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**The Law of Primogeniture and the Transition from
Landed Aristocracy to Industrial Democracy**

di

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ABSTRACT

This paper looks at the historical evolution of the relationship between an economy's structure and the corresponding political system, with a focus on the European experience starting from feudal times. We show why, in an early agricultural phase, aristocratic political systems prevail, while democracies tend to emerge with industrialization, while at the same time the law of inheritance evolves from primogeniture to equal partition as the primary source of wealth shifts from land to capital. The model also replicates the historical stylized facts of output growth and its sectoral composition, income and wealth distribution, and class structure.

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“But the law of inheritance was the last step to equality.”

Alexis de Tocqueville, *Democracy in America* (1835).

1 Introduction

Back in the Middle Age, Europe was a predominantly agrarian economy ruled by a feudal aristocracy which based its power on the land. Several centuries later, Europe’s societies are now democracies which have completed, and past, their industrialization process. Few attempts have been made to explain the long-term determinants of class structure and political participation and their connection with the process of structural reallocation from agriculture to manufacturing.

This paper fills this gap and looks at the historical evolution of the relationship between an economy’s structure and the corresponding political system, with a focus on Europe from feudal times. We start from the observation that indeed, at least in the European experience during the past ten centuries, agrarian societies tend to be inherently aristocratic, while industrialized societies, as capital replaces land, tend to move into the direction of democratization. At the same time, we observe an evolution in the legal system regulating the intergenerational transfers of property rights, with primogeniture being associated with land and aristocracy, and equal partition gaining ground as industrialization and democratization advance. Indeed, while feudal estates could not be divided up, capital, being reproducible and divisible, can be easily partitioned (and this is true for physical, and even more so for human capital). Under the reasonable assumption that wealth is the principal source of political power, when there is a change in the primary source of wealth political power will shift as well, and the intergenerational transmission of wealth affects the distribution of power. The goal of the paper is to establish how the evolution of the law of inheritance is connected with the growth path of the economy, the sectoral composition of aggregate output, class structure, income and wealth inequality, and political participation.

A few historical coordinates are supplied here, even though they are fully explored only in Section 6, where we also relate them to our results. The agrarian basis of Europe’s political

order dates back to the introduction of feudalism at the turn of the first millennium. To ensure a stable flow of income to support military expenses and an organized bureaucracy, the feudal lords were granted the income from great estates, in return for military service and for the local administration of justice. Primogeniture emerged around the 13th century as a reaction to the intensified demographic transition and inefficient partition of land, and kept spreading across Europe up to the 17th century. Despite marked regional differentiations, for centuries it remained the rule among the nobility, and whenever land constituted a dominant portion of wealth. The French revolution abolished entails, but it is only with the 19th century that most European countries finally outlawed them, despite all the controversies and the fact that the demographic, social and economic reasons for them to emerge were already changing by 1800. The persistence of primogeniture indicates that the distinctive agrarian and rural institutions created in Europe in the Middle Age kept influencing economic activity until and even after the advent of industrialization. Eminent economists and political and social scientists contributed to the debate on the optimal law of inheritance, which spread from Europe to colonial America. The relevance of the inheritance law is witnessed for instance by Smith ([1776] 1937), who writes:

“...when land was considered as the means, not of subsistence merely, but of power and protection, it was thought better that it should descend undivided to one... The security of a landed estate...depended upon its greatness. To divide it was to ruin it, and to expose every part of it to be oppressed and swallowed up by the incursions of its neighbors...”

While from De Tocqueville ([1835] 1956) we read:

“But the law of inheritance was the last step to equality... When framed in a particular manner, this law unites, draws together, and vests property and power in a few hands; it causes an aristocracy, so to speak, to spring out of the ground. If formed on opposite principles, its action is still more rapid; it divides, distributes, and disperses both property and power.”

The paper starts with a description of a static, purely agrarian economy which is associated with a stable aristocracy. There are two groups in the population, landlords and land-less workers. At this stage, wealth is land, power is wealth, so land is power. Next, we develop a dynamic model with an agricultural sector and a manufacturing sector, across which workers can migrate. We frame our analysis within an overlapping-generations model with bequests, where landed property is subject to primogeniture because of an estate maintenance technology dictating a minimum estate size. Land is therefore indivisible, while capital can be partitioned freely among all children. There is a minimum wealth requirement for participation of workers in the political process, and the political majority sets a tax rate on agricultural workers. When the aristocracy is in power it sets a positive tax rate, while the tax would be abolished by a workers' majority.

The economy evolves as follows: As capital accumulates, workers migrate towards the manufacturing sector, while the agricultural sector shrinks. Wages are increasing, while rents and interest rates are declining. The income gap between landlords and workers is gradually reduced, and can reverse its sign if net rents become negative. The capital bequest of the landlords is higher than the capital bequest of the workers, at least until negative net rents kick in. As workers' capital bequests increase, the process of democratization begins. The extension of the voting franchise is therefore endogenously determined by the process of economic development. Once the tax is abolished by a workers' majority, income and wealth equalization will accelerate, together with political participation. Moreover, capital accumulation and income growth speed up because the tax constitutes a distortion with respect of the output-maximizing sectoral allocation. Finally, the importance of land as a portion of total wealth declines, implying a gradual reduction of the incidence of primogeniture. Inheritance laws therefore endogenously evolve as a reaction to the change in the primary source of wealth from land to capital. Moreover primogeniture, by restricting land ownership to a stable minority, limits the decline of individual agricultural rents and the consequent demise of the landed aristocracy, despite the fact that its economic and political supremacy will eventually be eroded. By excluding younger children from landed property, it also affects the composition of the emerging middle class and its chances of upward social

mobility. The interaction between the evolution of net rents and the increase in wages and capital bequests will crucially determine the speed of the democratization process. To sum up, the model establishes a connection between the evolution of society from an aristocratic political system into a democracy, the process of capital accumulation and sectoral reallocation from agriculture into manufacturing, and the economic impact of primogeniture, thus generating a theory of endogenous determination of the law of inheritance based on the sectoral evolution of the economy.

Our work is primarily connected with the research program which has focussed on the connection between growth, development and political institutions in a long-term perspective. Examples from this literature are Acemoglu and Robinson (2000, 2002), Bourguignon and Verdier (2000), Gradstein and Justman (1999) and Bertocchi and Spagat (2001). Closely connected, another stream of the literature has built a unified theory that captures the historical evolution of population, technology and output from Malthusian stagnation to Solowian growth (see Galor and Weil (2000) and Hansen and Prescott (1999)). Galor and Moav (2002 a, b) are also closely related for their analysis of the long-term evolution of class structure.

There is also a literature on inheritance rules and the family, with some contributions attempting at finding an endogenous explanation of primogeniture and family structure, for which Becker (1981) provides a general introduction. Chu (1991) and Bergstrom (1994) develop the lineage survival approach, where primogeniture can emerge as an optimal dynastic policy to minimize the probability of extinction, while Faith and Tollison (2001) motivate partition as a device to minimize rent seeking among children.¹ None of these papers however looks at the primary source of wealth as an explanation of the prevailing law of inheritance.

On the role of land in dynamic models, we were inspired by the work of Eaton (1987) and Drazen and Eckstein (1988), from whom we take the basic structure of the model, although they assume constant population. Laitner (2001) and Koegel and Prskawetz (2001), in

¹Guner (1990) studies conditions for patrilineal inheritance rules to emerge, while Botticini and Siow (2001) study the optimal joint determination of bequests for sons and dowries for daughters.

similar setups, allow for population growth, but not for capital accumulation.² Sectoral shifts of the labor force from agriculture to manufacturing are at the basis of the Kuznets (1955) inverted-U relationship between income inequality and income. Recent work on the role of agriculture in development includes Caselli and Coleman (2001), who focus on regional growth patterns in the U.S. during the past century, and Gollin, Parente and Rogerson (2001, 2002) who stress the role of agricultural productivity in explaining cross-country income differences. The adverse impact of landowners' interests for the formation of industry and for education reform is explored by Parente and Zhao (2002) and by Galor, Moav and Vollrath (2002), respectively.³ None of these papers however explicitly analyzes the role of property rights on land within a neoclassical growth model with capital, population growth and technological progress.

