Agrarian Structure and Endogenous Financial System Development

Dietrich Vollrath†
University of Houston

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Abstract: Empirical research has shown that the distribution of land within a country is a significant predictor of financial system development, but has not provided an explanation for this observed relationship. This paper proposes a theory to explain the connection of agrarian structure and the financial system. In a two-sector, overlapping generations model, it is shown that landowners will oppose the development of the financial sector as this leads to higher wages and thus lower rents. Over time, the economy may accumulate enough capital such that even landowners will find financial sector development desirable. However, in situations of very concentrated land holdings, the economy will stagnate before sufficient capital is available to make this switch. The paper considers the results under several different political regimes which differ in the power landowners have to block financial reforms. Historical evidence is presented supporting the theory that agrarian interests have been politically opposed to financial sector reforms in several countries.

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† Corresponding author. 201C McElhinney Hall, Houston, TX 77204. devollrath@uh.edu

1 Introduction

The development of the financial system has often been considered a necessary condition for sustained economic growth (McKinnon, 1973; Shaw, 1973). Empirically research, summarized by Levine (2005), has established that financial development is causally related to economic growth. The source of variation in financial structure across countries is thus a topic of great interest. A primary explanation for this variation is differences in legal system origins, as documented by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998). Research by Vollrath and Erickson (2006), building on ideas from the development economics literature, established that agrarian structure (as measured by the concentration of landholdings across the agricultural population) is significantly linked to financial development as well. While establishing this empirical relationship, the authors do not offer an concise explanation for why such a relationship exists.

This paper proposes a theory to explain the observed connection of agrarian structure and financial development. The model hinges on the incentives of the landowners in the agricultural sector, who compete with the industrial sector to hire in workers. The wage rate of these workers depends on the productivity levels of the two sectors. Anything that raises productivity in the industrial sector raises the wage rate and therefore lowers the rental rate earned by landowners on their endowment. The financial sector in this economy can act to increase the aggregate productivity level in industry by allowing funds to be loaned from low to high productivity producers. However, the efficiency of this financial sector is subject to the influence of the landowners, who are assumed to have some degree of political power. Given the landowners dislike of industrial productivity increases, the landowners will act to limit financial efficiency. The analysis shows that the strength of their opposition is tied to the concentration of landholdings within the economy and to the overall land endowment.

The model presented here follows from the work of Galor, Moav, and Vollrath (2005) in studying the incentives of landowners to support institutions that foster economic growth. It departs from their model in focusing on the financial sector explicitly (as opposed to human capital provision), and in considering a richer political structure. In highlighting the connection of agricultural

structure and finance, the current work follows the work of Tomich, Kilby, and Johnston (1995) and Binswanger, Deininger, and Feder (1995), but provides a much more rigorous consideration of the incentives involved. Other theoretical explanations for financial development include the nature of the international trading regime (Rajan and Zingales, 2002), as well as the distribution of wealth (Chakraborty and Ray, 2005). The explanation presented here does not contradict the predictions of these papers, but rather adds to our knowledge of where variation in financial structure comes from.

The mechanisms discussed in this paper complement the literature on the endogenous development of the institutions of economic growth. Work by authors such as Olson (1982), Mokyr (1990), Parente and Prescott (2000), and Acemoglu and Robinson (2006) highlights the incentives of existing monopolies and elites to block technology adoption that would threaten their position. The historical work of Engerman and Sokoloff (1997) suggested that the agrarian structure dictated by the geographical conditions in Central and South America led the political elites of these areas to create institutions that perpetuated their own political and economic power. Unified growth models such as those reviewed comprehensively by Galor (2005) have shown how crucial elements such as the demographic structure (Galor and Weil, 2000) and class structure (Galor and Moav, 2006) evolve endogenously. This work adds to this broad literature by showing that financial institutions also arise endogenously through the process of economic development, and are not fixed by historical events.

The paper proceeds in section 2 by examining the historical record to establish that agrarian interests have been identifed with opposition to financial development. These examples show that landowners often opposed the reforms necessary for financial development, and were loathe to participate in the financial sector even when those reforms had passed. The historical evidence, in particular from Latin America, also shows that landowners opposed financial reform specifically because they felt it eroded their control of the labor market. Following the historical evidence, the model is presented in section 3 and then the paper concludes in section 4.

2 Historical Evidence

The proposition that agrarian interests are opposed to the development of the financial system can be seen in several different historical contexts. In the United Kingdom, the United States, Brazil, and Mexico, the creation of functioning financial systems is fought by landowners. The main differences across these countries lies in the success that the agrarian interests have in stalling financial reform.

2.1 The United Kingdom

The financial system of England at the time of the Glorious Revolution (1688) was defective and lagged far behind the Dutch (Dickson, 1967; Neal, 1990). As England entered back into war with France in 1688, the English government was desperate to obtain funding for its armies. With constitutional monarchy now established, it was necessary for this funding to be obtained with the approval of Parliament, who were disinclined to allow land taxes to rise any further.

Several innovations allowed the government to pay for the war with France. The first was the issuance of long-term debt to the public in 1690 that were garuanteed as "debts of the nation" by Parliament, as opposed to personal debts of the sitting monarch. The second was the establishment of the Bank of England in 1694, which was set up to provide a steady source of lending to the government. Support for the Bank came primarily from the mercantile and legal circles, who felt the Bank would foster a broader financial market in London by providing a ready market for government bonds.

The evidence from Dickson (1967) shows clearly that the landed interests in England wanted very little to do with establishing the Bank of England. Of the original subscribers to the Bank, only 10% came from outside of the greater London area. In fact, only nine peers subscribed at all to the Bank. According to Dickson, "The majority of subscribers.....belonged to the mercantile middle class of London". In further issuances of government debt and bank stock, landed peers accounted for between 0.5 and 4.3% of the total capital raised.

On the eve of the South Sea Bubble in 1720, the holdings of the peerage in the Bank of England,

the East India Company, and the large issuance of government bonds in 1717 were not significant. Following the bursting of the Bubble, Robert Walpole undertook to pay down the national debt and restructure the remainder to be on more favorable terms for the government. Walpole acted explicitly to create an environment conducive to financial activity and the expansion of commerce, which required him to navigate past the landed and farming interests of England who opposed the expansion of credit (Dickson, 1967).

In the period following the South Sea Bubble, the evidence again shows the almost complete absence of landed interests in the financial system. Of the greater than 10,000 subscribers to the 3% government loan of 1742, *all* were merchants and *none* were landed gentlemen. By the middle of the 18th century the proportion of MP's holding bank stock or government debt increased, due almost solely to the increasing number of merchants, lawyers, and military professionals in Parliament. Dickson states, "It seems fair to generalize that the landed classes as a whole were not significant contributors of new capital for public loans." Throughout this whole period of financial development, the landed class of England was wary of the establishment of broader credit facilities and showed their opposition by withholding their capital from inclusion in the financial system.

2.2 The United States of America

The success of the English financial system in stimulating commerce had a profound influence on many in the newly declared United States of America. One such person was Robert Morris, who too over the Office of Finance during the Revolutionary War in 1781. Not only was he impressed with the power of the British financial system, but he felt that "the Revolution meant a break with the agrarian past and the growth of commercial and industrial enterprise in the United States" (Ferguson, 1961). Morris undertook to restore the public credit first by having more accurate accounts and better information on income and debts. His second major effort was to create a Bank of North America, modelled directly on the Bank of England, with the expressed purpose of holding goverment debt and providing a stable source of funds for the government. Morris saw the presence of sound government debt as crucial to the establishment of wider securities markets. In addition, he wanted the Bank to form the basis for all paper money in the U.S., retiring the

individual state currencies already in existence.

