The Coevolution of Economic and Political Development from Monarchy to Democracy

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Abstract

This paper establishes a simple model of long run economic and political development, which is driven by the inherent technical features of different production factors and the political conflicts among factor owners on how to divide the outputs. The main production factor in economy evolves from land to physical capital and then to human capital, which enables their respective owners (landlords, capitalists, and workers) to gain political power in the same sequence, shaping the political development path from monarchy to oligarchy and finally to democracy with full suffrage. When it is too costly for any group of factor owners to repress others, political compromise is reached and economic progress is not blocked; otherwise, the political conflicts may lead to economic stagnation.

JEL: O10, O40, P16, N10.

Key Words: Economic Development, Political Development, Democratization, Class Structure, Land, Physical Capital, Human Capital, Monarchy, Oligarchy, Democracy, Suffrage Extension.

1 Introduction

The main story line of human history may be driven by the dynamic interactions between cooperative economic activities leading to greater aggregate wealth and political conflicts over its distribution. The current paper attempts to formalize this idea in a simple model of long run economic and political development illustrated in Figure 1. As the main factor of production shifts from land to physical capital and then to human capital, the relative economic and hence coercive power of landlords, capitalists, and workers shifts
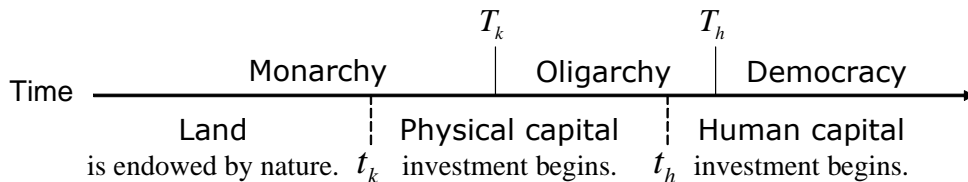
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Figure 1: The Time Line of Economic and Political Development

accordingly, inducing the transition of political system from monarchy to oligarchy (of landowners and capitalists) and finally to democracy with full suffrage. Every new political regime, by extending political power to the owners of the new form of capital and thus increasing their future economic gains from investment, speeds up economic progress. Such a smooth reinforcing coevolution path between economic and political development happens only when political compromise is reached at both transition periods T_k and T_h; otherwise the political conflicts over output distribution may lead to repression and economic stagnation.

The main results of the paper are consistent with historical evidence especially in Western Europe where the full time line in the model has been realized. From the beginning of settled agriculture, the predominance of land in production lasted thousands of years (Cipolla 1976). Gradually, commercial and industrial sectors replaced agriculture to become dominant economic activities, leading to the Industrial Revolution in the last half of the eighteenth century (North 1981). By the early twentieth century, the modern concept of the wealth of nations emerged: "It was that capital embodied in the people – human capital – mattered." (Goldin 2001)

The dynamic compatibility between the evolving composition of production factors in economy and the transition of political regimes is also observed in history. After the fall of the Roman Empire in the fifth century up to the year 1000, Europe was stagnating in income and population. The introduction of feudalism in the 9th century enabled Europe to gradually emerge from anarchy and develop a political-economic structure that produced sufficient order and stability and led to a concomitant expansion of both population and economic activity (North 1981). Feudal landlords directed all their attention and efforts to the maintenance and expansion of their inherited lands, which were the most important form of wealth and power. "The rising territorial rulers, the kings and emperors of the tenth to the thirteenth century, were in essence nothing more than the winners in the free-for-all for control over the sparse surpluses of a still relatively unproductive agricultural economy." (Blockmans 1998, p. 72) Through numerous conflicts, alliances, and combinations among the many political units of western Europe gradually emerged strong

national monarchies. By 1500 much of the political ground-plan of modern Europe was already there, where England and France were recognizable in their modern form.

As more surpluses from agriculture became available, towns started to grow in the tenth century in parallel to the formation and consolidation of the kingdoms. The princes benefited in this process by getting extra revenues from the cities. As the economic development strengthened the business and profession classes, the citizenry struggled for autonomy and independency. The survival of effectively functioning representative bodies, however, depended on both external pressures and domestic structures. The development of parliamentary democracy was made easier in England by its relatively weak repressive apparatus compared with continental monarchies and the joint force of the landowners and bourgeoisie (the upper stratum of town dwellers) against the monarchy (Moore 1966, p. 32). After the Glorious Revolution in 1688 "Parliament became more sympathetic and accessible to the aspirations of merchants, masters and manufacturers, farmers and landowners" (O'Brien 1994). The Industrial Revolution started first in England around the mid 18th century, and many years later spread to other countries. The industrialization process brought forth fundamental economic and political transformations across Europe especially after the French Revolution. Though different in timing and format across countries, the propertied class in western Europe had acquired substantial political powers during the 19th century and transformed the traditional absolute monarchies to an essentially oligarchical rule of landowners and capitalists.

The Industrial Revolution created a large working class concentrated in urban neighborhoods and workplaces free of segmental feudal control, greatly enhancing the coordination efficiency among workers. In its second phase the demand for skilled workers was driven up, which induced massive education reforms in many European countries during the latter half of the 19th century (Galor and Moav 2006). The rising human capital of workers and their increasing ability to coordinate in collective actions eventually led to franchise expansion in several European countries (Acemoglu and Robinson 2000). At the end of the First World War in the early 20th century, the agrarian societies of peasants and craftsman in many European countries had already been turned into industrialized societies of machine-tenders and bookkeepers, and correspondingly, the oligarchical rule was replaced eventually by democratic institutions with full suffrage across Western Europe.

In the model, the sequence of the economic development path is mainly determined by the distinct technical features of production factors: Land is endowed by nature and difficult to be created or destroyed; physical capital, in contrast, has to be produced endogenously with material investment; the raw labor is endowed by nature, but human capital beyond this basic level has to be acquired through endogenous

investment. The exogenous endowment of land and raw labor makes it beneficial to invest in physical capital first when savings become available, while the capital-skill complementarity would trigger human capital investment when the stock of physical capital is large enough (Galor and Moav 2006).

The establishment and transition of political regimes are driven by two assumptions. The first one is essentially *might-is-right* in that the agent or group with dominant coercive power becomes the ruler, where a group's coercive power depends on its economic strength and coordination efficiency. Once in power, the incumbent ruler may, depending on the repression cost, preserve its political dominance by stagnating the economic progress to curb the growing economic/coercive power of the challenging group. This leads to the second assumption, *the incumbent's advantage*, since the possibility to repress increases the incumbent's bargaining power above its coercive ability based upon economic strength. When the repression cost is neither too low nor too high, a political compromise that is mutually beneficial for both the incumbent ruler and the challenging group would be reached in equilibrium so that the political transition is achieved smoothly and the economic development is facilitated as illustrated in Figure 1. Otherwise, repression or revolution may occur and the economic development may be blocked or delayed.[1]

It is important to point out that in the model the economic growth is a necessary but not sufficient condition toward political development for at least three reasons. First, the more fundamental force underlying democratization is not the income level per se, but the changing factor composition (where the predominant factor shifts from land to physical capital and finally to human capital), since the latter determines the changing economic and coercive power of different factor owners. That is, the production factor composition is the common factor that affects both the nature of the political regime and the potential for economic growth. The reason is as follows. Landowners are easily separated by force from their land without endangering the supply of land or badly hurting the overall productivity. This promotes constant fighting over land ownership and often diverts valuable resources from investing constructively in capital and skills, which seems to be the ultimate cause for the natural resource curse (Ross 1999, Boix and Stokes 2003, Lagerlof and Tangeras 2007). It also explains the emergence of monarchy and other authoritarian governments, since it is possible for them to capture a large amount of land and other natural resource using coercive forces;

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[1] Note that the coercive ability is similar to the de facto power used by Acemoglu and Robinson (2006a), while the incumbent ruler's repression capacity has some similarity to the de jure power. From this perspective, an innovation of the current paper lies in the dynamic links between the de facto and de jure power: The group with dominant de facto power becomes the first ruler and hence acquires de jure power (the might-is-right assumption); the incumbent ruler can use de jure power to repress the ruled group to curtail its de facto power (the incumbent's advantage). The political development path is mainly driven by the *dynamic consistency* between the two types of power: As the economy grows, the relative de facto power of different groups keeps changing, which eventually leads to corresponding change in the allocation of de jure power, though in some circumstances the incumbent can delay such a process at the cost of having a stagnant economy and unstable political system.

the other side of the coin is that the absolute monarchy, by curbing the destructive rent-seeking behaviors necessarily prevalent in a land-dominant economy, actually facilitates economic development in comparison to anarchy and hence remains as a stable political regime for a long time in history. In sharp contrast to land, confiscating the shops or factories of capitalists is feasible only for a short time, since their ultimate source, the capitalists' entrepreneurial skills, is difficult to be captured by force. This implies that, with capital accumulation, the source of economic growth is now dispersed among individual capitalists and cannot be easily controlled or centralized by coercion as in the case of land or other natural resources. Moreover, the stock of physical capital keeps increasing as the economy grows, which would eventually replace the relatively fixed land as the predominant source of wealth and enable its owners to gain political rights to protect their capital returns; the alternative of repressing the growing power of capital owners is necessarily associated with a potentially high cost of stagnating the economy, which is not only economically unappealing but could also be politically dangerous for the monarch since an inefficient economy often induces domestic upheavals and foreign invasions. So the endogenous supply of physical capital is the fundamental driving force underlying the unavoidable democratization process from monarchy to oligarchy; since the same logic also applies to human capital beyond the raw labor, the oligarchy of landowners and capitalists would finally give way to full democracy where workers as the owners of human capital also gain political rights and all factor owners earn competitive returns. This accounts for why in both history and current times, most democracies have industrialized economies where human capital is the dominant production factor, while in countries with natural resources as the main factor in production, authoritarian political regimes are more likely to happen.[2]

The second reason is that a political transition often makes its breakthrough in a short period, while its preparation usually takes a long time through economic development. This is consistent with the findings of Acemoglu et al. (2006) who cast doubt on the short-term causal effect of income on democracy after World War II, but find evidence that such a relationship may exist in a much longer horizon. Similarly, Boix and Stokes (2003) argue that it is the prewar period—from the late nineteenth century through the end of World War II—in which the impact of income on democracy is most powerful. The third reason is that the level of repression costs during the crucial transitional periods, which may be affected by geopolitical, religious, ideological and other ultra-economic elements, is also critical in determining the ultimate political outcome. For example, a country with faster economic growth but faced with much lower repression costs may end up

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[2]See Lipset (1959), Huber et al. (1993), Burkart and Lewis-Beck (1994), Londregan and Poole (1996), Przeworski and Limongi (1997), Ross (1999), Boix (2003), and Epstein et al. (2006) among others in the large modernization literature.

in repression, while another country with slower growth but higher repression costs may make the political transition first.

