

Rationale for Paternalism

“Semifeudalistic” Tenancy Contracts in Imperial Japan

Masaki Nakabayashi*

Abstract

Risk sharing in the informal/traditional sector generally plays a critical role in the early development stages, but it destabilizes at some point. In Japan, the shogunate’s scheme to bear owner-farmers’ risk bearing through contingent land tax reductions when harvests were poor and in-kind land tax payments stabilized the owner–farmers’ economy until the Meiji Restoration of 1868. When the Meiji government denied contingent land tax reductions and enforced monetary land tax payments, many owner farmers failed and became tenant farmers. Emerging landlordism adopted the risk-bearing role through contingent rent reductions and in-kind rent payments, which served as substitutes for the shogunate’s risk-sharing measures from the 1880s, but landlordism destabilized in the 1930s. This paper investigates the reason for this sequence. First, we build a two-sector contract model to formalize the essence of tenancy contracts in modern Japan. Then, we show the quasiconcave structure of optimal contracts. Under a threshold, the landlord’s surplus increases with risk, and the optimal risk-bearing degree increases with the tenant farmer’s risk aversion; beyond the thresholds, these relationships reverse. Landlords were willingly paternalistic within the thresholds but not beyond them; at that point, a paternalistic welfare state had to step in, as in the 1930s.

Keywords Informal security; tenancy contract; path dependency; shogunate Japan; Meiji Restoration

JEL classification codes O17; D02; B24; B25.

Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed for the current study.

*Professor of Economics, Institute of Social Science, The University of Tokyo. Address: Hongo 7–3–1, Bunkyo, Tokyo 103–0033, Japan. Email: mn@iss.u-tokyo.ac.jp. The author is grateful to Jeremy Shearmur, Hugh Goodacre, David Chiavacci, Kaoru Sugihara, Keishi Shiratori, Hirokazu Ishise, and Akifumi Ishihara and other participants in workshops at Balliol College, University of Oxford, University of Zurich, University of Helsinki, and Ryukoku University as well as the Osaka Workshop on the Economics of Institutions and Organizations for their inspiring comments. This research was funded by JSPS Grant-in-Aid KAKENHI JP17K18558 and JP18H03630.

Don Vito Corleone was a man to whom everybody came for help, and never were they disappointed.

Mario Puzo, The Godfather (Puzo (2009[1969])), p. 9).

1 Introduction

Hayek (2007[1944]) found critical characteristics of the German Reich susceptible to socialism in its traditional vertical security scheme (Hayek (2007[1944]), p. 155). Yamada (1934) also identified essential elements that stabilized the political economy of the Empire of Japan in its traditional relational contracts, notably between landlords and farmers, and described the relational contract as “semifeudalistic” in the sense of a legacy from the shogunate regime before the Meiji Restoration of 1868 (Yamada (1977[1934]), pp. 250–260).

Hayek (2007[1944]) placed the German tradition of security in the context of the trade-off between “security and freedom”, which led to “the victory of the ideal of security over that of independence” (Hayek (2007[1944]), p. 155), because of which the German Reich was penetrated by socialism (Hayek (1960), p. 234). Applying the same concept, Hayek (1960) rejected “social security” in the form of compulsory universal insurance (Hayek (1960), pp. 285–305). Yamada (1934) described how in-kind rent payments shielded tenant farmers from the volatility of the commodities market and referred to them as “semifeudalistic” (Yamada (1977[1934]), pp. 250–252, 259).

Relational contracts with paternalistic characteristics were not specific to the traditional sectors of imperial Germany and Japan. Luporini and Parigi (1996)) presented that in the Kingdom of Italy, tenancy contracts that restricted tenant farmers’ access

to outside opportunities prevailed in the late nineteenth century. Luporini and Parigi (1996) characterized the clauses in tenancy contracts that restricted some actions of tenant farmers as “feudal” and “paternalistic” (Luporini and Parigi (1996), p. 453). In addition, in the US South after the Emancipation, paternalistic employment contracts between former slaves and former owners were common until the social security system replaced the risk-sharing mechanism in the 1930s (Alston and Ferrie (1985, 1993)). Alston and Ferrie (1993) used “paternalism” to signify a long-term commitment to an employer that transcends “spot-market exchanges” to provide the employer with labor services for a “variety of goods and services” (Alston and Ferrie (1993), p. 852).

Thus, from the US South to the Italian monarchy, imperial Germany, and imperial Japan, the restriction of agents’ access to the market by a principal has been referred to as “feudal”, as “paternalism”, or as a trade-off between “security and freedom.” Throughout this paper, we use “paternalism” to mean the restriction of agents’ access to the market by a principal who bears the risk, by which the degree of freedom is restricted at the exchange of security. In all constitutional monarchies of the Italian monarchy, imperial Germany, and imperial Japan—whose literacy rates as of 1913 were 62%, 97%, and 72%, respectively (Crafts (1997), p. 307)—a majority of agents in each nation were supposed to make a judgment to decide whether to conclude a contract. Such agents understood their benefit in receiving security from a principal. Therefore, by their own will, they committed to restricted market access. Accordingly, throughout this paper, we assume the binding participation constraint (individual rationality constraint), which captures the agent’s freedom to participate in a contract. In this sense, our definition of “paternalism”, a subset of which is semifeudalism in imperial Japan, is equivalent to “libertarian paternalism” (Thaler and Sunstein (2003)).

In general, when a state’s ability to enforce a contract is not reliable or the con-

tracted conditions are difficult to verify, we rely on an informal relationship (Brown, Falk and Fehr (2004); Gibbons and Henderson (2012); Helper and Henderson (2014); Ishiguro (2016); and Esteves and Geisler Mesevage (2019)). Within such a relationship, an agreement is implemented only when both parties intend for the relationship to continue in the future. Such forms of agreement implementation are perceived as “loyalty” between the parties (Board (2011)) and referred to as relational contracts (Malcomson (2013)). Relational contracting is especially pursued when the enforcement problem is severe either because a party is risk-averse (Thomas and Worrall (1988) and Malcomson (1999), 2300–2311) or moral hazards are difficult to prevent by third-party enforcement due to task design, such as multitasking situations (Daido (2006) and Ishihara (2020)).

The principal who bears the risk can improve efficiency by restricting the agent’s choice and addressing the adverse selection or moral hazard that stems from the asymmetric information between the risk-bearing principal and the risk-averse agent (Rothschild and Stiglitz (1976) and Greenwald and Stiglitz (1986)). This characteristic is the basis of the paternalistic relational contracts that were observed in the early developmental stages of advanced economies such as the US, Japan, Germany, and Italy and that are present in developing economies.

In addition, this risk-sharing role of the paternalistic relational contracts has attracted attention from development economics, and both theoretical predictions and empirical evidence have been presented, including Townsend (1995), Barrientos (2009), Loayza and Rigolini (2011), Kimura (2011), and Shoji (2018, 2021).

Although analyses of how informal risk-sharing stabilizes have deepened, little research has examined how it destabilizes. Logically, two forces can be considered to destabilize informal security. One is a higher-than-expected increase in the value of an outside option, which affects the participation constraint, as studied by Macchiavello and

Morjaria (2020). The other is a greater-than-expected exogenous shock, which affects the incentive compatibility constraint, as shown by Blouin and Macchiavello (2019).

