The Role of the Merchant Coalition in Pre-modern Japanese Economic Development: An Historical Institutional Analysis*

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Abstract

This paper examines the role of the merchant coalition (*kabu nakama*) in the eighteenth and the first half of the nineteenth century in Japan, from the standpoint of Historical Institutional Analysis (Greif[1997, 1998]). Quantitative economic history literature has made clear that market-based economic growth started around the end of the eighteenth century in Japan. On the other hand, the *Bakufu*, the central government, repeatedly promulgated *Aitai Sumeshi Rei* (Mutual Settlement Decree), prescribing that the public authorities would not accept suits on pecuniary affairs. This implies that the public system for third-party enforcement was not working well.

Activities of the merchant coalition substituted for the public third-party enforcement. Many of the merchant coalitions' codes wrote that all of each coalition's members should suspend transaction with those who cheated any one of the members of the coalition. This was the multilateral punishment strategy (MPS), formulated by Greif[1993]. It is hypothesized that *kabu nakama* played the role of contract enforcement using the MPS, which reduced incentives for the transaction counterparts to cheat, and thereby promoted a market economy.

Also, this paper empirically examines this hypothesis, using an opportunity of a natural experiment. In 1841, the *Bakufu* prohibited the coalition, intending to eliminate monopoly. The above hypothesis implies that prohibition of the coalition lowered the performance of the market economy. As predicted, we found that the growth rate of the real money supply contracted, that the efficiency of price arbitrage declined, and that inflation rate went up.

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Introduction

In this paper we reexamine the role of *kabu nakama*, a coalition of merchants or artisans, in Japanese economic development in the eighteenth and the first half of the nineteenth century (hereafter, the Edo Era). We have three clusters of the literature relating to the theme. The first one is the methodological literature on the institutional analysis of economic history. North and Thomas[1973] and North[1990, 1991] stressed the role of institutions, especially the public institutions for protecting property rights, as a prerequisite for modern economic development. Based on this view, and collaborating with the economists developing the Institutional Analysis (Aoki[1998, 2001]; Hayami and Aoki eds.[1998]), Greif[1989, 1993, 1997, 2002] substantially expanded the scope of the institutional analysis of economic history. He developed the methodology of Historical Institutional Analysis (HIA), which analyzes the mechanism for private institutions to be self-enforcing, using a game-theoretic framework.

The second cluster is the literature on the Japanese economic development in the Edo Era. This literature has made clear that the Edo society was based on a developed market economy. The quantitative economic history literature since the 1970s has provided rich evidences on the development of a market economy (Crawcour and Yamamura[1970]; Duffy and Yamamura[1971]; Crawcour[1974]; Smith[1973]; Sinbo[1978]; Okura and Shinbo[1978]; Hanley[1983]; Yasuba[1987]; Sinbo and Saito[1989]; Ito[1993]; Wakita[1996]). Meanwhile, Iwahashi[1988] examined the institutional basis of the economic development in the Edo Era, using North's framework. He stressed that institutions supporting the economic development existed in the Edo Era, including the stable political regime, the land tax system providing peasants with production incentives, the unified weights and measures, and the regulation dividing the people into classes of peasants, merchants and artisans.

Contribution of Iwahashi[1988], which focused on the institutional aspect of the premodern Japanese economic development, cannot be exaggerated, but on the other hand, Iwahashi [1988] does not pay attention to the third party enforcement of contracts by the public authorities, which is an essential point of the North's framework. As we discuss in Section 2, the public system for contract enforcement had a serious flaw in Edo Era. The coexistence of the stable economic development and week public contract enforcement in the Edo Era is a puzzle, given North's framework. We intend to resolve this puzzle.

The third cluster of the literature is that on *kabu nakama*. We suppose that *kabu nakama* is the key to resolve the puzzle. There is a classic book on *kabu nakama* by Mataji Miyamoto, in which he wrote that "the intermediate organizations, such as *kabu nakama*, could exist only on the condition that the state or the public authorities were not well developed", that "in pre-modern Japan, the statutory commercial law had not yet been legislated and the formal commercial rules did not exist", and that "the commercial customs of *kabu nakama* were the only standards for trade, and not only did

the *Bakufu's* court refer to the customs, but also each *kabu nakama* itself resolved commercial conflicts" (Miyamoto[1938], pp.151–152). It is remarkable that as early as in the 1930s, Miyamoto[1938] pointed out that private organizations played the role of contract enforcers in a society in which the public system of third party enforcement was incomplete[1].