The paper proceeds as follows. The related literature is discussed in the next section. The basic elements of the political economy model are introduced in Section 3, and the analysis of the model is in Section 4. Further discussions of related historical evidence are collected in Section 5. Some concluding remarks are offered in the final section. All proofs are relegated to the appendix.

2   Related Literature

The paper belongs to a broad literature connecting growth, development and institutions in a long-term perspective.[3] Its primary contribution is using a unified political economy framework to analyze the democratization process from monarchy to oligarchy and finally to democracy with full suffrage in the context of dynamic economic development. This framework seems very useful in uniting scattered results and reconciling conflicting views in a systematic way. To certain extent, the model suggests that the history of human society is in essence an integrated democratization process where each country, though taking their unique routes, moves in the same broad historical trend with its tone set by the changing predominance of land, physical capital, and human capital in economy.

The democratization process due to its immense importance and complexity has been a major subject in comparative history. In a landmark study Moore (1966, p. 429) found that "getting rid of agriculture as a major social activity is one prerequisite for successful democracy" and robust capitalist development is crucial in achieving this. Moore's conclusion on the role of the bourgeoisie as the primary agent of democracy, though widely shared by the orthodox Marxist and liberal social science view, is challenged by Rueschemeyer, Stephens and Stephens (1992, p. 270) who instead conclude that "a key actor in the development of full democracy almost everywhere" is not capitalists but the organized working class, and the widely believed association of capitalist development with democracy is mainly because it strengthens the working class. These seemingly conflicting conclusions are, however, consistent with and neatly reconciled by the main results of the current paper: The focus of Moore is on the first political transition from monarchy to oligarchy (or parliamentary democracy in more conventional terms), while that of Rueschemeyer et al. is mostly on the second political transition from oligarchy to full democracy. Distinguishing these two transitional stages helps to clarify the crucial role of capitalists in breaking the absolute power of monarchy and initiating the parliamentary democracy at an earlier historical occasion, and that of the working class strengthened during

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[3] See Bertocchi (2006b) for a survey of related literature.

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the industrialization process in pushing for further franchise expansion at a later time. To be sure, these two democratization stages inherently share some common features, which are also obvious in the model; distinguishing them analytically, however, seems to bring more insights than ignoring their critical differences in the historical timing and economic bases (of physical capital and human capital respectively).

The formal analysis of democratization started only recently in economics. Relatively few studies focus on the first political transition from monarchy to oligarchy: Olson (1993) argues that, compared with anarchy, a tax-collecting monarch brings substantial benefits to the people and "permits a considerable development of civilization." North and Weingast (1989) discuss the emergence of parliamentary democracy in the 17th century England and the corresponding improvement of property rights security after the Glorious Revolution. DeLong and Shleifer (1993) provide evidence showing that absolutist princes, in comparison to representative governments, retarded the economic growth especially in cities. Bertocchi (2006a) models the evolution of the land inheritance system from primogeniture to partition when landed estates are replaced by capital as the primary source of wealth. These results fit nicely into the framework of the current paper, where monarchy arises in equilibrium from the anarchy among landowners and facilitates economic development and capital accumulation, and if it is replaced later by oligarchy due to the growing strength of capitalists and other landlords, the commercial and industrial interests would be promoted, and when it is not, economic stagnation is the likely result.

There are quite a number of studies on how the voting franchise is further expanded from oligarchy to full suffrage. In the seminal study of Acemoglu and Robinson (2000), franchise expansion is used by the ruling elites to mitigate the revolutionary threat from workers; following the same theme of conflict resolution, Bertocchi and Spagat (2001) find that the elites may want to co-opt a subset of the challenging group. The alternative rationale for suffrage extension, in contrast, suggests that the elites may do it voluntarily in their own best interests (Lizzeri and Persico 2004, Jack and Lagunoff 2006, Lee 2003). Both views find support in historical evidence either in different countries or at different times, which prompts further research to characterize conditions that give rise to distinct transition paths (Justman and Gradstein 1999, Boix 2003, Engerman and Sokoloff 2005, Llavador and Oxoby 2005, Cervellati, Fortunato, and Sunde 2006, Gradstein 2007). The current paper adds to this stream of literature by endogenizing the increasing importance of human capital over the industrialization process, and specifying the exact timing and conditions for suffrage extension, repression, and revolution. More importantly, it accounts for the gradual suffrage extension from the absolute monarchy to oligarchy by landlords and capitalists, and finally to full democracy using the same analytical framework where the same fundamental forces are in play. It shows that this general historical

trend of political power being shared among more people over time is driven ultimately by the dynamic economic development where the predominant source of wealth evolves from land to physical capital and later to human capital.

The long-term growth literature typically abstracts from the political conflict that is the focus of the democratization literature. The economic development path in the current paper builds on the important insights of Galor and Moav (2006), who demonstrate that the complementarity between physical and human capital would eventually eliminate the class distinction between capitalists and workers. Galor and Weil (2000) show that human capital accumulation and the associated demographic changes are the driving forces in the transition from Malthus stagnation to modern growth, while Hansen and Prescott (2002) emphasize the role of exogenous technological progress in moving the economy from agricultural to industrial production methods. These and other studies on the unified growth theory are surveyed by Galor (2005). The current paper contributes to this literature by highlighting the natural change of production factor composition during the economic growth process and the role of political transitions in shaping the distinct economic development paths across countries.

Another strand of literature studies the effects of institutions on long-run growth. North (1981) proposes a dynamic framework of political economy and substantiates it by rewriting the Western history in its light. He recognizes not only the influence of technology advancement on political institutions especially the property rights, but also the effects of political institutions on future technological and economic development. In some sense, the current paper is an attempt to formalize this dynamic framework in a simple model. It thus may shed light on the current debates on whether technology or institutions are more important for long-run growth. Acemoglu, Johnson, and Robinson (2005) argue that institutions are the fundamental cause of long-run growth,[4] while Glaeser et al. (2004) demonstrate that human capital is more fundamental than institutions. Actually both claims can be true in the chain of dynamic interactions between economic fundamentals and political institutions shown in the current paper, depending on which specific segment one chooses to investigate. For example, among countries with similar institutional backgrounds (e.g. colonies of the same mother country), the initial gap in economic fundamentals may become the ultimate cause of their later divergence since institutions are often endogenously adopted (Engerman and Sokoloff 1997, Rajan and Zingales 2006). Consistent with results in the current paper, Galor, Moav and Vollrath (2006) find that the inequality of land ownership, though beneficial in earlier development, can be a major hurdle in the

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[4] In a related work along this line, Rodrik, Subramanian, and Trebbi (2004) find that conventional measures of geography have a strong indirect effect on incomes by influencing the quality of institutions.

emergence of human capital promoting institutions and hence negatively affect future economic performance. Similarly, Gradstein (2007) shows that high income inequality may induce poor protection of property rights and hence stagnate the economy. On the other hand, between countries with similar initial human capital (e.g. North and South Korea), different institutions caused by exogenous factors may account for their later economic development gaps. In this paper, the same economy with different repression costs during the political transition periods may generate distinct political outcomes, which will affect the economic development path afterwards. This is similar in spirit to Acemoglu and Robinson (2006b), who find that the political security of the incumbent elites may determine whether they would block technological and institutional innovations that potentially undermine their incumbency advantages.

To the extent that the cooperative and conflicting sides of human interactions are treated simultaneously, the paper is connected with Hirshleifer (1994), Grossman and Kim (1995), and Grossman (2002) among others. The paper's analysis of the political conflicts among factor owners is similar to the Marxist approach of class struggles (Marx and Engels 1848), which has become a very useful analytical tool in social sciences. In the paper, however, the class conflicts over income distribution are embedded in the cooperative context of economic activities, and eventually resolved under democracy where political rents disappear and each factor earns its competitive market returns. This result echoes Polany's (1944) view that a competitive market economy was brought forth *together* with political democracy for the first time in human history by the industrialization process. He observes that both harmony and conflicts are inherent in economy, and they often lead to each other in a dynamic world. On this point the current paper further suggests that the cooperative side dominates history progress in the long run, though the conflicting side may change historic paths for some time and often into the stagnant direction.