In developed nations such as the US, Japan, Germany, and Italy, risk-sharing through informal relational contracts completed its dominant role in the first half of the twentieth century, notably during the Great Depression, and was replaced by the welfare state. We focus on this collapse of informal security in Japan and so contribute to the literature on collapses of relational contracts due to exogenous shocks, represented by Blouin and Macchiavello (2019).

Inquiry into how informal security crippled in the advanced economies at the time can have critical policy implications. Such studies demonstrate how emerging economies can better prepare to replace informal security with formal social security programs financed by the state since formal law evolves according to the historical paths of informal rules and norms (Nakabayashi (2019) and Gutmann and Voigt (2020)). A transformation from informal to public security is currently urgent for China (Hsu, Liao and Zhao (2018)) and will certainly be for other emerging economies, as discussed by Mishchuk, Bilan, Yurchyk, Akimova and Navickas (2020).

Regarding Japan, Yamada (1934) mentioned the importance of risk-sharing between landlords and tenant farmers. Arimoto (2005) theoretically analyzed how this process worked, and Arimoto, Okazaki and Nakabayashi (2010) presented empirical evidence. Nakabayashi (2019) focused on the evolutionary path dependency of the welfare state with different legal origins replacing informal security. However, there is no formal analysis of how the once-stable paternalistic risk-sharing mechanism between landlords and tenants collapsed in Japan. Yamada (1934) argued that the risk-sharing mechanism began to destabilize in the 1920–1930s, but did not discuss the reason for its destabilization. This paper attempts to provide an explanation.

Specifically, through a historical review, we identify the essential characteristics of Japan’s paternalistic landlordism that prevailed from the 1880s to the 1920s as a substitute for the shogunate risk-sharing scheme that existed before the Meiji Restoration of 1868. We then present a model to analyze when such a risk-sharing mechanism stabilizes or destabilizes, which helps explain Japan’s structural changes from the 1930s onward. Key elements of the shogunate regime regarding the bearing of owner–farmers’ risk were contingent land tax reductions when harvests were poor to insure farmers against weather risks and in-kind land tax payments to insure against commodity market risks. After the Meiji Restoration, the government denied both elements. Instead, landlords offered contingent rent reductions when harvests were poor and in-kind rent payments. Thus, landlordism in modern Japan emerged as a risk-sharing substitute for the shogunate regime. This paper’s contributions include analyzing the incentives of landlords in bearing risk in tenancy markets considering risky modern labor markets and showing how the arrangement collapsed. More broadly, we show how relational contracts destabilize due to shocks that are greater than expected, along with Blouin and Macchiavello (2019).

The remainder of the paper is organized as follows. Section 2 reviews the development of the land and financial market institutions from the Edo shogunate age (1600–1868) and introduces the essential characteristics inherited by Japan’s landlordism from the shogunate regime in the modern age as stylized facts. Section 3 builds a two-sector contract model to characterize the essential characteristics induced by historical narratives and deduces its implications. Section 4 argues that the risk and risk aversion of tenant farmers diverged during the Great Depression. Standard settings of contract theory assume that agents’ risk preference is stable, and this assumption is empirically supported in stable environments (James (2007) and Baucells and Villasís (2010)). However, risk

preferences might depend on technical and emotional contexts (Reynaud and Couture (2012) and Conte, Levati and Nardi (2018)) and could change depending on the degree of risk (Cahlíková and Cingl (2017) and Hanaoka, Shigeoka and Watanabe (2018)). Therefore, we examine both possible channels: changes in risk and changes in agents' tolerance to risk.

2 Historical context for modeling

2.1 Establishment of farmers' property rights

Japan was under the shogunate federation from 1600 to 1868, during which the shogunate and lords ruled their respective domains (Ravina (1999), 16–45). The shogunate and lords of most regions ruled thorough cadastral surveillance during the seventeenth century. This surveillance specified each parcel of farmland and the stem family that cultivated it. Then, the shogunate and lords vested the stem family with property rights over that parcel and taxed it. Provided the registered household paid its land tax as stipulated, the family's property rights were strictly protected by the shogunate's or lord's court against any bystander. While the land tax was initially a fixed rate, the shogunate and lords of advanced domains later switched to a fixed amount (Saito (2009); Mandai and Nakabayashi (2018); Kumon (2018b); Nakabayashi (2020, 2021); and Nakabayashi, Fukao, Takashima and Nakamura (2020)).

Shogunate law vested a family as a going concern, not an individual with property rights. To maintain agriculture as the family business, a better successor was actively sought through adoption (Mandai (2021)). The institution also helped curb ownership concentration in Japan in relation to the West (Kumon (2018a)).

2.2 Regulation and risk-sharing under the shogunate regime

To stabilize the owner–peasant economy, the shogunate adopted two measures: (1) regulations of farmland market and farmland–collateral loan market and (2) risk-sharing between the shogunate/lord and the farmers (Mandai and Nakabayashi (2018) and Nakabayashi (2020, 2021)).

From the 1720s to the 1740s, the shogunate elaborated the procedural requirements for the foreclosure of pledged farmland. Notably, the shogunate judicial system limited the enforcement of foreclosures to cases in which the lender and borrower were residents of the same village. This regulation restricted the otherwise possible geographical expansion of farmland–collateral loan markets and prevented the concentration of farmland ownership among city merchants or wealthy farmers (Mandai and Nakabayashi (2018) and Nakabayashi (2020, 2021)).

As insurance against weather risks, the land tax was temporarily reduced by switching to the fixed-rate taxation scheme, which, by construction, shared the risk between the state and the taxpayer if the output was 30% less than an average year (Oishi (1969[1794]), p. 189). Moreover, joint liability for the land tax payment was allowed at the village level. The village office was responsible for land tax payments each year, which enabled financial arrangements among farmers living in the same village for land tax payments. Furthermore, the land tax was payable in kind, most often with rice. These measures shielded owner peasants from weather and rice market risks (Mandai and Nakabayashi (2018) and Nakabayashi (2020, 2021)). The regulation kept the wealth distribution egalitarian in early modern Japan, particularly in comparison with the West (Kumon (2018b)).

