary outcome sustainable in equilibrium.

As well as relating our paper to Buenrostro et al. (2007) directly as above, it is appropriate and useful to contextualize it in terms of Myrna Wooders' broader contributions to economic theory. In her early work, Wooders (1978, 1980) develops a foundational model of club formation in economies with local public goods, demonstrating how individuals can self-organize into coalitions to shape institutions and share resources. This framework envisions flexible coalition formation, typified by settlers on the American frontier choosing their own communities and institutions. In later work, Wooders explores more constrained political environments. In Buenrostro et al. (2007), agents are not free to exit the institutional environment in which they find themselves, so they may revolt instead, while the government may choose to preempt unrest through concessions.

In our setting, the ROS are even more tightly bound: they cannot exit, and they are subject to trade policy set unilaterally by an entrenched elite. In this sense, our paper further highlights the consequences of institutional rigidity, offering a complementary perspective to Wooders' original paradigm by modeling what happens when the freedoms that underpin club formation are absent. More broadly, our model reflects Wooders' long-standing interest in the formation, persistence, and constraints of institutional arrangements. It speaks to the enduring question at the heart of her work: under what conditions can self-interested agents generate stable and inclusive institutions?

The paper proceeds as follows. In Section 2, we introduce the Heckscher-Ohlin (H-O) model with trade policy, and characterize the conflict of interest between the elite and ROS over trade policy. In Section 3, we examine how trade policy interacts with the form of government, showing how the elite's commitment problem influences their incentives to maintain dictatorship or democratize. In Section 4, we characterize the political equilibrium, demonstrating how dictatorship, democracy, and revolution emerge as equilibrium outcomes in MPE. In Section 5, we examine how the economy can transition from stable dictatorship to revolution, relating this to the French Revolution. Conclusions are drawn in the final section.

2. The H-O Model with Trade Policy

The model describes a small open economy, whose population consists of a continuum of risk-neutral agents. The agents are divided between two groups: the elite, ε, and the

ROS, ρ, with the elite forming a minority. The elite's mass is $\theta < 1$, and the ROS has a mass normalized to 1, making the total population $1 + \theta$.

The economy operates over an infinite time horizon, with periods indexed by $t = 0, 1, \ldots, \infty$. It is endowed with two primary factors of production: labor, l, and land, λ. The total labor endowment is $1 + \theta$, distributed equally between the elite and the ROS. The elite own all the land, with a total endowment of θ distributed uniformly across all of them, while the ROS hold none. Let y_t^j denote agent j's factor income in period t, where $j \in \{\varepsilon, \rho\}$. For the elite, factor income is $y_t^\varepsilon = w_t + r_t$, while for the ROS it is $y_t^\rho = w_t$, where w_t and r_t are the wage and rental rate, respectively.

To understand how trade policy affects income distribution, we define the factor income share ϕ_t^j for each group:

$$\phi_t^j = \frac{y_t^j}{y_t}, \tag{2.1}$$

where aggregate factor income is $y_t = (1 + \theta)w_t + \theta r_t$. Given the group sizes, the population's income share sums to $\theta\phi_t^\varepsilon + \phi_t^\rho = 1$. Members within each group are identical, and the groups differ only by their factor endowments.

2.1. Production

The economy produces two goods: food, f, which is land-intensive, and manufactures, g, which are labor-intensive. The economy is competitive in both production and factor markets. Each good requires both labor and land, with technology exhibiting constant returns to scale and decreasing returns to each factor.

There is free mobility of factors between the food and manufacturing sectors, leading to a single factor price equated to the value of that factor's marginal product. Denote the price of food relative to manufactures in period t by p_t. As the country is small, it takes the world price, p^w, as given. The autarky price of food relative to manufactures is denoted as p^a. Hence, manufactures serve as the numeraire. While goods may be traded internationally, factors remain immobile across borders.

Output of good $i \in \{f, g\}$ in period t is denoted by x_{it}. Free entry into both sectors drives profits to zero. Given initial endowments, population shares, and production technology, outputs and factor prices are determined by p_t, allowing us to express $w_t = w(p_t)$, $r_t = r(p_t)$, and $x_{it} = x_i(p_t)$ for period t.[4]

Since the economy has a regular 2×2 H-O model structure, standard results apply. We focus particularly on the Stolper-Samuelson theorem, which states that if p_t increases in a given period, the real rental rate unambiguously rises while the real wage unambiguously falls. Following Jones (1965), we can express the main implication of the Stolper-Samuelson theorem as follows:

$$r_t^* > p_t^* > 0 > w_t^*, \tag{2.2}$$

where a superscript-$*$ indicates proportional change (e.g., $r_t^* = dr_t/r_t$). Given our assumptions about endowments, we can translate this result into the effects of price changes on the incomes of the respective groups. Before doing so, we must specify the redistributive implications of trade policy and the underlying preferences.

2.2. Preferences

Agents $j \in \{\varepsilon, \rho\}$ have identical preferences and share the same discount factor $\beta < 1$. The expected utility of agent j at time 0 is:

$$U_0^j = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t u\left(c_{ft}^j, c_{gt}^j\right),$$

where $\mathbb{E}_t$ is the expectations operator based on information available at time t. Utility in each period is represented by the function $u(c_{ft}^j, c_{gt}^j)$, which is strictly quasi-concave in food, f, and manufactures, g. Tastes are identical and homothetic, yielding well-behaved demand functions for agent j: $c_{it}^j = c_i^j(p_t, Y_t^j)$, where Y_t^j is total income for agent j. By homotheticity, we can express demand as $c_i^j(p_t, Y_t^j) = c_i(p_t)Y_t^j$.[5]

Aggregate demand for good i is denoted by c_{it}, where $c_{it} = c_i(p_t, Y_t)$ and Y_t is aggregate income. Since all individuals share identical homothetic preferences, we simplify this to $c_i(p_t, Y_t) = c_i(p_t)Y_t = \theta c_i(p_t)Y_t^\varepsilon + c_i(p_t)Y_t^\rho$. These assumptions ensure the existence of well-behaved optimal policies for each group.

[4] For compactness, we suppress the dependence of x_{it} on factor endowments unless relevant, which will become important when discussing the cost of revolution.

[5] A formal definition of Y_t^j follows below. It includes both factor income, y_t^j, and income from trade policy. We also suppress the world price p^w in functional notation.

2.3. Policy Instruments, Trade, and Income

We will assume that there is no domestic fiscal capacity, and so policy instruments are restricted to trade taxes. Trade taxes create a wedge between domestic and world prices for both consumers and producers. Without loss of generality, assume trade policy is applied to food (f). We do not specify the country's comparative advantage, so food could be either the exportable or import-competing good. A domestic price above the world price implies an import tariff (or export subsidy if exported), while a domestic price below the world price corresponds to an export tax (or import subsidy if imported).

Following Mayer (1984), trade policy revenue is assumed to be neutral regarding income distribution, meaning agent j's share of policy revenue in period t equals their factor income share, ϕ_t^j, as defined by (2.1).[6] Thus, agent j's net trade policy revenue in period t is:

$$tr_t^j = \phi_t^j \cdot tr_t, \tag{2.3}$$

where tr_t is aggregate trade policy revenue. Let $m_t = m(p_t, Y_t) = c_f(p_t)Y_t - x_f(p_t)$ denote the quantity of food imported, and $m(p_t, Y_t)$ the import demand function. Then $tr_t = tr(p_t) = (p_t - p^w)m_t$. If food is imported, $m(p_t, Y_t) \geq 0$ and $p_t \geq p^w$; if exported, $m(p_t, Y_t) \leq 0$ and $p_t \leq p^w$.[7] Therefore, $tr_t \geq 0$.

Total income Y_t, measured in terms of manufactures (m), is given by:

$$Y_t = (1+\theta)w(p_t) + \theta r(p_t) + tr(p_t) = p_t x_f(p_t) + x_g(p_t) + (p_t - p^w)m_t. \tag{2.4}$$

Under homothetic preferences, we can solve for m_t and Y_t:

$$m_t = m(p_t) = \frac{c_f(p_t)(p_t x_f(p_t) + x_m(p_t)) - x_f(p_t)}{1 - (p_t - p^w)c_f(p_t)}, \tag{2.5}$$

$$Y_t = Y(p_t) = \frac{p^w x_f(p_t) + x_g(p_t)}{1 - (p_t - p^w)c_f(p_t)}. \tag{2.6}$$

Assuming $0 < c_f(p_t) < 1$ and $p_t - p^w$ is sufficiently small, $(p_t - p^w)c_f(p_t) < 1$ holds in equilibrium. These equations express imports and total income purely in terms of prices.