3 The Political Economy Model

3.1 The Economy

Technology. In every period the economy produces a single homogeneous good that can be used for consumption and investment. The production function at time t is

$$Y_t = A_t(L + K_t)^{1-\alpha}H_t^\alpha.$$

The knowledge stock A_t grows at an exogenous speed $g > 0$ so that $A_{t+1} = A_t(1+g)$, which is the ultimate growth engine. The quantity of land L is fixed overtime, while the stock of physical capital K_t and human capital H_t depreciates fully after one period. Physical capital K_{t+1} is produced by capitalists who combine

material resources m_t^k and knowledge A_{t+1} according to

$$K_{t+1} = K(m_t^k, A_{t+1}), \tag{1}$$

which strictly increases in both arguments. We assume $K(0, \cdot) = 0$ where a positive amount of material $m_t^k > 0$ is needed to produce any physical capital. The aggregate human capital at time t is $H_t \equiv N_t h_t$ where N_t is the number of workers and h_t the amount of human capital per worker. The human capital production function is

$$h_{t+1} = h(m_t^h, A_{t+1}), \tag{2}$$

which strictly increases in both arguments, where m_t^h denotes the material resources spent in public education.[5] We assume $h(0, \cdot) = 1$ so that a worker is endowed with a basic unit of human capital, namely the raw labor, even without any education expenditure; to acquire human capital above the basic level, however, positive amount of material is needed. A related assumption is $h_1(0, \cdot) = \gamma < +\infty$ meaning that the human capital production function has a finite slope at zero investment.

The sequence of the economic development path in Figure 1 is mainly determined by the distinct technical features of these three factors of production, where land and raw labors are endowed by nature, while physical capital and human capital have to be produced endogenously. The exact timing of the economic development stages, however, is also affected by institutional elements such as the political structure discussed below.

Preferences and Demographic Structure. There are overlapping generations in the economy with a fixed population size.[6] Each individual lives for two periods, who may accumulate human capital in childhood and participate in production at adulthood. Individuals are identical in preferences, which are represented by a log-linear utility function[7]

$$u_{ti} = (1 - \beta) \log c_{ti} + \beta \log(Z + b_{ti}),$$

where c_{ti} is the adulthood consumption of individual i in generation t, b_{ti} is his bequest for offspring, $\beta \in (0, 1)$ indicates the relative weight of bequest in utility, and $Z > 0$ represents some threshold level of income. The budget constraint is $c_{ti} + b_{ti} \leq I_{ti}$, where I_{ti} is individual i's income at adulthood. As a result of utility maximization, his optimal bequest is $b_{ti} = \max\{\beta(I_{ti} - Z), 0\}$; that is, only when an individual's

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[5] Though mass education by private financing is possible in principal (Bertocchi and Spagat 2004), it was not the typical case in history due to the subsistence level of wages and the imperfection of credit markets; see Galor and Moav (2006) for more evidence.

[6] In an earlier version of the paper the population size was set to follow the broad demographic trends in history as in Hansen and Prescott (2002); the main results were the same.

[7] This type of utility function is used by Galor and Moav (2006) and Fishman and Simhon (2002) among others; as long as the society saves, the exact specifications of utility function are not essential for the qualitative results.

income is higher than a certain level indicated by Z, would there be any resources left as bequest. The total bequest in society is

$$B_t = \sum_i b_{ti} = \sum_i \max\{\beta(I_{ti} - Z), 0\}, \tag{3}$$

which can be invested in physical or human capital for the next generation where $m_t^k + m_t^h \leq B_t$.

There are N_L landowners and N_K capitalists who are few in number. The initial endowment of land among landowners is exogenously given and then passed on to their children, and so is the ability of capitalists to generate physical capital, while such ability, unlike the physical capital itself, cannot be grabbed by others.[8] The majority are N workers who are endowed with only raw labor. These three groups of factor owners (landlord, capitalists, and workers) participate in production using land, physical capital, and human capital respectively.

3.2 The Political Structure

The division of products among the factor owners is determined by the political system, where the ruling group may exploit ruled agents through taxes and confiscation. The establishment and transition of political regimes are based on two assumptions. The first assumption, *might-is-right*, means that the ruler group is composed of agents who have dominant coercive capability than the ruled agents.[9] The coercive ability v_{Gt} of N_G individuals each with income I_{ti} and coordination ability e_t is

$$v_{Gt} = \psi(N_G, e_t) \sum_{i=1}^{N_G} I_{ti},$$

where $\psi(N_G, e_t)$ denotes the group's organizing efficiency with $\psi_1 < 0$ and $\psi_2 > 0$. The reason for $\psi_1 < 0$ is because a group's coordination efficiency decreases in the number of individuals involved in collective actions due to free-riding and information problems. For simplicity, we assume $e_t = h_t$ for workers and $e_t = E > 1$ for landlords and capitalists, where $\psi(1, E) = 1$ for normalization. Consistent with the historical evidence that workers as raw labors typically have lower collective coercive ability than landlords and capitalists,[10]

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[8] The factories and machines may be confiscated by others, but the most important assets of capitalists in capital accumulation, such as their entrepreneurial skills, technical know-how and business networks, are difficult to be captured by force. These special talents of capitalists are not readily accessible to everyone in the population either. Even in current times, how to become a successful entrepreneur is still elusive to most people. The standard human capital such as the skills to read, write, and calculate, in comparison, can be systematically acquired through education.

[9] This is in line with North's (1981, p. 21-22) theory of state where the key to understanding the state involves the potential use of violence to gain control over resources: "The contract theory assumes an equal distribution of violence potential amongst the principals. The predatory theory assumes an unequal distribution."

[10] Until modern times, the peasant is an "object of history," over which "historical changes pass but which contributes nothing to the impetus of these changes." (Moore 1966, p. 453)

the following condition about the workers' organization efficiency

$$\psi(N, 1) < \frac{1-\alpha}{\alpha} \frac{\psi_E}{1+\psi_E} \tag{A1}$$

is assumed, where $\psi_E \equiv \psi(N_K + N_L - 1, E)$. Under this assumption, workers lack enough coercive might to gain political rights before human capital investment starts.

When two groups fight, the one with higher coercive power wins; if they have equal coercive power, each wins with equal probability. The winner in a fight with a player of income I can capture a gross revenue τI where $\tau \in (0, 1)$, while the rest $(1 - \tau)I$ is either hidden or destroyed by the defeated player; the winner's net benefit is $\eta \tau I$ where $\eta \in (0, 1)$, since he has to incur $(1 - \eta)\tau I$ as the fighting cost. The initial political regime is established based purely on might-is-right, where the dominant group becomes the first ruler and imposes tax on others. The tax collecting cost is $1 - \eta$ of the tax revenue. The ruler also determines the capital investment policy, namely the allocation of the total bequest B_t between physical capital investment m_t^k and pubic education expenditure m_t^h.

The dynamic economic development would constantly shift the relative economic power of groups and eventually pose threats to the old political order. In a crucial period when the political regime would have changed based on might-is-right, the incumbent ruler can choose to compromise or repress. When compromise is chosen, the incumbent ruler extends political power to the challenging group so that no tax is imposed on their incomes. When repression is chosen, the incumbent ruler may preserve its political dominance by thwarting the growing economic power of the challenging group; this leads to the second assumption, *the incumbent's advantage,* since the possibility to repress increases the incumbent's bargaining power above its coercive ability. The repression, however, can be very costly since the state machinery of police and army is needed to repress domestic unrest and fend off foreign invasions. The repression cost is represented by a stochastic parameter $\theta_t > 0$ with distribution $F(\cdot)$ and support $[\underline{\theta}, \overline{\theta}]$, since it is often affected by exogenous elements such as the geopolitical situations and history.[11]

Consistent with the horizon of economic decisions in the overlapping generation model, the length of an individual's adulthood, which corresponds to one period in the model, is also used as the horizon for political decisions. This implies the ruler would not take any preemptive repressing actions in peaceful time when the balance of coercive power is in its favor and the ruled group has no alternative but to obey the current

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[11]It may also be useful to point out that repression is different from imposing taxation. Under repression, the economy is necessarily stagnated since the ruler has to curb the otherwise rising coercive power of the challenging group, who plays the leading role in economic growth. Taxation, however, does not block economic progress, and the economic gains from it are shared between the ruler and the ruled agents.

political order.[12] In a crucial period when the political regime would have changed based on might-is-right, a political game illustrated in Figure 2 is played. Faced with the potential challenge, the incumbent ruler moves first by choosing Compromise or Repress. The game ends if the ruler selects Repress since at the beginning of this period it still has dominant coercive power. When Compromise is chosen, the challenging group moves next, choosing to accept the proposed compromise or reject it. If compromise is accepted, the political power is shared between the incumbent ruler and the challenging group; if Reject is selected, the incumbent ruler may still choose to repress, otherwise the challenging group becomes the new ruler based on might-is-right (i.e., revolution occurs). The exact payoffs and subgame perfect Nash equilibria are discussed in the next section.
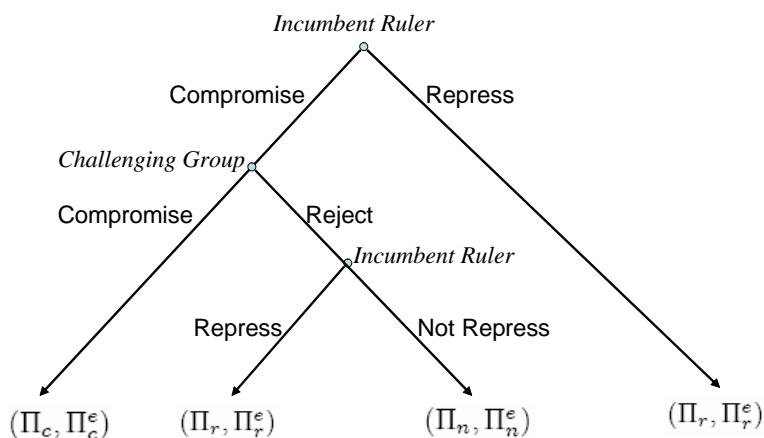

Figure 2: The Political Game between Incumbent Ruler and Challenging Group

4 The Economic and Political Development

4.1 Land and Monarchy: $[0, t_k]$

The initial state of the model economy corresponds to a time when agriculture is the dominant production method, and people are not educated. The productivity is so low that no saving is available for capital

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[12]Due to the extremely long period (often in the magnitude of hundreds of years) the model covers, it is not realistic to assume agents can take into consideration of all the future economic and political changes when they make decisions. For example, Moore (1966, p. 30) observed that "it is unlikely that more than a very few people had any but the haziest notions as to ... what kind of a society might lie over the horizon." Moreover, most European thrones were insecure, which keeps kings from taking a long view (DeLong and Shleifer 1993). Allowing longer horizons and strategic options such as preemptive repression may alter the timing but not the qualitative results of the transition process; Acemoglu and Robinson (2006b), for example, find similar results for the political transition problem in a more abstract setting with infinite horizons.

accumulation, and capitalists are thus not distinguishable from the worker group. Such a situation will continue until period t_k determined below in (5), which means $h_t = 1$ and $K_t = 0$ in any period $t \in [0, t_k]$.