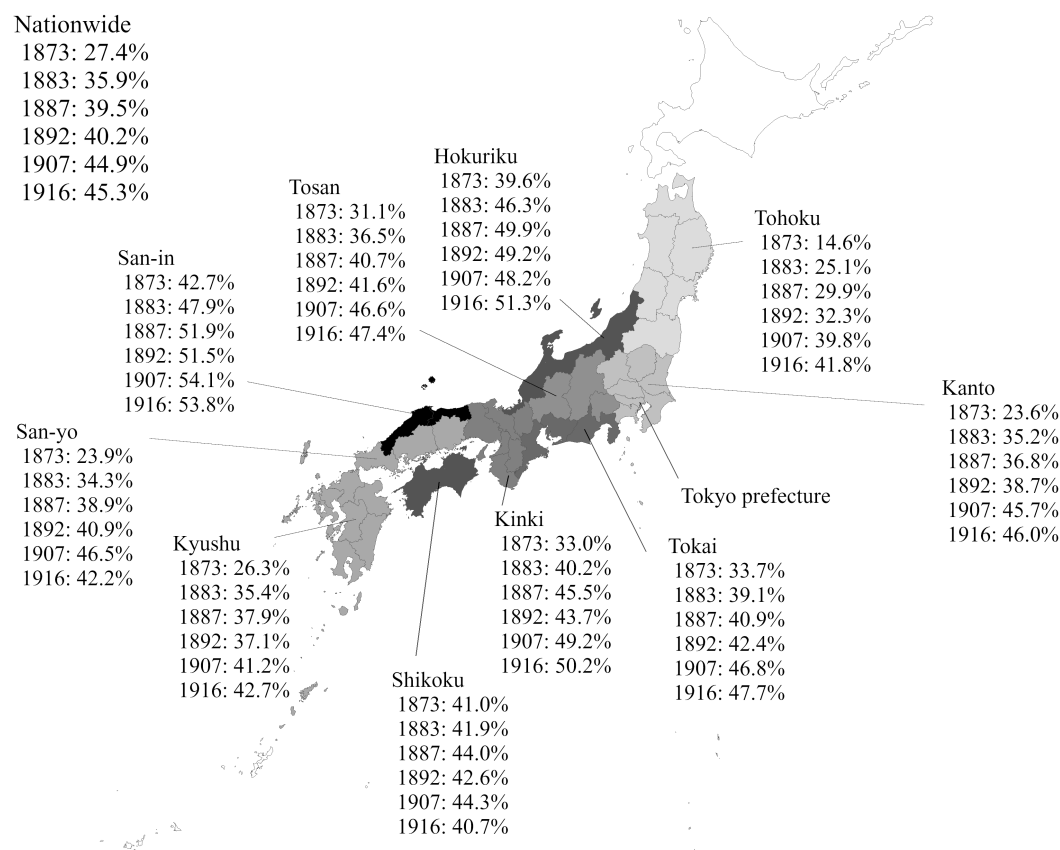
2.3 Meiji Restoration of 1868

After the Meiji Restoration of 1868 and the abolition of the federal system in 1871, the centralized imperial government implemented reforms that affected the risk-sharing mechanism of farmers. The Land Tax Reform Act of 1873 abandoned the joint land tax liability and stipulated the monetary payment of land tax. Furthermore, it denied contingent land tax reductions in cases of poor harvests (Nakabayashi (2020, 2021)).

Meanwhile, the imperial government enacted the Ordinance of Pledging and Securing by Farmland of 1873, which removed the regional restriction on foreclosure enforcement. Thus, the court now enforced foreclosures beyond village borders (Nakabayashi (2020)). Furthermore, while property rights belonged to the family under the shogunate regime, the Civil Code of 1896 stipulated that property rights belonged to not the family but an individual. The legislation enabled household heads to pledge their own parcels of farmland for farmland-collateral loans and to dispose of parcels without the need for agreement from family conferences. Additionally, the National Bank Act of 1872 liberalized and modernized the banking sector, which led to the establishment of more than 150 banks across Japan during the 1870s (Hoshi and Kashyap (2001), pp. 18–24).

Thus, individual owner peasants were now directly exposed to weather and market risks and had greater freedom to leverage their farming business by pledging their farmland under the drastic deregulation of farmland and agricultural financial markets by the Meiji government. To grasp the effects of the shogunate's regulation on maintaining the owner-farmer class and the impacts of deregulation by the Meiji Restoration, the changes in the tenanted farmland ratio are informative.

Figure 1: Nationwide and regional averages of tenanted land ratio, 1873–1916.



Sources: Furushima (1958), p. 332 and Yamaguchi (1956), pp. 48–49.

Notes: Prefectural borders are as of 1916. Estimates of 1883 are partially for 1884. Estimates of 1873 were interpolated by Furushima (1958) with an assumption that the growth rate in the ratio between 1873 and 1883 equaled the average of the growth rate (a) between 1883 and 1887 and (b) that between 1887 and 1892. There are no estimates for Okinawa and Hokkaido prefectures as of 1873. Hokkaido had been largely holdings of native Ainu, Ezo, and Okinawa had been quasi-independent Ryukyu Kingdom until the Meiji Restoration and hence legal systems including land institutions had been different from those in other prefectures until 1890s.

Figure 1 shows the tenanted land ratio estimated by Yamaguchi (1956) and Fu-

rushima (1958). Geopolitically, the Kanto Region surrounded the shogunate capital Edo (Tokyo) and belonged to the shogunate or proshogunate lords' domains. The Tohoku Region belonged mostly to the proshogunate lords' domains, as did the Kinki, Tosan and Tokai regions. In those regions, the tenanted land ratio remained particularly low: estimated as 14.6% in the Tohoku Region and 23.6% in the Kanto Region as of 1873, when the deregulation of farmland and agricultural financial markets began. The nationwide average of the tenanted land ratio was estimated to be 27.4% as of 1873. Overall, the shogunate regulation of the farmland and agricultural financial markets maintained the owner-farmer class by restricting the land ownership concentration notably in the shogunate and proshogunate domains.

However, the nationwide average of the tenanted land ratio rose to 39.5% as of 1887 and 40.2% as of 1892. The rapid increase was driven by increases in the Tohoku, Kanto, Tosan, Tokai, and Kinki regions, which had maintained shogunate regulation until the Meiji Restoration. The national average of the tenanted land ratio climbed to 44.9% and stabilized at approximately 45% through the 1910s.

Landlordism in Japan was thus not a traditional social system but emerged following the deregulation of the Meiji Restoration that transferred risk from the state and village community to owner farmers. Not coincidentally, Japanese landlordism was characterized by two essential features: in-kind rent payments and contingent land tax reductions when harvests were poor (Arimoto and Sakane (2021)).

The government implemented a detailed survey of tenancy contracts in all prefectures in 1921 (Tsuchiya (1942b, 1942a)). The survey conveys the prevalent customs of modern landlordism in Japan. In most regions, landlords adopted fixed rent contracts instead of sharecropping and temporarily reduced rents when harvests were poor less than an average year by 10 to 15 %. While sharecropping was also adopted in counties or

villages where harvests were extremely volatile, they were exceptional cases or were not adopted at all in most prefectures other than the Aomori and Iwate prefectures (Tsuchiya (1942b), pp. 85–86, 117–119) as Arimoto (2005) theoretically predicted. Regarding rent payments, in-kind payments were dominant except for the Okinawa prefecture, which had been the Ryukyu Kingdom and only under indirect control by the Japanese authority before the Meiji Restoration (Watanabe (2022)); thus, its historical and institutional backgrounds differed from those of other prefectures (Tsuchiya (1942a), pp. 848–849). Therefore, fixed rents with contingent rent reduction when harvests were poor and in-kind rent payments were dominant practices of modern landlordism in prefectures that had been under the rule of the shogunate regime.

2.4 Induced stylized facts

After the Meiji Restoration of 1868, landownership concentration accelerated due to deregulation. While the Meiji government abandoned contingent land tax reductions, landlords adopted fixed rent contracts with contingent rent reductions when harvests were poor (Tsuchiya (1942b, 1942a); Arimoto (2005); and Arimoto and Sakane (2021)), which followed the shogunate’s risk-sharing scheme (Oishi (1969[1794]), p. 189).

Additionally, landlords paid monetary land taxes while tenant farmers paid in-kind rent to the landlord. The in-kind rent payments shielded tenant farmers from rice market volatility, as had shogunate in-kind tax collections (Arimoto and Sakane (2021), p. 18). Yamada (1934) described the risk-sharing mechanism through in-kind rent payments as “semifeudalistic” (Yamada (1977[1934]), pp. 250–252, 259).