The rest of the paper is organized as follows. Section 2 describes a static agrarian economy as an introduction to the fully-developed dynamic, two-sector model. Section 3 describes the main model for the analysis, with both an agricultural and a manufacturing sector. Section 4 analyzes the model and derives the main results. Section 5 considers a number of extensions of the basic model. Section 6 looks at the historical evidence and provides for it an interpretation in light of our results. Section 7 draws some conclusions and indicates lines for future research.

2 A static agrarian economy

As an introduction to the fully-developed model, we start presenting the pre-existing static agrarian economy with an aristocratic political system, before capital accumulation begins. This helps to introduce the basic notation and the crucial assumptions.

We consider an overlapping-generations model where production takes place in the agri-

²Matsuyama (1992), Galor (1992) and Kongsamut, Rebelo and Xie (2001) explore a number of technical issues on the dynamics of two-sector models. Classic papers on dualism are Jorgenson (1961) and Ranis (1988).

³On the related issue of land reform, see Horowitz (1993), Grossman (1994), Binswanger, Deininger and Feder (1995), and Conning and Robinson (2002).

cultural sector. There are only two factors of production, land and labor. There is no capital. Land is in fixed supply, and equal to L . The labor force N is also constant, since population growth equals 0. At each t , the output of the agricultural sector, A , is therefore constant and given by

$$A = L^\alpha N^{1-\alpha} \quad (2.1)$$

where $0 < \alpha < 1$. The agricultural good is not storable and can be used only for consumption. There are two groups of individuals: landlords \mathcal{L} and land-less workers W . The size of the landlords' group is small if compared to the size of the workers' group. We assume that landlords also work. Each landlord owns an equal share e of the total amount of land, where e represents the minimal size of an estate. The costs of protecting and administering an estate are infinite if its size is smaller than e . Such costs, to be covered out of the agricultural rents, are constant and equal to $\xi \geq 0$ if the estate is equal or larger than e . Since $e\mathcal{L} = L$, setting $e = 1$ we obtain $\mathcal{L} = L$. Land is passed on from parent to child. There is no market for land since land is never put for sale. In this model, wealth is the only determinant of political power. Since the only form of wealth is land, landed property is the sole source of power. The landlords therefore constitute an aristocracy, i.e., literally, a political system that exclusively assigns power to a few. Accordingly, as we shall see, they are in a position to charge workers a tax on their labor income. We shall refer to the resulting tax rate as to a voting equilibrium, even though at this stage the structure of the political system is rudimentary.

Individuals live for two periods. In the first period of life, they are born with one unit of labor that they supply inelastically. In their first period of life, the children of the aristocracy also receive their land inheritance. Production takes one period to be completed, so during the next period individuals receive their wage and rental income, where rental income of course only accrues to the landlords. In the second period of their life individuals optimally choose their level of second-period consumption, c_{t+1} , and the land inheritance for their children, e_{t+1} . Preferences are given by

$$u_{it} = \log c_{it+1} + e_{t+1} \quad (2.2)$$

for $i = L, W$. For expositional convenience, for the determination of factor prices we will assume perfect competition, and that there is a tax on wages unilaterally imposed by the landlord. For his estate each landlord receives a rent which is given by

$$\rho = \alpha \left(\frac{N}{L}\right)^{1-\alpha} \quad (2.3)$$

and the individual wage is

$$\omega = (1 - \alpha) \left(\frac{L}{N}\right)^\alpha \quad (2.4)$$

Wages are subject to a proportional tax at a rate τ , such that $0 < \tau < 1$, and tax revenues are collected by the landlords. The level of the tax rate is determined by an implicit upheaval technology, and therefore can be interpreted as a measure of the degree to which agrarian relations depart from competition. Under these assumptions, each landlord receives a constant after-tax rent which is given by

$$\rho^\tau = \left[1 + \frac{\tau(1 - \alpha)}{\alpha}\right] \alpha \left(\frac{N}{L}\right)^{1-\alpha} \quad (2.5)$$

and the individual after-tax wage is

$$\omega^\tau = (1 - \tau)(1 - \alpha) \left(\frac{L}{N}\right)^\alpha \quad (2.6)$$

Alternatively, we could have derived the same factor prices by assuming that workers do not receive their marginal product, but an average of what is left after landlords appropriate a fraction λ of the agricultural product, where $\lambda = [\alpha + \tau(1 - \alpha)]$. In other words, according to this interpretation factor prices in agriculture are determined on the basis of a sharing rule λ , where $\lambda > \alpha$ for $\tau > 0$, while $\lambda = \alpha$ for $\tau = 0$, and again λ is determined by the relative strength of the landlords' group.

Let y_i , $i = L, W$, denote individual i 's total income exclusive of land inheritance at time t . Therefore we have $y_L = \omega^\tau + \rho^\tau - \xi$ and $y_W = \omega^\tau$. Each individual will maximize utility (3.3) subject to the constraints

- (i) $c_{it+1} \leq y_i$, and
- (ii) $e_{t+1} \geq e$

for $i = L, W$. The first constraint is standard, while the second captures the indivisibility of estates following from our assumptions about maintenance costs. The solutions will be $c_i = y_i$, $i = L, W$, and $e_{t+1} = e$, i.e., a stationary level of consumption, with landlords consuming more than workers as long as $\rho^r > \xi$, and a time-invariant estate size. In their second period, landlords also set the tax rate τ (or, equivalently, the sharing rule λ) to be imposed at $t + 1$.

No savings are allowed in this model, and the entire agricultural output is divided between consumption and estate costs, according to

$$A = c_L L + c_W W + \xi L \quad (2.7)$$

A perfect-foresight political equilibrium is a constant sequence $\{c_{LA}, c_{WA}, A\}_{t=0}^{\infty}$ such that at each t utility and profits are maximized, the agricultural good market clears, and the tax rate τ is a voting equilibrium.

Given the constant size of the population, the absence of technological progress, and the absence of capital accumulation, consumption is constant for each social group, as is their income and the society's income and wealth distribution. A stable aristocracy naturally arises given the structure of property rights on land.

Even though the analysis of the transition from the static agrarian economy and the dynamic two-sector economy is beyond the scope of the present paper, we can think of the transition as being originated by an exogenous event. Indeed the new political and economic order permitted the expansion and the improvement of cultivated land. and therefore the emergence of technical progress in agriculture. In a Malthusian framework, this event allows constant or increasing wages and consumption, pushing towards a permanent increase in the rate of population growth. In turn, the resulting agricultural surplus may have caused, at some point of the development process, the start of the process of capital accumulation.⁴ The newly-determined economic conditions, characterized by technical progress in agriculture,

⁴Maddison (2001) indeed attributes the increase in the rate of growth of population in Europe after the year 1000 to an increase in the area of rural settlement and the gradual incorporation of technological changes that raised land productivity.

population growth, and an initial condition for capital, are fully explored in the following analysis.

3 A dynamic model

3.1 Production

We now consider an overlapping-generations model with bequests and two specific-factors technologies producing an agricultural and a manufacturing good using three factors, land, capital, and labor. At time t , production of the agricultural good, A_t , uses labor N_{At} and a fixed amount of land L , according to

$$A_t = (G_t L)^\alpha N_{At}^{1-\alpha} \quad (3.1)$$

where G_t is the level of technological progress in the agricultural sector and $G_{t+1} = (1+g)G_t$. The quantity of effective land is therefore $G_t L$. Production of the manufacturing good, M_t , uses labor N_{Mt} and capital K_t according to

$$M_t = K_t^\alpha N_{Mt}^{1-\alpha} \quad (3.2)$$

where the competitive labor share is assumed to be the same as in agriculture. The agricultural good is not storable and can be used only for consumption, while the manufacturing good can either be used for consumption or bequeathed to children, who will in turn employ it as capital in the manufacturing sector. Labor is perfectly mobile between sectors at no cost.

3.2 Population

Total population grows at a rate n , and consists of two groups: landlords \mathcal{L} and land-less workers W . As in the static agrarian economy, we assume that landlords also work and that each landlord owns an equal share e of the total amount of land L , where e represents the minimal size of an estate, with associated costs $\xi \geq 0$. However, the costs now grow with the

level of effective land, i.e., at a rate g . The size of the landlords' group is initially small and cannot increase over time, given our assumptions on minimal estate size. Therefore, land is passed on to one child only (unigeniture). It is natural to assume that the heir of the estate is always the first child (primogeniture). The younger, land-less children become part of the workers' group.