[6] Mayer's neutrality assumption is akin to lump-sum redistribution of tariff revenue, neutralizing trade policy revenue's effect on determining optimal trade policy for group j. Deviating from neutrality would affect the range of values for β under which the revolution constraint binds, but not the qualitative results. See the discussion of the revolution constraint.

[7] Exports are expressed as negative imports.

The total income of an agent in group j, Y_t^j, is the sum of their factor income and share of trade policy revenue. Using y_t^ε, y_t^ρ, (2.1), and (2.3), total income for a member of group j can be written as:

$$Y_t^j = Y^j(p_t) = \phi^j(p_t)Y(p_t). \tag{2.7}$$

This shows that total income for each group depends on aggregate income and the group's income share, both as functions of p_t. This formulation simplifies the characterization of each group's preferred trade policy.

2.4. Welfare of Each Group and their Preferred Price Level

Using (2.7), the welfare of a group $j \in \{\varepsilon, \rho\}$ in period t can be measured with the indirect utility function:

$$W_t^j = W^j(p_t, Y^j(p_t)), \quad j \in \{\varepsilon, \rho\}. \tag{2.8}$$

Adapting Mayer (1984), each group's preferred trade policy is determined by maximizing W_t^j with respect to p_t. Group j's preferred price level $\hat{p}^j$ is the value of p_t that maximizes W_t^j. The first-order condition for p^j is:[8]

$$\text{foc}^j(p_t) = \frac{dW_t^j}{dp_t} = \frac{\partial W_t^j}{\partial Y_t^j}\left[\phi^j(p_t)(p_t - p^w)\frac{\partial m_t}{\partial p_t} + Y(p_t)\frac{\partial \phi_t^j}{\partial p_t}\right] = 0. \tag{2.9}$$

The first term in brackets represents group j's share of the aggregate distortion from protection, or 'j's distortion share.' The second term captures the redistributive 'Stolper-Samuelson effect' on group j's factor income. Assuming $\frac{\partial^2 W_t^j}{\partial p_t^2} < 0$, there is a unique $\hat{p}^j$ that satisfies $\text{foc}^j(p^j) = 0$. Solving (2.9) gives:

$$\hat{p}^j = p^w - \frac{Y(p_t)}{\frac{\partial m_t}{\partial p_t}} \frac{\frac{\partial \phi_t^j}{\partial p_t}}{\phi^j(p_t)}, \quad j \in \{\varepsilon, \rho\}. \tag{2.10}$$

The solution for $\hat{p}^j$ may involve a trade tax or subsidy. We first assume fiscal capacity allows $\hat{p}^j$ to be implemented. Later, we consider a corner solution where fiscal capacity is limited. Since $Y(p_t)$, $-\frac{\partial m_t}{\partial p_t}$, and $\phi^j(p_t)$ are positive, the position of $\hat{p}^j$ relative to p^w depends solely on the sign of $\frac{\partial \phi_t^j}{\partial p_t}$. Differentiating $\phi^\varepsilon(p_t)$ and $\phi^\rho(p_t)$, we get:

[8]Details of this derivation are provided in Appendix A.1 of Zissimos (2017).

$$\frac{\partial \phi_t^{\varepsilon}}{\partial p_t} = \frac{w(p_t)r(p_t)}{[(1+\theta)w(p_t)+\theta r(p_t)]^2 p_t}\left(\frac{r_t^* - w_t^*}{p_t^*}\right) > 0; \tag{2.11}$$

$$\frac{\partial \phi_t^{\rho}}{\partial p_t} = -\frac{\theta w(p_t)r(p_t)}{[(1+\theta)w(p_t)+\theta r(p_t)]^2 p_t}\left(\frac{r_t^* - w_t^*}{p_t^*}\right) < 0. \tag{2.12}$$

Thus, we conclude that $\hat{p}^{\varepsilon} > p^w > \hat{p}^{\rho}$. To ensure $\hat{p}^{\rho} > 0$, we can fix p^w sufficiently large.[9]

When the country has a comparative advantage in good f, $p^a < p^w$: food is produced relatively cheaply in autarky, and chases higher prices abroad when the country opens to trade. In this case, the elite benefit from greater openness, while the ROS prefer more protection. Since $p^w < \hat{p}^{\varepsilon}$, the elite would ideally seek an export subsidy to raise the price of good f above the world price. However, given our assumption that trade subsidies are infeasible, the elite must settle for free trade (p^w). For $\hat{p}^{\rho}$, the interior solution suggests that the ROS prefer an export tax on f, allowing some openness: $p^a < \hat{p}^{\rho} < p^w$. Depending on preferences for goods f and g, it could be that $\hat{p}^{\rho} < p^a$, in which case the ROS would prefer an import subsidy large enough to reverse the country's comparative advantage. But without fiscal capacity, they may have to settle for autarky.

With a comparative advantage in good g, $p^w < p^a$. In this case, the welfare of the ROS is maximized at a higher level of openness than that of the elite. Since the ROS's factor income increases with greater openness, they prefer more openness. The preferred price level of the ROS, $\hat{p}^{\rho} < p^w$, would imply an import subsidy if domestic fiscal capacity were available. Without this capacity, the ROS can do no better than free trade. At an interior solution for $\hat{p}^{\varepsilon}$, $p^w < \hat{p}^{\varepsilon} < p^a$, implying an import tariff. However, $p^a < \hat{p}^{\varepsilon}$ is also feasible, indicating an export subsidy on good ε large enough to overturn the country's comparative advantage in good ρ. In the absence of domestic fiscal capacity, the elite would be limited to imposing autarky. This analysis is summarized in Zissimos (2017) as follows.

[9] The results that $\partial \phi_t^{\varepsilon}/\partial p_t > 0$ and $\partial \phi_t^{\varepsilon}/\partial p_t < 0$ are driven by the Stolper-Samuelson effect. The elite, who own land, benefit from a rise in p_t, which increases their income share. In contrast, the ROS, being reliant on labor income, see their income share decrease. Agents in our model lie either side of the benchmark agent introduced by Mayer (1984), whose factor endowments equaled the national average, thus remaining unaffected by changes in p_t.

Proposition 1, Zissimos (2017). *With domestic fiscal capacity available,* $\hat{p}^{\rho} < p^{w} < \hat{p}^{\varepsilon}$ *regardless of comparative advantage. If domestic fiscal capacity is absent then:*
(i) with a comparative advantage in good f, $\hat{p}^{\varepsilon} = p^{w}$ *while* $p^{a} \leq \hat{p}^{\rho} < p^{w}$;
(ii) with a comparative advantage in good g, $\hat{p}^{\rho} = p^{w}$ *while* $p^{w} < \hat{p}^{\varepsilon} \leq p^{a}$.

This result shows that each group's preferred level of openness depends on which group owns the factor used intensively in the good for which the country has a comparative advantage.[10] Proposition 1 also highlights that domestic fiscal capacity for trade subsidies influences the characterization of $\hat{p}^{\varepsilon}$ and $\hat{p}^{\rho}$.

In our application to the French Revolution, we will assume that France has a comparative advantage in good ε. This is a reasonable assumption for 18th Century France, whose main trade partner was England at the time. According to Doyle (2018), England was more advanced in its industrial development at the time, and so had a comparative advantage in good ρ. So Proposition 1(i) will be appropriate for the analysis of this case. Moreover, to simplify our framework for Propositions 2 and 3, we will make the simplifying assumption that $\hat{p}^{\rho} = p^{a}$, meaning that we do not have to deal with the complexities of variations in $\hat{p}^{\rho}$ in establishing these results. However, our main result in the form of Theorem 1 does not require these assumptions and will be developed in general terms.

3. Trade Policy and the Form of Government

We now combine the Mayer H-O model with the model of the form of government developed by AR. Our goal is to explore whether, and if so how, trade policy can be used to resolve the threat of a revolution, either through franchise extension or forestalling democratization. In doing so, we will identify a range of the parameter space where the threat of revolution can give rise to revolution itself, followed by democratization.