In this paper, following Miyamoto[1938], we examine the contract enforcement function of *kabu nakama*, based on the framework of the Historical Institutional Analysis. We intend not only to present a new hypothesis on the function of *kabu nakama*, but also to test the hypothesis empirically. As stated later, the *Bakufu* prohibited and dissolved *kabu nakama* in 1842. This historical event can be regarded as a natural experiment for testing the role of *kabu nakama*. Using this opportunity, we examine the contract-enforcement hypothesis of *kabu nakama* with quantitative data, as well as with descriptive materials.

The paper is organized as follows. In Section 2, we provide an overview of the economic development and the legal system in Edo Era Japan, from which we derive the puzzle mentioned above. In Section 3, we examine the codes of *kabu nakama*, and present the contract enforcement hypothesis of *kabu nakama*. In Section 4, we test the hypothesis, focusing on the natural experiment after 1842. Section 5 concludes the paper.

2. Economic development and legal system in Edo Era: An overview

(1) Development of the market economy

Akashi[1989], one of the quantitative researches on Edo Era Japan, focused on the macro aspect of economic development. He measured the economic growth from 1725 to 1856, based on an original estimation of the real money supply, and found that while there was no trend in the real money supply until 1790, since then an upward trend emerged. The average annual growth rate of the real money supply was around 0.7% (Figure 1)[2]. He interpreted the growth of the real money supply as a measure of economic growth, assuming that the Marshallian k was constant over time. Although the assumption of a constant k is restrictive, if we accept it, the implications of this finding are remarkable[3].

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[1] Concerning the literature on the *kabu nakama* in the postwar period, see Imai[1989] and Iwabushi[1994]. In the 1960s and early 1970s, the researches on *kabu nakama* focused on its role as a part of the political regime in the Edo Era (Tsuda[1961]; Hayashi[1967]; Nakai[1971]). In recent years, many researches have focused on the *kabu nakama* as a social group composing the city community (Yoshida[1985]; Imai[1989]). On the other hand, we intend to shed new light on the economic aspects of the *kabu nakama*, which Miyamoto[1938] explored in the prewar period.

[2] Here money refers to the metal money issued by *Bakufu*.

[3] Commercialization and financial development would raise k . So, the real money supply is an index

First, it supports the view that the economic growth started before the Meiji Restoration, which has been proposed by other quantitative economic history researches. At the same time, it implies that the starting point of the growth was not around 1820 as is widely accepted, but around 1790 (Akashi[1989] pp.47–48)[4]. The fact that economic growth started around 1790 is significant for us, because it coincides with the so called Tanuma Period, when *Roju* (the head of the *Bakufu* bureaucracy) Okitsugu Tanuma implemented a policy promoting *kabu nakama*.

Besides the macro aspect, rich literature has made clear that the Edo society was a society with a developed market economy. It is well known that the commerce in Edo Era was based on credit (Shinbo[1957]pp.116-117; Miyamoto[1961] p.61; Fujita, Miyamoto and Hasegawa[1978] pp.112–113). Significance of the credit in trade can be illustrated by an example of Hasegawa, a major cotton wholesaler in Edo (Kitajima ed[1962] p.182). Hasegawa stocked cotton clothes from the buyers in several cotton weaving areas. For this purpose, Hasegawa sent money to the buyers in those areas in advance. In 1705, the credit given to the buyers was 22% of Hasegawa's total asset.

Iwahashi[1981] and Miyamoto[1988] examined the efficiency of the market mechanism, focusing on the price arbitrage between the local rice markets. Miyamoto[1988] calculated correlation coefficients of the growth rates of rice prices in five regions, namely Edo, Osaka, Nagoya, Hiroshima and Aizu, and found that the coefficients increased from 0.57 in the second half of the seventeenth century to 0.72 in the first half of the nineteenth century (Table 1). Miyamoto[1988] also calculated correlation coefficients using the data of twelve local rice markets[5]. In this case, while an upward trend of the coefficients was not observed, the coefficients were as large as around 0.7 in the eighteenth and the first half of the nineteenth century. These results imply that price arbitrage worked fairly well among the local rice markets.