Furthermore, Yamada (1934) considered an equilibrium of low wages in the modern sector and high rents in the agricultural sector (Yamada (1977[1934]), p. 217). Thus, facing the labor market of the modern sector and the tenancy market of the agricultural

sector, farmers chose a contract in either sector to equalize their utility level in both sectors. Such arbitrage has been well documented in previous works. Regarding the late nineteenth century before the Meiji Restoration, Mandai (2019) demonstrated that landlords in the Kinki Region had to set rents to compete for tenant farmers who chose between the urban service and manufacturing sectors and the agricultural sector (Mandai (2019), pp. 377–444). In modern times, after the Meiji Restoration, Oguri (1997) studied cases in which regional industrialization led to tenant farmers’ demand for rent reduction (Oguri (1997), pp. 43–121, 251–259). Arimoto and Sakane (2008) empirically demonstrated how urbanization and industrialization in a region led to the demand for rent reductions in the region.

Last, the Great Depression hit the peasant economy in the 1930s. Japan’s largest export before the Second World War was raw silk (silk yarn) to the US (Nakabayashi (2006, 2014)). Farmers, particularly in eastern Japan (Tohoku and Kanto), cropped the material for raw silk, cocoons, as well as rice (Nishida (1972) and Nakabayashi (2006)). The overall downward pressure from the US due to the Great Depression devastated the peasant economy (O’Sullivan (forthcoming)), which led to the demise of landlordism.

In summary, 1) modern landlordism replaced the risk-bearing role of the shogunate regime as the Meiji government abandoned its risk-sharing mechanisms in the forms of in-kind rent payments and contingent rent reductions when harvests were poor; 2) landlords faced arbitrage by worker/tenant farmers who chose between modern and agricultural job opportunities; and 3) while landlordism served as a risk-sharing mechanism in ordinary times, it was vulnerable to shock of the Great Depression. These elements, induced from the historical retrospection of the modern landlordism of Japan, which prevailed from the 1880s to the 1920s, are what I model in Section 3.

3 Two-sector contract model

3.1 Model

To analyze the asymmetric information rationale behind paternalistic mechanisms, we can model either the agent's limited liability constraint, as in Basu (1992) and Janvry and Sadoulet (2007), or the moral hazard with the agent's risk aversion, as in Sadoulet, Fukui and de Janvry (1994) and Arimoto (2005). Since the limited liability constraint and the agent's risk aversion cannot be treated within a model and hence, a limited liability constraint model assumes the risk neutrality of agents, we need to choose between them.

If the contingent reduction were not a choice variable but rather, the landlord were forced to reduce rent temporarily, it would be a limited liability constraint, and hence a limited liability model would have fitted this study. If the landlord attempted to exploit an agent's risk aversion to earn surplus in return for risk-bearing through contingent rent reductions when harvests were poor and in-kind rent payments, then we would model the moral hazard by risk-averse agents. Although the reality of tenancy contracts could contain both characteristics, we focus on paternalistic protection as a choice variable for the principal to capitalize on the risk aversion of the agent to earn a surplus in return for compensation of the risk-averse agent's utility decreasing under risk. Thus, we modeled the moral hazard by the risk-averse agent. Under such conditions, paternalistic risk-sharing might improve the payoff of the risk-bearing principal and the total surplus by shielding the risk-averse agent from bad weather and market volatility. Here, we model this situation while considering the interaction between employment contracts in the modern sector and tenancy contracts in the agricultural sector.

Let $e_M \in (0, 1)$ and $e_A \in (0, 1)$ denote the effort levels of the worker in the modern sector and the tenant farmer in the agricultural sector, respectively. Let $C(e_M) = e_M^2/2$

and $C(e_A) = e_A^2/2$ denote the cost of effort e_M and e_A of the worker in the modern sector and the tenant farmer in the agricultural sector, respectively. For simplicity, we assume identical cost functions for the worker and the tenant farmer. Let $y_M(e_M)$ be the output per worker in the modern sector and $y_A(e_A)$ be the output per tenant farmer in the agricultural sector for each period.

We assume that $y_M(e_M) = e_M + \epsilon_M$, $\epsilon_M \sim N(0, \sigma_M^2)$, and $y_A(e_A) = e_A + \epsilon_A$, $\epsilon_A \sim N(0, \sigma_A^2)$. Here, the variance in the output in the modern sector, σ_M^2 , captures the risk incurred by a worker, while the variance in the agricultural sector, σ_A^2 , captures that incurred by a tenant farmer. Output y_M in the modern sector is assumed to be observable by the employer, and y_A in the agricultural sector is assumed to be observable by the landlord. Effort level e_M in the modern sector is assumed to be unobservable by the employer, and e_A is assumed to be unobservable by the landlord.

We also assume that the employer/landlord is risk neutral and that the worker/tenant farmer is risk-averse and has a constant, absolute, risk-averse (CARA) utility function, $u(w) = 1 - \exp\{-\lambda(w - C(e_i))\}$, $i \in M, A$. Here, w is compensation, and $\lambda = -(\partial^2 u(w)/\partial w^2) / (\partial u(w)/\partial w)$ is the coefficient of the worker/tenant farmer's absolute risk aversion (Pratt (1964); Arrow (1971[1965]); and Holmstrom and Milgrom (1987)). The assumption of an exponential utility function validates a linear compensation scheme (Holmstrom and Milgrom (1987)).

For the modern sector, we assume that the compensation scheme is $w_M(e_M) = \beta y_M(e_M) + \alpha$, where α is a constant that satisfies the labor market participation constraint and β is the incentive intensity.

In the agricultural sector of modern Japan, fixed rent contracts prevail. On a fixed rent contract basis, risk-sharing usually takes the form of a special stipulation for contingent rent reduction in the case of poor harvests (Tsuchiya (1942b, 1942a) and Arimoto

(2005)). That is, the compensation scheme is $w_A(e_A) = y_A(e_A) - \gamma$, where γ is a fixed rent.

For simplicity, I also assume perfect correlation of the risks in both sectors. The protection of tenants by landlords certainly includes a contingent reduction in rent in the case of poor harvests and may include relational contracts in multiple social dimensions as Besley (1995) generally discussed and Arimoto et al. (2010) and Sakane and Arimoto (2017) studied Japanese experiences. We further assume that the modern and agricultural sector markets are integrated and the landlord has a mechanism for bearing the output risk of tenant farmers by allocating a portion of the expected output, $E[y_A]$, such that

$$\sigma_{AI}^2 = \sigma_M^2 - f \frac{(E[y_A(e_A)])^2}{2} = \sigma_M^2 - f \frac{e_A^2}{2},$$

where σ_{AI}^2 is the risk incurred by the tenant farmer under the landlord's insurance and f denotes the risk-bearing technology of the landlord.

As Equation (5) shows, a decrease in the tenant farmer's utility level due to an increase in risk increases with the variance of $w_A = y_A(e_A) - \gamma$. If error term ϵ_A linearly increases with effort level e_A , the risk characterized by its variance $\sigma_A^2 = \epsilon_A^2$ increases as the square of e_A and hence, the decrease in the agent's utility due to the risk increases as the square of e_A . For this reason, the cost to cover the landlord's protection to compensate for a decrease in the tenant farmer's utility due to risk increases with e_A^2 . Therefore, given the CARA utility function of the agent, we reasonably assume f is a constant $b > 0$ such that

$$\sigma_{AI}^2 = \sigma_M^2 - b \frac{(E[y_A(e_A)])^2}{2} = \sigma_M^2 - b \frac{e_A^2}{2}. \quad (1)$$

The degree of paternalistic protection, b , is a choice variable of the landlord and differs from a transfer due to the binding limited liability constraint. The landlord selects b based on the degree of the tenant farmer's risk aversion, λ , to maximize the landlord's payoff.