Each individual also receives a capital bequest. Being a reproducible, divisible resource, capital can be divided up among all children in equal parts without restrictions (partition). Capital is subject to partition even among the landlords' class, in fact we assume that compensatory capital transfers are ruled out.⁵ We assume that all individuals start with an identical level of initial capital bequest, b_0 , and that the relative size of e is larger than b_0 , so that at the start capital represents a negligible portion of the landlords' wealth. Moreover, the aggregate size of the initial capital bequests, $B_0 = \sum_j b_0$, where j is a representative individual, is also small, so that aggregate initial wealth in the economy is composed mostly of land.

3.3 Political system

In this model, wealth is the only determinant of political power. When wealth consists primarily of land, landed property is the sole source of power. The landlords therefore still constitute an aristocracy. Initially, capital plays no role in the political equilibrium of the model. In fact, we assume there is a minimum wealth requirement, $\tilde{b} \geq b_0$, for participation of workers in the political process. It is only when all workers will reach a level of wealth \tilde{b} that the political system will turn into a full democracy, i.e., literally, a political system that assigns power to all the people. However, for workers to play a role in the political process, a partial degree of enfranchisement will suffice. And, since we assume that political decisions are made through majority voting, workers will be in a position to determine the outcome of elections as soon as enfranchised workers outnumber the members of the aristocracy. As we will see, enfranchisement in this model will be gradual and will progress at an endogenously-determined speed, even if all workers start with an identical initial capital bequest.

⁵In an extension we introduce the possibility of compensatory bequests for younger children.

Landlords and workers are assumed to have different voting preferences regarding tax policy. In particular, under aristocracy, landlords impose a proportional tax τ on agricultural wages, which proxies for the feudal relations applying to that sector, while the tax is abolished when the median voter is a worker, i.e., as society evolves towards democracy.

3.4 Preferences

Individuals live for two periods. In the first period of life, they are born with one unit of labor that they supply inelastically, and they receive their land and capital bequests, which are employed in the production processes together with their labor. Production takes one period to be completed, so during the next period individuals receive their wage, interest, and rental income. As previously clarified, rental income and land bequests are exclusively reserved for the aristocracy. In the second period of their life individuals optimally choose their level of consumption and a capital bequest for their children. The landlords also bequeath their estate to their first children. Second-period consumption of an individual born at t is given by $c_{t+1} = c_{t+1}^A + c_{t+1}^M$, where c_{t+1}^A and c_{t+1}^M are the individual consumption levels of the agricultural and of the manufacturing goods, respectively. The agricultural and the manufacturing goods are assumed to be perfect substitutes in consumption, i.e., their relative prices are fixed. Preferences are given by

$$u_{it} = \delta \log c_{it+1} + (1 - \delta) \log b_{it+1} + e_{t+1} \quad (3.3)$$

for $i = L, W$, where δ is a preference parameter, $0 < \delta < 1$, c_{it+1} is consumption, and b_{it+1} and e_{t+1} are the capital and the land bequests to the children, respectively.

3.5 Factor prices

As in Section 2 we initially assume that in the agricultural sector the labor market is competitive, while there is no market for land since land is never put for sale. For his estate, in terms of effective land units, each landlord receives a before-tax rent which is given by

$$\rho_t = \alpha \left(\frac{NAt}{G_t L} \right)^{1-\alpha} \quad (3.4)$$

and is increasing in the level of employment in agriculture. To be noticed also is that the actual rent a landlord receives for his estate, is instead given by $\alpha G_t^\alpha (\frac{N_{At}}{L})^{1-\alpha}$, which grows with the agricultural technological progress while, were the land partitioned among all the landlords' children, each of them would receive $\alpha G_t^\alpha (\frac{N_{At}}{L_t})^{1-\alpha}$. The before-tax individual wage is

$$\omega_{At} = (1 - \alpha) \left(\frac{G_t L}{N_{At}} \right)^\alpha \quad (3.5)$$

When our story starts and the society's political system is an aristocracy, agricultural wages are still subject to a proportional tax at a rate τ , such that $0 < \tau < 1$, and tax revenues are collected by the landlords. Therefore, each landlord receives an after-tax rent which is given by

$$\rho_t^\tau = \left[1 + \frac{\tau(1 - \alpha)}{\alpha} \right] \alpha G_t^\alpha \left(\frac{N_{At}}{L} \right)^{1-\alpha} \quad (3.6)$$

The individual after-tax wage therefore is

$$\omega_{At}^\tau = (1 - \tau)(1 - \alpha) \left(\frac{G_t L}{N_{At}} \right)^\alpha \quad (3.7)$$

Again, the relative shares of the agricultural output could alternatively be interpreted as the outcome of a sharing rule $\lambda = [\alpha + \tau(1 - \alpha)]$, where $\lambda > \alpha$ for $\tau > 0$, while $\lambda = \alpha$ for $\tau = 0$. The tax can therefore be interpreted as a measure of the discrepancy between feudal agricultural returns and their competitive level.

In the manufacturing sector both the capital and the labor market are competitive. Profit maximization yields the following wage and interest rate:

$$\omega_{Mt} = (1 - \alpha) \left(\frac{K_t}{N_{Mt}} \right)^\alpha \quad (3.8)$$

$$r_t = \alpha \left(\frac{N_{Mt}}{K_t} \right)^{1-\alpha} \quad (3.9)$$

The capital stock is subject to full depreciation. Note that migration ensures the equality of the wage between the two sectors, i.e., $\omega_{At}^\tau = \omega_{Mt} = \omega_t$. Equating (3.7) and (3.8), we obtain the following expression for N_{At} :

$$N_{At} = G_t L (1 - \tau)^{\frac{1}{\alpha}} \frac{N_{Mt}}{K_t} \quad (3.10)$$

which shows that the number of workers in agriculture is a decreasing function of the level of the capital stock.⁶

From (3.6) and (3.10) taken together, it follows that the after-tax rent increases in the tax even though employment in agriculture decreases with it, i.e., the net effect of tax on rent is positive.

We will use the notation y_{it} , $i = L, W$, to denote individual i 's total income inclusive of capital inheritance but exclusive of land inheritance at time t . Therefore we have $y_{Lt} = b_{Lt}r_t + \rho_t^r - \xi G_t + \omega_t$ and $y_{Wt} = b_{Wt}r_t + \omega_t$.

4 Analysis of the model

4.1 Utility maximization

Each individual will maximize utility (3.3) subject to the constraints

- (i) $c_{it+1} + b_{it+1} \leq y_{it}$,
- (ii) $e_{t+1} \geq e$, and
- (iii) $\sum_j b_{it+1}^j = (1+n) b_{it+1}^j$,

for $i = L, W$, where b_{it+1}^j is the individual capital bequest received by child j . The first constraint simply states that the individual's consumption and capital bequest have to be less or equal to total income inclusive of the capital bequest received by the individual. The second constraint captures the indivisibility of estates due to our assumptions about maintenance costs. The third constraint imposes identical capital bequests to all children, i.e., rules out compensatory capital bequests. The solutions will be $c_{it+1} = \delta y_{it}$, $b_{it+1} = (1 - \delta)y_{it}$, $i = L, W$, $e_{t+1} = e$, and $b_{it+1}^j = \frac{b_{it+1}}{1+n}$. Note that, independently on which sector individuals receive their income from, they can consume both goods since they can trade intragenerationally at the unit price.

⁶Were the two technologies characterized a lower labor share in agriculture, as widely accepted, equation (3.10) would predict a smaller size of the agricultural employment and output, relative to manufacturing.

In their second period, those individuals whose capital holdings are higher than \tilde{b} vote on the tax policy to be implemented at $t + 1$.

4.2 Market clearing

Given the above results, the market-clearing condition for the capital market is

$$K_{t+1} = (1 - \delta)y_{Lt}L + (1 - \delta)y_{Wt}W_t \quad (4.1)$$

Aggregating over individual incomes, we obtain

$$K_{t+1} = (1 - \delta)(M_t + A_t) \quad (4.2)$$

where the employment level in each sector is given by (3.10), and by the following condition for market clearing in the labor market

$$N_{At} + N_{Mt} = N_t \quad (4.3)$$

The agricultural and the manufacturing goods markets must also be cleared at each t , implying

$$A_t = c_{Lt}^A L + c_{Wt}^A W_t + \xi L G_t \quad (4.4)$$

$$M_t = c_{Lt}^M L + c_{Wt}^M W_t + K_{t+1} \quad (4.5)$$

As previously explained, no market for land exists since land is never put for sale under our assumptions.