A landlord i owns land $L_i \in (\underline{L}, L]$ where $\underline{L} = \frac{L}{N + N_K} \frac{\alpha}{1 - \alpha}$ and $\sum_{i=1}^{N_L} L_i = L$. He employs N_{ti} workers at market wage w_t. Under might-is-right and assumption (A1), the landlord has the dominant coercive power and thus can exploit his workers by withholding τ proportion of their wages. So his total revenue is composed of not only pure land profit π_{ti}, but also the net wage tax $\eta \tau N_{ti} w_t$ due to his dominance in coercive capability.

Lemma 1 *The optimal profit of landlord i with land L_i is $\pi_{ti} = \lambda_t L_i$ where $\lambda_t \equiv (1 - \alpha) A_t (\frac{N + N_K}{L})^\alpha$, while his total revenue is*

$$I_{ti} = \pi_{ti} + \eta \tau N_{ti}^* w_t^* = (1 + \frac{\alpha \eta \tau}{1 - \alpha}) \lambda_t L_i; \tag{4}$$

both are proportional to L_i.

Since initially there is no incumbent ruler, landlords can seize each other's land by coercion. By the assumption of might-is-right, a landlord i with dominant coercive capacity can grab the land of landlord j to get a net return $\eta \tau I_{tj} > 0$. Let Ω be the set of all possible coalition that can be formed among landowners, and $G \in \Omega$ a generic element of the set. The following proposition shows that monarchy emerges as the political regime in equilibrium where the king owns the largest piece of land.

Proposition 1 *Monarchy is a political equilibrium immune to coalition when land is the primary production factor. The king is the biggest landowner who owns land L_M where $L_M > \max_{G \in \Omega} \{\psi(N_G, E) \sum_{i \in G} L_i\}$ and imposes a tax rate τ on land revenues and wages; the land ownership is secure.*

This proposition implies that, thanks to the overwhelming power of the king who protects the petty landowners for taxes, no resources are wasted in fighting over land ownership, and the property rights of land are more secure under monarchy than anarchy. The high inequality of land ownership under monarchy often shortens the time for society to start capital investment. So monarchy greatly facilitates economic development when land is the main production factor. This may explain why throughout history, "individuals given a choice between a state – however exploitative it might be – and anarchy, have decided for the former." (North 1981, p. 24)

The king's total income at any period $t \in [0, t_k]$ includes his land profit and tax revenues from other landlords and workers, which is

$$I_{tM} = \pi_{tM} + \eta \tau (\sum_{i \neq M} \pi_{ti} + N_t^* w_t^*) = \lambda_t \overline{L},$$

where $\overline{L} \equiv (1 - \eta\tau)L_M + \frac{\eta\tau}{1-\alpha}L$. Since the king is the richest person and his income I_{tM} increases over time, a society starts to have positive bequests when I_{tM} reaches the threshold income Z in period t_k, which is determined by

$$I_{t_k,M} = \lambda_{t_k}\overline{L} = Z. \tag{5}$$

It is obvious that t_k arrives earlier when L_M, L, and τ are larger.

4.2 Physical Capital and Oligarchy (Elite Ruling): $(t_k, T_k]$

With surpluses available in society after t_k, capitalists start to use their special skills to produce physical capital.[13] The *endogenous* supply of physical capital marks its fundamental difference from land; it reinforces the cooperative aspect and down plays the conflicting side of the relationship among factor owners. Such a change in economic arena will induce corresponding adjustment in the political system.

4.2.1 The Economy with Physical Capital

Capitalists produce physical capital $K_t = K(m^k_{t-1}, A_t)$ where $m^k_{t-1} = B_{t-1}$, that is, the total bequest in society is all invested in physical capital accumulation; as to be shown later in Proposition 3, this is actually the optimal investment choice. Individual landowners choose the optimal demands for capital and labor to maximize their profits, taking as given the capital return rate r_t and wage w_t, which clear the capital and labor markets in equilibrium.[14] By the assumption of might-is-right, capitalists also have to pay τ proportion of their incomes to the king.

Lemma 2 *The optimal land profit of landlord i in period $t \in (t_k, T_k]$ is*

$$\pi_{ti} = r^*_t L_i, \tag{6}$$

where $r^*_t = (1 - \alpha)A_t(\frac{N}{L+K_t})^\alpha$ is the market-clearing rate of capital return. The aggregate wage of workers and the king's total revenue are, respectively,

$$Nw^*_t = \frac{\alpha}{1 - \alpha}r^*_t(L + K_t), \tag{7}$$

$$I_{tM} = r^*_t(\overline{L} + \frac{\eta\tau}{1 - \alpha}K_t). \tag{8}$$

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[13]The assumption that capitalists do not emerge from landowners is consistent with historical evidence, though it has no effect on the qualitative results. Doepke and Zilibotti (2007), for example, show that the crucial characteristics of capitalists such as patience and work ethics were initially cultivated in certain working families but not in the landed class.

[14]When the borrowing cost is positive, the capital return rate r_t can be interpreted as the *net* rate earned by capitalists; without loss of generality, we normalize the borrowing cost at zero.

The ever increasing stock of physical capital induces faster growth in the total output $Y_t = A_t(L + K_t)^{1-\alpha}N^\alpha$. The king benefits from capital accumulation through increased tax revenues. The economic development, however, would gradually build up pressure to challenge the absolute power of the king. Measured by before-tax revenues, the aggregate income of the elites (the capitalists and landlords), $r_t^*(L - L_M + K_t)$, grows faster than the king's $r_t^* L_M$, and so does their coercive power, which would eventually equal the king's in period T_k. T_k is thus uniquely determined by $\psi_E(L - L_M + K_{T_k}) = L_M$, or equivalently

$$K_{T_k} = (1 + \frac{1}{\psi_E})L_M - L, \tag{9}$$

where $\psi_E \equiv \psi(N_K + N_L - 1, E)$ is the coordination effectiveness of the elites.

4.2.2 The Political Game Between the King and Elites at T_k

At the beginning of period T_k when the king still has slightly dominant coercive power, the elites and the king play the political game in Figure 2. If mutual compromise is reached, the political power is extended to the elites so that no tax is imposed on land and physical capital, and they share the total wage tax $\eta\tau N w_t^*$ from workers. So the king's income shrinks to

$$\Pi_c = \pi_{T_k,M} + \frac{L_M}{L + K_{T_k}}\eta\tau N w_{T_k}^* \underset{\text{by (6) \& (7)}}{=} (1 + \frac{\alpha\eta\tau}{1-\alpha})\pi_{T_k,M},$$

where $\pi_{T_k,M}$ is his land profit in (6) at period T_k, and the second term is his share of wage tax. If the compromise is rejected and the king chooses Not Repress, the elites would gain the ruling power at the end of period T_k based on might-is-right and impose a tax rate τ on the king. The net income of the king with Not Repress is his after-tax land profit

$$\Pi_n = (1 - \tau)\pi_{T_k,M}.$$

The king may choose to repress by stagnating the economic and hence the coercive power of the elites. For example, he can freeze the physical capital stock at certain level $\overline{K} \leq K_{T_k}$; without much loss of generality, we set $\overline{K} = K_{T_k}$. So the king's income with Repress is

$$\Pi_r \equiv I_{T_k,M} - \theta_{T_k},$$

where $I_{T_k,M}$ is the king's total revenue in (8) at period T_k, while θ_{T_k} is the repression cost in T_k.

Note the king's payoff is higher when compromise is reached than when it is rejected and followed by Not Repress since $\Pi_c > \Pi_n$ holds due to $\tau > 0$; both payoffs are independent of the repression cost θ_{T_k}, while Π_r strictly decreases in it. The comparison between Π_n, Π_c and Π_r is summarized by Lemma 3 and illustrated in Figure 3.