Equation (1) characterizes the feature under which tenant farmers with higher efforts are insured more. That feature might sound counterintuitive if “insurance” serves to protect more vulnerable agents or at least to offer equal protection. However, given the risk aversion of the agent under informal contract setting, the mechanism works to maximize the landlord's surplus and the total surplus.

The first reason is technical. Equation (1) assumes that landlords' contributions and tenant farmers' efforts complement one another to insure tenant farmers against risk. As Arimoto (2005), Arimoto et al. (2010), Sakane and Arimoto (2017), and Arimoto and Sakane (2021) describe, landlords attempted to affect the risk burden incurred by tenant farmers through a voluntary long-term relationship between them. The observations indicate that the relationships were mutually beneficial to both parties. Consistent with such observations, we assume that the landlord's protection and the tenant farmers' efforts complement one another so that the tenant farmers' effort e_A is multiplied by the landlord's protection level b to reduce risk in Equation (1).

The second reason is strategic. Provided that the insurance offered by the landlord maximizes the landlord's surplus and through that the total surplus, while assuming the CARA utility function of the agents, insurance by Equation (1) is straightforward. If the degree of protection increases with the degree of effort, as characterized by Equation (1), an increase in the insurance level accompanies an increase in the effort level. The landlord decides the optimal level of protection b to maximize their own surplus, where a balance exists between the insurance cost and the surplus increase due to an increase

in effort levels.

In summary, provided complementarity is assumed between the landlord's contribution and the tenant farmer's efforts to bear the risk and the tenant farmer's CARA utility function, specification by Equation (1) is theoretically reasonable. Therefore, whether the landlord's insurance characterized by Equation (1) can be justified depends on whether the characterization is consistent with real practices.

Regarding the period before the Meiji Restoration, Mandai and Nakabayashi (2017) and Mandai (2019) described a case in a suburban village of Osaka in the nineteenth century in which the landlord offered a more generous rent reduction to a tenant farmer who had higher performance to entice him to enter a relational contract (Mandai and Nakabayashi (2017) and Mandai (2019), pp. 377–444). For the period after the Meiji Restoration, Nishida (1972) showed that an increase in output due to an increase in cocoon production led to an increase in the landlord's revenue and to a greater rent reduction. Shimizu (1977) studied a case in which tenant farmers whose product quality was higher were offered more generous protections. Therefore, historically observed practices are that landlords offered greater protections to tenants whose $E[y_A]$ was higher. Characterization by Equation (1) is consistent with the common practices in the period concerned.

Another factor to be explained is the landlord's technology underlying the risk-bearing mechanism as characterized by Equation (1). As described in Subsections 2.3 and 2.4, risk-bearing by landlords took two forms. One was contingent rent reductions when harvests were poor. Since the government after the Meiji Restoration did not reduce the land tax when harvests were poor, contingent rent reductions implied a transfer of the weather risk from tenant farmers to landlords. The other was allowing for in-kind rent payments that shielded the peasant economy from the risk of the rice market, which

was quite volatile before the shift to the command economy in 1938 during the Sino-Japanese War (Ito, Maeda and Noda (2018)). Since landlords had to pay monetary land taxes to the government, in-kind rent payments implied a transfer of the entire market risk from tenant farmers to landlords.

The technology enabling such measures originated from two sources. One was the ownership of larger acreage of farmland to compensate for random losses in one plot by random gains in another. The other was the landlord's diversification in their investment portfolio. Figure 1 shows that the tenanted land ratio stabilized at approximately 45% in the 1900s. From the 1900s, following the stock market, the bond market also began to expand rapidly (Hoshi and Kashyap (2001), pp. 25–50). The growth in the securities market was accelerated by the Commercial Code of 1899, which improved the information disclosure of the financial status of joint stock companies. Moreover, the Income Tax Act of 1899 applied a lower tax rate to income and capital gains than to agricultural income. Indeed, from the 1900s, landlords rapidly increased their investment of rent revenue in securities, as case studies have documented (Nakamura (1979), 1–121; Nakamura (1985); and Hirota (1988)). Thus, the saturated expansion of landlordism from the 1900s indicated by Figure 1 reflects landlords' diversification of investment from the further acquisition of farmland to the modern sector. The diversified portfolio as well as the ownership of larger acreages provided landlords with the capacity to bear the weather and rice market risks to protect tenant farmers, as characterized by Equation (1).

The timing of the game is as follows. First, the employer of the modern sector sets an incentive intensity β and a fixed term α for wages. Second, the landlord sets a fixed rent γ and a protection level b . Third, the worker/tenant farmer decides whether to join the labor market in the modern sector as a worker or the agricultural sector as a tenant

farmer. If the payoff in the agricultural sector is weakly greater than that in the modern sector, they stay within the agricultural sector. That is, the payoff in the modern sector sets the participation constraint for the agricultural sector and the threshold for the decision of the worker/tenant farmer on whether to join the workforce or quit. Considering this situation and the incentive compatibility constraint, the landlord determines the optimal fixed rent γ and protection level b to maximize their own surplus and the total surplus of the landlord and the tenant farmer. The assumption concerning the arbitrage between the labor and tenancy markets conforms to Yamada's understanding of the interaction between the modern and agricultural sectors (Yamada (1977[1934]), p. 250).

The certainty equivalent for the worker in the modern sector is

$$\begin{aligned} CE_M &= E[w_M(e_M) - C(e_M)] - \lambda \frac{\text{Var}[w_M(e_M) - C(e_M)]}{2} \\ &= \beta e_M + \alpha - \frac{e_M^2}{2} - \lambda \frac{\beta^2 \sigma_M^2}{2}, \end{aligned} \tag{2}$$

where $\text{Var}[\cdot]$ denotes variance. The first-order condition of the incentive compatibility constraint, i.e., the worker's maximization problem with respect to effort level e_M yields $e_M = \beta$. Satisfying this incentive compatibility constraint leads to $CE_M = (1 - \lambda \sigma_M^2) e_M^2 / 2 + \alpha$. Since the employer's expected payoff is $E[y_M(e_M) - w_M(e_M)]$, the total surplus is $TS_M = E[y_M(e_M) - w_M(e_M)] + CE_M = e_M - (1 + \lambda \sigma_M^2) e_M^2 / 2$. The first-order condition to maximize the landlord's surplus with respect to e_M , which also maximizes the total surplus, yields the optimal effort and the optimal contract's incentive intensity in the modern sector, $e_M^* = \beta^* = 1 / (1 + \lambda \sigma_M^2)$. With this effort level, the worker's certainty equivalent in the modern sector is

$$CE_M^* = \frac{1 - \lambda \sigma_M^2}{2(1 + \lambda \sigma_M^2)^2} + \alpha. \tag{3}$$