Note that at the aggregate level the unit price assumption, together with our preferences, implies that some manufacturing goods must be consumed, otherwise the price of the manufacturing good would have to be higher than the price of the agricultural good. In other words, $K_{t+1} < M_t$ and the saving rate $(1 - \delta) = \frac{K_{t+1}}{Y_t}$ is therefore bounded above by $\frac{M_t}{Y_t}$, where $Y_t = M_t + A_t$. Another feature of the model is that, while the aggregate saving rate $(1 - \delta)$ is constant over time, the portion of the manufacturing output which is invested at

each t must of course vary over time, being given by $\frac{K_{t+1}}{M_t} = (1 - \delta)(1 + \frac{A_t}{M_t})$ which is larger than $(1 - \delta)$ and, as we will show, will decrease over time as $\frac{A_t}{M_t}$ declines.

4.3 Political equilibrium

A perfect-foresight political equilibrium is a sequence

$\{c_{Lt}^A, c_{Wt}^A, c_{Lt}^M, c_{Wt}^M, K_t, A_t, M_t, G_t, N_{At}, N_{Mt}\}_{t=0}^{\infty}$ such that at each t utility and profits are maximized, all markets clear, and the tax rate τ is a voting equilibrium, starting from given initial values of K_0 , N_0 , and G_0 , and given the set of parameters $n, g, \alpha, \delta, L, \xi$, and \tilde{b} .

The equilibrium path solves simultaneously equations (3.6)-(3.9) and (4.2)-(4.5), plus the wage-equalization condition (3.10). The dynamic evolution of the system can be analyzed using the capital market clearing condition (4.2), starting from an initial condition K_0 , where K_0 is assumed to be small. Given the available number of workers and the available amount of land, the distribution of workers across sectors will be determined by (3.10). For the resulting levels of N_{A0} and N_{M0} , the output levels A_0 and M_0 will in turn be determined. Out of resulting income levels, consumption will be chosen optimally, together with the level of capital to be used in the following period, K_1 . From (3.10), it is clear that, along the equilibrium path, workers migrate to the manufacturing sector as the capital stock grows, while the agricultural sector shrinks. Therefore, the agriculture share of output varies inversely with the level of development.⁷ In fact, we can derive the following expression for total output at each t :

$$Y_t = \psi(\tau, K_t) K_t^\alpha N_t^{1-\alpha} + (1 - \psi(\tau, K_t)) (G_t L)^\alpha N_t^{1-\alpha} \quad (4.6)$$

where $\psi(\tau, K_t) \equiv \left(\frac{K_t}{K_t + G_t L (1-\tau)^{\frac{1}{\alpha}}}\right)^{1-\alpha}$. Employment and output in agriculture will be lower, and employment and output in manufacturing higher, the higher the tax rate, i.e., with the intensity of feudal power. For $\tau = 0$, the process of structural adjustment therefore slows down, implying that democratization, and the associated shift in the distribution of income within the agricultural sector, is associated with a larger, albeit still declining, agricultural

⁷If, as discussed in footnote 6, the labor share were lower in agriculture than in manufacturing, along the equilibrium path we would observe an increase in the aggregate labor share as manufacturing expands.

sector.

4.4 The balanced-growth path

In the long run, the dynamical system will evolve towards a unique and stable balanced-growth path, where all the relevant variables, and in particular K_t and Y_t , must grow at a rate n . It is clear now that the rate of growth of technological progress in agriculture, g , has to be equal to n in order to sustain such a path. With land as a fixed factor, population growth has to be balanced by an identical growth of effective land.

4.5 The output-maximizing tax rate

Maximization of the total level of output in (4.10) yields a tax rate equal to 0. Therefore, the change in tax policy brought about by democratization positively affects the process of capital accumulation and income growth by removing the distortion associated with the tax on sectoral allocation. The abolition of the tax leads to higher balanced-growth levels of K_t and Y_t .

4.6 Evolution of income and wealth distribution

We shall keep track of the evolution of income and its distribution as time goes and as sectoral reallocation progresses, taking into account the impact of a change in tax policy, i.e., of the abolition of feudal relations in agriculture.

Let us start with the agricultural wages. Their evolution is given by

$$\frac{\omega_{At+1}}{\omega_{At}} = \left(\frac{1+n}{1+n_t^A} \right)^\alpha \quad (4.6)$$

where n_t^A is the rate of growth of employment in agriculture. Before the system settles down along the balanced-growth path, $n_t^A < n$, since $n_t^A < 0$, so wages increase over time. In balanced growth, they will be constant, since agricultural employment grows at the same rate as population. The same pattern must apply to manufacturing wages, which are equalized

to those in agriculture, and evolve according to

$$\frac{\omega_{Mt+1}}{\omega_{Mt}} = \left(\frac{K_{t+1}/K_t}{1+n_t^M} \right)^\alpha \quad (4.7)$$

where n_t^M is the rate of growth of employment in manufacturing. Together with the condition for wage equalization, (4.7) implies that $\frac{K_{t+1}}{K_t} = \frac{1+n_t^M}{1+n_t^A}(1+n)$.

Examine now the evolution of rents per unit of effective land, which is given by

$$\frac{\rho_{t+1}}{\rho_t} = \left(\frac{1+n_t^A}{1+n} \right)^{1-\alpha} \quad (4.8)$$

which implies declining rents until they settle at a constant balanced-growth level. However, it is important to notice how rents per unit of actual land show, of course, a different pattern, given by $(1+n)^\alpha (1+n_t^A)^{1-\alpha}$, with rents always growing, at a rate slower than n before balanced growth is reached, and at a rate n in balanced growth. Therefore, the actual rental income of each landlord grows, while the size of the landlords' group is kept constant by primogeniture. Moreover, were primogeniture replaced by partition, the rate of growth of actual rent per landlord would be lower, and given by $\frac{(1+n)^\alpha (1+n_t^A)^{1-\alpha}}{(1+n)^{1-\alpha}}$, which reduces to $(1+n)^\alpha$ in balanced growth. Finally, the interest rate will follow a pattern similar to that of effective rents, according to

$$\frac{r_{t+1}}{r_t} = \left(\frac{1+n_n^M}{K_{t+1}/K_t} \right)^{1-\alpha} \quad (4.9)$$

Let us turn now to the between-classes evolution of income distribution, taking into account the estate maintenance cost ξ . The difference between the after-taxes level of income of a landlord and a worker is given by $y_{Lt} - y_{Wt} = (b_{Lt} - b_{Wt})r_t + \rho_t^l - \xi G_t$. Since rents and interest rates decrease outside balanced growth, the gap is gradually reduced. Notice that, at least initially, interest income is a larger portion of landlords' income, since accumulation for them has been faster despite an identical initial capital condition. Moreover, at the same time, the wage component is increasing. At some point, however, if given the parameters of the model the unit rent per estate becomes smaller than the maintenance costs, the net rent will become negative, and the sum of wage and rental income will become smaller for landlords than for workers. As the process intensifies, eventually the capital bequest of

the landlords will become lower than the capital bequest of the workers.⁸ To keep track of the distribution of total wealth, land has to be considered as well. Even though land remains the exclusive property of the landlords, its weight as a portion of total wealth declines, since before balanced growth is reached capital is growing more than effective land. With the decline of the incidence of land out of total wealth, we also observe a reduced impact of primogeniture on the transmission of the economy's wealth. So the economic importance of primogeniture declines with capital accumulation and sectoral reallocation towards manufacturing. De facto, partition will regulate intergenerational transfers for most of existing wealth and for most families in the long run.

We should now go back to the impact of taxes, i.e., of the feudal nature of labor relations in agriculture. Clearly, with taxes, the income gap between landlords and workers is amplified, so the abolition of the tax would contribute to income equalization. In addition, from the previous section, we know that the presence of taxation affects the allocation of workers across sectors, with a smaller N_{At} being associated with a tax, and this in turn affects capital accumulation and income growth.⁹ With taxes affecting income distribution, wealth distribution will also be affected, with taxes amplifying the gap between capital bequests of the landlords and of the workers. To sum up, tax policy affects income and wealth distribution, as well as sectoral allocation and income growth.¹⁰

4.7 Middle class formation

The most interesting aspect in the evolution of distribution is the fact that the model endogenously creates multiple income and wealth classes, as new cadet lines are created at

⁸We assume that the process never goes beyond the point at which the income of the landlords falls below 0.