Without the threat of revolution, the elite set their preferred trade policy, $\hat{p}^{\varepsilon}$. If the ROS attain democracy, either via franchise extension or revolution, they can set their preferred trade policy, $\hat{p}^{\rho}$. The elite will try to prevent democratization to avoid $\hat{p}^{\rho}$ by

[10] The conflict over trade policy between groups extends beyond this framework. While we could consider any number of goods and factors, doing so would obscure the simple revenue logic of trade policy in the 2×2 case.

offering trade policy concessions, ensuring the ROS prefer the status quo over revolution.

The elite may face a commitment problem: they might not be able to credibly commit to trade policies that make the ROS as well off under the status quo of elite rule as revolution would. In such cases, it is better for the elite to extend the franchise than to face revolution, as this avoids the cost.

The elite do not face a commitment problem if they are able to set a status quo price, p^{sq}, that equates the ROS's payoff under the status quo with what they would gain from revolution, i.e. being able to set $\hat{p}^{\rho}$ in all future periods. However, the elite are only able to credibly commit to p^{sq} during periods when revolution is a threat. If the threat is frequent enough, the elite can forestall democratization by setting p^{sq}. But if the threat arises infrequently, the elite face a commitment problem and must decide whether or not to extend the franchise when the threat arises.

We now formalize this framework. Initially, political power (in de jure form) is held by the elite, who control trade policy. When the elite hold power they set p_t directly, denoted p_t^{ε}. In each period, there is a probability κ that the ROS resolve their coordination problem and can mount a revolution. This is the 'high threat state' (H). With probability $1 - \kappa$, there is no threat of revolution ('low threat state' or L). In state L, the elite set $\hat{p}^{\varepsilon}$. In state H, the elite can either extend the franchise, ushering in democracy, or set a status quo price p^{sq} favorable to the ROS.[11]

If the ROS mount a revolution, it is always successful, leading to democracy, where the median voter determines trade policy, p_t. Since $\theta < 1$, the median voter belongs to the ROS, whose preferred price is $\hat{p}^{\rho}$. Thus, democratization transfers control of trade policy from the elite to the ROS.

We follow Collier (1999) in modeling the cost of revolution. Collier identifies three types of economic costs of conflict: diversion, destruction, and disruption. We focus on disruption, which limits the ability of agents to allocate factors to productive uses. Accordingly, if revolution occurs, only a share $\psi l = \psi(1+\theta)$ of labor and $\psi\lambda = \psi\theta$ of land can be used in production, where $\psi < 1$, causing a radial contraction of the production

[11]It is straightforward to extend this framework to include repression. The basic insight is that the elite will choose repression if it offers a lower-cost means of avoiding revolution.

possibility frontier during the revolution. The main advantage of this approach is that it holds constant all the gradients in the model, so $\hat{p}^{\varepsilon}$ and $\hat{p}^{\rho}$ are invariant to the occurrence of revolution, simplifying the analysis considerably. In the period after revolution and there after, both factors can be allocated fully to production.

By the linear homogeneity in factors of $x_{\varepsilon t}$ and $x_{\rho t}$, both are unambiguously lower in the event of a revolution. Using (2.6) and (2.7), and denoting a member of group j's income under revolution by $Y_R^j(p_t)$, it follows that for given p^w, $Y_R^j(\hat{p}^{\rho}) = \psi Y^j(\hat{p}^{\rho})$.[12] The disruption cost to agent j is then $Y^j(\hat{p}^{\rho}) - Y_R^j(\hat{p}^{\rho}) = (1-\psi)Y^j(\hat{p}^{\rho})$. This relationship will play a key role in equilibrium characterization.

The game is initialized with the assumption that in period 0 there is rule by the elite. Within a period, t, the sequence of events is as follows.

1. The world price, p^w, and the threat level to the elite regime $z \in \{H, L\}$ are revealed.
2. The elite decide (probabilistically) whether or not to extend the franchise. If they do then there is democracy. If they do not, they set trade policy, $p_t = p_t^{\varepsilon}$.
3. If $s = H$ and the elite have not extended the franchise then the ROS decide (probabilistically) whether or not to mount a revolution. If they do so it is successful for sure, leading to democracy.
4. If there is democracy then trade policy $p_t = \hat{p}^{\rho}$ is set by the median voter (a member of the ROS).
5. Production takes place, demands are realized, markets clear and consumption takes place.

To complete the model specification, we make the following additional assumptions. If democracy is established in period t, it becomes an absorbing state, meaning it cannot be reversed. Then from $t+1$ onward, the sequence begins at stage 4, and the state z is irrelevant. Otherwise, the game restarts from stage 1.[13] Since all members of both groups,

[12] As before, when $p_t = \hat{p}^{\rho}$, $Y^j(\hat{p}^{\rho})$ represents agent j's income under full factor supplies.

[13] The assumption that democracy is an absorbing state allows us to focus on whether trade policy can prevent democratization. Acemoglu and Robinson (2001) explore scenarios where democracy may fail to consolidate, and this model could be extended in that direction.

the elite and the ROS, are identical within their groups (having identical endowments, and differing across groups only by their endowments), we can simplify the analysis without loss of generality by treating each group as a single player. Thus, we model the situation as a two-player game between the elite and the ROS.

3.1. Definition of Equilibrium, Payoffs, and the Commitment Problem

The equilibrium concept we will use is Markov Perfection, where each player's strategy depends only on the current state (F, z) in a given period.[14] Let us now outline the strategies employed by each group. Denote by s^{ε} the set of pure strategies $e \in \{0,1\}$ played by the elite when the state is $z = L$ or H, regarding extension of the franchise: $e = 0$ if they do not extend the franchise and $e = 1$ if they do so. Also, when $e = 0$, the elite set a price p^{ε}. Let s^{ρ} be the set of pure strategies played by the ROS, with elements $a \in \{0,1\}$: $a = 1$ if they mount a revolution and 0 otherwise. Then the elite's mixed strategy σ^{ε} is a probability distribution over pure strategies in s^{ε}, and the ROS's mixed strategy σ^{ρ} is a probability distribution over pure strategies in s^{ρ}.

The elite's best response function, $\tilde{\sigma}^{\varepsilon}(F, z)$ yields the elite's mixed strategy when the state is $F = D$ or E, and $z = L$ or H. Similarly, the ROS's best response function, $\tilde{\sigma}^{\rho}(F, z\,|e, p^{\varepsilon})$ yields the ROS's mixed strategy when the state is $F = D$ or E, and $z = L$ or H, and the elite have chosen e and p^{ε}. Then a Markov perfect equilibrium in mixed strategies is a set of mutual best responses $\{\tilde{\sigma}^{\varepsilon}(F, z), \tilde{\sigma}^{\rho}(F, z\,|e, p^{\varepsilon})\}$.

Moreover, a Markov perfect equilibrium in pure strategies is an outcome where each best response, $\tilde{\sigma}^{\varepsilon}$ and $\tilde{\sigma}^{\rho}$, is degenerate, in that each puts a probability of 1 on one of its two pure strategies, and a probability of 0 on the other.

To determine the equilibrium outcome, we formalize the payoffs for each group under the possible outcomes. Let $V^{j}(D, \hat{p}^{\rho})$ represent the present discounted value under democracy for $j \in \{\varepsilon, \rho\}$. For a member of group j, the payoff under democracy, achieved

[14]In this setup, any Markov Perfect Equilibrium (MPE) coincides with Subgame Perfect Equilibrium (SPE). This occurs because the returns to the strategies available to agents are independent of history. Since MPE conditions only on the current state, a different outcome could emerge under SPE if agents could choose strategies based on past outcomes.

through franchise extension, is given by:

$$V^j(D) \equiv \frac{W^j(D)}{1-\beta}, \tag{3.1}$$

where $W^j(D) \equiv W^j(\hat{p}^\rho, Y^j(\hat{p}^\rho))$, and $1/1-\beta$ yields the present discounted value of $W^j(D)$, given trade policy under democracy of $\hat{p}^\rho$.

For revolution (R), the payoff is:

$$V^j(R) \equiv W^j(R) + \beta\frac{W^j(D)}{1-\beta} \tag{3.2}$$

where $W^j(R) \equiv W^j\left(\hat{p}^\rho, Y^j_R(\hat{p}^\rho)\right)$. The first term reflects the payoff in the revolution period, while the second captures the discounted payoff in subsequent periods. Since $p_t = \hat{p}^\rho$ for all t, both groups prefer franchise extension over revolution, as it avoids the disruption cost $(1-\psi)\,Y^j(\hat{p}^\rho)$. It is now clear from (3.1) and (3.2) that democratization will always resolve the threat of a revolution, because $W^j(D) > W^j(R)$, for $j \in \{\varepsilon, \rho\}$.