Lemma 3 *There exist two levels of repression costs θ_c and θ_n in $[\underline{\theta}, \overline{\theta}]$, where $\theta_c < \theta_n$, such that $\Pi_r > \Pi_c > \Pi_n$ for $\theta_{T_k} < \theta_c$, $\Pi_c \geq \Pi_r \geq \Pi_n$ for $\theta_{T_k} \in [\theta_c, \theta_n]$, and $\Pi_c > \Pi_n > \Pi_r$ for $\theta_{T_k} > \theta_n$.*
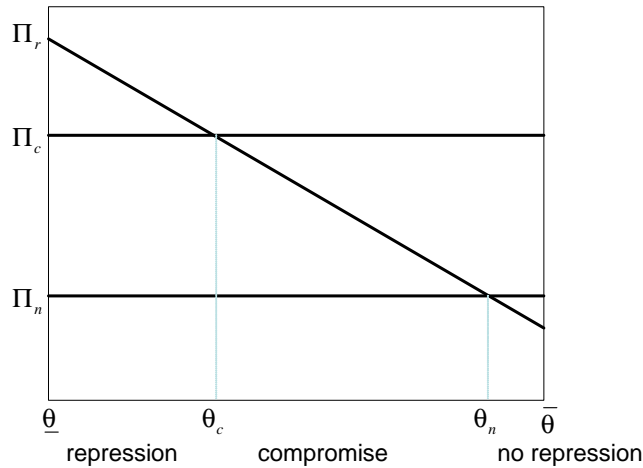

Figure 3: The Incumbent Ruler's Incomes and Repression Cost θ

For the elites, compromise is better than repression since under compromise the economic progress is not blocked and they pay no tax, and the case of no repression is even better since they get extra tax revenues from the King's land. So $\Pi_n^e > \Pi_c^e > \Pi_r^e$ always holds.

Proposition 2 *The Subgame Perfect Nash Equilibrium in the political game between the king and elites at period T_k is (Repress, Repress; Compromise) when $\theta_{T_k} < \theta_c$, (Compromise, Repress; Compromise) when $\theta_{T_k} \in [\theta_c, \theta_n]$, and (Compromise, Not Repress; Reject) when $\theta_{T_k} > \theta_n$.*

The proposition suggests mutually beneficial compromise is reached only when the repression cost θ_{T_k} is in the middle range $[\theta_c, \theta_n]$, while repression and economic stagnation are more likely to happen when θ_{T_k} is low; when the repression cost is very high, revolution happens and the king loses political power to the challenging group. The paper focuses on the smooth case of $\theta_{T_k} \in [\theta_c, \theta_n]$ where the landlords and capitalists share political power and impose no tax on themselves from period T_k onwards.[15]

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[15] The coalition between capitalists and landowners seems more likely to happen than the co-option alternative where the king divides the elites by co-opting either landowners or capitalists (Bertocchi and Spagat 2001). When $\theta_{T_k} \in [\theta_c, \theta_n]$ so that compromise would have been reached if the political game analyzed here is played, the co-option payment must be at least as large as their tax payment to the king, otherwise they should reject it and ally with each other; it must, however, be smaller than the joint tax revenue paid by both groups, otherwise the king would not benefit from co-option. But then the group that is not co-opted can bribe the other by offering a transfer up to their tax payment. So co-option of one group is at least weakly dominated by the coalition between capitalists and landowners when $\theta_{T_k} \in [\theta_c, \theta_n]$, and it is strongly dominated when $\theta_{T_k} > \theta_n$ and the king is too weak to repress. In the repression case of $\theta_{T_k} < \theta_c$, the king does not need to coopt any group since it is more cost effective to repress them.

4.3 Human Capital and Democracy: $[T_k, T_h]$

During the initial periods under elite ruling, workers are still raw labors and their after-tax wages are too low to have bequests. The following proposition shows that when the physical capital stock becomes large enough, the elites would find beneficial to start investing in human capital through public education. It also justifies our earlier assumption that only physical capital was invested under monarchy.

Proposition 3 *Under elite ruling human capital investment starts in period t_h that is determined by*

$$\alpha(L + K_{t_h})\gamma - (1-\alpha)(K_{t_h})_1 = 0; \tag{10}$$

the optimal public education expenditure m_t^{h*} in any period $t \geq t_h$ is determined by

$$\alpha(L + K_t)h_1 - (1-\alpha)h_t K_1 = 0, \tag{11}$$

where $\frac{\partial m_t^{h*}}{\partial B_t} > 0$. Human capital investment does not start under monarchy if the capital stock at the transition period T_k is so small that $\alpha(L + K_{T_k})\gamma - (\xi_{T_k} - \alpha)(K_{T_k})_1 < 0$ holds, where $\xi_{T_k} \equiv \frac{1+\psi_E}{\eta\tau+(1-\alpha+\alpha\eta\tau)\psi_E}$.

As the human capital level h_t goes up over time, workers' wage w_t and coordination effectiveness continue to increase, and so is their collective coercive power $\psi(N, h_t)\alpha Y_t$. It will eventually match that of the elites, $\psi(N_K + N_L, E)(1-\alpha)Y_t$, in some period T_h, which is uniquely determined by

$$\psi(N, h_{T_h})\alpha = \psi(N_K + N_L, E)(1-\alpha). \tag{12}$$

The political game between the elites and workers at period T_h is the same as that between the king and the elites. If compromise is reached, full suffrage obtains and no tax is imposed on wages, which means each factor earns its competitive returns and the exploitative tax disappears. With similar arguments, we get the following results.

Proposition 4 *There exist two levels of repression costs θ'_c and θ'_n in $[\underline{\theta}, \overline{\theta}]$, where $\theta'_c < \theta'_n$, such that the subgame perfect Nash equilibrium in the political game between elites and workers at period T_h is (Repress, Repress; Compromise) when $\theta_{T_h} < \theta'_c$, (Compromise, Repress; Compromise) when $\theta_{T_h} \in [\theta'_c, \theta'_n]$, and (Compromise, Not Repress; Reject) when $\theta_{T_h} > \theta'_n$.*

4.4 A Smooth Development Path: Summary

The development path in the model is driven mainly by the technical features of different production factors and political conflicts among factor owners in dividing the outputs, while the effects of many elements (such

as geography, culture, religion, ideologies, wars, and colonization) that give much richness to the actual history are mainly reflected by cross-sectional and intertemporal differences in repression costs.

If the repression costs remain in the middle ranges at both transition times T_k and T_h, a smooth economic and political development path as illustrated in Figure 1 is to be taken, where the political regimes adjust smoothly to the evolving factor composition of land, physical and human capital; England seems to be such a case, where political compromises were reached in these crucial moments. This type of coevolution path is summarized by the following proposition.

Proposition 5 *When the repression costs are in the middle ranges where $\theta_{T_k} \in [\theta_c, \theta_n]$ and $\theta_{T_h} \in [\theta'_c, \theta'_n]$ such that compromises between the incumbent ruler and the challenging group are reached, the political economy would evolve as follows. Physical capital accumulation starts at period t_k while human capital investment starts at t_h. Monarchy is the political equilibrium before period T_k, then it's replaced by the oligarchy of landlords and capitalists, and finally, workers also gain political rights and hence full suffrage is realized after period T_h. The time path $t_k < T_k < t_h < T_h$ suggests that economic development leads to political transition, which in turn facilitates future economic development. This fast-track economic and political development is characterized in the following table.*

The Smooth Development Path

The Political Transition			
Time	$t \le T_k$	$t \in (T_k, T_h]$	$t > T_h$
Political Regime	Monarchy	Oligarchy	Democracy
The Ruler	King	Landowners & Capitalists	All Factor Owners
The Economic Growth			
Time	$t \le t_k$	$t \in (t_k, t_h]$	$t > t_h$
Land	L	L	L
Physical Capital Stock	0	$K(B_{t-1}, A_t)$	$K(B_{t-1} - m^h_{t-1}, A_t)$
Human Capital Stock	1	1	$h(m^h_{t-1}, A_t)$
Total Output	$A_t(L)^{1-\alpha}(N + N_K)^\alpha$	$A_t(L + K_t)^{1-\alpha}N^\alpha$	$A_t(L + K_t)^{1-\alpha}(Nh_t)^\alpha$
Output Growth Rate	g	$g(\frac{L+K_{t+1}}{L+K_t})^{1-\alpha}$	$g(\frac{L+K_{t+1}}{L+K_t})^{1-\alpha}(\frac{h_{t+1}}{h_t})^\alpha$

Note: t_k, t_h, T_k and T_h are determined by (5), (10), (9), and (12) respectively; B_{t-1} and m^h_{t-1} are specified in (3) and (11) respectively; $A_{t+1} = A_t(1 + g)$.

4.5   Development Paths with Repression or Revolution

The smooth development path characterized above serves as the benchmark case to be compared with various deviations; it happens when the repression costs are "just right". When the repression costs are too low

during the political transition, the economic progress is often stagnated by political repression, which may continue for a long time until the repression cost is dramatically increased by some random shocks such as natural disasters or foreign invasions so that the incumbent is forced to share political power with the challenging group in a political compromise or yield it to the latter in a revolution.[16]

The revolution case is relatively rare since it happens only when the repression cost is extremely high. When it happens in the transition process from monarchy to oligarchy of elite ruling, the result does not differ much from the compromise case since in both cases the political power is shared among landowners and capitalists, while only one landowner's treatment is different. When it happens under the elite ruling, workers become the new ruler who imposes tax on land and physical capital.

In the cases of both repression and revolution, the economic development is lagging behind that of the benchmark case, while the worst scenario is under repression where the economic and political development is stagnated. Though different in the specific timing, the sequence of the developmental stages is the same in all scenarios: land endowment precedes physical capital investment, which in turn precedes human capital investment, and the correspondence between land predominance and monarchy, physical capital predominance and oligarchy, and finally human capital predominance and democracy is maintained. In other words, the dynamic compatibility of the economic and political development illustrated in Figure 1, which is the main insight of the paper, holds for all scenarios.

5   Historical Evidence

Roughly speaking, most OECD countries have experienced all the developmental stages and are now beyond T_h, though their paths may not be as smooth as in England. Many countries unfortunately are still stuck at earlier developmental stages. An important reason for different paths across countries seems to be their different repression costs in major political transition times, which may give rise to distinct political outcomes such as political compromise, repression, and revolution; these outcomes then determine their relative positions in economic development, where those lagging behind may have to adopt different institutions that further shape their future repression costs.