⁹Note that the impact of tax on accumulation depends on sectoral reallocation and not on intergenerational redistribution (as, for example, in Drazen and Eckstein (1988)) since in our model all sources of income accrue to individuals in the same period of their lives.

¹⁰In the above discussion we have implicitly assumed that balanced growth is not reached until the second stage. But balanced growth can actually be reached by the system even in the first. If that is the case, the change in tax policy constitutes a shock that causes the system to move to a different balanced-growth equilibrium, with a larger agricultural sector, a larger level of capital and income, and reduced inequality.

each t . By cadet lines, we mean generations of younger children of the aristocracy that at each t are excluded from land ownership and join the workers' class, starting with a capital bequest which differs from that of the original workers lines, as well as from that of the previously-created cadet lines. In other words even assuming, as we did, identical initial capital bequests, at each time t we will observe $t + 1$ types of individuals defined by the different level of the capital bequest they receive. The first type characterizes individuals who come from the original aristocracy (at each t , we have a line of landlords, i.e., of first born at each t of the original landlords, for each original landlord). A second type characterizes individuals who come from the original workers (again, we have a line of "pure" workers, expanding at the rate n , for each original worker). The remaining $t - 1$ types come from subsequent generations of cadets who are expelled from the landlords' class at each t . In turn, given the $t + 1$ types of bequests received at time t , there will be $t + 2$ types of bequests left for, and received by, generation $t + 1$, since the younger children of the landlords will not receive any net rent, so their income will be different from the income of their oldest sibling, even though they received identical bequests.

The workers' group, including the constant inflow of cadets, grows over time at a rate $\tilde{n}_t \equiv n \frac{N_t}{N_t - L} > n$ and will include, besides the children of the original workers, first-generation workers, i.e., cadets just coming from the aristocracy, as well as previous-generation workers, i.e., children of cadets who came from the aristocracy at earlier times.

For example, for simplicity assume that $n = 1$ and that at $t = 0$ we have only one landlord and one worker, with $b_{L0} > b_{W0}$. At $t = 1$, there will be one first-born of the landlord, receiving a certain capital bequest, a second-born of the landlord, receiving an identical capital bequest but moving into the workers' group, and two children of the original worker, receiving an identical bequest. So indeed at $t = 1$ there are two types of bequests being received, three types of bequest being left - since the cadet will receive a different income if compared with his older brother - and $\tilde{n}_1 = \frac{4}{3} > 1$. At $t = 2$, there will be again one first-born of the landlord, a second-born of the landlord, with an identical bequest and moving into the workers' group, four grand-children of the original worker, and two children of the previous-generation cadet. This adds up to three kinds of bequests being received,

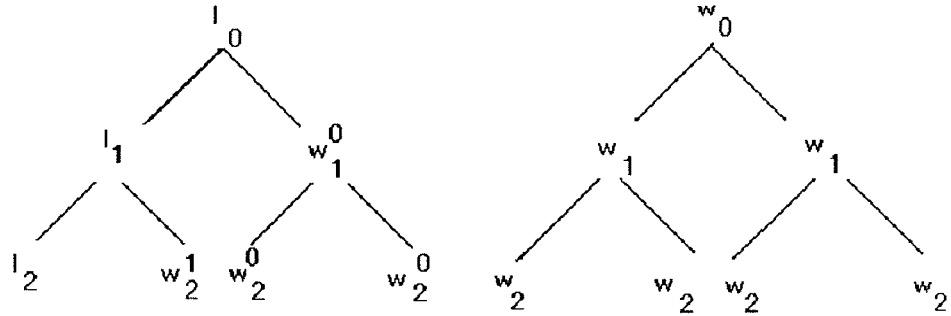


Figure 1: The inheritance tree

four being left, and $\tilde{n}_2 = \frac{8}{7}$, with $n < \tilde{n}_2 < \tilde{n}_1$, i.e., the growth rate of the workers' group remains higher than n , but decreases over time as the landlords' group represents a smaller and smaller fraction of total population.

Figure 1 maps the pattern of population growth, group by group, for $t = 0, 1, 2$, and for the case of $n = 1$ and only one individual per group at $t = 0$, l_0 and w_0 . The subscript indicates the period in which each individual is born, while the superscript is introduced only for individuals for whom a change of group has occurred during their family history. The difference between the subscript and the superscript indicates how many generations have past since the change occurred so, for example, w_1^0 denotes a worker born at time 1 whose father was a cadet (i.e., the second-born of the landlord), while w_2^0 denotes a worker born at time 2 whose grand-father was a cadet.

4.8 Evolution of political participation

Given the evolution of net effective rents previously examined, the time at which the richest group of workers reaches \tilde{b} will determine the composition of the newly-enfranchised group of workers, call it the newly-formed middle class. This will in turn affect the speed of the democratization process. Consider the following two cases.

1. *Gradual democratization.* If \tilde{b} is reached when net rents are still positive and the

aristocracy is not yet impoverished, the middle class will be composed of cadets, i.e., cadets are going to be the first to be able to vote since they are at the top of the workers' income distribution. If that is the case, enfranchisement is going to be gradual. In addition, assuming that workers remain poorer than the cadets for another while, since at each t there are nL new cadets, it will take $\frac{1}{n} + 1$ subsequent generations of enfranchised cadets before the middle class reaches a voting majority. If instead, in the meantime, some workers reach \tilde{b} , than the process will be speeded up. In general however, there will be a time gap between the beginning of the democratization process and its completion.

2. *Abrupt democratization.* Otherwise, if \tilde{b} is reached when the aristocracy is already impoverished significantly by the process of erosion of net rents, it could even be that it is the children of the original peasants, or else the children of previous cadet lines, that will make it first. In this case, a much larger number of individuals will be enfranchised at once. In addition, while in the former case enfranchisement will not immediately imply that the median voter is a member of the middle class, in the latter it will, because the children of the original workers will outnumber the landlords at once. Therefore, the change of regime will be abrupt in this case. ¹¹

Thus the composition of the middle class, and the time at which it constitutes a majority, is crucially determined by the way inheritance is distributed in the model. After the middle class has conquered political power over tax policy, and the tax is abolished, the decline in the income and wealth gap between the two groups is accelerated, and political participation is furtherly expanded.

4.9 Summary

To sum up, we will reorganize the discussion from the previous sections, stage by stage. For each stage, we summarize the evolution of the model, in all its dimensions, i.e., capital accumulation, sectoral allocation, income and wealth distribution, the incidence of primogeniture, the composition of the middle class, and political participation.

In the aristocratic stage, as capital accumulates, workers start migrating towards the

¹¹Bertocchi and Spagat (2001) analyze middle-class formation with a specific focus on revolutions.

manufacturing sector, while the agricultural sector shrinks. Wages are increasing, while rents and interest rates are declining. The income gap between landlords and workers is gradually reduced, and can reverse its signs if net rents become negative. The capital bequest of the landlords is higher than the capital bequest of the workers until negative net rents kick in. The importance of land as a portion of total wealth declines, implying a reduction of the incidence of primogeniture. As the workers' capital bequests increase, the richest workers - whose identity is determined by the degree of impoverishment the aristocracy - will reach \tilde{b} , and the process of democratization begins.

The next stage is reached when enough workers have reached \tilde{b} , and the median voter belongs to the middle class. The agricultural sector will continue its reduction manufacturing its expansion, even though the tax removal arrests the migration out of agriculture. Capital accumulation and income growth accelerate. Democratization affects factor prices and pushes towards income and wealth equalization. The importance of land as a portion of total wealth keeps declining, together with the economic impact of primogeniture. Therefore, we observe an association between the evolution of society from an aristocratic political system into a democracy, on the one hand, and the sectoral reallocation between agriculture and manufacturing, on the other. We also observe that the intergenerational transmission of property rights is regulated by norms that reflect the composition of wealth in society.

Finally, we can briefly perform a comparative-statics exercise, by examining the impact of the parameters which are special to this model. For a larger ξ , the impoverishment of the aristocracy starts earlier so, for a given \tilde{b} , cadets are more likely to fall at the bottom of the wealth distribution among workers. This will delay enfranchisement, but will shorten the distance between the start of the democratization process and the abolition of taxes. On the other hand, a higher \tilde{b} implies a delay in democratization, which could come only at a late stage of the sectoral reallocation process, i.e., for an economy which has already industrialized. Finally, a higher τ means higher inequality and slower growth.