We now formalize the commitment problem faced by the elite. The commitment problem arises when the elite cannot credibly commit to resolve the threat of revolution by using trade policy to redistribute to the ROS. The following 'revolution constraint' specifies a necessary (but not sufficient) condition for the elite to face a commitment problem. Assuming the state in period t is H, the revolution constraint binds if:

$$W^\rho(R) + \beta\frac{W^\rho(D)}{1-\beta} > W^\rho(D) + \beta\frac{W^\rho(E)}{1-\beta} \tag{3.3}$$

where $W^j(E) \equiv W^j(\hat{p}^\varepsilon, Y^j(\hat{p}^\varepsilon))$, $j \in \{\varepsilon, \rho\}$, is the payoff to j under dictatorship. When this constraint binds, the payoff to revolution (left hand side) is greater than the payoff of maximal redistribution in the current period implemented by the elite setting $\hat{p}^\rho$ (equivalent to $W^\rho(D)$), followed by no redistribution in all periods thereafter, implemented by $\hat{p}^\varepsilon$ (right hand side). If this constraint fails then the elite can simply resolve the threat of revolution by a single period of implementing $\hat{p}^\rho$. Moreover, they can credibly commit to implement $\hat{p}^\rho$ under the threat of revolution. Therefore, if this constraint fails, the commitment problem does not arise, because the elite can always resolve the threat of revolution in each period that it arises using redistribution through trade policy.

Since $W^\rho(D) > W^\rho(E)$, we can always make β sufficiently close to 1 that the revolution constraint binds. In that case, the elite must set $\hat{p}^\rho$ for multiple periods to raise the ROS's payoff above the level achievable through revolution. However, during some of these periods, the state may switch to L, where the elite can credibly commit only to $\hat{p}^{\varepsilon}$. If L occurs frequently enough, the elite cannot credibly commit to provide the ROS with a level of welfare matching what they could obtain through revolution, resulting in a commitment problem. Thus, the revolution constraint is a necessary (but not sufficient) condition for a commitment problem to arise. Throughout the analysis, we will assume a value of β so that the revolution constraint binds.[15]

Whether or not the elite face a commitment problem depends on whether they can set a status quo price $p^{sq} \in [\hat{p}^{\rho}, \hat{p}^{\varepsilon})$ during every occurrence of H that yields the same payoff for the ROS as revolution. To evaluate this, we calculate agent j's payoff under the status quo:

$$V^j\left(E, p^{sq}; H\right) \equiv W^j\left(SQ\right) + \beta\left(\kappa V^j\left(E, p^{sq}; H\right) + \left(1 - \kappa\right) V^j\left(E, \hat{p}^{\varepsilon}; L\right)\right). \tag{3.4}$$

where $W^j\left(SQ\right) = W^j\left(p^{sq}, Y^j\left(p^{sq}\right)\right)$. The first term on the right-hand side represents agent j's payoff in the current period when the elite set p^{sq}. The second term, discounted by β, shows the expected payoff in the next period. If the state H persists (with probability κ), the elite will continue setting p^{sq}, maintaining agent j's utility. However, if the state transitions to L, (with probability $1 - \kappa$) the elite will revert to their preferred price $\hat{p}^{\varepsilon}$.

Solving recursively, $V^j\left(E, p^s; H\right)$ is given by[16]

$$V^j\left(E, p^{sq}; H\right) = \frac{1 - \beta\left(1 - \kappa\right)}{1 - \beta} W^j\left(SQ\right) + \frac{\beta\left(1 - \kappa\right)}{1 - \beta} W^j\left(E\right) \tag{3.5}$$

The first term reflects agent j's payoff from p^{sq}, weighted by the expected frequency of state H. The second term captures their payoff from $\hat{p}^{\varepsilon}$, weighted by the expected frequency of state L. Together, these terms provide the expected payoff to agent j under the status quo of dictatorship.

[15] If the elite could use some of their income, such as tariff revenue, to make direct transfers to the ROS in the current period, this would raise the β threshold for the revolution constraint to bind. Conversely, allowing the ROS to seize the elite's assets in a revolution would increase the first-term value in the revolution constraint, lowering the required size of β. However, these adjustments would not qualitatively alter the analysis.

[16] The expression for $V^j\left(E, \hat{p}^{\varepsilon}; L\right)$ is the same as that for $V^j\left(E, p^s; H\right)$, except that in the first term, $W^j\left(SQ\right)$ is replaced by $W^j\left(E\right)$.

4. Dictatorship, Democracy, and Revolution in Equilibrium

We now use our framework to characterize equilibrium, focusing on the outcomes of dictatorship, democracy, and revolution. In terms of our case study of the French Revolution, this provides a map of the political possibilities available to the Ancien Régime, by identifying the conditions under which it can maintain the status quo using trade policy, and when it may be forced to relinquish power and democratize. This characterization sets the stage for our later analysis of how a regime transition emerges in response to a shock.

To characterize equilibrium, we consider the maximum welfare that the elite can feasibly induce for the ROS using trade policy, denoted by $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$. We will say that in state H it is feasible for the elite to credibly commit to set any trade policy up to $\hat{p}^{\rho}$, as distinct from state L where they cannot feasibly commit to anything other than $\hat{p}^{\varepsilon}$. The idea of feasibility enables us to compare distinct outcomes such as dictatorship, democracy, and revolution across the parameter space of κ, as an interim step to the exact characterization of equilibrium.

Accordingly, $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$ is induced by the elite setting $\hat{p}^{\rho}$ in every period where H arises, and setting $\hat{p}^{\varepsilon}$ in every period where L arises. Formally, $\overrightarrow{V}^{\rho}(E|\,\kappa; H) \equiv V^{\rho}(E, \hat{p}^{\rho}; H)$, because $p^{sq} = \hat{p}^{\rho}$ so that $W^{\rho}(SQ) = W^{\rho}(D)$ in (3.5). The condition for the elite to face a commitment problem is then $\overrightarrow{V}^{\rho}(E|\,\kappa; H) < V^{\rho}(R, \hat{p}^{\rho})$.

We can now determine the range of κ where the elite face a commitment problem, and where they do not. We can see by inspection that $\overrightarrow{V}^{\rho}(E|\,0; H)$ equals the right hand side of the revolution constraint, (3.3). Therefore, with β set so that the revolution constraint binds, $\overrightarrow{V}^{\rho}(E|\,0; H) < V^{\rho}(R, \hat{p}^{\rho})$, so the elite face a commitment problem at $\kappa = 0$. We can also see that $\overrightarrow{V}^{\rho}(E|\,1; H) = V^{\rho}(D) > V^{\rho}(R, \hat{p}^{\rho})$, since if the threat of revolution arises with probability 1, the elite can feasibly set $p^{sq} = \hat{p}^{\rho}$ in every period, which is equivalent to the outcome in democracy. Moreover, $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$ increases linearly with κ: $\partial\overrightarrow{V}^{\rho}(E|\,\kappa; H)/\partial\kappa = \beta(W^{\rho}(D) - W^{\rho}(E))/(1-\beta)$. Since the payoff to revolution lies between $\overrightarrow{V}^{\rho}(E|\,0; H)$ and $\overrightarrow{V}^{\rho}(E|\,1; H)$, and since $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$ is linear between $\kappa = 0$ and $\kappa = 1$, there must exist a unique value of κ, which we will denote by $\overrightarrow{\kappa}$, at which the maximum feasible level of welfare for ROS is equal to welfare under revolution: $\overrightarrow{V}^{\rho}(E|\,\overrightarrow{\kappa}; H) = V^{\rho}(R)$.

It follows that for $0 < \kappa < \overrightarrow{\kappa}$, $\overrightarrow{V}^{\rho}(E|\,\kappa; H) < V^{\rho}(R, \hat{p}^{\rho})$ and so the elite face a commitment problem over that range of κ, while for $\overrightarrow{\kappa} < \kappa \leq 1$, $\overrightarrow{V}^{\rho}(E|\,\kappa; H) > V^{\rho}(R, \hat{p}^{\rho})$ and so over that range they do not. Over the range where they do not face a commitment problem, in state H they can use trade policy to resolve the threat of revolution, and their ability to maintain dictatorship is assured.