This section gathers some historical evidence trying to convince the reader that the simple model analyzed above is relevant and useful in organizing our thoughts on long run economic and political development. The main focus is the history of England, France, and Germany where the full time line suggested in the

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[16]More details on the development paths with repression and revolution are in the appendix.

model has been realized, and political compromises were reached timely enough to avoid prolonged economic stagnation.[17] A systematic analysis of other countries is best left for future research.

5.1 England

England became a unified state since the initial conquest of the Anglo-Saxon England in 1066 by William the Conqueror. The basis of the power of the monarchy was obviously in the economy of the crown lands, especially in its concentrated location and productive capacity; in order to retain control over both the territory and his human resources, William the Conqueror took care that the lands of his greatest vassals were located in the distant corners of his newly conquered country. In the following five hundred years, the essential integrity of the monarchy was not compromised despite some royal concessions of minorities and weak kings to the magnates (Roberts 2002, p. 506). The productivity of agriculture started to increase under the stable political order, and the rise in food production enabled towns to develop steadily.

The growth of commerce in the towns during the 16th and 17th centuries had created in the English countryside a market for agriculture products, thereby setting in motion a process leading toward commercial and capitalist agriculture in the countryside itself. The joint force of the landowners and the upper stratum of town dwellers was an important cause of the Civil War and the ultimate victory of the parliamentary cause. Another important element for the success of parliament over the monarchy is the latter's lack of strong repressive apparatus such as an effective bureaucracy and a strong army, possibly due to the previous evolution of the monarchy and the reliance on the navy rather than on the army (Moore 1966, p. 32).

The Glorious Revolution in 1688 marked the fundamental political transition in England from the monarchy to parliamentary rule of landowners and bourgeois, while the crown still kept considerable political power within the parliament. From then on, England was governed by oligarchies representing the effective possessors of social and economic power, who constantly took care "to defend the commercial interests of the country and accepted the leadership and guidance in this of the collective wisdom of the City of London." (Roberts 2002, p. 566) As a consequence, the commercial and industrial interests were well reflected in governmental policies, and the economic development was greatly facilitated in the eighteenth-century England (North and Weingast 1989).

Inside the framework provided by prosperity and English political institutions, technical progress was continuous. By 1750 the most advanced techniques were practiced and the integration of agriculture with

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[17] As Olson (1993) pointed out, though "there are a fair number of democracies, there have not been many spontaneous and entirely autonomous transitions from autocracy to democracy." England and France are arguably the main exceptions.

a commercial market economy had gone furthest in England. The profits were then invested in capital to further improve productivity. An expanding overseas commerce generated further profits for investment, and the growing financial institutions enhanced the process. It is thus by no coincidence that the Industrial Revolution started first in England in the middle of the 18th century, which fundamentally transformed the society from a primarily agrarian one to a mature industrial society in one century.

The value of human capital in production was still limited in the first phase of the Industrial Revolution, when workers developed skills primarily through on-the-job training, and child labor was highly valuable. Under Elizabeth and Stuart statutes which remained unreformed between 1688 and 1815, the state retained considerable powers to determine wages and conditions of employment; such statutes and the common law strengthened the authority of employers and depressed wages (O'Brien 1994). Not surprisingly, workers still received very low wages, and their living standards showed no clear progress before 1820 (Lindert 1994).

Soon afterwards, however, employers found that they need more than a labor force that was available, since the contribution of workers to superior economic performance depends on both their skills and attitudes. The increasing importance of human capital in the second phase of the Industrial Revolution prompted a sequence of education reforms in England since the 1830s, designed primarily to satisfy the increasing skill requirements (Galor and Moav 2006). Realizing that workers would only expend high levels of effort in the production process if they expected to receive a 'fair share' in the consequent returns, employers became receptive to sharing power with workers' organizations rather than fighting unionization. The employers' acceptance of collective bargaining in turn opened the way for political transformations. "In the eyes of the British political elite of the 1860s and 1870s the advent of cooperative industrial relations under the aegis of business-minded union leaders transformed craft workers from uncontrollable subversive into responsible citizens. One result was the 1867 extension of the right to vote to the better-paid of the workers." (Lazonick 1994) Full suffrage was finally realized in Britain in 1884 for men and in 1928 including women.

The English development path seems to fit best into the benchmark case of smooth development, where a national monarchy was established early to provide a stable and peaceful environment, and political compromises were achieved in a relatively peaceful way and timely enough to reflect the evolving composition of production factors in the economy and the corresponding change of power balance among factor owners. The economic development was thus greatly facilitated in England, which became the first nation to start the industrialization and democratization process that has fundamentally transformed the world.

5.2 France

The French kingdom was initially very decentralized. In the middle of the 15th century France gradually evolved from a feudal country to an increasingly centralized state organized around a powerful absolute monarchy. All the main structural variables and historical trends in French society differed sharply from those in England from the 16th through the 18th centuries. The final political outcome, however, was quite similar in the 19th and 20th centuries after the French Revolution.

The commerce and manufacturing in France lagged behind that in England. Under the 17th century monarchy, the bourgeoisie was heavily dependent on royal favor, subject to royal regulation, and oriented toward the production of arms and luxuries for a restricted clientele. The practice of selling positions in the bureaucracy, by converting the bourgeoisie to an aristocrat, diminished the bourgeois drive toward property and political independence. Commercial influences as they penetrated into the French countryside, unlike those in England, did not undermine or destroy the feudal framework. There were no important technical innovations in agriculture, which continued to be carried on in fundamentally the same technical and social framework as had existed during the Middle Ages. The landed proprietor was not yet a full-blown capitalist farmer, while his earlier functions in the feudal system were taken over by royal officials; what he possessed were essentially claims to a specific share of the economic surplus enforceable through the repressive apparatus of the state.

The growth of the French monarchy had largely deprived the landed upper classes of political responsibility and diverted much of the bourgeois impulse to its own purposes, which made unlikely for French society to generate a parliament of landlords with bourgeois overtones from the cities in the English fashion (Moore 1966, p. 62). The French situation was not alone in Continental Europe. The representative institutions that had appeared in many countries in the later Middle Ages experienced a nearly universal decline in the 16th and 17th centuries. By 1789, most of Western Europe was ruled by monarchs little hindered by representative bodies; the main exception was in Great Britain (Roberts 2002, p. 572).

But the ancient regime, which diverted energy and resources from commerce and industry and hence was repressive in terms of economic development, was already under severe strains and soon to be mortally wounded by the French Revolution in 1789. "Hitherto, political power had been virtually a noble monopoly. Between 1789 and 1799, however, France was governed and reformed by overwhelmingly bourgeois assemblies, largely elected by bourgeois voters. No subsequent regime was ever able substantially to reverse these advances." (Doyle 1992, p. 376) The Revolution seriously weakened the whole interlocking complex of

aristocratic privilege: monarchy, landed aristocracy, and seigneurial rights, a complex that constituted the essence of the ancient regime. The ultimate outcome of all the forces at work was a victory for an economic system of private property and a political system based upon equality before the law, the essential features in Western parliamentary democracies. Though not a bourgeois revolution in the restricted sense of the seizure of political power by a bourgeoisie that already had won the commanding heights of economic power, historians generally agreed that the French Revolution was a triumph for the bourgeoisie (Moore 1966, p. 109).

The right to vote in France was still severely restricted under the restored Bourbons from 1815 to 1830; the electorate included only the largest property owners. After the July Revolution of 1830, the number of voters doubled; at this point the old aristocracy disappeared as a coherent and effective political group. Then the French industrial revolution started, a century later than Britain. Though universal suffrage for all adult male citizens was introduced as a result of the revolutionary upheavals of 1848, it was not functioning normally in the Second Empire from 1852 to 1870. Industrial expansion continued during this time, which strengthened the economic and political power of the working classes. The old regime collapsed in the defeat of war in 1871, indicating the start of a lasting democratic constitution entailing universal male suffrage.

The French experience is less smooth and clear-cut than that in England. Its political transition from absolute monarchy to oligarchy was accomplished by violent upheavals and revolutions, while the subsequent transition to democracy with full suffrage was delivered by the military defeat of war. The state's high repressive capacity seems to be the main reason behind its difference from England, which was probably due to the necessity of a strong army to establish a central monarchy in the first place and to survive in the conflicts with other continental European states. It seems likely that the repression and economic stagnation might have stayed longer in France if it was left alone without competition from the advanced economy of neighboring England. Luckily, the revolutions broke the grips of the old regime early enough for France to catch up with the industrialization and democratization process ahead of many other nations.

5.3   Germany

Germany as a modern nation-state was unified only in 1871 when the German Empire was forged with the Kingdom of Prussia as its largest constituent. The long time fragmentation among German states contributed to their late industrialization compared with England and France, and as a result the democratization process was interwoven with nation building in a complicated manner that shaped its distinct conservative modernization path led by authoritarian governments. The stable democracy was finally realized only after

the authoritarian state's strong repression capacity was destroyed at major military defeats.[18]

By the middle of the 14th century, Prussia still resembled Western Europe where the peasants were prosperous and relatively free. Toward the end of this century, however, certain changes began that later led to enserfment of the peasants. One of the most important changes was the coming of grain exports. In the following two centuries, the German Junkers established a labor repressive system in order to grow the grain for exporting, and at the same time reduced the towns to dependence by short-circuiting them with their exports. The result was a militarized fusion of royal bureaucracy and landed aristocracy in the 17th and 18th century.[19]

The low repression costs were perhaps the main reason why labor repressive agrarian system was adopted in Germany. The resistance to such a system from peasants and towns was limited and easily suppressed. Early in the 19th century when the industrialization started to gather momentum, a strong movement of liberal and democratic opposition began forming in the German states. It culminated in the Revolution of 1848 but was soon suppressed. A fundamental reason is that the commercial and industrial class was still too weak and dependent to take political power, partly due to its need of an authoritarian state's support to unify the national market and compete with the advanced industrial economies.