5 Extensions

5.1 Compensatory bequests

The historical literature documents the wide-spread use of non-land, at least partially compensatory bequests for cadets, as well as dowries for daughters. In the present model, these provisions would amount to a distribution of the capital bequests among children in an unequal way, with the first-born getting a smaller share, in order to compensate his primogeniture on the land.¹² Note that, when capital is still a small portion of family's wealth, i.e., in a relatively early phase of the development process, this would imply the absence of a capital bequest for the first-born while, in a later phase, the first-born would simply receive a smaller capital bequest. In any event, compensatory bequests reduce wealth inequality between landlords and the cadets and increase it between cadets and workers, thus accelerating the start of a gradual process of democratization.

5.2 An agrarian aristocracy

To capture a widely-shared, but only partially verified perception of the aristocracy as a group that did not contribute to industrialization, and remained attached to the landed estates as its only source of wealth, consider the following variant of the basic model. Landlords have no initial capital b_0 , only workers do. Moreover, the aristocracy is prevented from purchasing capital at later dates, and can simply consume its entire rental and labor income. This implies that cadets are left with their own labor to supply, and no capital, so they will always enter the workers' class from the bottom. The predictions of this variant of the model are the emergence of an association between an early, conspicuous level of consumption for the aristocracy, its rapid and drastic impoverishment as rents decline without being replaced by capital income, and the rapid emergence of a middle class consisting of individuals of

¹²A rigorous comparison between land and capital would of course require to consider the price of the two assets. However, the price in this model would be given by the present discounted value of the income accruing to each asset, i.e., rents and interests, respectively. Since both prices would decline through time, we can abstract from their explicit consideration, without affecting the qualitative results.

low social extraction, which abruptly gains political power.

5.3 Universal primogeniture

In some periods, and in specific regions, the law of primogeniture was imposed on capital as well, typically under the pressure of the aristocracy, or the Church. However, forcing capital to be distributed unequally actually does not advantage the aristocracy, at least within the present model, since concentration of property means that only the first-born among workers will eventually be able to vote but, on the other hand, these first-born will be in a position to vote more quickly, and to gain power at once since by assumption they outnumber the aristocracy. Under this scenario, society could evolve towards the establishment of a newer aristocracy founded on capital wealth, rather than on land, which would coexist with a large “under-class” of workers with forever-limited political power.

5.4 The voting preferences of the middle class

So far we have assumed that the form of tax policy is a binary choice between the presence or the absence of a set tax rate. Instead, let tax policy under democracy be a function of the composition of the middle class. It is not implausible that its voting preferences depend on its social origins, with most recent cadet lines being closer to the preferences of the aristocracy. It is well known that many of the cadets were actually entering the clergy or the military, rather than the narrowly-defined working class, and therefore constituted a well defined, separate within-classes social group. Assume that the tax rate is a function of the social distance between the aristocracy and that fraction of the middle class which is deciding the voting outcome. To simplify, assume that the tax rate can take three possible values: $\theta > 0$ when the aristocracy is in power, 0 when a middle class which is closer to the aristocracy has gained power, and $-\theta$ when power is gained by a middle class with lower social origins. The size of the manufacturing sector relative to agriculture, as well as income and wealth inequality, are increasing in the tax, and are therefore highest in the first regime, and lowest in the third. Capital and income on the other hand are highest under the second regime, because taxes - of either sign - distort the output-maximizing sectoral allocation.

6 Historical evidence

The main purpose of this section is to justify on the basis of the available historical evidence the main assumptions on which our model rests on. In particular, we provide support for the assumption that aristocratic power was based on the land, and that primogeniture was common practice among the aristocracy because of a need to keep large estates together. We also provide information on the role of cadets, the nature of feudal rights and estate maintenance costs, and the evolution of class structure and political power within the relevant time framework. We indicate how geographical differentiation and time variations may have influenced the evolution of different areas of Europe. The evidence we bring also confirms the main results of the model concerning the process of growth and sectoral reallocation, the evolution of feudal rents and the consequent demise of aristocracies, and the diminishing relevance of primogeniture.

6.1 The time framework

Up to the year 1000, after the fall of the Roman Empire and continuing through the phase of the barbaric invasions, Europe goes through a deep economic and political crisis. Income and population stagnate. Things turn for the better in the next millennium, in part thanks to the introduction of feudalism in the 9th century. Maddison (2001) provides long-term data on population and GDP growth for Western Europe. Population stagnates until the year 1000, and starts growing in the 1000-1500 period (at an average annual rate of 0.16%, despite the occurrence of natural catastrophes such as Black Death). Population growth intensifies in 1500-1820 (+0.26%) and takes off after 1820. Per capita GDP growth in Western Europe is estimated to grow at an average annual rate of 0.13% in the 1000-1500 period, 0.14% in 1500-1600 and 0.15% in 1600-1820, to jump to 1.51% in 1820-1998.¹³ So the period we are interested in witnesses a slow but steady process of development, which accelerates only towards the end. Together with the sizeable increase in population, the 1000-1500 period

¹³For Eastern Europe, the pattern is quite similar, with average annual population rates of 0.15%, 0.31% and 0.72% in 1000-1500, 1500-1820 and 1820-1913, respectively, and per capita GDP growth at 0.04% in 1000-1500, 0.10% in 1500-1820, and 1.06% in 1820-1998.

comes with an expansion of the area of rural settlement and with an increase in agricultural productivity. The 12th century is commonly viewed as the golden age of the feudal economic and political system. Afterwards, agriculture starts its transformation, trade begins its development, urban growth slowly accelerates. The impact of these phenomena implies a deterioration of the feudal organization of society, which reaches a deep crisis in the 14th century, which preludes to the transition towards mercantile capitalism. In extreme synthesis, in turn during the 17th century mercantile capitalism enters a crisis leading to the rise of industrial capitalism. In fact, the most important difference between the preindustrial and the modern industrial societies rests on the greatly diminished role of agriculture in the latter, following the progressive rise of manufacturing which starts, at least in Britain, at the beginning of the 18th century. Accordingly, urbanization rates in Western Europe are estimated by Maddison at 6.1 in 1500, 7.8 in 1600, 9.9 in 1700, 10.6 in 1800 and 31.3 in 1890. Nevertheless, the influence of feudalism on the economy and society does not fade until the 19th century (Pirenne (1925, 1963), Goldstone (1991)).

Overall, our focus is on the period running from 1300 to 1800, which witnesses the transition from feudalism to capitalism, i.e., starts from the decline of the primarily agrarian and aristocratic society of the 14th century and ends with the emergence of industrial capitalism and parliamentary democracy. Of course the presence of cyclical patterns and marked geographic differentiation ¹⁴ makes it difficult to trace a simple historical trend and will force us to unavoidable generalizations.

6.2 The aristocracy and the land

In the critical scenario of Middle-Age Western Europe, feudalism is introduced by the Frankish kings in the 9th century as a system of military and political relationships aimed at maintaining external security and domestic order. In order to guarantee a stable flow of income to support, on the one hand, military expenses and on the other, an organized bureaucracy, the

¹⁴For example, the early demise of the feudal organization in the 12th century is faster where trade grows faster, i.e., in Lombardy, Tuscany, Northern France, and Flanders, while it manifests itself only in the 13th century in Germany and England. On the other hand, the subsequent phase of technological improvement was faster in Northern France and Southern Britain, slower in the Mediterranean area.

feudal lords were granted the income from great estates, in return for military service and for the local administration of justice (Pirenne (1963), Cameron (1989)). By bringing political and economic stability, feudalism contributes to the solution of Europe's crisis. At the same time, it establishes the agrarian basis of Europe's political order and the roots of aristocratic power. Despite regional differentiations, but with substantial homogeneity within Europe, at least until the end of the 18th century the nobility will remain a ruling social elite whose economic power is based on the land and that exercises military and political power (Labatut (1978)). In some countries, for example Russia and Poland, literally all the land was in the hands of the nobility, while this was not true for example in Sweden or France. In England the nobility holds a portion of the land much higher than in the rest of Europe (Dewald (1996)). Nevertheless, the control of the land by the aristocracy was preponderant overall.