It will be useful in our characterization of equilibrium to solve explicitly for $\overrightarrow{\kappa}$. To do so, we use (3.2) and (3.5) in conjunction with $p^{sq} = \hat{p}^{\rho}$ to set $\overrightarrow{V}^{\rho}(E|\,\overrightarrow{\kappa}; H) = V^{\rho}(R)$. Then solving for $\overrightarrow{\kappa}$, we obtain

$$\overrightarrow{\kappa} = \frac{\beta\left(W^{\rho}(D) - W^{\rho}(E)\right) - (1-\beta)\left(W^{\rho}(D) - W^{\rho}(R)\right)}{\beta\left(W^{\rho}(D) - W^{\rho}(E)\right)}. \tag{4.1}$$

Of course, if β is set so that the revolution constraint binds, $\overrightarrow{\kappa} \in (0, 1]$. If $\psi = 1$ so that $W^{\rho}(D) = W^{\rho}(R)$, then $\overrightarrow{\kappa} = 1$, while we can choose a value of $\psi < 1$ so that $\overrightarrow{\kappa} \to 0$ from above.

The possibility that revolution can arise along the equilibrium path becomes evident when we consider the elite's options in addressing the commitment problem (where $0 < \kappa < \overrightarrow{\kappa}$). To see this, consider whether it is feasible for the elite to play a strategy of 'delayed franchise extension' in the current period: that is, the elite redistribute to ROS maximally in the current period by setting $\hat{p}^{\rho}$, maintaining the status quo of dictatorship, but promise to extend the franchise the next time the state is H.

Obviously, this cannot be part of a pure strategy. If the ROS played a pure strategy of accepting the status quo then the elite would play a pure strategy of always delaying franchise extension. And if the ROS always mounted a revolution in response to delayed franchise extension, then they would always bear the cost, while by accepting the promise of delayed franchise extension they could avoid this. This suggests the possibility of a mixed strategy where the elite delay franchise extension with some probability, and the ROS mount a revolution with some probability.

We will also need to consider the possibility that the strategy of delayed franchise extension fails to raise the ROS's expected welfare above that of revolution over some range of κ. In that case, the elite will be compelled to respond to the threat of revolution by extending the franchise immediately over that range of the parameter space.

To formalize this set of possibilities, we consider the maximum welfare that the elite can feasibly induce for the ROS by playing the strategy of delayed franchise extension, denoted by $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$. The value to the ROS of this is given by:

$$\overleftarrow{V}^{\rho}(E|\,\kappa; H) = W^{\rho}(D) + \beta\left(\kappa V^{\rho}(D) + (1-\kappa)\, V^{\rho}(E, \hat{p}^{\varepsilon}; L)\right). \tag{4.2}$$

The first term reflects the ROS's payoff from receiving maximal redistribution from $\hat{p}^{\rho}$ in the current period, while the second term captures the continuation payoff. The latter is based on the value of democratization, $V^{\rho}(D)$, arising with probability κ, and the continuation of elite rule, $V^{\rho}(E, \hat{p}^{\varepsilon}; L)$, arising with probability $1-\kappa$.

Solving recursively, $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$ is given by[17]

$$\overleftarrow{V}^{\rho}(E|\,\kappa; H) = W^{\rho}(D) + \frac{\beta\kappa}{1-\beta(1-\kappa)} V^{\rho}(D) + \frac{\beta(1-\kappa)}{1-\beta(1-\kappa)} W^{\rho}(E) \tag{4.3}$$

Inspection of (4.3) reveals that $\overleftarrow{V}^{\rho}(E|\,0; H)$ is equal to the right hand side of the revolution constraint, (3.3), just like $\overrightarrow{V}^{\rho}(E|\,0; H)$. In addition, $\overleftarrow{V}^{\rho}(E|\,1; H) = V^{\rho}(D)$, again just like $\overrightarrow{V}^{\rho}(E|\,1; H)$. Also just like $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$, $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$ is increasing in κ: $\partial\overleftarrow{V}^{\rho}(E|\,\kappa; H)/\partial\kappa = \beta\left(W^{\rho}(D) - W^{\rho}(E)\right)/\left(1-(1-\kappa)\beta\right)^{2} > 0$. But, $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$ is strictly concave in κ: $\partial^{2}\overleftarrow{V}^{\rho}(E|\,\kappa; H)/\partial\kappa^{2} = -2\beta^{2}\left(W^{\rho}(D) - W^{\rho}(E)\right)/\left(1-(1-\kappa)\beta\right)^{3} < 0$ and this is different to $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$. From this, we know that $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$ lies everywhere above $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$, and there must exist a unique value of κ, denoted by $\overleftarrow{\kappa}$, that solves $\overrightarrow{V}^{\rho}(E|\,\tilde{\kappa}; H) = V(R)$. Moreover, it must be that $\overleftarrow{\kappa} < \overrightarrow{\kappa}$.

We can now see that over the range $0 \leq \kappa < \overleftarrow{\kappa}$, in state H the elite must play a pure strategy of extending the franchise to resolve the threat of revolution. The reason is that $\overleftarrow{V}^{\rho}(E|\,\tilde{\kappa}; H) < V(R)$ over this range: delayed franchise extension is not sufficient to raise the level of welfare for ROS above that from revolution. If the elite played a strategy of delayed franchise extension it would be met by a ROS best response of mounting a revolution.

For $\kappa \in (\overleftarrow{\kappa}, \overrightarrow{\kappa})$, by contrast, if the elite play a strategy of delayed franchise extension, this does raise the expected level of welfare of the ROS above what they could obtain from revolution. So over this range, it is not a best response for the ROS to play a pure

[17] The expression for $\overleftarrow{V}^{\rho}(E|\,\kappa; L)$ is the same as that for $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$, except that the first term is replaced by $W^{\rho}(E)$.

strategy of mounting a revolution. We will show below that there exists a mixed strategy equilibrium, where the elite delay franchise extension with some probability, and the ROS respond by mounting a revolution with some probability.

Like for $\overrightarrow{\kappa}$, it will be useful to solve explicitly for $\overleftarrow{\kappa}$. To do so, we use (3.2) and (4.3) to set $\overleftarrow{V}^{\rho}(E|\overleftarrow{\kappa};H) = V(R)$. Then solving for $\overleftarrow{\kappa}$, we obtain

$$\overleftarrow{\kappa} = \frac{\beta\left(W^{\rho}(D) - W^{\rho}(E)\right) - (1-\beta)\left(W^{\rho}(D) - W^{\rho}(R)\right)}{2\beta\left(W^{\rho}(D) - W^{\rho}(E)\right)}$$

This expression confirms that $\overleftarrow{\kappa} < \overrightarrow{\kappa}$: the numerators of each are identical, while the denominator of $\overleftarrow{\kappa}$ is twice the size of that of $\overrightarrow{\kappa}$.

Let us now consider mixed strategies. We will denote the probability that the elite play strategy $e = 1$ by π_e: $\pi_e \equiv \sigma^{\varepsilon}(e=1)$. Similarly, for ROS we will denote $\pi_a \equiv \sigma^{\rho}(a=1)$. Turning to the value functions under mixed strategies, we start with the elite because, in the sequence of events, they choose their strategy first. Denoting $\overleftrightarrow{V}^{\varepsilon}(E|\kappa;H;\sigma^{\varepsilon})$ as the elite's value function under mixed strategies, we have

$$\begin{aligned}\overleftrightarrow{V}^{\varepsilon}(E|\kappa;H;e=0) &= (1-\pi_a)\left(W^{\varepsilon}(D) + \beta\left(\kappa V^{\varepsilon}(D) + (1-\kappa)V^{\varepsilon}(E,\hat{p}^{\varepsilon};L)\right)\right)\\ &\quad +\pi_a V^{\varepsilon}(R)\end{aligned}$$

as the payoff to the elite when they play a pure strategy of $e = 0$ and the ROS adopt a mixed strategy of π_a. The first line captures the same elements as in (4.2) but here for the elite specifically, and multiplies this by the probability that the ROS do not mount a revolution. The second line captures the probability that the ROS do mount a revolution, multiplied by the payoff to the elite from the occurrence of a revolution. Next note that the payoff to the elite of an immediate extension of the franchise is given by

$$\overleftrightarrow{V}^{\varepsilon}(E|\kappa;H;e=1) = V^{\varepsilon}(D)$$

Focusing on $\kappa \in [\overleftarrow{\kappa}, \overrightarrow{\kappa})$, we can now show that there exists a unique equilibrium value, $\tilde{\pi}_a \in (0,1)$ consistent with an MPE in mixed strategies. As standard, a condition of mixed-strategy MPE is that $\tilde{\pi}_a$ is set such that the elite obtain the same expected payoff from either strategy: $\overleftrightarrow{V}^{\varepsilon}(E|\kappa;H;0) = \overleftrightarrow{V}^{\rho}(E|\kappa;H;1)$. First consider $\pi_a = 0$, i.e. the ROS play a pure strategy of never mounting a revolution. In that case, the elite would always gain by playing a pure strategy of maintaining the status quo, since $V^{\varepsilon}(D) <$