The total surplus in the modern sector becomes

$$TS_M^* = \frac{1}{2(1 + \lambda\sigma_M^2)}. \quad (4)$$

Next, in the agricultural sector, the contract's incentive intensity for the tenant farmer is fixed at 1 under a fixed rent contract. Landlords bear the tenant farmer's risk under the scheme described by Equation (1). Thus, the certainty equivalent of the tenant farmer is

$$\begin{aligned} CE_A &= E[w_A(e_A) - C(e_A)] - \lambda \frac{\text{Var}[w_A(e_A) - C(e_A)]}{2} \\ &= -\frac{2 - \lambda b}{4} e_A^2 + e_A - \gamma - \lambda \frac{\sigma_M^2}{2}. \end{aligned} \quad (5)$$

The first-order condition of the tenant farmer, that is, the incentive compatibility constraint, to maximize the landlord's surplus and the total surplus, gives the optimal effort level in the agricultural sector,

$$e_A^* = \frac{2}{2 - \lambda b}. \quad (6)$$

Equation (6) implies that the effort level of the tenant farmer becomes nonpositive for $2/\lambda \leq b$. Thus, we reasonably assume that the landlord chooses protection level b^* such that

$$b < \frac{2}{\lambda}. \quad (7)$$

The certainty equivalent of the tenant farmer at effort level (6) is

$$CE_A = \frac{1}{2 - \lambda b} - \lambda \frac{\sigma_M^2}{2} - \gamma. \quad (8)$$

Arbitrage between the two markets imposes the tenant farmer's participation constraint on the landlord, $CE_A \geq CE_M^*$, which implies that

$$\frac{1}{2 - \lambda b} - \lambda \frac{\sigma_M^2}{2} - \left[\frac{1 - \lambda \sigma_M^2}{2(1 + \lambda \sigma_M^2)^2} + \alpha \right] \geq \gamma. \quad (9)$$

Thus, the optimal rent is

$$\gamma^* = \frac{1}{2 - \lambda b} - \frac{\lambda^2(2 + \lambda \sigma_M^2)\sigma_M^4 + 1}{2(1 + \lambda \sigma_M^2)^2} - \alpha, \quad (10)$$

which satisfies the participation constraint (9) by equality. The certainty equivalent of the tenant farmer under effort level (6) and rent (10) is

$$CE_A^* = \frac{1 - \lambda \sigma_M^2}{2(1 + \lambda \sigma_M^2)^2} + \alpha. \quad (11)$$

The surplus of the landlord under (1), (6), and (10) is

$$LS = \gamma^* - b \frac{(E[y_A(e_A^*)])^2}{2} = \frac{2 - \lambda b - 2b}{(2 - \lambda b)^2} - \frac{\lambda^2(2 + \lambda \sigma_M^2)\sigma_M^4 + 1}{2(1 + \lambda \sigma_M^2)^2} - \alpha. \quad (12)$$

Given (11) and (12), the total surplus is

$$TS_A = LS + CE_A^* = \frac{2 - \lambda b - 2b}{(2 - \lambda b)^2} - \frac{\lambda \sigma_M^2 [\lambda(2 + \lambda \sigma_M^2)\sigma_M^2 + 1]}{2(1 + \lambda \sigma_M^2)^2}. \quad (13)$$

The first-order condition of the total surplus with respect to the protection level b and that with respect to the landlord's surplus are equivalent to yield

$$b^* = \frac{2(\lambda - 2)}{\lambda(\lambda + 2)}. \quad (14)$$

$\partial^2 TS_A / \partial b^2 < 0$ under condition (7) so that b^* satisfies the second-order condition. We do not consider the situation in which the landlord increases instead of reduces the risk burden on the tenant farmer under the risk-bearing technology (1). Thus, we assume that $\lambda \geq 2$, which, with condition (7), implies $b^* < 1$. Under the protection level (14), the optimal effort level of the tenant farmer by (6) increases with the degree of the tenant's risk aversion λ such that

$$e_A^* = \frac{2 + \lambda}{4}. \quad (15)$$

Given the complementary efforts of landlords and tenant farmers to reduce the risk burden of the paternalistic environment (1), a more risk-averse tenant farmer makes a greater effort.

The optimal risk-bearing level (14) with the optimal effort level of the tenant farmer (6) and optimal rent (10) deliver the maximized surplus of the landlord,

$$LS^* = \frac{\lambda(\lambda + 2)^2}{16\lambda^2} - \frac{\lambda^2(2 + \lambda\sigma_M^2)\sigma_M^4 + 1}{2(1 + \lambda\sigma_M^2)^2} - \alpha, \quad (16)$$

and the maximized total surplus of the landlord and tenant farmer,

$$TS_A^* = \frac{\lambda(\lambda + 2)^2}{16\lambda^2} - \frac{\lambda\sigma_M^2[\lambda(2 + \lambda\sigma_M^2)\sigma_M^2 + 1]}{2(1 + \lambda\sigma_M^2)^2}. \quad (17)$$

3.2 Analysis

From (4) and (17), we define social welfare as

$$SW = TS_M^* + TS_A^* = \frac{1 - \lambda^2(2 + \lambda\sigma_M^2)\sigma_M^4}{2(1 + \lambda\sigma_M^2)^2} + \frac{\lambda(\lambda + 2)^2}{16\lambda^2}. \quad (18)$$

Proposition 1. *Social welfare decreases with risk in the modern sector.*

Proof.

$$\frac{\partial SW}{\partial \sigma_M^2} = -\lambda \frac{(\lambda \sigma_M^2 + 1)^2 + 1}{2(\lambda \sigma_M^2 + 1)^2} < 0.$$

□

That is, provided the worker/tenant farmer is risk-averse ($\lambda > 0$), an increase in risk in the modern sector always deteriorates social welfare. However, the landlord's payoff with regard to risk in the modern sector is nonmonotonic.

Proposition 2. *Assume that the worker/tenant farmer is risk-averse, i.e., $\lambda > 0$. Then, the landlord's surplus LS is quasiconcave with respect to risk in the modern sector, σ_M^2 . There is a risk threshold in the modern sector, σ_M^{2*} , such that optimal rent γ^* and LS increases with σ_M^2 until σ_M^{2*} but decreases with σ_M^2 beyond σ_M^{2*} .*

Proof. From (10) and (16), the ranges of $\lambda \geq 0$ and $\sigma_M^2 \geq 0$ yield