In the first few centuries of the modern age the European nobility faces a series of transformations linked to the advent of capitalism and its impact on the agricultural sector. While in the beginning the land was the basis of the nobility's wealth, diversification occurred even at a relatively early stage. In 1500 land was still the only form of investment, and in fact it was forbidden for a nobleman to become engaged in commerce or industry, but progressively this was relaxed. For example, France in 1669 allowed the nobility to be involved with maritime trade. Manufacturing and banking were also allowed by 1767. In England the nobility was deeply involved in mining and trade (Labatut (1978)). Therefore, despite the incontrovertible decline of the landed basis of aristocratic power, at the same time the nobility was able to adapt to the changing economic conditions and, with the gradual loss of importance of the land, we observe a progressive diversification of its wealth, with involvement in commercial and industrial activities (Dewald (1996)). This process intensifies after the 17th century with the decline of feudalism and the inability of land to provide a large income. By mid-18th century many members of the nobility invest in commercial and financial activities.

To conclude, the evidence confirms the role of land as the basis of aristocratic power and, on the other hand, the ability of the aristocracy to diversify its wealth into trade and manufacturing as land loses its central role.

6.3 The land and primogeniture

During the 13th century, primogeniture emerges as a reaction to the intensified demographic transition and the consequent inefficient partition of land (Kelly (1992)). It kept spreading across Europe up to the 16th and the 17th century, although marked differentiations in the local laws and in the actual customs were present (Le Roy Ladurie (1976)). Generally speaking, however, for many centuries it remained most common among the nobility (Thirsk (1976)), and whenever land constituted a dominant portion of wealth (Howell (1976)). In particular, primogeniture tended to be linked to feudal tenures, where it was favoured partly for military reasons and partly for generalized control, and it was also supported by Church and State (Goody (1976)).

One should be aware that the regulation of inheritance may be based on the laws, the customs or the actual practices, which need not correspond. Moreover, customary systems of law continued to change even after the customs were codified. Nevertheless, and despite the presence of variations within Europe, the broad similarities within which these variations occurred allow to offer a unified picture of these developments.¹⁵ Cooper (1976), in his seminal study on great landowners in the period between the 15th and the 18th centuries, establishes that the descent of land among great landowners was indeed regulated by male primogeniture, settled by a system of entails which forbid alienation of the family land. This is a distinctive feature of Western European society, practically unknown to antiquity, and also uncommon among Islamic cultures. Thirsk (1976) draws a map of the customs of inheritance for Europe in 1500-1700, showing that primogeniture predominates in England, Scandinavia and parts of France and Eastern Europe while partition, at least at the beginning of this period, prevails in Italy. In a relatively late stage Castilla also adopted primogeniture through the so-called *mayorazgo*. The introduction of primogeniture in Italy was delayed to the 16th century. Partition was prevalent in trade-oriented 14th century's Italy and fideicommissary entails subsequently spread due to Spanish domination, and gained

¹⁵Ekelund, Hebert and Tollison (2002), within their economic analysis of the Protestant Reformation, exploit these regional variations and treat primogeniture as a proxy for wealth stability, which was indeed higher in countries with strong feudal elites.

ground as Italy was becoming a primarily agrarian economy. Among the Venetian nobility fideicommissa became general after 1550. They were not accompanied by primogeniture and simply prohibited alienation but, since usually only one brother married and the other left their shares to their nephews, the result was much the same as that brought about by primogeniture. ¹⁶ Le Roy Ladurie (1976) documents a differentiation in the customs even within two areas of 16th-century France. Primogeniture (preciput) prevailed in the South and in the Walloon, while partition prevailed in the West, which in fact was more widely infused with an old peasant and non-noble culture. However, Cooper (1976) demonstrates that, even if for instance in Brittany the law did not allow entails, still de facto entails were used to set up rules of succession for great families, so that the founder of an entail was able to change or suspend customary law. In addition, despite the existence of customs of partible inheritance and the fact that all the sons possessed the same rights of succession, in the actual practice they did not divide the inheritance at their father's death. As in Venice, only one of them married and had legitimate sons who later in turn received the whole inheritance. In Germany the tradition in favor of partitioning estates had been strong in the Middle Ages, but primogeniture gained ground in the 16th and early 17th centuries. It was, however, never adopted in Russia (Cooper (1976)).

A distinction between laws of inheritance can also be observed for social groups below the nobility. Within each custom the rules applicable to nobles differed from those for commoners, under the notion that nobles should have privileged modes of inheritance, and the rules are generally thought to have begun with the ruling groups and to have spread downwards. In the early 16th century in England primogeniture was noticeably extending among the gentry (Thirsk (1976)). Later on, in the 18th century, the aspirations of the gentry in turn filtered down to the next class below (yeomen), until finally primogeniture was adopted even by the middle classes in the 19th century. In Italy the practice of primogeniture started from great nobles in the early 16th century and then spread downwards to lower classes. In his analysis of peasants' customs in Germany, Berkner (1976) notices how the Calenberg region, where large holdings prevailed, was also characterized by stem families

¹⁶The dramatic demographic consequences of this preference for celibacy were that the Venetian nobility was on the verge of extinction by the 17th century.

and primogeniture, while in the Gottingen region much smaller holdings appeared to be associated with nuclear families and partition. Howell (1976) shows that for peasants in the British Midlands in the period from 1280 to 1700, there existed a clear relationship between type of inheritance pattern and nature of wealth, with only reproducible resources such as fishing and forestry being subject to partition. By the 12th century primogeniture started to emerge slowly in areas of land shortage, while partition continued to be practised over wide areas with sparse population or supported by fishing.

The predominance of primogeniture throughout the centuries occurred despite all the controversies that it provoked, and the fact that the demographic, social and economic reasons for it to emerge were already changing by 1800 (Cooper (1976)). The French revolution abolished entails. In the middle of the 18th century, fideicommissary entails were outlawed in Piedmont and Tuscany since they were believed to restrict the number of landowners and prevent profitable use of land. But it is only with the 19th century that most European countries outlawed them, with some exceptions like Germany and with parents' discretion still surviving in certain cases as Britain. The persistence of primogeniture indicates that the distinctive agrarian and rural institutions created in Europe in the Middle Age kept influencing economic activity until and even after the advent of industrialization, and that the modes of inheritance of great landowners helped to determine important characteristics of European states and societies.

Eminent economists and political and social scientists, among them Smith, Montesquieu, De Tocqueville and Jefferson, contributed to the debate on the optimal law of inheritance. In the early 16th century a growing literature had favored primogeniture and helped the diffusion among great landowners of legal forms of settlement which entailed their lands on a succession of tenants for life (Thirsk (1976)). One traditional defence of entails and primogeniture had been that they preserved the property and name of great houses on which the political stability of monarchies was founded, while partible inheritance would undo them and promote social mobility. Werner (1998) indeed attributes the origin of the nobility in the landed wealth which was inherited and stayed within the family. As de Tocqueville well understood, it is the law of inheritance that produces aristocracies, since

the inheritance laws based on primogeniture were able to protect the cohesion of the family wealth. With the Enlightenment and the French Revolution the maintenance of a wider distribution of property started to be viewed instead as the foundation of political stability. By the 19th century, England witnessed attacks on strict settlements as against freedom of alienation, and the campaigns for free trade in land. The controversy on inheritance laws spread from Europe to colonial America. Virginia formally adopted primogeniture, while the Massachusetts legislature adopted partible inheritance though it gave the elder son a double share, an idea coming from Biblical sources.¹⁷

To conclude, the historical evidence confirms the link between land and primogeniture, and therefore between aristocratic power and primogeniture.

6.4 Primogeniture and the cadets

Special attention should be devoted on the consequences of primogeniture on younger children, which were the object of harsh controversies throughout the centuries. First of all it should be noticed, as stressed by Labatut (1978), that during the entire period which was characterized by primogeniture, cadets were taken care of somehow. As confirmed also by Goody (1976), the exclusion of younger siblings was rarely if ever total, and meant in most cases only exclusion from the land, with provisions in money as a partial compensation. Even when the preservation of estates in noble families was made more effective, after the early 14th century, by means of joint feoffments and family trusts that established a more secure legal framework, younger sons were still provided for (Thirsk (1976)). The duke of Savoy, for instance, in 1648 allowed primogeniture to be applied to fiefs, but at the same time the younger sons to claim *alimenta*. Even in those cases where primogeniture over the land was practiced by peasants, as documented by Spufford for 16-18th century's Cambridgeshire, as much as possible seemed to have been done for the other children.