$V^{\varepsilon}(E, \hat{p}^{\varepsilon}; z)$. Moreover, the ROS have an incentive to deviate from a pure strategy of never mounting a revolution. As we saw above, for $\kappa < \overrightarrow{\kappa}$, $\overrightarrow{V}^{\rho}(E|\,\kappa; H) < V^{\rho}(R, \hat{p}^{\rho})$, and so the ROS have a best response to the status quo of mounting a revolution. Next consider $\pi_a = 1$. Then the elite bear the cost of revolution with certainty, and $V^{\varepsilon}(R) < V^{\varepsilon}(D)$. Moreover, we know the elite can improve on revolution by delayed franchise extension. The equilibrium value, $\tilde{\pi}_a \in (0,1)$, balances the outcomes at $\pi_a = 0$ and $\pi_a = 1$ so that the elite's payoff is equal to $V^{\varepsilon}(D)$. Crucially, as we will see next, by setting a sufficiently high value of $\tilde{\pi}_a$, the ROS gain a level of expected welfare equal to that of revolution, so revolution is not triggered with certainty.

Turning now to the ROS:

$$\begin{aligned}\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=0) &= W^{\rho}(D) \\ &\quad +\beta\kappa\left(\pi_e V^{\rho}(D) + (1-\pi_e)\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=0)\right) \\ &\quad +\beta(1-\kappa)V^{\rho}(E, \hat{p}^{\varepsilon}; L)\end{aligned}$$

where $\overleftrightarrow{V}^{\rho}(E|\,\kappa; H;\, e=0|\,a=0)$ states that the ROS condition setting $a=0$ on having observed the elite setting $e=0$. Note that setting $\pi_e = 1$ in this function obtains $\overleftarrow{V}^{\rho}(E|\,\kappa; H)$ given by (4.2), while setting $\pi_e = 0$ obtains $\overrightarrow{V}^{\rho}(E|\,\kappa; H)$. Alternatively, if the ROS play $a=1$, their value is given by

$$\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=1) = V^{\rho}(R).$$

In parallel to the equilibrium condition on $\tilde{\pi}_a$, a condition of mixed-strategy MPE is that $\tilde{\pi}_e$ is set such that the ROS obtain the same expected payoff from either strategy: $\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=0) = \overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=1)$. For $\kappa \in (\overleftarrow{\kappa}, \overrightarrow{\kappa})$, this condition defines a unique equilibrium value of $\tilde{\pi}_e \in (0,1)$. To see this, note that for $\pi_e = 0$, we have $\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=0) = \overrightarrow{V}^{\rho}(E|\,\kappa; H) < V^{\rho}(R)$, while for $\pi_e = 1$, we have $V^{\rho}(R) < \overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=1; a=0) = \overleftarrow{V}^{\rho}(E|\,\kappa; H)$. Since $\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e=0; a=0)$ increases linearly in π_e, there must exist a unique value of $\tilde{\pi}_e \in (0,1)$ such that the condition is satisfied.

We have now proved our main result, which we can state as follows.

Theorem 1. *Assume a value of* β *sufficiently high that the revolution constraint binds. For* $\kappa \neq \overleftarrow{\kappa}$, $\kappa \neq \overrightarrow{\kappa}$, *there exists a unique Markov Perfect Equilibrium with the following characteristics.*
(i) If $\kappa < \overleftarrow{\kappa}$ *then there is a pure strategy equilibrium where the elite resolve the threat of revolution by extending the franchise.*
(ii) if $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$ *then there is a mixed strategy equilibrium where the elite extend the franchise with probability* $\tilde{\pi}_e \in (0, 1)$, *and the ROS mount a revolution with probability* $\tilde{\pi}_a \in (0, 1)$.
(iii) If $\overrightarrow{\kappa} < \kappa$ *then there is a pure strategy equilibrium where the elite resolve the threat of revolution by temporarily setting the status quo price using trade policy, thereby raising the ROS's welfare to what they would have obtained from revolution.*

The statement of this result provides us with the opportunity to contrast our interpretation of the model with that of Acemoglu and Robinson (2000, 2006, 2017). They characterize dictatorship in terms of Theorem 1(i). The probability of the threat of revolution occurring is low, but when it does arise the elite must extend the franchise to resolve the threat. We interpret the model differently. We characterize dictatorship in terms of Theorem 1(iii). High threat states arise relatively frequently, but the elite do not face a commitment problem and can resolve these threats using temporary adjustments to trade policy that keep food cheap. If and when a shock arises to push the economy into the region characterized by Theorem 1(ii), the situation changes to one where democratization becomes a possibility, either through peaceful franchise extension or a revolution.

We will now use our basic framework to understand more deeply if and when democracy arises through revolution, as in France. We will do this by establishing three results. Proposition 2 will consider the shock that pushes the economy from the region of the parameter space where there is no commitment problem, $\overrightarrow{\kappa} < \kappa$, to one where there is, and where a revolution can arise, $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$. Proposition 3 will examine how an increase in inequality can give rise to revolution. And Theorem 1′ will examine how the existence of the possibility of revolution on the equilibrium path characterized by Theorem 1(ii) depends, paradoxically, on sufficiently high trust of the ROS in the elite.

5. The Transition from Dictatorship to Democracy

We will now consider three results that focus on how a regime transition emerges in response to a shock. We will focus first on the result at an analytical level. As in previous sections, the statement of the result will follow the analysis as a summary. After the statement of the result, we will discuss in detail how we use the result to interpret the occurrence of the French Revolution.

5.1. The Cost of Revolution

We will now show that a sufficiently large fall in the cost of revolution will push the equilibrium solution from stable dictatorship characterized by Theorem 1(iii) to the possibility of revolution characterized by Theorem 1(ii). Assume, as before, that β is sufficiently large that the revolution constraint binds. Fix a value of $\kappa \in (0, 1)$. Next note that for any set of the remaining parameters of the model, we can find a level of ψ for which $\overrightarrow{\kappa} < \kappa$. To see this, first note from the foregoing discussion that if $\psi = 1$ then $W^{\rho}(R) = W^{\rho}(D)$ and so $\overrightarrow{\kappa} = 1$. Also note from the foregoing that, given the revolution constraint binds, there must exist a value of $\psi < 0$ such that $\overrightarrow{\kappa} \to 0$ from above. It follows that we can find a value of ψ between these endpoints that corresponds to any $\overrightarrow{\kappa} \in (0, 1)$. So for any $\kappa \in (0, 1)$ that we have fixed, we can fix a value of ψ so that $\overrightarrow{\kappa} < \kappa$. In this manner, we can choose an initial point whereby the equilibrium is characterized by Theorem 1(iii).

Next, we consider an unanticipated shock to ψ that moves the economy from $\overrightarrow{\kappa} < \kappa$ to $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$.[18] We argued above that the disruption cost to revolution is captured by $(1 - \psi) Y^j(\hat{p}^{\rho})$. So a fall in the disruption cost of revolution is captured by an increase in ψ. From (4.1), and using the fact that $W^{\rho}(R) = \psi W^{\rho}(D)$, we have

$$\frac{\partial \overrightarrow{\kappa}}{\partial \psi} = \frac{(1 - \beta) W^{\rho}(D)}{\beta (W^{\rho}(D) - W^{\rho}(R))}.$$

Therefore, a fall in the cost of revolution brings about an increase in $\overrightarrow{\kappa}$. Since this effect is monotonic all the way to $\psi = 1$, starting from a point where $\overrightarrow{\kappa} < \kappa$, we can always

[18] Assuming that the shock is unanticipated simplifies the analysis, since agents expect a stationary equilibrium where dictatorship is maintained indefinitely when $\overrightarrow{\kappa} < \kappa$. If, instead, they anticipated the possibility that $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$, they would foresee the possibility of democratization, resulting in an equilibrium that blends features of Theorem 1(i) and Theorem 1(ii).

find an increase in ψ that is sufficiently large to increase $\overrightarrow{\kappa}$ to a point where $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$. This would change the characterization of equilibrium from one given by Theorem 1(iii) to one characterized by Theorem 1(ii). We summarize this analysis in the following result.