In his fight to establish the Bank of North America, Morris was opposed by agrarian interests. For these agrarians, "Money in this sense is not meant to stimulate economic activity; its amount is to be limited to the needs of trade and legal payments," (Hammond, 1957). The agrarian interests in the U.S. acted to limit the establishment of the Bank, and in fact in 1785 these interests in Pennsylvania were able to cancel its charter (the Bank operated out of Philadelphia). Not only did agrarian interests attempt to sabotage the Bank of North America, but across all states as the United States grew "these agrarians restricted banks and bank currency to the point of prohibiting them, without supplying a substitute," (Hammond, 1957).

With the end of the war and the creation of the Consitution, the most visible argument within the U.S. over financial development was over the establishment of the Bank of the United States in 1791. Alexander Hamilton pushed for the national bank explicity to promote industry and development, while Thomas Jefferson opposed the bank as something that would defile the agrarian core of America and lead to centralization of government.[1] Ultimately, 33 of the 39 "Yes" votes for the Bank came from New England, New York, New Jersey and Pennsylvania, the commerical and industrial heart of America, while 15 of the 20 "No" votes were from the plantation dominated states of Georgia, North Carolina, South Carolina, and Virginia (Hammond, 1957).

The growth of the financial sector following the establishment of the Bank was dramatic. In 1790 there were 3 chartered commercial banks in the U.S., but by 1815 there were 212 and by 1835 there were 584 (Bodenhorn, 2000). Interestingly, even though Jefferson's Republicans were in power from 1800 to 1811, they did not act to remove the banking legislation. Hammond speculates that this is due to the fact that even the small farmers who formed the basis of Jefferson's support were experiencing dramatic economic gains due to the increase in commerce.

Over the first part of the 19th century, agarian interests continued to put barriers in the way of financial development as new states were settled and admitted to the Union. Hammond finds that only after the Western states developed industrially did they remove laws limiting the amount of banking allowed. This situation of state-level restrictions ended in 1864 with the National

[1] Incidentally, Jeffereson was not ignorant of the role of banks in expanding the money supply. His understood this quite well, but felt that it was an evil to be avoided by an agrarian economy (Hammond, 1957).

Bank Act, which taxed state currencies out of existence, required reserves, and allowed for private national banks to be created. Following the Act, interest rate differentials declined across the United States, indicating further financial integration and development (James, 1978).

2.3 Latin America

The histories of the U.K. and U.S. show the successful introduction of financial reform despite the opposition of agrarian interests. The general history of Latin America, however, is one in which the agrarian interests were more successful in restricting the growth of the financial system. Most Latin American countries became independent in the 1820's, but this independence did not alter the highly concentrated nature of landholdings across the region. The landholding class was also the ruling political class and "there were few occassions when political hegemony was not exercised by landowners who - not surprisingly - used the power of the state whenever possible to reinforce their privledged status," (Bulmer-Thomas, 2003).

Across the region this political hegemony led to a manipulation of factor markets in the interest of keeping labor costs low, favoring the owners of land and mines who hired in labor extensively. In addition, the financial sector remained underdeveloped, with informal lending and the Church acting as the main sources of funds for commerce. This led to a situation in which industry failed to advance. Bulmer-Thomas cites two main reasons that the small handicraft sector was not able to convert itself to higher-productivity activities. First, there were few funds available for working or fixed capital. Second, the potential entrepeneurs were not part of the landed, political elite and were not able to push for favorable financial reforms.

These conditions led to a financial sector much smaller than in colonies favored with more equitable concentrations of land and political power. By 1913, the amount of bank deposits per person (in U.S. dollars) was 3.3 in Bolivia, 9.4 in Brazil, 26.0 in Chile, 2.3 in El Salvador and 1.2 in Venezuela. Argentina was far more developed, with $75.7 in deposits per head, but even this trailed far behind Australia (150.3), Canada (142.9) and New Zealand (108.5) (Bulmer-Thomas, 2003).

The barriers to financial development are apparent in the specific histories of Brazil and Mexico.

In Brazil, the financial system was almost non-existent until the end of the 19th century. By 1888, Brazil had only 26 banks and seven of Brazil's twenty states had no banks at all (Haber, 1997). This limited financial situation was due largely to policies that discouraged the creation of banks and corporate entities. The imperial government had the sole right to charter banks and was far more interested in creating a few large banks that could act as a source of government finance. In addition, constant changes in regulation hindered these large banks ability to create a smooth financial system (Haber, 1997). The incorporation law of 1860 required any joint-stock company to obtain an imperial charter and did not permit limited liability, and an investor could be held liable for a firm's debt even after the stock had been sold (Haber, 1997; Haber 1998).

In 1888 the imperial government, in part to appease the republican opposition, abolished slavery and opened up the capital markets by allowing twelve banks to issue currency and granting seventeen banks interest-free loans (Haber, 1997; Hanley, 1998). Imperial rule in Brazil ended in 1889, replaced by a federal republic. The republicans had overthrown the traditional oligarchy, reducing (but not eliminating) the influence of the large landowners. The republican government, though, had changed the political center of the country to Rio de Janeiro and Sao Paulo, and "left behind the guarded policies of the monarchy and actively favored the expansion of domestic enterprise," (Hanley, 1998). In 1890 the government deregulated the financial industry, allowed for limited liability, and authorized margin purchases of securities. In the six months following the passage of these reforms over 200 new joint-stock companies were formed in Sao Paulo alone, leading to the formation of the Sao Paulo Bourse. By 1905 the volume and value of the shares listed in Sao Paulo had tripled (Hanley, 1998). Haber (1998) presents evidence that the productivity levels of textile firms in Brazil were much higher for those firms that obtained finance through the makets, as opposed to those who relied on the informal channels that had dominated previously.

The increase in Brazilian productivity due to financial reforms stands in contrast to the experience of Mexico, which was not able to bring forward as deep a financial reform in this period. Mexico headed into the late 19th century with a financial sector as limited as Brazil's prior to the revolution. In 1884 only 8 banks were operating in Mexico, and even by 1911 there were only 47 banks, of which only 10 could lend for longer than a year (Haber, 1998). The lack of financial

sophistication was tied in many ways to the interests of the ruling oligarchy. Marichal (1997) documents that the government routinely defaulted on debts to its public bondholders, undermining trust in financial instruments in general. The laws governing the financial sector were backwards and applied haphazardly; Mexico did not have a general incorporation law at all until 1889. Ties to the ruling regime were by far the most important factor in contract enforcement and in obtaining financing during this period.

Haber (1998) suggests that the motivation for the restrictive nature of the banking sector in Mexico was because is served the purposes of the ruling elite, who wished to have financing available to the government and to maintain the near monopoly on banking services that the Banco National de Mexico held. The result was a tiny source of financing available to entrepeneurs, and that political connections rather than skill determined access to that small pool of financing. While the ruling regime of Profirio Diaz was interested in industrialization, it strongly supported and remained politically tied to the hacienda owners, who opposed the modernization program and encroachments on the labor peonage system (Garner, 2001).

3 A Model of Endogenous Financial Depth

The purpose of proposing the following theory linking land distribution and financial development is to address several issues with the existing research that touches on this area. While the economic development literature has examined the interaction of land ownership and financial markets closely, they generally do so by taking the structure of the financial markets as given. While they can provide predictions about how owners or tenants may respond to the availability of credit, they cannot make any statements about how the financial sector evolves over time. An additional issue is that as the economy industrializes, it is not clear why the relationship of land and finance in agriculture would continue to matter to the financial sector as a whole. We propose a model that allows the financial structure to evolve based on initial land inequality, and additionally shows how initial land inequality can have long-lasting effects on financial development.