Nevertheless, there is a widespread perception that primogeniture was operating strictly with respect to cadets, at least in England. One explanation is that the large literature complaining about the abuse of primogeniture and fate of cadets seems to have been concerned

¹⁷See Alston and Schapiro (1984) for a description of inheritance laws in the colonies.

with the lesser gentry which, as explained by Thirsk (1976), had indeed adopted primogeniture early on, if compared to the Continent, because of the greater fluidity of English society at this time, which caused a rapid dispersion of the aspirations of the nobility through the lower ranks of society. Now, while primogeniture among the nobility was most common and accepted, because it did not cause excessive hardship to younger sons of a social group that still had the means to provide adequately for all, its hardships were felt more keenly among the gentry, because their means were not sufficient to provide decently for younger sons, who were pushed at some point on the verge of poverty. As a consequence, compulsory legal provisions for cadets were long demanded in England, with analogous provisions from France, Italy and the Flanders brought as examples.

More interesting to us is the social and economic role of cadets in society. As suggested by Cooper (1976), one reason why primogeniture survived the feudal world was precisely the growth of capitalism, which occurred in England earlier than elsewhere and enabled younger sons to earn a living without necessarily inheriting a share of the paternal estate. Somebody even applauded primogeniture for ensuring socially useful occupations for younger sons of landowners who would otherwise have neglected such opportunities. Goldstone (1991) also noticed the revolutionary potential of the disinherited offsprings of elites. Pirenne (1963) describes the condition of the large number of people expelled from the aristocracy, and in particular from the lesser nobility, and pushed towards the army or the clergy. Pirenne (1925) speculates that younger sons of peasants, which also were eradicated from the land their families were attached to, may have originated within medieval cities the class of merchants and artisans.

6.5 The feudal rights

In the present model the feudal rights are captured by the tax parameter. It is well-known that peasants normally owed labor services as well as other dues and fees to the feudal lords (Pirenne (1963), Binswanger, Deininger and Feder (1995)). Geographical differences were present. Labatut (1978) in particular notices how in Eastern Europe rights over the peasants were more advantageous for the nobility. Consistently with the prediction of this model, the

presence of feudal rents is explicitly indicated by Dewald (1996) as a growth-retarding factor. This is confirmed by the growth performances, for example, of Russia.

Over time we observe an evolution of feudal rents. Serfdom was slowly abolished after the 12th century, even though feudal dues persisted much longer. A stricter enforcement of serfdom, disallowing migration out of agriculture, constituted an additional growth-retarding factor for Russia. Pirenne (1963) describes how as a reaction to the initial crisis of feudalism many nobles, being unable to adapt to the new situation, became heavily indebted and eventually ruined. However, the largest landowners were able to survive more easily, by initiating a process of reorganization of production towards more efficiency. After the 17th century with the decline of feudalism land does not provide large income any longer, in part because of the tendency toward a progressive relaxation of the servile relationships, which intensifies towards the end of the 18th century. The French revolution completes the process of removal of residual feudal rights in agriculture (with exceptions surviving in the latifundia of Spain and Southern Italy). Again, as a reaction, the nobility attempts at making the land more productive. During the 17th and 18th centuries the methods of cultivation were modernized, and enclosures of the landed properties was introduced in Britain. At the same time, as previously discussed in 6.2, the nobility also starts expanding its role in trade and manufacturing, which becomes noticeable by the end of the 17th century. Overall, therefore, in Europe the income of the nobility remains relatively high during the first centuries of the modern age, despite regional and individual variations.¹⁸

6.6 The estate maintenance costs

Over the centuries, there was an evolution in the nature of the costs attached to the maintenance of an estate, even though they always consistently remained large (Pirenne (1963)).

¹⁸O'Rourke and Williamson (2002) present data on the ratio wage over rental rate, which is shown to remain stable in the static agrarian phase (1000 to 1500), decline from 1500 to 1600, rise with the initial industrialization phase and then remain constant again until 1900. They attribute the rise of the rate, more than to the Industrial Revolution, to the process of internationalization. We provide evidence which also can explain a rise in the ratio after 1900, because of maintenance costs absorbing rental income and the abolition of feudal dues.

European society at the close of the Dark Ages was characterized by extreme military insecurity that was caused on the one hand by the wars among the successors of Charlemagne, and on the other by the incursions of Vikings, Magyars, and Moslems. This insecurity gave rise to an extremely high demand for military protection (Volckart (2000)). Wars and army equipment always remained a problem and in fact the military revolution of the 16th century actually dramatically increased the cost of war by changing its scale (Goldstone (1991)). The costs of maintaining a court were the other crucial component. In addition, after some point, the mere standard of living also became extremely expensive for the nobility (Labatut (1978)) which, especially after the 17th century, became more and more inclined to spend for a number of reasons. Religious reasons were especially important in Spain, while elsewhere it was burdened with services due to the State, and everywhere enormous sums were used for countryhouses and gardens. The development of the market economy with the 17th century exposed the nobility to growing needs of cash to sustain its living standards and social status, in a situation where the inheritance law forbid selling of properties. As a consequence of these large expenses, combined with declining rents as described in the previous section, as documented by Dewald (1996) many noble families were ruined, even though overall the nobility as a whole was able to preserve its wealth and status thanks to modernization of agriculture and diversification.

6.7 Class structure and political power

Class structure in the early rural society is based on the distinction between the lord and the peasants. The clergy is somehow in between, even though its composition includes members of both classes. The nobility was formally involved in the exercise of political power and the administration of the State. The first challenge against aristocratic power is represented by rebellions starting in the 11th century within the cities (Pirenne (1925)), led by enriched merchants demanding freedom from feudal control on society. While the period from 1540 to 1640 is viewed by some as marking the final decline of aristocratic prestige in England, a revival of aristocratic power occurs later on, only to be followed by a new crisis in 1740-1832 (Goldstone (1991)). In France it is the capitalistic bourgeoisie that guided the political

revolution which at the end of the 18th century ended the ancien regime (Pirenne (1925)). In 4.8 we distinguish between two possible patterns of evolution of political participation. As an example of the gradual case, one could indeed think of the English experience which started the path towards parliamentary democracy early on with the 1688 Glorious, Bloodless Revolution, as opposed to the delayed but abrupt case of the French Revolution.

Overall, the industrial revolution has little impact on the political power of the aristocracy (Dewald (1996)). Still up until Waterloo the landed aristocracy keeps its power, and up until the middle of the 19th century the richest are still the landed aristocrats. This supremacy, however, is challenged by the growing middle class which, by mid-19th century, has reached the political and economic leadership in Western Europe and, by the end of the same century, in most of Central Europe as well. This middle class has made its appearance between the nobility and the workers by the beginning of the 19th century, after the start of industrialization. The working class now includes the peasants as well as factory workers and artisans, with peasants becoming numerous but less and less important throughout the 19th century. The middle class itself is further differentiated internally (Cameron (1989)).

The 19th century witnesses a progressive extension of the voting franchise. In Britain the franchise was extended in 1832 for the first time, and went through further extensions until 1928. France also went through a nonlinear process of franchise extension, starting from 1830. In Germany, popular participation started rising in 1848 (Bendix (1978)). However, despite the progressive extension of the franchise, up until the end of the century the nobility will keep its control of most of the economic, political and cultural life.

7 Conclusion

This paper has established a connection between the transition of society from an aristocratic political system into a democracy, the process of capital accumulation and sectoral reallocation from agriculture into manufacturing, and the evolution of the system of inter-generational transmission of property rights. The model replicates the historical stylized facts of output growth, its sectoral composition, and income and wealth distribution. It also provides a framework to understand the evolution of class structure, the demise of landed

aristocratic power, and the emergence of the middle class.

Our model is based on the assumption of indivisibility of landed estates, which indeed characterized Western Europe for several centuries. In the present paper, we do not yet consider the eventual impact of democratization on the estate maintenance technology, which will in fact tend to lose its significance. Once the political and economic justification for primogeniture is removed, land will be divided among all children as capital is, implying a faster impoverishment of the aristocracy. Moreover, as landed property no longer plays a special role, alienation will also be possible, causing an even more fragmented ownership structure. Eventually, the economy evolves towards a standard factor-specific model whose dynamic evolution is determined by capital and the price of land, partition dominates, and traditional social classes disappear because anybody can own either land or capital. The pressure of urbanization on land prices and the emergence of capitalistic farming, would constitute the next step of the analysis but, at least for now, at this point we lose interest. Still, we believe that our contribution can help to understand the distinctive agrarian roots of European civilization, which kept manifesting themselves until and even after the advent of industrialization. The disproportional political weight of the agricultural sector in the current European policy debate can perhaps be better understood within this framework.

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