On the other hand, Ito[1993] and Wakita[1996] tested the efficiency of the rice market using a more sophisticated methodology. As is well known, the Dojima Rice Exchange in Osaka was one of the earliest futures markets in the world (Duffie[1989]). The Dojima Rice Exchange was equipped with a system of cash settlement of rice futures as well as a membership system. Rice futures were traded during a certain period. Ito[1993] tested econometrically whether the futures price on the first day of the trading period was an unbiased estimator of the price on the last day of the period, as predicted by the efficient market hypothesis. Ito[1993] obtained a result that rejected the efficient

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which reflects wider aspects of economic development

[4] Quantitative economic history literature has supposed that the inflation in the 1820s and 1830s started the sustainable economic growth by reducing the real wage rate (Shimbo[1978]; Umemura[1981]; Miyamoto[1989]).

[5] Besides the above five regions, Banshu, Fukuchiyama, Bocho, Saga, Kumamoto, Shinshu and Dewa are included.

market hypothesis. Wakita[1996] retested the hypothesis, splitting the data by season, to have a result that the efficient market hypothesis could not be rejected for the spring and autumn markets.

(2) Legal system

Assuming a developed market economy in the Edo Era on one hand and North's framework on the other, we naturally expect that a public system for contract enforcement worked well. However, this was not the case. The legal system in the Edo Era has been investigated in the legal history literature (Ishii[1960]; Henderson [1965]; Takigawa[1985]; Maki and Fujiwara[1995]). As in the modern legal system, law suits were classified into the criminal affairs (*ginmi suji*) and the civil affairs (*deiri suji*), and their legal procedures were different between these two categories. Concerning a criminal affair, whether there was an accusation or not, the *Bakufu* authorities arrested the criminals and placed them before the court. On the other hand, with respect to a civil affair, the process of justice was initiated by a suit by the plaintiff (Fujiwara and Maki[1995] p.233). Hereafter, we focus mainly on civil affairs.

Civil affairs were further classified into three subcategories, namely *honkuji* (main suits) *kanekuji* (money suits) and *nakamagoto* (mutual affairs). *Kanekuji* was a suit concerning credit with interest and credit without collateral. *Nakamagoto* was a suit concerning distribution of profit within a private organization. *Honkuji* was a civil suit other than *kanekuji* and *nakamagoto*. It is remarkable that the above classification corresponded to the solidity of the protection of the plaintiffs' claims. The claims most rigidly protected by the *Bakufu* authorities were the claims concerning *honkuji*, while the other extreme was *nakamagoto*. Regarding *nakamagoto*, in principle, the *Bakufu* authorities did not accept a suit, on the grounds that it should be resolved within the organization. *Kanekuji* lay in between, and protection of the plaintiff's claims was relatively weak, compared with those concerning *honkuji* (Henderson[1965] pp.106-116; Maki and Fujiwara[1995] pp.241-242).

The weakness of the plaintiff's claims concerning *kanekuji* was reflected in *Aitai Sumashi Rei*, (Mutual Settlement Decree), prescribing that the *Bakufu* authorities would not accept *kanekuji* suits. In Edo City, *Aitai Sumashi Rei* were promulgated in 1622, 1661, 1663, 1682, 1685, 1702, 1719, 1746, 1789, 1797 and 1842, which means that those decrees were not exceptional. Those decrees, except that in 1719, applied to all claims before the promulgation of the decree. The decree of 1719 applied to future claims as well, until it was repealed in 1729 (Henderson[1965] p.107). *Aitai Sumashi Rei* did not deny the claim itself, but it is remarkable that the Bakufu *authorities* from time to time suspended enforcement of contracts. North's framework cannot consistently explain this fact and the highly developed market economy based on credit. As mentioned in Section 1, we suppose that the key to resolving this puzzle is *kabu nakama*.