Haber (1991) and Binswanger, Deininger & Feder (1995) suggest that land owners have incentives to limit the outside options or their tenants, and that one way of doing this is to limit their access to credit. We model this incentive explicitly, and create an economy in which the depth of the financial sector is endogenously determined. In the model the financial sector exists to allocate capital across different possible uses, and the more efficient the financial sector is, the more efficiently capital is allocated and the higher is production in the manufacturing sector. The efficiency of the financial sector is assumed to depend on regulation by the government, and is funded by a tax on individuals assets. One could imagine that this regulation consists of provided a legal system to enforce contracts and providing means to punish those who default. In a word, institutions.

Those without land will support a socially optimal level of taxation that maximizes aggregate income and hence aggregate wages and capital rents, as labor and capital are the two assets that landless persons possess. Land owners, on the other hand, will resist taxation for the purposes of financial regulation. An increase in the efficiency of the financial sector will increase wages in the economy and that lowers the rents they can obtain from their land. At some point, if the economy is able to industrialize enough, land owners themselves will come to support the socially optimal tax for financial regulation because they move from net employers of labor to net providers of labor. However, at high enough levels of land inequality, an economy can become stuck in a low income, low financial depth regime.

The structure of the model is taken from Galor, Moav, and Vollrath (2005), and is a overlapping generations economy. The economy has two sectors, agriculture and manufacturing, that produce a homogenous good that can be used for consumption or investment. The total population of the economy is normalized to be of size one, and there is no population growth.

3.1 Production

Total output is denoted y_t and is the sum of output from the agricultural, y_t^A and manufacturing, y_t^M,

$$y_t = y_t^A + y_t^M \tag{1}$$

3.1.1 Agriculture

Agricultural production is a Cobb-Douglas production function over land and labor

$$y_t^A = X^\alpha (1 - s_t)^{1-\alpha} \tag{2}$$

where X is the amount of land and $(1 - s_t)$ is the share of the population working in agriculture. Because population is normalized to size one, equation (2) is both aggregate and per worker output from agriculture.

Agricultural producers maximize profits given the wage rate w_t^A and rental rate ρ_t and with perfect competition the payments to the factors of production exhaust all output. This implies that X and $(1 - s_t)$ are chosen by producers to satisfy the following

$$w_t^A = (1 - \alpha) \left(\frac{X}{1 - s_t} \right)^\alpha \tag{3a}$$

$$\rho_t = \alpha \left(\frac{1 - s_t}{X} \right)^{1-\alpha} \tag{3b}$$

3.1.2 Manufacturing

Production in the manufacturing sector consists of a final goods sector and an intermediate goods sector. Total production of intermediate goods by firms of type i is given by

$$m_{it} = A_i K_{it} \tag{4}$$

where A_i is a productivity term and K_{it} is the capital stock employed by that firm. The productivity term takes one of two values for any firm, either A_H or A_L, with $A_H > A_L$.

The final manufacturing good is produced by a combination of labor with the intermediate goods such that

$$y_t^M = s_t^{1-\alpha} (m_{Ht} + m_{Lt})^\alpha \tag{5}$$

Producers in the final goods sector maximize profits given the wage rate w_t^M and the price of intermediate goods, q_t, and with perfect competition the payments to the two factors of production will exhaust all output from the sector. This implies that

$$w_t^M = (1-\alpha)\, s_t^{-\alpha} \left(m_{Ht} + m_{Lt}\right)^{\alpha} \tag{6a}$$

$$q_t = \alpha s_t^{1-\alpha} \left(m_{Ht} + m_{Lt}\right)^{\alpha-1} \tag{6b}$$

The intermediate goods firms take the price q_t for their output, and will pay R_{it}, based on their productivity

$$R_{it} = q_t A_{it} \tag{7}$$

which implies that high productivity firms will be willing to pay more for capital than low productivity firms. Thus firms with low productivity could potentially make more by renting their capital to the high productivity firms than by actually producing. The ability to make loans is determined by the financial sector, described below.

Combining (4) with (5) yields the following specification for manufacturing production

$$y_t^M = s_t^{1-\alpha} K_t^{\alpha} \left(A_H \frac{K_{Ht}}{K_t} + A_L \frac{K_{Lt}}{K_L} \right)^{\alpha} \tag{8}$$

where it can be seen that manufacturing production is a simple Cobb-Douglas form over labor and aggregate capital, modified by a productivity term that is a weighted average of A_H and A_L. The allocation of capital between the low and high productivity intermediate firms is thus crucial for determining the productivity of manufacturing.

We define

$$\bar{A}_t \equiv \left(A_H \frac{K_{Ht}}{K_t} + A_L \frac{K_{Lt}}{K_L} \right)^{\alpha} \tag{9}$$

The final manufacturing output can thus be characterized as

$$y_t^M = \bar{A}_t K_t^{\alpha} s_t^{1-\alpha} \tag{10}$$

Notice that the elasticity of manufacturing output with respect to capital, α, is identical to the elasticity of agricultural output with respect to land (see (1)). This assumption makes the model more tractable, but is not essential to the results. Finally, capital is assumed to depreciate fully after each period.

3.1.3 The Financial Sector

In each period the productivity of each intermediate goods firm in the economy is randomly assigned as either A_H or A_L. Each firm also is assumed to have a claim to a certain amount of capital within the economy. It is assumed that the share of total capital controlled by those firms endowed with high productivity is $\bar{k}$ in each period. Individuals within the economy are presumed to have equal shares of ownership in all firms, both low and high productivity, that is unrelated to $\bar{k}$.[2]

Given the nature of intermediate production in (4), manufacturing output is maximized when all capital is controlled by those firms with high productivity endownments. This would mean that $\frac{K_{Ht}}{K_t} = 1$ and therefore $\bar{A}_t = A_H^{\alpha}$. This implies that the capital controlled by firms with low productivity endowments is loaned to those with high productivity endowments.

However, we assume that the financial sector is not perfectly efficient. Lenders are only capable of recovering a limited amount in the event that a borrower defaults on their loan. This proportion is equal to $\tau_t \bar{k} K_t$, where $\tau_t > 0$. Lenders will therefore only loan an amount up to $\tau_t \bar{k} K_t$ to borrowers, and this may constrain credit below the optimal level. Therefore the parameter τ_t measures the financial development of the economy. This form of financial friction is similar in spirit to the collateral constraints found in Kiyotaki and Moore (1997), Aghion and Banerjee (2005), and Aoki, Benigno, and Kiyotaki (2006).

This means that the capital allocated to the high productivity firms can be represented as

[2] This structure implies that each individual earns an identical return from their own capital in the manufacturing sector, even though returns may vary by firm based on productivity.

$$\frac{K_{Ht}}{K_t} = \begin{cases} \bar{k}\,(1+\tau_t) & \text{if } \tau_t < \frac{1}{\bar{k}} - 1 \\ \\ 1 & \text{if } \tau_t \geq \frac{1}{\bar{k}} - 1 \end{cases} \tag{11}$$

and this means that productivity in the manufacturing sector can be represented as

$$\bar{A}_t = \begin{cases} \left(\left(A_H - A_L\right)\bar{k}\,(1+\tau_t) + A_L\right)^{\alpha} & \text{if } \tau_t < \frac{1}{\bar{k}} - 1 \\ \\ A_H^{\alpha} & \text{if } \tau_t \geq \frac{1}{\bar{k}} - 1 \end{cases} \tag{12}$$

The central results of the paper derive from the assumption that τ_t is a policy parameter set by the ruling coalition, and increases in τ_t increase the financial depth and industrial productivity of the economy. The parameter τ_t can be thought of as representing the level of regulation or enforcement that occurs within the economy. That level is dictated by those who control the regulatory and enforcement body, the government. It is not assumed that there is any marginal cost to increasing τ_t, so that there is no need to raise taxes of any kind to increase financial development.