Proposition 2. *Assume that β is sufficiently large that the revolution constraint binds. For any given initial cost of revolution $(1-\psi)\, Y^j\,(\hat{p}^\rho)$ giving rise to $\overrightarrow{\kappa} < \kappa$, there exists an unanticipated fall in the cost of revolution, given by an increase in ψ, that is sufficiently large to increase $\overrightarrow{\kappa}$ to the point where $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$. This changes the equilibrium path from one characterized by Theorem 1(iii), where no revolution can occur, to one characterized by Theorem 1(ii), where a revolution can occur.*

This result pinpoints how our view contrasts with that of AR on how democratization comes about. AR argue that $\kappa < \overleftarrow{\kappa}$ is the natural case, so that equilibrium is characterized by Theorem 1(i) (AR, Acemoglu and Robinson 2000, 2006, 2017). We argue, by contrast, that equilibrium under dictatorship is typically characterized by $\overrightarrow{\kappa} < \kappa$, where threats of revolution arise relatively frequently, but where the ruling elite can manage the threats using international trade policy and so dictatorship is stable. It is only when a sufficiently large shock lowers the cost of revolution enough that the country shifts into the region of the parameter space where $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$, that revolution, and hence democratization, becomes a possibility.

Note that the shock to ψ could be so small that the economy remains in the range where $\overrightarrow{\kappa} < \kappa$. It could alternatively be that the shock is so large that the country is shifted to the range where $\kappa < \overleftarrow{\kappa}$, meaning that the extension of the threat of revolution will guarantee a peaceful extension of the franchise. Therefore, starting from $\overrightarrow{\kappa} < \kappa$, a shock to ψ is necessary but not sufficient to bring about the possibility of revolution.

Now we will interpret Proposition 2 in the context of the French Revolution. We argue that France shifted from a position of stable dictatorship to one in which revolution became possible as a result of the financial crisis that followed the American War of Independence. The fiscal strain weakened the Ancien Régime's capacity to finance the coercive apparatus necessary to maintain the State's Weberian monopoly on violence. In effect, this compromised the regime's ability to repress dissent and thereby lowered the cost of mounting a successful revolution, shifting de facto power away from the elite and toward the ROS. We associate this shock to state capacity with an increase in ψ in our model. While highly stylized, this reduced-form mapping illustrates how a fiscal shock translated into a regime transition by lowering the elite's ability to suppress revolt.

It is worth clarifying the distinction between the cost of revolution on the one hand, and the ROS's ability to resolve their coordination problem and mount a revolution on the other. In our model, κ represents the probability that, in any given period, a revolution becomes feasible. That is, an event occurs which creates the conditions under which the ROS can resolve their coordination problem and hence a revolution can succeed. The Storming of the Bastille on 14 July 1789 can be interpreted as the realization of such an event. It brought the ROS onto the streets, resolved their coordination problem, and thereby triggered the high-threat state in which revolution became feasible.

Finally, we can be precise about exactly how the predictions of the model map into the trade policy that was adopted by France prior to, and in the aftermath of, the Revolution. The Ancien Régime and the wider elite were land owners, and so favored free trade. This they achieved through the Eden Agreement, and through a broader policy of laissez-faire that aligned with free trade more generally (Horn 2006). The Eden Agreement itself was abandoned in 1793, and the principle of laissez-faire was unwound thereafter as France became more protectionist (Crouzet 2003). Increasing export restrictions on French agricultural produce lead food to remain at home, making it more plentiful and hence cheaper, raising the real incomes of the ROS (Goubert 1986).

5.2. Inequality and the Threat of Revolution

Recall from (2.2) that $r_t^* > p_t^* > 0 > w_t^*$. This says that an increase in the price of food within the country will lead to an increase in income from land and a decrease in wages, thereby increasing factor-income inequality. Since the elite are land owners, and the ROS derive income from labor, this effect has the potential to increase inequality between the two groups. Additionally, each group derives income from trade policy revenue. However, by the 'Mayer assumption', represented by (2.3), the share of trade policy revenue that $j \in \{\varepsilon, \rho\}$ receives is proportional to their factor income share. So as the factor income share increases, the share of trade policy revenue increases as well. This means that an increase in p_t will increase income inequality between the elite and the ROS.

We now specify the shock that drives an increase in inequality. We will assume that this is brought about by a positive shock to p^w. To show concretely how this drives inequality, we first specify comparative advantage. Arguably, France had a comparative advantage in f, since its main trade partner at the time, England, had a comparative advantage in g. We know from Proposition 1(i) that with a comparative advantage in f, and in the absence of domestic fiscal capacity, $\hat{p}^\varepsilon = p^w$. We also know from Proposition 1(i) that $p^a \leq \hat{p}^\rho < p^w$. To simplify the analysis, we will assume the underlying parameters of the model are such that $\hat{p}^\rho$ is at a corner: $\hat{p}^\rho = p^a$. Under these assumptions, a positive shock to p^w increases $\hat{p}^\varepsilon$ in the same magnitude, but has no effect on $\hat{p}^\rho$.

Next we will show that a positive shock to $\hat{p}^\varepsilon$ increases $\overrightarrow{\kappa}$. Hence, as with the shock to ψ, the shock to p^w can push the country from $\overrightarrow{\kappa} < \kappa$ where dictatorship is stable to $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$ where revolution can occur. However, differently to the shock to ψ, we cannot always find a value of p^w that will push the country from $\overrightarrow{\kappa} < \kappa$ to $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$, so our approach to the proof must be different.

To begin our analysis of the effect of the shock to p^w, fix a set of parameters so that $\overrightarrow{\kappa} \in (0, 1)$, $\kappa = \overrightarrow{\kappa} + \omega$, where $\omega \to 0_+$ so that $\overrightarrow{\kappa} < \kappa$. Our assumption that $\hat{p}^\rho = p^a$ ensures that $W^\rho(D)$ is unaffected by p^w, so a shock to p^w only affects $W^\rho(E)$. Moreover, a positive shock to p^w reduces $W^\rho(E)$ because the ROS are made worse off by higher world food prices through a fall in real wages: $\partial W^\rho(E)/\partial p^w < 0$.

We can now use (4.1) to determine the effect of a positive shock to p^w on $\overrightarrow{\kappa}$. Differentiating with respect to p^w, we have

$$\frac{\partial \overrightarrow{\kappa}}{\partial p^w} = -\frac{W^\rho(D)(1-\beta)(1-\psi)\,\partial W^\rho(E)/\partial p^w}{\beta\left(W^\rho(D) - W^\rho(R)\right)^2} > 0.$$

This says that providing ω is sufficiently small, a given positive shock to p^w will push $\overrightarrow{\kappa}$ to a new level, $\overrightarrow{\kappa}'$ at which $\kappa = \overrightarrow{\kappa} + \omega < \overrightarrow{\kappa}'$, whereby revolution becomes possible along the equilibrium path. To see why, recall that $\overrightarrow{\kappa}$ occurs at the point where $\overrightarrow{V}^\rho(E|\,\overrightarrow{\kappa}; H) = V^\rho(R)$, with the intercept of $\overrightarrow{V}^\rho(E|\,0; H)$ at $\kappa = 0$ being the right hand side of the revolution constraint, (3.3), and $\overrightarrow{V}^\rho(E|\,1; H) = V^\rho(D)$ at $\kappa = 1$. Since a positive shock to p^w reduces $W^\rho(E)$ and hence the intercept, $\overrightarrow{V}^\rho(E|\,0; H)$, while the right hand end of $\overrightarrow{V}^\rho(E|\,\overrightarrow{\kappa}; H)$ at $V^\rho(D)$ is unaffected, $\overrightarrow{\kappa}$ must increase. We summarize follows.