3. Organization and function of *kabu nakama*

K*abu nakama* is defined as "a group composed of members who have *kabu*." *Kabu* means a business license granted by the public authorities. That license and therefore the organization of *kabu nakama* was regional, for example in Edo or in Osaka. In many cases, the grant of *kabu* was based on application by a group of merchants or artisans. Usually *kabu* was embodied in a wooden card, and was an object of inheritance, loan, pawn and trade. If a member of *kabu nakama* intended to sell his *kabu*, he should have approvals of all of the other members. Each *kabu nakama* had a members' meeting (*yoriai*) as an organization for decision making, and a manager (*gyoji*) as its executive (Miyamoto[1938] chapter 2, 3). Numbers of the members were different from nakama to nakama, but we can infer the approximate scale by the following data. Higaki Kaisen Tsumi Ton'ya Nakama was a league of major *kabu nakama* in Edo. In 1813 it was composed of 63 *kabu nakama*. The members of those *nakama* distributed from 1 to 113, and the average was 30.7[6].

Kabu nakama emerged in the seventeenth century. In the early seventeenth century, the *Bakufu* prohibited the private collusion of merchants and artisans, following the policy prohibiting coalitions (*za*) by Hideyoshi Toyotomi, who unified the nation for the first time after the *Muromachi Bakufu* lost power in the late fifteenth century. However, its policy started to change in the middle of the seventeenth century. As a part of the *Kyoho* Reform in the early eighteenth century, the *Bakufu* adopted a policy promoting *kabu nakama* for the purpose of controlling prices and distribution. Moreover, as mentioned in Section 2, during the Tanuma Period in the 1770s and the 1780s, the *Bakufu* promoted *kabu nakama* still more actively to collect taxes, as well as to expand commerce (Duffy and Yamamura[1971] p.397; Inoue et al.[1988] p.823).

Miyamoto[1938] classified the functions of *kabu nakama* into four categories, namely, monopoly, protection of interest, coordination, and maintenance of reputation. Included in the categories of protection of interest and maintenance of reputation is the function of contract enforcement on which we focus here. For example, "The Code of Salt Wholesale Merchants" (1741) prescribed that "If a broker cheats one of the members of the *kabu nakama* concerning the salt price, all of the *nakama* members should promise to suspend trade with the broker who cheated."

Interestingly enough, the mode of conduct prescribed in the Code was essentially the same as the multilateral punishment strategy (MPS), which Greif[1993] formulated regarding the coalition of Maghribis traders in medieval Mediterranean society. As Greif[1993] showed, if the MPS was an equilibrium of the game, a cheating agent would lose future profit from trade not only with the cheated merchant himself but also with all of the other members of the coalition. Therefore, the agent would choose to be honest rather than to cheat for a single gain.

The cases in which *kabu nakama* adopted the MPS regarding commercial trade were not

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[6] Calculated from Table 43 of Hayashi[1967](p.43). One *kabu nakama* whose number of members is not available is excluded from the average.

limited to the example of the salt merchants mentioned above. A systematic survey of *kabu nakama* is not available, but Miyamoto[1938] cited many codes of *kabu nakama*. Among those codes, we can find eleven cases prescribing the MPS concerning commercial trade. Each of them prescribes that all the *nakama* members should suspend commercial trade with the counterpart who cheated one of the *nakama* members. As a cheating to be punished, nine of the eleven codes concerned non-payment of the price of the commodities which were sold and delivered in advance. This reflects the fact that the credit was widely used in market transactions. Besides non-payment of the price, non-payment of commission, non-delivery of the commodity and the provision of a poor quality commodity were regarded as cheating.

Kabu nakama applied this strategy not only to commodity trade, but also to organizing production, namely to managing the putting-out system. The putting-out system has been supposed to play a major role in the weaving industry in Edo Era Japan[7]. On the other hand, Landes [1969] examined the putting out system in the textile industry from a comparative institutional standpoint, and pointed out that embezzlement of yarns was its inherent problem[8]. The relationship between a weaver and subcontractors can be regarded as a typical agency relationship with asymmetric information, and the weaver was always faced with the possibility of embezzlement by the subcontractors. Therefore, without a certain mechanism for overcoming this problem, the putting out system would not work. We suppose that in Edo Era Japan the mechanism was provided by *kabu nakama*.

Let us look at the case of the silk weaving industry in Kiryu, where production was mainly organized by the putting out system. The silk weaving industry in Kiryu was started in the early eighteenth century. It is remarkable that *kabu nakama* began to be organized almost at the same time,

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[7] The role of the putting out system in the cotton weaving industry in Edo Era Japan is reflected in the vicissitudes of the local production places. Abe[1988] found important insights by compiling the information in the local histories and the histories of local industrial associations. First, in many areas, production of weavings to sell started after the latter half of the eighteenth century, and the Tanuma Period was the most important epoch in the development of the cotton weaving industry. Second, the new production areas that emerged after the latter half of the eighteenth century developed faster than the older areas, and in many of those new areas the putting out system was used. These findings suggest that the putting out system brought about the development of the new production areas after the latter half of the eighteenth century. Moreover, the second finding is remarkable, because the Tanuma Period was the heyday of *kabu nakama* as mentioned above.