The effect on capital rents is as follows. Given the set-up, each individual has exactly $\frac{K_{Ht}}{K_t}$ of their capital in the high productivity sector, so that each individual will receive exactly the same total return for their capital. This return is a weighted average of R_{Ht} and R_{Lt}, based on the actual value of $\frac{K_{Ht}}{K_t}$. Using the fact that intermediate good firms earn (6*b*) on their output, which determines their payments to capital. The total return to capital is thus

$$R_t = \frac{R_{Ht}K_{Ht} + R_{Lt}K_{Lt}}{K_t} \tag{13}$$

which given (7) yields the following

$$R_t = \alpha \bar{A}_t \left(\frac{s_t}{K_t}\right)^{1-\alpha} \tag{14}$$

This is the same return that is obtained if one examines the return to capital implied by the final goods sector production function in (10).

3.1.4 Factor Market Equilibrium

It is assumed that labor is freely mobile, so that s_t adjusts to set

$$w_t^A = w_t^M \tag{15}$$

and given $(3a)$ and $(6a)$ we can solve for s_t explicitly as

$$s_t = \frac{\bar{A}_t^{1/\alpha} K_t}{\bar{A}_t^{1/\alpha} K_t + X} \tag{16}$$

Note that s_t maximizes aggregate income by setting the marginal product of the common factor (labor) equal across sectors.

With the population normalized to one, total wage income in the economy as well as wages per person are

$$w_t = (1-\alpha)\left(\bar{A}_t^{1/\alpha} K_t + X\right)^{\alpha} \tag{17}$$

The land rental rate and capital rental rates can also be solved for given (16)

$$R_t = \alpha \bar{A}_t^{1/\alpha} \left(\frac{1}{\bar{A}_t^{1/\alpha} K_t + X}\right)^{1-\alpha} \tag{18}$$

$$\rho_t = \alpha \left(\frac{1}{\bar{A}_t^{1/\alpha} K_t + X}\right)^{1-\alpha} \tag{19}$$

3.2 Individuals

Each period a generation is born of size one. Each individual lives for two periods. Preferences of an individual i are over consumption in the second period of life, c_{t+1}^i and the bequest they leave to their child, b_{t+1}^i. Utility is log linear in these two items

$$u_t^i = (1-\beta)\ln c_{t+1}^i + \beta \ln b_{t+1}^i \tag{20}$$

where $\beta \in (0,1)$.

Individual i born in period t receives a bequest from their parent of b_t^i in the first period of their life, which they save for use as capital in period $t+1$. In addition, land is passed directly from parent to child in the amount x^i. There is no market for land, and hence no capital gains are possible.

In the second period of life the invidual joins the labor force and works for wage w_{t+1}. The individual earns income from investing of $R_{t+1}b_t^i$ and also earns rent on the land they received from their parent of $\rho_{t+1}x^i$. Total income in the second period of life for individual i is thus

$$I_{t+1}^i = w_{t+1} + R_{t+1}b_t^i + \rho_{t+1}x^i \tag{21}$$

and the budget constraint is

$$c_{t+1}^i + b_{t+1}^i \leq I_{t+1}^i \tag{22}$$

Given (20), (21) and (22), the individual allocates the income across consumption and the bequest such that

$$b_{t+1}^i = \beta I_{t+1}^i \tag{23}$$

due to the log linear utility function. Note that utility is strictly increasing in I_{t+1}^i, so that individuals will be concerned with maximizing income, while the split of income between consumption and bequest will always follow the rule in (23).

Finally, we assume that a fraction λ of the population are landowners, so that each landowner has an equal amount of land, X/λ. For these individuals, denoted with $i = L$, the size of their bequest at time t will be b_t^L. The remaining $1-\lambda$ fraction of the population are tenants, and their bequests are denoted b_t^N. Since these two types of people make up the whole population their combined bequest, B_t, can be represented as

$$B_{t+1} = \lambda b_{t+1}^{L} + (1-\lambda)\, b_{t+1}^{N} \tag{24a}$$

$$= \beta\left(\lambda I_{t+1}^{L} + (1-\lambda)\, I_{t+1}^{N}\right) \tag{24b}$$

and because all output in the economy (y_t) must be distributed completely as income between these two types of individuals, we have that

$$B_{t+1} = \beta y_{t+1} \tag{25}$$

Given the tax rate of τ_t and the total bequest, the capital stock evolves as follows

$$K_{t+1} = B_t \tag{26a}$$

$$= \beta y_t \tag{26b}$$

3.3 Optimal Levels of Regulation

The level of financial regulation imposed on the economy is subject to the choice of the individuals in the economy. The optimal choice, though, of landlords and tenants differs over the course of development, as will be seen later. Before examining their choices individually, let us consider first the optimal level of regulation from the perspective of a social planner. That is, the level of regulation that maximizes income per capita within the economy. Define the following

$$\tau_t^* = \arg\max y_{t+1} \tag{27}$$

We can make the following statements about this optimal level of regulation

Proposition 1 *The optimal regulation level is* $\tau_t^* = 1/\bar{k} - 1$ *and satisfies the following conditions.*
a) $\tau_t^* = \arg\max w_{t+1}$

b) $\tau_t^* = \arg\max R_{t+1}$

c) $\tau_t^* = \arg\min \rho_{t+1}$

Proof. First, note that from (1), (2), and (10) that aggregate output (and output per capita) can be written as

$$y_{t+1} = \left(\bar{A}_t^{1/\alpha} K_t + X\right)^{\alpha}. \tag{28}$$

Output is therefore increasing in $\bar{A}_t$ and $\bar{A}_t$is maximized by allowing all capital to flow to high-productivity industrialists. This is accomplished by a policy of $\tau_t^* = 1/\bar{k} - 1$, as can be seen from (12).

To show part a), from (17) we know that

$$w_{t+1} = (1-\alpha)\, y_{t+1} \tag{29}$$

and therefore τ_t^* must maximize w_{t+1} as well as y_{t+1}.

For part b), notice that τ_t^* maximizes y_{t+1}^M, which can be seen by differentiating y_{t+1}^M with respect to τ_t and utilizing the fact that $\partial s_{t+1}/\partial \tau_t = 0$ because the share of labor allocated to manufacturing is assumed to maximize aggregate income. Since $R_{t+1} = \alpha y_{t+1}^M/\beta y_t$, it follows that R_{t+1} must be maximized by τ_t^* because y_{t+1}^M is as well.

Finally, for part c), note from (3*b*) and (3*a*) that rental rates are inversely related to agricultural wages. From part a) we know that wages are maximized by τ_t^* and it then follows that rental rates are minimized by τ_t^*. ■

With the results of the proposition, we can now turn to the optimal regulation from the perspective of the two types of individuals in the economy, tenants and landlords. From (21) we know that income for tenants can be written as

$$I_{t+1}^N = w_{t+1} + R_{t+1} b_t^N \tag{30}$$

Lemma 2 *The optimal regulation level from the tenants perspective,* τ_t^N*, is equal to the socially optimal level,* τ_t^*

Proof. Follows from (30) combined with the results of Proposition 1. ■

Landlords, on the other hand, have an income that depends partly on land rentals

$$I_{t+1}^{L} = w_{t+1} + R_{t+1} b_t^{L} + \rho_{t+1} \frac{X}{\lambda} \tag{31}$$

and their preferred regulation level does not necessarily coincide with the socially optimal level. While τ_t^* does maximize wages and capital rents, it minimizes their land rental income.