The 1848 revolution failed also because it attempted to create democratization and national unification simultaneously. It nonetheless helped pave the ways for the eventual achievement of its goals in a sequential matter. It "carried the rural social revolution, launched sixty years earlier in France, to its conclusion in central and most of eastern Europe." (Roberts 2002, p.753) In 1849 the Prussia three-class franchise system that greatly favored the wealthy class was introduced, and then carried over to the unified Germany until 1918 when the Weimar Republic was formed. The coalition of "Iron and Rye" formed in the 1850s "combining authoritarianism with bourgeois elements, against the menace of peasant and proletariat" (Trebilcock 1981). This alliance between the landed class and the rising industrial class created a climate more favorable to industrial advance. The unification of German was finally achieved in 1871 when the Prussian army destroyed the last monarchical regime in France and created the German Empire or the Second Reich, a constitutional monarchy with a parliament of very limited power.

The size of Germany's industrial proletariat had increased as a result of intensive industrialization since the 1850s, and workers started to organize a socialist party and trade unions in 1869. Felt threatened by a

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[18] In this regard the experiences of Italy and Japan were similar.

[19] England, in contrast, made the agriculture commercialization without tying peasants to the land and hence facilitated the development of town life. "Much of the subsequent history of the two countries goes back to this homely difference." (Moore 1966, p. 460)

potentially revolutionary force, the state issued repressive laws against socialist organizations, while at the same time also extended suffrage and established a social welfare system to win over the poor masses. The full democracy, however, was to be achieved mainly as consequences of military defeats: In 1918 at the end of the first World War, the Weimar Constitution came into effect, which transformed the German Empire into a democratic republic albeit a fragile one; the establishment of a stable liberal parliamentary republic had to wait until after the World War II in West Germany, and in East Germany until the reunification of Germany in 1990. "Without the defeat, it seems quite likely that Germany would not have become a democracy for decades, until something created a decisive shift in the balance of class forces." (Rueschemeyer et al. 1992, p. 109)

6 Concluding Remarks

This paper establishes a simple model where the coevolution of economic and political development is driven by the inherent technical features of different production factors and the political conflicts among factor owners in output distribution. The dynamic economic progress transforms the main production factor from land to physical capital and then to human capital, enables their respective owners, landlords, capitalists, and workers to gain political power in the same sequence, and consequently shifts the political regime from monarchy to oligarchy of landowners and capitalists and then to democracy with full suffrage. When it is too costly for any group of factor owners to repress others, political compromise would be reached at the transition periods so that the economic progress is not blocked; otherwise, political conflicts may lead to repression of some factor owners and hence economic stagnation.

A main insight emerging from the paper is the dynamic compatibility of economic and political development, which has two implications. First, it brings a developmental perspective into the discussions of appropriate or growth-enhancing political institutions. For instance, the paper suggests that, when natural resources are the main factor in production, imposing democracy may induce anarchy and stagnation. Only when human capital becomes predominant in economy, which often happens after a society has a large enough physical capital stock, would a political democracy be more likely to sustain itself. Secondly, it highlights the importance of a society's capacity for smooth political transitions in facilitating economic development. Such a capacity, which is captured in the model by the repression costs at major transitional occasions, can be influenced by many elements such as religions, cultures, geography, and history. For example, the willingness and ability to make political compromise may have greatly facilitated the economic progress in the history of

England, which had that "most elusive yet decisive institutional feature that makes for economic success: the flexibility to adapt its economic and legal institutions without political violence and disruptions." (Mokyr 2005) Unfortunately, in many societies the institutions are quite rigid and difficult to change from within; their ultimate changes are often forced upon by the intense global competition that imposes outside threats to inefficient economies and hence reduces the feasibility of repressive political regimes.

The paper's analytical framework may prove useful in understanding related long run development issues. For instance, it can be readily extended to study the effects of international forces such as war, colonization, and globalization on the development process of either an individual country or at different historical times, while taking into consideration that the changing motivation, format, and frequency of these international activities may also reflect the shifts of factor composition in production. This may generate new insight on the relationship between democracy and war: If democratic countries are necessarily highly invested in human capital, which is often true, it is not surprising that they seldom wage wars at each other. What is the point of conquering a nation whose main wealth is human capital? – The relevant parties could have been better off by engaging each other in peaceful international trade. The model can also be extended by endogenizing the state's repression capacity and costs. For example, the virtually perfect correlation between country size and landlord strength is no accident, since only strong landlords had the coercive power to conquer more lands and establish large monarchies; this may help explain the distinct development paths of small countries. The evolution of education system, in terms of both contents and financing methods, may also be shaped by similar driving forces as in the model, including the evolving factor composition and the changing power balance among factor owners.

APPENDIX 1: Proofs

Lemma 1.

Proof. The landlord's profit maximization problem is $\max_{N_{ti}} A_t(L_i)^{1-\alpha}N_{ti}^{\alpha} - w_t N_{ti}$, taking the wage rate w_t as given. The FOC $\alpha A_t(L_i)^{1-\alpha}N_{ti}^{\alpha-1} = w_t$ leads to the optimal labor demand $N_{ti}^* = (\frac{\alpha}{w_t}A_t)^{\frac{1}{1-\alpha}}L_i$. When the labor market clears, $\sum_{i=1}^{N_L} N_{ti}^* = N + N_K$ must hold, which yields the equilibrium wage rate $w_t^* = \alpha A_t(\frac{L}{N+N_K})^{1-\alpha}$. Then $N_{ti}^* = \frac{(N+N_K)L_i}{L}$ and the optimal profit is $\pi_{ti} = (1-\alpha)(\frac{N+N_K}{L})^{\alpha}A_t L_i \equiv \lambda_t L_i$, where $\lambda_t \equiv (1-\alpha)A_t(\frac{N+N_K}{L})^{\alpha}$.

The coercive ability of an individual worker is lower than that of the landlord since $\psi(1,1) < \psi(1,E)$ holds by $\psi_2 > 0$ and $w_t^* < \pi_{ti}$ holds given $L_i > \underline{L}$. The total income of landlord i's workers is $N_{ti}^* w_t^* = \alpha\lambda A_t L_i$. The aggregate coercive ability of worker is thus $v_W = \psi(N,1)\frac{\alpha}{1-\alpha}\lambda_t L_i$; it is smaller than the landlord's coercive ability $v_L = \lambda_t L_i$ under assumption A1. With a dominant coercive ability, the landlord thus can grab a proportion τ of wages based on might-is-right and get a total revenue I_{ti} in (4). ∎

Proposition 1.

Proof. The monarchy is indeed an equilibrium since there are no profitable deviations. No coalition is able to challenge the king given $L_M > \max_{G \in \Omega}\{\psi(N_G, E)\sum_{i \in G} L_i\}$, since the coercive power is proportional to land revenue and hence to land size. The king would not grab other landlords' land since the tax rate τ yields the same amount of revenue as doing so. The landlords would accept the tax because they get no benefit from fighting either as individuals or as groups. The landlords would not fight each other because the net benefit of doing so is at most zero: By grabbing another landlord j's land, one can get at most $\eta\tau\pi_{tj}$, which, however, is lower than the land tax $\tau\pi_{tj}$ to be be paid to the king. The workers would also pay wage tax $\tau N_t^* w_t^*$ to the king since their collective coercive power $\psi(N,1)\alpha\lambda_t L$ is dominated by the king's $(1-\alpha)\lambda_t L_M$ by assumption (A1) and condition (9) where $L_M = \frac{\psi_E}{1+\psi_E}(L + K_{T_k}) > \frac{\psi_E}{1+\psi_E}L$. ∎

Lemma 2.

Proof. We solve landlord i's decision problem from the last step, where his objective function is

$$\pi_{ti} = \max_{N_{ti}, K_{ti}} A_t(L_i + K_{ti})^{1-\alpha}N_{ti}^{\alpha} - w_t N_{ti} - r_t K_{ti}.$$

The optimal demands for labor and physical capital are determined by

$$w_t = \alpha A_t(L_i + K_{ti}^*)^{1-\alpha}(N_{ti}^*)^{\alpha-1},$$

$$r_t = (1-\alpha)A_t(L_i + K_{ti}^*)^{-\alpha}(N_{ti}^*)^{\alpha}.$$

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Together with market clearing conditions we get

$$w_t^* = \alpha A_t (\frac{L + K_t}{N})^{1-\alpha},$$

$$r_t^* = (1 - \alpha) A_t (\frac{L + K_t}{N})^{-\alpha},$$

$$N_{ti}^* = N \frac{L_i + K_{ti}^*}{L + K_t}.$$

The optimal land profit is thus $\pi_{ti} = (1 - \alpha) A_t (\frac{N}{L+K_t})^\alpha L_i = \frac{L_i}{L+K_t}(1-\alpha)Y_t$, where $Y_t \equiv A_t(L+K_t)^{1-\alpha}N^\alpha$ is the aggregate output in the economy. The total income of capitalists is $r_t^* K_t = (1 - \alpha) A_t (\frac{N}{L+K_t})^\alpha K_t$, while that of workers is $w_t^* N_t^* = \alpha Y_t = \alpha A_t (\frac{N}{L+K_t})^\alpha (L + K_t)$. The total income of the king

$$
\begin{aligned}
I_{t,M} &= A_t (\frac{N}{L + K_t})^\alpha [(1 - \alpha)(L_M + \eta\tau(L - L_M)) + (1 - \alpha)\eta\tau K_t + \alpha\eta\tau(L + K_t)] \\
&\equiv r_t^*(\overline{L} + \frac{\eta\tau}{1 - \alpha}K_t),
\end{aligned}
$$

includes the king's land profit plus tax revenues from other landlords, capitalists and workers. ∎

Lemma 3.