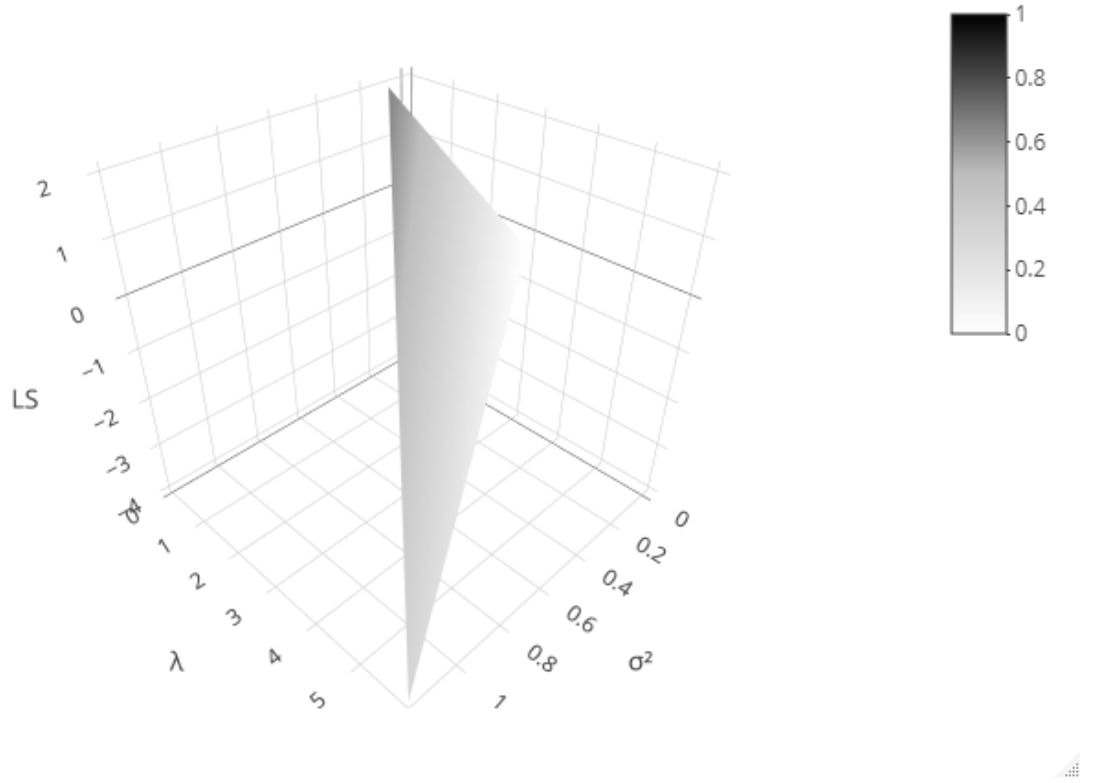
$$\begin{aligned} \frac{\partial LS^*}{\partial \sigma_M^2} &= \lambda \frac{2 - \lambda \sigma_M^2 (3\lambda^2 \sigma_M^4 + 3\lambda \sigma_M^2 + 4)}{2(\lambda \sigma_M^2 + 1)^3} \\ &\begin{cases} > 0 & \text{if } \sigma_M^2 < \left[\left(\frac{109}{27\lambda^6} \right)^{\frac{1}{2}} + \frac{2}{\lambda^3} \right]^{\frac{1}{3}} - \frac{1}{3\lambda^2 \left[\left(\frac{109}{27\lambda^6} \right)^{\frac{1}{2}} + \frac{2}{\lambda^3} \right]^{\frac{1}{3}}} - \frac{1}{\lambda}, \\ \leq & \text{otherwise.} \end{cases} \end{aligned} \quad (19)$$

The righthand side of the inequality in the first case of (19) is positive for any $\lambda > 0$. □

Figure 2 presents a plane of the landlord's surplus when $\alpha = 0.1$ and $3 < \lambda < 6$. The rationale for the quasiconcavity result is straightforward. The trade-off is between the exploitation of the tenant farmer's risk aversion, which led the tenant farmer to accept higher rents in return for risk reduction, and the compensation of the risk premium to

be transferred to the tenant farmer when the latter faces the risk. If $\sigma_M^2 \leq \sigma_M^{2*}$, the former effect dominates. If $\sigma_M^2 > \sigma_M^{2*}$, the latter effect dominates.

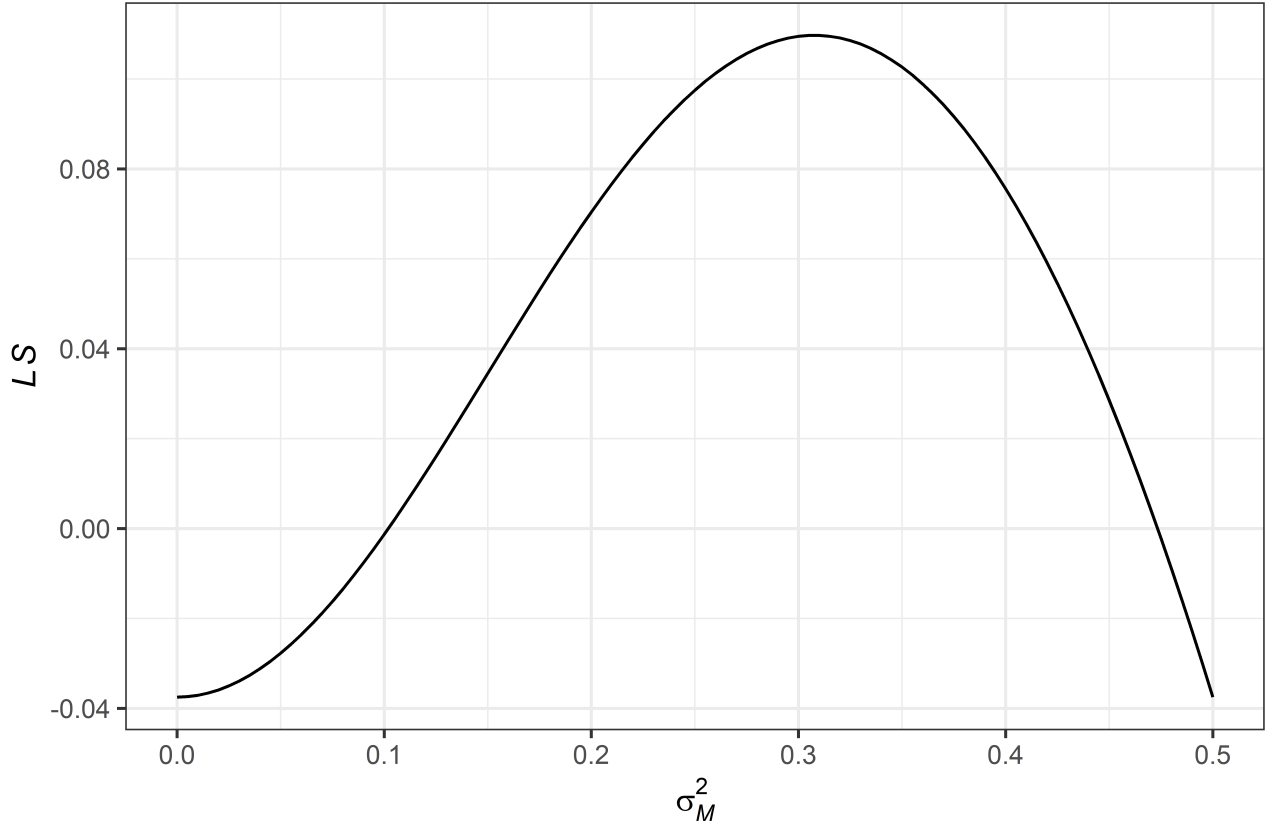
Figure 2: Landlord's surplus LS .



Notes: A case in which $\alpha = 0.1$ and $3 < \lambda < 6$.

LS falls into the negative territory beyond a certain threshold of tenant's risk aversion λ and risk of the modern sector σ_M^2 . For better visibility, Figure 3 fixes λ at 4 and shows that LS increases until a certain level of σ_M^2 but subsequently falls into the negative territory.

Figure 3: Landlord's surplus LS .



Notes: A case in which $\alpha = 0.1$ and $\lambda = 4$.

If risk in the modern sector is limited relative to the degree of the worker's/tenant farmer's risk aversion, the landlord can increase rents and increase their surplus when the risk in the modern sector increases. A riskier modern sector makes the landlord's protection of the tenant farmer more profitable to the landlord. However, if the modern sector becomes more volatile beyond the limit, the relationship collapses.