Proposition 3 *The optimal regulation level from the landlords perspective, τ_t^L, satisfies the following conditions.*

a) $\tau_t^L = 0$ *if* $\lambda < (1 - s_t)$

b) $\tau_t^L = \tau_t^*$ *if* $\lambda \geq (1 - s_t)$

Proof. To see the landlords decision more clearly, we can rewrite I_{t+1}^L in the following terms, using the definitions of wages from $(3a)$

$$I_{t+1}^{L} = w_{t+1} \left(1 - \frac{1 - s_t}{\lambda}\right) + R_{t+1} b_t^{L} + \frac{X^{\alpha} \left(1 - s_t\right)^{1-\alpha}}{\lambda} \tag{32}$$

Differentiating (32) with respect to τ_t yields the following

$$\frac{\partial I_{t+1}^{L}}{\partial \tau_t} = \frac{\partial w_{t+1}}{\partial \tau_t} \left(1 - \frac{1 - s_t}{\lambda}\right) + \frac{\partial \left(1 - \tau_t\right) R_{t+1}}{\partial \tau_t} b_t^{L} \tag{33}$$

The landlords optimal value $\left(\tau_t^L\right)$ is found by setting (33) equal to zero. If the term $\left(1 - \frac{1-s_t}{\lambda}\right)$ is positive, then τ_t^L is found by setting $\frac{\partial w_{t+1}}{\partial \tau_t} = \frac{\partial R_{t+1}}{\partial \tau_t} = 0$, which from Proposition 1 we know will yield the socially optimal choice, or $\tau_t^L = \tau_t^*$. However, if $\left(1 - \frac{1-s_t}{\lambda}\right) < 0$, then the landlord will find $\tau_t^L < \tau_t^*$. Given the Cobb-Douglas nature of the agricultural production function, landlords will not only find $\tau_t^L < \tau_t^*$, but find that $\tau_t^L = 0$. A complete proof of this last result is available in Appendix A in Galor, Moav, and Vollrath (2006). ■

Proposition 3 shows that landlords optimal financial regulation policy depends on the relative sizes of λ and $(1 - s_t)$. If $\lambda < (1 - s_t)$, the share of labor working in agriculture is larger than

the share of landowners, implying that landowners are hiring in labor, and that an increase in wages will lower their income. Hence, they prefer to keep financial regulation low and wages low. However, once $(1 - s_t) < \lambda$, then landowners are selling some of their labor to the manufacturing sector, and now prefer to maximize their wage income, which leads them to choose τ_t^*. The optimal level of regulation from the landlords perspective thus evolves with the economy, and as capital is accumulated and $(1 - s_t)$ falls, they may eventually support the socially optimal financial regulation rate.

3.4 The Political Mechanism

The actual level of regulation in the economy is assumed to depend in some manner on the preferences of the population. Tenants always support τ_t^*, while landlords optimal level of financial regulation depends on the development of the economy, as seen in Proposition 3. The question of this section is how the actual regulation level gets set in any period t.

One overriding assumption about the political process is that we do not consider bargaining between the two parties. The political systems are all "winner take all" in the sense that whichever group (landlords or tenants) has power is able to set the financial regulation policy to their optimal level. A richer model of the political process might allow for one party to remain in power by offering a concession to the other party, the concession being an adjustment in τ_t that is a compromise between the extreme positions of $\tau_t = 0$ and $\tau_t = \tau_t^*$. Instead, we focus primarily on the dynamics of the landlords optimal regulation rate, and show how this, and thus the whole economy, are affected by different levels of land inequality (λ) or land endowments (X). It is presumed that the economy always begins with $\tau_0 = 0$, and that financial development is something that must be instituted.

Before considering the types of political mechanisms, it will be useful to define several variables and discuss in general the dynamics of the model. First, define the following as the actual productivity rates under the two levels of financial regulation that individuals may find optimal

$$\bar{A}_t = \begin{cases} \bar{A}_0 \equiv \left((A_H - A_L)\,\bar{k} + A_L\right)^{\alpha} & \text{if } \tau_t = 0 \\ \\ \bar{A}_D = A_H^{\alpha} & \text{if } \tau_t = \tau_t^* \end{cases} \tag{34}$$

and we have that $\bar{A}_D > \bar{A}_0$. Utilizing the characterization of $\bar{A}_t$ in (34), the definition of aggregate income from (28), and the dynamics of the capital stock from (26*b*) the income per capita evolves according to the following:

$$y_{t+1} = \begin{cases} \left(\bar{A}_0^{1/\alpha}\beta y_t + X\right)^{\alpha} & \text{if } \tau_t = 0 \\ \\ \left(\bar{A}_D^{1/\alpha}\beta y_t + X\right)^{\alpha} & \text{if } \tau_t = \tau_t^* \end{cases} . \tag{35}$$

Note that given y_t, y_{t+1} is always higher when $\tau_t = \tau_t^*$, by the fact that τ_t^* is defined as the output maximizing value of the tax rate. Letting $y_{ss}(\tau)$ define the steady state value of income per capita given the tax rate, this means that $y_{ss}(\tau_t^*) > y_{ss}(0)$. Notice that in neither regime does the path of income depend on the distribution of land.

Finally, using the value of s_t from (16) the level of income at which $\lambda = (1 - s_t)$ under the $\tau_t = 0$ regime is

$$\hat{y}(\lambda) \equiv \left(\frac{1-\lambda}{\lambda}\right)\frac{X}{\beta\bar{A}_0^{1/\alpha}} \tag{36}$$

and at any income $y_t < \hat{y}(\lambda)$ the landowners oppose financial development, while at any point $y_t \geq \hat{y}(\lambda)$ landlords will support financial development, as seen in Proposition 3. From (36) we also see that $\hat{y}$ is inversely related to λ. In particular, $\hat{y}'(\lambda) < 0\ \forall\lambda$, and when $\lambda = 1$, $\hat{y} = 0$ and $\lim_{\lambda\to 0}\hat{y} = \infty$. The more concentrated the holdings of land are, the higher the income level that must be achieved before landowners support financial development.

3.4.1 Landowner Oligarchy

This political mechanism presumes that landowners are the only members of society with a vote on financial policy, one which accords very well with much of history. Mariscal and Sokoloff (2000) document how suffrage rules were based on property requirements throughout much of the Western Hemisphere well into the 20th century. Expansions of the franchise in England that occurred in 1832 still required a minimum household wealth, and it was not until 1884 that most agricultural workers had a right to vote.

Will landowners ever support financial development? This depends on whether income ever reaches the point where $\lambda \geq (1 - s_t)$. That is, does the economy reach $\hat{y}(\lambda)$ before it reaches $y_{ss}(0)$?

Proposition 4 *There is a level of land ownership, $\hat{\lambda}$, below which the economy will never transition to financial development. The level $\hat{\lambda}$ solves the equation $\lambda^{1-\alpha}/(1-\lambda) = X^{1-\alpha}/\beta \bar{A}_0^{1/\alpha}$.*

Proof. Notice from (35) that the evolution of income is not affected by the level of land ownership, λ. So economies that differ in land ownership will evolve similarly in the no tax regime. However, from (36) we see that $\hat{y}$ is inversely related to λ. In particular, $\hat{y}'(\lambda) < 0 \, \forall \lambda$, and when $\lambda = 1$, $\hat{y} = 0$, and $\lim_{\lambda \to 0} \hat{y} = \infty$. Therefore, there is some level, $\hat{\lambda}$, such that for any $\lambda < \hat{\lambda}$, $\hat{y}(\lambda) > y_{ss}(0)$. The actual level of $\hat{\lambda}$ can be found as follows. As y_{t+1} is concave in y_t, it must be the case that there is a single steady state $y_{ss}(0)$. Therefore, if $y_{t+1} = y_t$, then this means that y_t is the steady state $y_{ss}(0)$. Consider what y_{t+1} is in the $\tau_t = 0$ regime at the point where $y_t = \hat{y}(\lambda)$. This is $y_{t+1} = (X/\lambda)^{\alpha}$. Setting this equal to $\hat{y}(\lambda)$ from (36) and rearranging gives $\lambda^{1-\alpha}/(1-\lambda) = X^{1-\alpha}/\beta \bar{A}_0^{1/\alpha}$. Given $X^{1-\alpha}/\beta \bar{A}_0^{1/\alpha}$, the level of λ that solves this equation is the cutoff level of $\hat{\lambda}$. At any $\lambda < \hat{\lambda}$, it is the case that $y_{t+1} < y_t$ and hence $y_{ss}(0) < \hat{y}(\lambda)$. Thus the economy will stagnate at $y_{ss}(0)$, and income will never reach a level sufficient for landlords to support financial development. ■