Proof. Conditions $\Pi_c \geq \Pi_r$ and $\Pi_r \geq \Pi_n$ can be simplified to, respectively,

$$\theta_{T_k} \geq \theta_c \equiv I_{T_k,M} - \pi_{T_k,M},$$

$$\theta_{T_k} \leq \theta_n \equiv I_{T_k,M} - (1 - \tau)\pi_{T_k,M},$$

where $I_{T_k,M} = (1 + \frac{\alpha\eta\tau}{1-\alpha} + \frac{\eta\tau}{(1-\alpha)\psi_E})r_{T_k}^* L_M$, and $\pi_{T_k,M} = (1 + \frac{\alpha\eta\tau}{1-\alpha})r_{T_k}^* L_M$ by (6) and (9). So we get

$$\theta_c = \frac{\eta\tau}{(1 - \alpha)\psi_E}r_{T_k}^* L_M,$$

$$\theta_n = \theta_c + \tau(1 + \frac{\alpha\eta\tau}{1 - \alpha})r_{T_k}^* L_M.$$

It is straightforward to see that $\theta_c < \theta_n$. ∎

Proposition 2.

Proof. When $\theta_{T_k} < \theta_c$, the king would repress capitalists since $\Pi_r > \Pi_c > \Pi_n$ holds by lemma 3. When $\theta_{T_k} \in (\theta_c, \theta_n]$, the king would choose to repress if his proposed compromise is rejected since $\Pi_r \geq \Pi_n$; given the king's strategy, the elites would accept the compromise; then the king would choose to compromise in the first place due to $\Pi_c \geq \Pi_r \geq \Pi_n$. So (Compromise, Repress; Compromise) is the SPE for $\theta_{T_k} \in [\theta_c, \theta_n]$. When $\theta_{T_k} > \theta_n$ the king would choose 'Not Repress' after the compromise is rejected since $\Pi_r < \Pi_n$; knowing this the capitalists would reject the compromise proposed by the king, and the SPE is (Compromise, Not Repress; Reject). ∎

Proposition 3.

Proof. The objective function of the elites in period t is

$$\max_{m^h_{t-1}} I_{e,t} \equiv (1 - \alpha + \alpha\eta\tau)A_t(L + K_t)^{1-\alpha}(Nh_t)^\alpha,$$

taking as given m^h_{t-1}, $h_t = h(m^h_{t-1}, A_t)$, and $K_t = K(B_{t-1} - m^h_{t-1}, A_t)$. The FOC for m^h_{t-1} is

$$\alpha(L + K_t)h_1 - (1 - \alpha)h_t K_1 = 0 \text{ if } m^h_{t-1} > 0, \tag{13}$$

$$\alpha(L + K_t)\gamma - (1 - \alpha)K_1 \leq 0 \text{ if } m^h_{t-1} = 0, \tag{14}$$

where $h_1(0, \cdot) = \gamma$ and $h(0, \cdot) = 1$ are substituted in (14). For interior solutions of (13) we have

$$\frac{\partial m^{h*}_{t-1}}{\partial B_{t-1}} = \frac{\alpha K_1 h_1 - (1 - \alpha)h_t K_{11}}{-SOC} > 0.$$

The LHS in (14) also strictly increases in the total surplus B_{t-1}, and it would eventually arise to zero at certain period t_h, after which human capital investment starts. t_h is thus defined by (14) at equality.

When the capital stock at T_k, K_{T_k} in (9), is too small, human capital investment will start after the elite ruling replaces monarchy at T_k. The king's objective function is

$$\max_{m^h_{t-1}} I_{e,t} \equiv A_t(\frac{Nh_t}{L + K_t})^\alpha[\overline{L} + \eta\tau K_t)].$$

The FOC is

$$\alpha(L + K_t)h_1 - (\xi_t - \alpha)h_t K_1 \leq 0,$$

where $\xi_t \equiv \eta\tau\frac{L + K_t}{\overline{L} + \tau K_t}$ and $\xi_{T_k} = \frac{1 + \psi_E}{\eta\tau + \psi_E(1 - \alpha + \alpha\eta\tau)}$. So human capital investment will not start under monarchy when the above inequality holds strictly at T_k. ∎

Proposition 4.

Proof. At the beginning of period T_h, if the elites freeze the workers' income at Y_{T_h}, they get

$$\Pi'_r \equiv (1 - \alpha + \alpha\eta\tau)Y_{T_h} - \theta_{T_h},$$

where θ_{T_h} denotes the repression cost. If a compromise is reached where workers are allowed to share political power and imposed no tax, the elites then get[20]

$$\Pi'_c \equiv (1 - \alpha)Y_{T_h}.$$

---

[20] The implicit assumption is that the total bequest in society is not reduced by the transition of political regime, which requires workers to have positive bequest at least from period T_h. When this is not true, the elites have more incentives to repress workers and hence may delay the transition, while the main results still hold.

If the elites do not repress, workers would get exclusive political power after period T_h and impose taxes on both landowners and capitalists. Then the elites would get their after-tax income

$$\Pi'_n \equiv (1-\alpha)Y_{T_h}\frac{(1-\tau)L + (1-\tau)K_{T_h}}{L + K_{T_h}} = (1-\alpha)(1-\tau)Y_{T_h},$$

which is smaller than Π'_c.

Conditions $\Pi'_c \geq \Pi'_r$ and $\Pi'_r \geq \Pi'_n$ can be simplified to, respectively,

$$\theta_{T_h} \geq \theta'_c \equiv (1-\alpha+\alpha\eta\tau)Y_{T_h} - (1-\alpha)Y_{T_h} = \alpha\eta\tau Y_{T_h},$$

$$\theta_{T_h} \leq \theta'_n \equiv (1-\alpha+\alpha\eta\tau)Y_{T_h} - (1-\alpha)(1-\tau)Y_{T_h} = \theta'_c + (1-\alpha)\tau Y_{T_h}.$$

$\theta'_n > \theta'_c$ is due to $\tau > 0$. Similar to Lemma 3, $\Pi'_r > \Pi'_c > \Pi'_n$ holds for $\theta_{T_h} \in [\underline{\theta}, \theta'_c)$, $\Pi'_c \geq \Pi'_r \geq \Pi'_n$ for $\theta_{T_h} \in [\theta'_c, \theta'_n]$, and $\Pi'_c > \Pi'_n > \Pi'_r$ for $\theta_{T_h} \in (\theta'_c, \overline{\theta}]$.

The challenging group, workers in this case, always prefers no repression to compromise, and compromise to repression. The fundamental features of this game are similar to that between the king and elites. The equilibrium results follow directly from the proof of Proposition 2. ■

APPENDIX 2: The Development Paths with Repression or Revolution

Revolution. In the case of high repression cost $\theta_{T_k} \in (\theta_n, \overline{\theta}]$, the subgame perfect Nash equilibrium is revolution where the elites of landowners (except the king) and capitalists become the new ruler. The economy is not stagnated, but less effective than in the benchmark case where political compromise is reached since extra resources are wasted in revolution and tax collecting.

Repression. In the case of low repression cost $\theta_{T_k} \in [\underline{\theta}, \theta_c)$, the subgame perfect Nash equilibrium is repression and the economy is stagnated with the physical capital stock fixed at K_{T_k}. Then the same political game is played in each period $t > T_k$ as long as repression is the equilibrium result in the last period.

This happens when the repression cost in period t is low enough that $\theta_t \in [\underline{\theta}, \theta_{ct})$ holds, where

$$\theta_{ct} \equiv I^R_{t,M} - \pi^R_{t,M} = A_t\left(\frac{N}{L+K_{T_k}}\right)^\alpha \frac{\eta\tau}{\psi_E}L_M$$

following similar arguments as in Lemma 3, with $I^R_{t,M} = A_t(\frac{N}{L+K_{T_k}})^\alpha(1-\alpha+\alpha\eta\tau+\frac{\eta\tau}{\psi_E})L_M$ and $\pi^R_{t,M} = A_t(\frac{N}{L+K_{T_k}})^\alpha(1-\alpha+\alpha\eta\tau)L_M$ by (6) and (9). Note $\theta_{ct} > \theta_c$ holds since $A_t(\frac{N}{L+K_{T_k}})^\alpha > A_{T_k}(\frac{N}{L+K_{T_k}})^\alpha = \frac{r^*_{T_k}}{1-\alpha}$.

Similarly, we can get the other threshold repression cost

$$\theta_{nt} \equiv I^R_{t,M} - (1-\tau)\pi^R_{t,M} = \theta_{ct} + \tau\pi^R_{t,M}.$$

If after a number of periods under repression, the repression cost falls into the middle range $\theta_t \in [\theta_{ct}, \theta_{nt}]$ for the first time in some period t, then political compromise is reached, the elite ruling of landowners and capitalists starts, and economic progress resumes. If after some periods under repression, the repression cost becomes so high in some period t that $\theta_t \in [\theta_{nt}, \overline{\theta}]$ happens, then revolution occurs, the elite ruling of landowners (except the king) and capitalists starts, and economic progress resumes.

So repression may continue for a long time unless either repression or compromise happens, usually as a result of unexpected shocks such as natural disasters or wars. Then the society proceeds to the next developmental stage, the elite ruling of landowners and capitalists. Similar arguments apply to the transition period from oligarchy to democracy with full suffrage.

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