In addition, I investigate the effects of a possible change in the degree of risk aversion λ under acute pressure (Čahlíková and Cingl (2017) and Hanaoka et al. (2018)) on the

optimal protection level b^* .

Proposition 3. *Assume that the worker/tenant farmer is risk-averse, i.e., $\lambda > 0$. Then, the optimal protection level b^* is quasiconcave with respect to the absolute risk aversion coefficient of the tenant farmer, λ . λ has a threshold λ^* such that the optimal protection level, b^* , increases with λ until λ^* but decreases with λ beyond λ^* .*

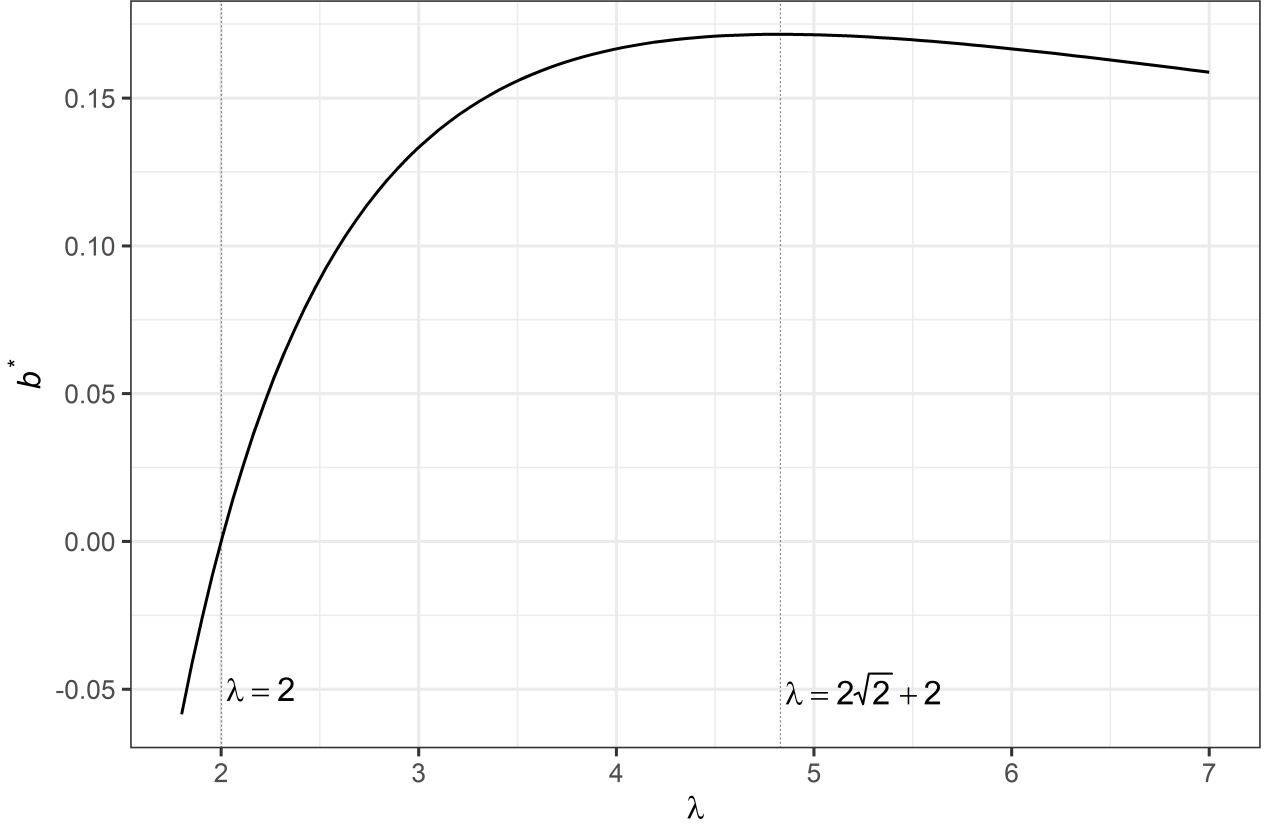
Proof. From (14), we have,

$$\frac{\partial b^*}{\partial \lambda} = -\frac{2(\lambda^2 - 4\lambda - 4)}{\lambda^2(\lambda + 2)^2} \begin{cases} > 0 & \text{if } \lambda < 2\sqrt{2} + 2 \\ \leq 0 & \text{otherwise.} \end{cases} \quad (20)$$

□

Figure 4 shows the landlord's optimal paternalistic protection level trajectory, b^* , over the degree of the tenant farmer's risk aversion, λ . The quasiconcavity result of b^* with respect to λ is caused by the trade-off between the exploitation of and compensation for risk aversion. Below the threshold, the former effect dominates, but it reverses beyond the threshold.

Figure 4: Optimal paternalistic risk-bearing level of the landlord, b^* .



The incentive compatibility constraint (6) implies that an increase in the protection level b increases the effort level of the tenant farmer. If the absolute risk aversion coefficient λ is below $2\sqrt{2} + 2$, the increase in the effort level increases the landlord's surplus. However, if the tenant farmer becomes greatly risk-averse, such that $\lambda > 2\sqrt{2} + 2$, an increase in the compensation of the risk premium will more than offset the effect of an increase in the tenant's effort. That is, it is not optimal for the landlord to increase protection level b exactly when the tenant farmer is desperate, such as in the Great Depression, which implies the end of paternalism.

4 Discussion

Provided the risk from the modern sector and the risk aversion of tenant farmers are under the thresholds, the landlord's surplus increases with their risk-bearing degree. A riskier modern sector makes greater risk-bearing more profitable to the landlord under the threshold. Furthermore, when the tenant farmer is more risk-averse, greater risk-bearing by the landlord becomes more profitable to the landlord under the threshold. Landlords exploit the risky modern sector and risk aversion of tenant farmers.

Our analysis shows that the rapport between landlords and tenant farmers can collapse when the risk of the modern sector or the risk aversion of tenant farmers increases beyond a threshold. Japanese paternalism lost its economic relevance once the sudden increase in risk in the modern sector and vulnerability in the peasant economy exceeded the threshold analyzed during the Great Depression.

In response, tenant farmers supported the political alliance between the imperial army and state-socialists, who suppressed the interests of landlords and shareholders. The administration of the alliance, supported by poor farmers, invaded China in 1937 and the US in 1941, while beginning to build an extensive welfare state, with public healthcare granted from the National Health Insurance Act of 1938 and the Employee's Pension Insurance Act of 1941. Meanwhile, the Rent Controlling Ordinance of 1939 based on the National General Mobilization Act of 1938 capped rent. Thus, along with the controlled rice price, the state took responsibility from landlords for security for tenant farmers, essentially marking the end of landlordism in modern Japan (Kawagoe (1999[1993])).

The subsequent developments in Japan and Germany proved correct the concern of Hayek (2007[1944]) and Hayek (1960) in terms of the focus given to security discussed

in section 1. The collapse of these countries' endogenous vertical security forced people to support militarist states. Furthermore, even when they lost the Second World War, Japan and Germany drastically extended their welfare states. In Japan, universal public health insurance was created as one of the most egalitarian policies in the world through the National Health Insurance Act of 1958 (Kondo and Shigeoka (2013)). The universal public pension plan was completed by the National Pension of 1959. Japan's welfare state replaced its informal security (Nakabayashi (2019)).

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