What Proposition 4 implies is that economies with sufficiently low land ownership and a landowner oligarchy will remain with financially undeveloped, and with lower aggregate productivity, forever. Notice as well that this possibility increases with the size of the land endowment. As

X increases, the cutoff level of $\hat{\lambda}$ increases as well. What is occuring is that as land endowments increase, so do landlord rents, and it takes a larger capital stock and higher aggregate income to change their incentives to supporting financial development. So the agrarian structure, in terms of both inequality and total endowment, matter crucially in determining whether the economy transitions to financial development.

To see what is happening more clearly, consider figure 1. This diagram shows the evolution of income under both tax regimes described in 35. It also displays two different levels of $\hat{y}(\lambda)$, one with and equitable distribution of land (λ_{High}) and one with an unequal distribution (λ_{Low}) where $\lambda_{High} > \lambda_{Low}$. The diagram is drawn such that $\hat{y}(\lambda_{High}) < y_{ss}(0) < \hat{y}(\lambda_{Low})$. Starting from y_t close to zero, output expands along $y_{t+1} = \left(\bar{A}_0^{1/\alpha}\beta y_t + X\right)^{\alpha}$. If $\lambda = \lambda_{High}$, then once income reaches $\hat{y}(\lambda_{High})$ landlords now support an optimal tax regime and the economy jumps up in income and expands along the $y_{t+1} = \left(\bar{A}_D^{1/\alpha}\beta y_t + X\right)^{\alpha}$ path and will end up at $y_{ss}(\tau_t^*)$. However, if land is unequally distributed and $\lambda = \lambda_{Low}$, then the economy will reach $y_{ss}(0)$ prior to the point where landlords would support the optimal tax rate, and the economy ends up poorer and without any financial regulation. Thus the level of λ is crucial in that it determines whether an economy makes the leap to a developed financial system or not.

3.4.2 Strict Democracy

In this case, every single person has an equal vote, and thus the preferences of the median voter will decide the state of the financial system. Given the nature of the model, this depends solely on the parameter λ. If $\lambda < 1/2$, then tenants are the dominant political party and they vote at time zero to improve the financial system. Thus $\tau_t = \tau_t^*$ for all t, and the economy will eventually reach $y_{ss}(\tau_t^*)$, the higher steady state level of income per capita.

If on the other hand $\lambda > 1/2$, then landowners are the dominant political party and their position on financial development holds sway. Presuming that $y_0 < \hat{y}(\lambda)$, they start out opposing financial development. As y_t increases over time, the landowners may come to support financial development, but this depends on whether the economy reaches the steady state $y_{ss}(0)$ before it reaches $\hat{y}(\lambda)$. We saw in Proposition 4 that for any $\lambda < \hat{\lambda}$, $y_{ss}(0) < \hat{y}(\lambda)$ and the landowners will

never support financial development. So is there a range of λ such that landowners constitute a majority of the economy ($\lambda > 1/2$), yet is unequal enough that $y_{ss}(0) < \hat{y}(\lambda)$?

Proposition 5 *In a strict democracy with landowners as the majority* ($\lambda > 1/2$)*, then if* $X^{1-\alpha}/\beta\bar{A}_0^{1/\alpha} < 2^{\alpha}$ *the economy will always transition to financial development, but if* $X^{1-\alpha}/\beta\bar{A}_0^{1/\alpha} > 2^{\alpha}$ *then for* $\lambda \in \left(1/2, \hat{\lambda}\right)$ *the economy will not ever transition to financial development.*

Proof. If $\hat{\lambda}$ is less than $1/2$, then we know by the assumption that landowners are a majority that $\lambda > \hat{\lambda}$ and the economy will eventually transition to financial development (that is the economy will reach $\hat{y}(\lambda)$ before $y_{ss}(0)$). Putting $\lambda = 1/2$ into the equation $\lambda^{1-\alpha}/(1-\lambda) = X^{1-\alpha}/\beta\bar{A}_0^{1/\alpha}$ shows that $\hat{\lambda} \leq 1/2$ when $X^{1-\alpha}/\beta\bar{A}_0^{1/\alpha} < 2^{\alpha}$. If however, $\hat{\lambda} > 1/2$, then there is a range of values of $\lambda \in \left(1/2, \hat{\lambda}\right)$ over which $y_{ss}(0) < \hat{y}(\lambda)$ and landlords will never support financial development. ■

Proposition 5 shows that under a strict democratic system in which landowners are the dominant party, the possibility of financial development depends again the agrarian structure. There is a set of conditions which involve, 1) an X sufficiently large so that $\hat{\lambda} > 1/2$ and 2) inequality such that $\lambda \in \left(1/2, \hat{\lambda}\right)$, that imply a strict democracy will never transition to financial development. In contrast to the landowner oligarchy, though, if tenants do constitute a majority of the population, then financial development occurs immediately.

3.4.3 Wealth as Political Power

The last political mechanism considered is one in which the relative wealth of the tenants and landlords is relevant. One can imagine that the policy-making process is subject to influence, and so each party can attempt to drive the policy by spending their wealth. Thus what matters is now the median dollar of wealth, not the median voter. Wealth is defined by the size of a generation's bequest. So in any period, the younger generation sets τ_t based on the preference of the party with more wealth, where wealth is measured by the size of the bequests. Landowners have bequests of size b_t^L, giving them a total wealth of λb_t^L as a party. Tenants hold, in aggregate, $(1-\lambda)\, b_t^N$ in wealth.

If tenants ever take power, then $\tau_t = \tau^*$. When landlords are in power, the choice of τ_t depends on their preferences regarding financial development. The level of y_t relative to $\hat{y}(\lambda)$ is thus of importance again, and if $y_t > \hat{y}(\lambda)$ then landlords themselves supporting financial development. So there are two ways in which financial development may occur: tenants holding the majority of wealth, or landlords supporting development while they hold the majority of wealth.