Proposition 3. *Fix a set of parameters so that $\overrightarrow{\kappa} < \kappa$ by a small margin. Then a given positive shock to p^w, which causes an increase in inequality, will change the equilibrium path from one characterized by Theorem 1(iii), where no revolution can occur, to one characterized by Theorem 1(ii), where a revolution can occur.*

This result shows that a rise in inequality driven by a world price shock can make the ruling elite vulnerable to a revolution. However, the conditions for such a shift are more restrictive than those for a fall in the cost of revolution to do so as in Proposition 2. In general, we will reach $\overrightarrow{V}^{\rho}(E|\,0;H) = 0$ at a value $\overrightarrow{\kappa} < 1$. This means that for κ sufficiently close to 1, there does not exist a positive shock to p^w large enough to make $\kappa < \overrightarrow{\kappa}'$. This explains in turn why we must assume that initially $\kappa = \overrightarrow{\kappa} + \omega$, rather than anywhere in the range $\kappa \in (\overrightarrow{\kappa}, 1)$ as in Proposition 2.

Proposition 3 may or may not still hold under a relaxation of the assumption that $\hat{p}^{\rho} = p^a$. This assumption simplifies the analysis in two ways. First, it ensures that wage income does not respond to a shock to p^w in the event of democracy. Moreover, it ensures that there is no trade policy revenue, and so possible changes in trade policy revenue resulting from an increase in p^w are removed from consideration. That is why $V^{\rho}(D)$ does not change under a shock to p^w. However, if $\hat{p}^{\rho}$ were at an interior solution, then in general we should expect a positive shock to p^w to worsen wages under democracy as well as dictatorship, and this would lower $V^{\rho}(D)$ as well $\overrightarrow{V}^{\rho}(E|\,0;H)$. This in turn would make the effect of a shock to p^w on $\overrightarrow{\kappa}$ ambiguous. It in turn provides an explanation for why a rise in inequality does not necessarily imply that revolution becomes more likely.

This result provides a possible explanation for how Przeworski et al. (2000) find that dictatorships are significantly more vulnerable to political transition when income inequality is higher, while Boix (2003) does not. In terms of our framework, this would happen if the countries in Przeworski et al.'s data set had values of κ that were greater than $\overrightarrow{\kappa}$ by a sufficiently small margin that the shock to $\overrightarrow{\kappa}$ put them to the left of it, whereas the countries in Boix (2003) remained to the right of $\overrightarrow{\kappa}$ even after the shock.

It is important to emphasize that an increase in inequality, driven by an increase in world food prices, is not part of our narrative about the cause of the French Revolution. Rather, we think of this result as showing how a given p^w and corresponding level of inequality locates Pre-Revolutionary France sufficiently close to $\overrightarrow{\kappa}$, while still being above it, that the shock to ψ described above is sufficient to push the country to the left of $\overrightarrow{\kappa}$. Undoubtedly, high inequality formed part of the backdrop that created the conditions for the French Revolution, but we interpret the rise in ψ as the proximate cause.

5.3. When Revolution Cannot Happen in Equilibrium

The early literature on the role of the threat of revolution in the precipitation of democracy was mistaken in its conclusion that revolution could not happen on the equilibrium path (Acemoglu and Robinson 2017). At one level this mistake was inconsequential because, as the empirical literature has shown, what really matters for democratization is not whether or not a revolution happens but the occurrence of the threat of revolution. However, now that we have gained a full understanding of the possibility of revolution on the equilibrium path, it is useful to return to the question of whether the characterization of equilibrium in the early literature, where no revolution can happen on the equilibrium path, can be restored via the introduction of a reasonable assumption. We explore this question here.

Consider the range of the parameter space $\overleftarrow{\kappa} < \kappa < \overrightarrow{\kappa}$ where revolution can occur on the equilibrium path, as characterized by Theorem 1(ii). The reason that revolution can occur over this range is because, as discussed before Theorem 1, $V^{\rho}(R) < \overleftarrow{V}^{\rho}(E|\,\kappa; H)$: that is, the elite can renege on the promise to extend the franchise in the current period, promising instead to extend it the next time the threat of revolution arises. The key assumption that supports the equilibrium characterized in Theorem 1(ii) is that the ROS believe that the elite will extend the franchise with some probability the next time the threat of revolution arises. Indeed, in equilibrium $\tilde{\pi}_e \in (0,1)$ is chosen so that the ROS's expected payoff is equal to $V^{\rho}(R)$, and the ROS believe this probability to be accurate.

Now assume that the ROS, having observed the elite renege on their promise to extend the franchise under the threat of revolution in the current period, believe this implies that the elite will delay franchise extension indefinitely: $\pi_e = 0$. In that case, $\overleftrightarrow{V}^{\rho}(E|\,\kappa; H; e = 0|\, a = 0) = \overrightarrow{V}^{\rho}(E|\,\kappa; H) < V^{\rho}(R)$, and a best response is for the ROS to mount a revolution. In that case, the range of the parameter space where a revolution can occur on the equilibrium path disappears, and equilibrium is characterized as follows.

Theorem 1′. *Assume a value of β sufficiently high that the revolution constraint binds. For $\kappa \neq \overrightarrow{\kappa}$, there exists a unique Markov Perfect Equilibrium with the following characteristics.*
(i) If $\kappa < \overrightarrow{\kappa}$ then there is a pure strategy equilibrium where the elite resolve the threat of revolution by extending the franchise.
(ii) If $\overrightarrow{\kappa} < \kappa$ then there is a pure strategy equilibrium where the elite resolve the threat of revolution by temporarily setting the status quo price using trade policy, thereby raising the ROS's welfare to what they would have obtained from revolution.

That is, if having observed no extension of the franchise, the ROS believe that the elite will delay franchise extension indefinitely, then the mixed strategy equilibrium characterized in Theorem 1(ii) collapses to the pure strategy equilibrium characterized in Theorem 1(iii) for the full range $\kappa < \overrightarrow{\kappa}$.

How reasonable is it to argue that the ROS hold the belief that $\pi_e = 0$? We think this is defensible as a complement to the assumption that democracy is an absorbing state once it is achieved. This implies that the ROS do not have the opportunity to learn the true equilibrium probability $\tilde{\pi}_e \in (0, 1)$ through experimentation. One could argue that a poor relationship between the elite and the ROS prior to equilibrium could lead the ROS to have a Bayesian prior of $\pi_e = 0$. One could equally argue that the elite may anticipate this, incentivizing them to invest in a better relationship. Both assumptions seem defensible, depending on the wider context. The surprising conclusion is that revolution only occurs on the equilibrium path if the ROS trust the elite enough to believe that they may extend the franchise in future with positive probability.

Applied to the French case, if trust in Louis XVI had already collapsed by 1789, a revolution may never have occurred. However, historians have shown that Louis XVI's early gestures toward constitutional monarchy maintained public legitimacy into mid-1789, even after the Storming of the Bastille (Caiani 2012, pp. 27-114). This indicates that, even amidst turmoil, portions of French society retained enough trust to believe reform was possible. Theorem 1′ therefore helps frame the revolution not as an inevitable collapse, but as a strategic equilibrium response conditioned on residual, fragile trust in elite willingness to reform.

6. Conclusions

This paper develops a new economic-theory-based approach to the French Revolution. By integrating the political-economy logic of Acemoglu and Robinson (2000) with a general equilibrium trade model in the tradition of Mayer (1984), we provide a framework in which trade policy, not domestic taxation, acts as the mechanism of redistribution between the ruling elite and the ROS. This shift allows us to capture key historical dynamics specific to pre-revolutionary France, including the redistributive implications of the 1786 Anglo-French Eden Agreement.

A central contribution of the paper is to bring the actual occurrence of revolution, and not merely the threat of it, into focus. Our analysis shows that revolution can be a necessary outcome in equilibrium when elite strategies for managing unrest become ineffective. This perspective aligns with the revisionist literature on the French Revolution and challenges the dominant thread in the democratization literature that emphasizes peaceful transitions. We also incorporate endogenous inequality, allowing us to explore how changes in world food prices can alter the political equilibrium. In doing so, we offer a theoretical explanation for the mixed empirical findings on the relationship between inequality and democratization.

Our framework opens several avenues for future research. One is to explore how our model of the French Revolution might be extended to explain other episodes of large-scale political upheaval, such as the Arab Spring. Another is to investigate the potential for structural estimation to identify the conditions under which rising inequality brings about revolution. Finally, a core insight of the model is the paradoxical role of trust in revolutionary settings. The very possibility of revolution depends on the elite sometimes extending the franchise and the ROS sometimes choosing not to revolt. This requires that the ROS assign some probability to elite promises being kept. In this sense, revolution actually depends on a certain level of trust in the existing regime. Understanding how such trust arises and persists could deepen our understanding of political transitions and their failures.

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