We assume again that the economy starts with $\tau_0 = 0$, and the question is whether the economy reaches the lower steady state, $y_{ss}(0)$, before one of the political combinations that supports financial development arises. We begin the answer by considering all the steady states at which landlords retain the majority of wealth. This leads to the following proposition

Proposition 6 *There is a level of landownership, $\tilde{\lambda}$, above which landowners retain the majority of wealth in the steady state.*

Proof. The landlords bequest, using (31), can be written as

$$b_t^L = \beta I_t^L = w_t + R_t b_{t-1}^L + \rho_t \frac{X}{\lambda} \tag{37}$$

and using the definitions of factor returns from (17),(18),(19) and the fact that from (35) aggregate income can be written as $y_t = \left(\bar{A}_0^{1/\alpha}\beta y_{t-1} + X\right)^{\alpha}$ gives the following

$$b_t^L = \beta\left((1-\alpha)\, y_t + b_{t-1}^L\left(\alpha \bar{A}_t^{1/\alpha} y_t^{(\alpha-1)/\alpha}\right) + \alpha\frac{X}{\lambda} y_t^{(\alpha-1)/\alpha}\right) \tag{38}$$

At any given income steady state $y_t = y_{t-1} = y_{ss}$. At this steady state for income, the steady state level of the landlords bequest, $b_{ss}^L = b_t^L = b_{t-1}^L$ is

$$b_{ss}^L = \frac{\beta y_{ss}\left((1-\alpha)\, y_{ss}^{1/\alpha} + \alpha\frac{X}{\lambda}\right)}{y_{ss}^{1/\alpha} - \alpha\bar{A}_t^{1/\alpha}\beta y_{ss}} \tag{39}$$

For landlords to hold the majority of wealth at the steady state values of y_{ss} and b_{ss}^L, it must be the case that

$$\lambda b_{ss}^L \geq \frac{\beta y_{ss}}{2} \tag{40}$$

given that the total bequest is equal to βy_t in any given period. Solving (40) and (39) for λ as a function of y_{ss} allows us to see what land distribution is sufficient to maintain the landlord majority of wealth in the steady state.

$$\lambda \geq \frac{1}{2}\left(1 - \frac{\alpha X}{(1-\alpha)\, y_{ss}^{1/\alpha}}\right) \equiv \tilde{\lambda} \tag{41}$$

■

What Proposition 6 tells us is that land ownership must be sufficiently widespread in order for landlords to retain power. While each individual landlord is certainly richer than each individual tenant, because of their rental income, the landlord class must have a minimum size in order to stay in power in the steady state. This minimum size, labelled $\tilde{\lambda}$, is decreasing in the size of X. That is, if the land endowment increases, the rents of the landlords increase sufficiently that a smaller number of them (a smaller λ) is capable of retaining the majority of wealth in the economy.

To understand exactly what happens to financial regulation over time, the definition $\tilde{\lambda}$ of can be combined with the level of income, $\hat{y}(\lambda)$, that determines when landlords will come to support financial development. Figure 2 plots both relationships. The upward sloping line labelled $\tilde{\lambda}$ captures the cutoff point at which the land distribution is wide enough for landlords to retain power in the steady state. This crosses the horizontal axis at $\left(\frac{\alpha}{1-\alpha}X\right)^{\alpha}$, the point at which the cutoff level is actually zero. At any steady state value of income below this cutoff, landlords will always have more than half the wealth and will always retain power. Given a level of steady state income, any land distribution with $\lambda \geq \tilde{\lambda}$ will mean that landlords retain the majority of wealth.

The line labelled $\hat{y}$ plots the point at which landlords find it beneficial to support financial development. When $\lambda = 1$, $\hat{y} = 0$, and then $\hat{y}$ asymptotes to zero as income increases. The $\hat{y}$ and $\tilde{\lambda}$ relationships divide the graph into four regions in which different political outcomes occur affecting the possibility of financial development. The actual outcome for an economy is determined by the actual level of λ and $y_{ss}(0)$ it is endowed with. These two values determine a point on figure 2, and the region in which that point falls tells us the outcome of the political process.

In zone I, the economy has a steady state income level that leaves it below the $\hat{y}$ line, meaning

that the steady state is reached prior to landlords coming to support financial development. In addition, because zone I is above the $\tilde{\lambda}$ cutoff, this means that land ownership is sufficient widespread that landlords will retain the majority of the wealth in the steady state. In zone I, there is never any financial development both because landlords always oppose it and because they always retain power.

Zone II differs in that it lies above the $\hat{y}$ line, meaning that this cutoff will be reached prior to the steady state level of $y_{ss}(0)$. However, landownership is still sufficiently widespread that landlords always retain the wealth majority. At some point in the evolution of the economies in zone II, income will hit $\hat{y}$, landlords will come to support financial development, and will enact it based on the fact that they control the political mechanism. At that point the economy exits the dynamics summarized in figure 2 and evolves towards the higher steady state of $y_{ss}(\tau^*)$.

This end result is matched in zone III, in which everything works towards financial development. Here, land ownership is too concentrated for landlords to retain power in the steady state, and tenants eventually take over. The tenants will enact financial reform immediately upon taking power. Alternately, in the zone the landlords themselves will eventually come to support financial development. The model doesn't allow for a simple solution as to which occurs first, but at some point the economy will exit the low steady state dynamics due to financial reform.

The final zone, IV, also reveals economies that will enact financial reform. This zone, though, perhaps features the most scope for conflict. In zone IV, land ownership is so highly concentrated that landlords will eventually lose their majority of wealth to the tenants. At that point the tenants will enact financial reform. However, landlords in this zone will not have come to support financial reform themselves. So while in zone III the whole economy eventually agrees on financial development, in zone IV the landlords retain their opposition.[3]

Overall, in only one region will financial reform fail completely, zone I. This zone is characterized

[3]This does not necessarily mean that landlords will oppose financial reform forever. If tenants enact financial regulation, then the aggregate income will grow, and may grow to the point that landlords come to support financial development. Similar to the value of $\hat{y}(\lambda)$, we can imagine $\hat{y}_D(\lambda)$ which describes the level of income at which landlords come to support financial development in the case where $\tau_t = \tau^*$. If the higher steady state $y_{ss}(\tau^*) < \hat{y}_D(\lambda)$, then landlords will never support financial development, creating a situation in which part of the population is consistently opposed to the current regulations. However, when $y_{ss}(\tau^*) > \hat{y}_D(\lambda)$, then landlords will eventually drop any opposition to financial development.

by a low steady state value of $y_{ss}(0)$, and the lower the steady state value, the more widespread land can be and still keep financial reform from occuring. The possibility of getting caught in this no financial development zone is influenced crucially by the size of the land endowment.

To see this, consider figure 3. This shows the result of an increase in X from X_0 to X_1. First, the $\tilde{\lambda}$ line will shift to the right, indicating that at any level of $y_{ss}(0)$, landlords are more able to retain the wealth majority. Second, the $\hat{y}$ line shifts up, meaning that the level of income at which landlords support financial development becomes higher for every level of λ. The combination of these two effects is to make zone I grow unambiguously. So the larger the size of the land endowment, holding constant both λ and $y_{ss}(0)$, the more likely it is that financial development does not occur.

3.4.4 Summary

The previous sections have attempted to show how various types of political mechanisms influence the possibility of financial development. In all cases, the agrarian structure proves to be crucial to determining whether financial regulation is undertaken or not. For economies with very concentrated land holdings (i.e. a small λ), it is quite possible that landlords will not support financial regulation, and the likelihood of this is increasing in the size of the land endowment. In these cases, financial development will only occur if tenants are able to take control of the political mechanism, either through strict democratic voting or by acquiring the majority of wealth in the economy.

4 Conclusion

It has often been proposed that the development of the financial sector is a key component of economic development in general, as it allows for capital to be allocated more productively across different uses. This general hypothesis has been supported by cross-country empirical evidence showing the strong link of financial depth and economic growth. This body of theoretical and empirical work, though, has generally not been as clear about exactly why financial systems vary in their sophistication across countries in the first place.

The most prominent explanation to date is that the legal origins of a country's corporate law are of great importance to the effectiveness of the financial sector. Recent empirical work has highlighted a new source of variation in financial development as well: land inequality. The relationship of land inequality and finance is something suggested in the development literature, and appears to be quite robust in cross-country empirical work. However, there has not been a coherent account of the incentives present in the economy that drive the land inequality and finance relationship.

This paper has developed a model of endogenous financial system development in which the sophistication of the financial sector is determined as a policy variable by those in charge of the political system. It highlights the difference between two classes of individuals, tenants and landlords. Despite the clear improvement in the efficiency of the manufacturing sector, landlords are hesitant to support the policies which provide financial development because this raises the wage costs on their lands and reduces their rental income. The analysis shows that the specific agrarian structure, defined here as the distribution and total endowment of land, are crucial in determining the ultimate fate of the financial sector. Several different political mechanisms are analyzed, each of them showing that a higher concentration of land is detrimental to the chances of financial development, matching the cross-country empirical evidence. Historical evidence from several countries supports the hypothesis that landowners oppose financial development, and that their motivation is often explicitly to hold down labor mobility and hence wages.

The theory proposed in this paper is part of a recent research effort to understand the origins of the various institutions which govern economic activity across countries. It shows that when the set of institutions governing the financial sector are subject to a political system that includes landowners, the improvement of these institutions is not an inevitable outcome. Financial institutions are thus not just an endowment from history, but a malleable thing subject to the preferences of the people within the economy.

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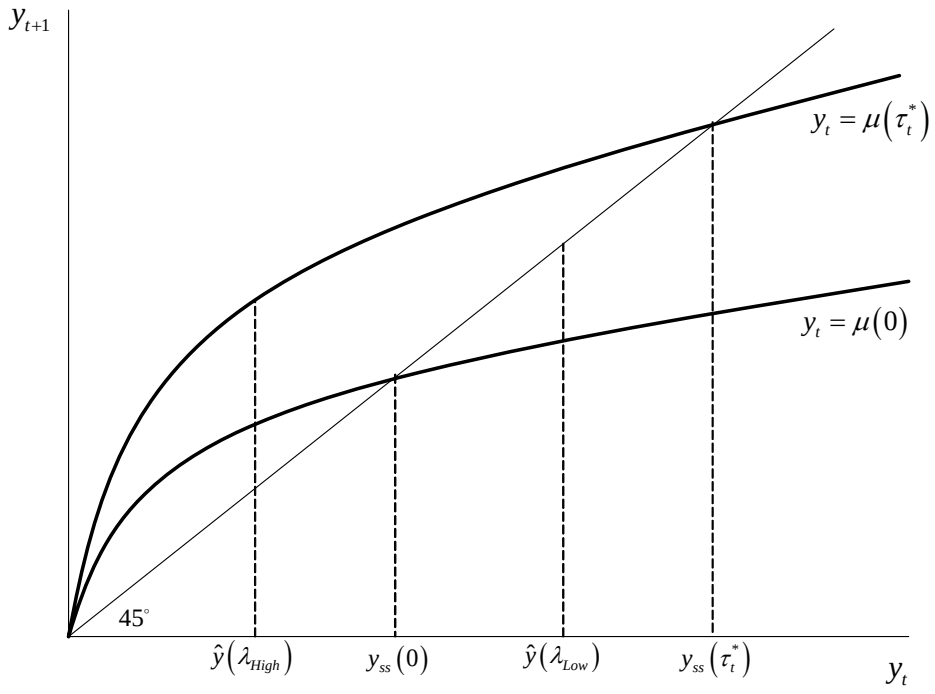

Figure 1: Dynamics of income under different financial regulatory regimes

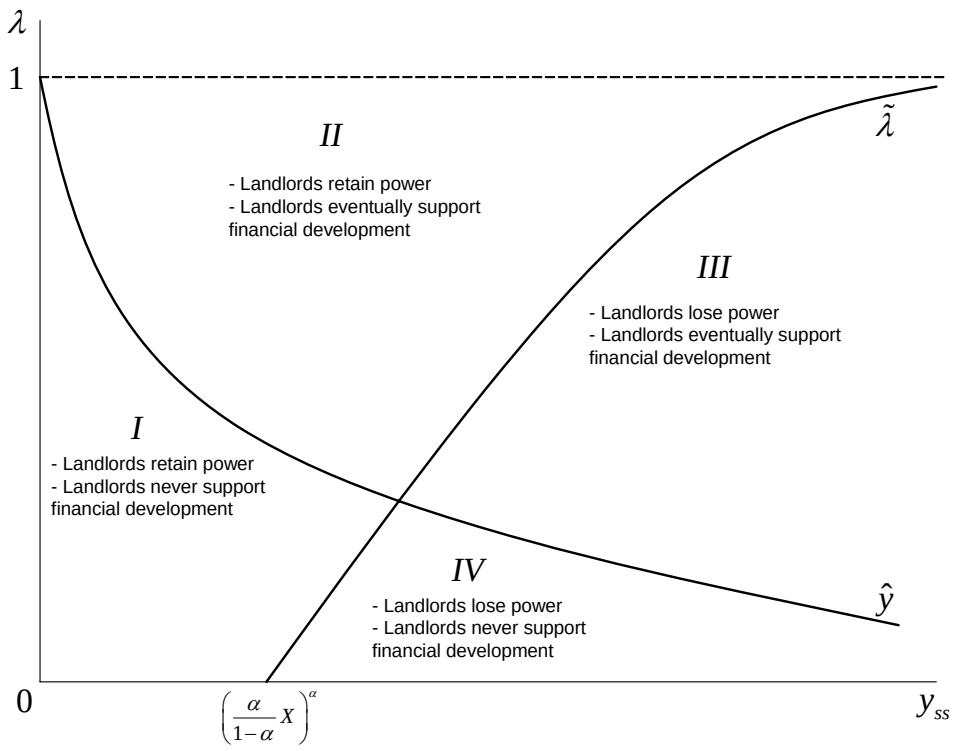

Figure 2: Determining the political and financial outcome in the economy where wealth is power.

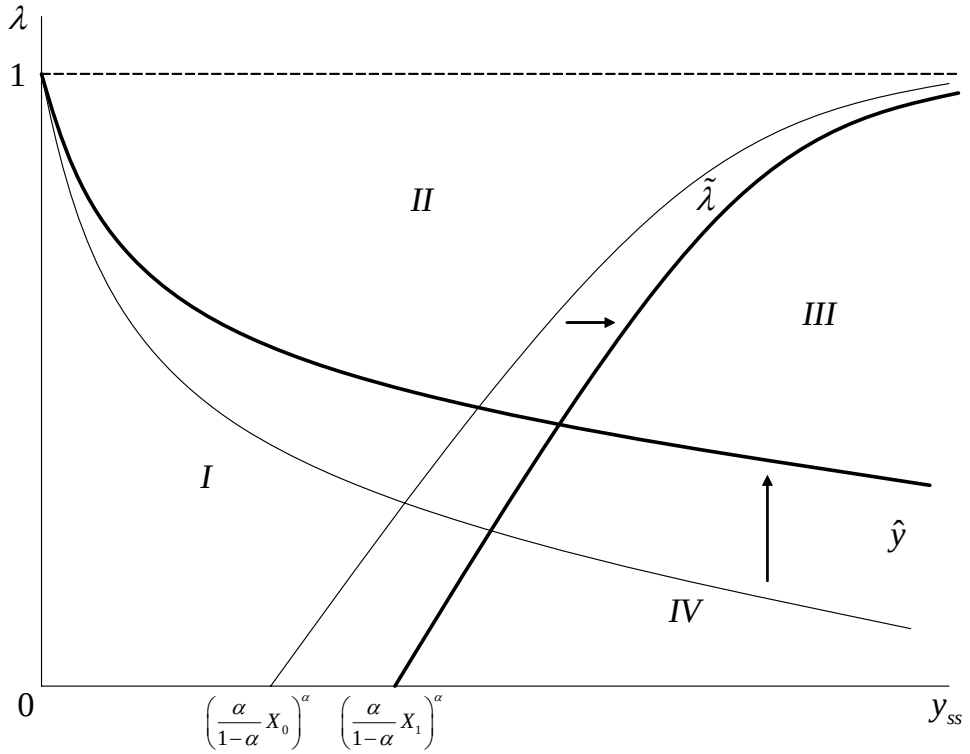

Figure 3: Changes to the financial development outcome when the land endowment, X, increases.