[8] Embezzling in the putting out system was observed also in early twentieth-century Japan. Abe[1989] reports that the subcontracting weavers cheated the entrusting weavers through the embezzling of yarn and default on obligations in the Osaka area (pp.203-204).

the Silk Broker *Nakama* in 1713, the Spreader *Nakama* in 1774 and the Weaver *Nakama* in 1797 (The Editorial Committee of the History of Kiryu Weavings[1935] pp.360–361). The Code of the Weaver *Nakama* in 1824 prescribed that "If a spinner or a subcontracting weaver returns products containing less yarns than the weaver supplied, the price of the yarns deficit should be subtracted from the payment to the spinner or the subcontracting weaver. If cheating occurs, the *nakama* member should report it to the *nakama* manager. In this case, all of the *nakama* members should not entrust yarns or weaving machines to the cheater."

The case of the Kiryu Weaver *Nakama* is remarkable in the following senses. First, the problem it aimed to resolve was the embezzlement of yarns, which Landes[1969] regarded as the inherent problem of the putting out system. Second, the Kiryu Weaver *Nakama* adopted the strategy that all of the members should suspend entrusting yarns and weaving machines to a subcontractor who cheated one of the *nakama* members. In other words, they applied the MPS to resolve the inherent problem of the putting-out system. A similar example concerning the putting out system is found in Osaka. The code of the Seven *Nakama* of Wool and Cotton prescribed that "The cloth dyeing should be entrusted to the members of a certain dyeing artisan *nakama*. If an artisan cheats one of our members, the Seven *Nakama* should agree not to entrust dyeing to the artisan, and this measure should be written down by each of our members."

Furthermore, *kabu nakama* adopted the MPS to cope with the cheating inside the firm. Some weavers in Kiryu directly employed workers in their workshops, besides subcontractors under the putting out system. With respect to these employees, the above mentioned Code in 1824 prescribed that "If a male employee, a female employee, or a temporary worker cheats one of the members, and it cannot be ignored, the cheated member should report it to the *nakama* manager. We should write the cheater's name on the black list, and never employ him or her."

Examples of the MPS concerning employment relationships are found also in the codes of the merchant *nakama.* The Code of the Rice and Exchange *Nakama* in 1751 prescribed that "If a member discharges a servant, a sales clerk or a shop boy because of cheating, he should announce it to the other members. The *nakama* members should not employ the cheater, even if the ex-employer has no objection to do so." Miyamoto[1938] interpreted that this prescription aimed to prevent from draining the confidential code, skill, knowledge and the ex-employer's relationships with customers. This interpretation is reflected in the fact that Miyamoto[1938] classified these cases in the category of coordination rather than protection of interest. It is true that concerning some *kabu nakama* his interpretation is correct, because they prescribed that the other members could employ the dismissed employee, if the ex-employer approved. However, in cases where re-employment was prohibited whether the ex-employer approved or not, like the Rice and Exchange *Nakama* mentioned above, the reason cannot be to avoid leakage of knowledge. It is more appropriately interpreted as the MPS. The MPS is clearly observed in the case of the Code of Domestic Raw Indigo Broker *Nakama*. It

prescribed that all the *nakama* members should not hire the ex-employee who cheated, but that if the employee was dismissed peacefully, the members could employ him after inquiries to the ex-employer. Those cases indicate that *kabu nakama* played the role of supporting the employment relationship through the MPS.

An important question is how pervasive the MPS was as a punishment strategy in *kabu nakama*. It is difficult to answer this question, because a comprehensive survey of *kabu nakama* codes is not available, but some conjecture is possible. In 1868, just after the Meiji Restoration, the new government dissolved *kabu nakama*. Ten years later, the Osaka Chamber of Commerce proposed to promote commercial and industrial associations, in order to resolve commercial disorder after the Restoration. For this purpose, the Osaka Chamber of Commerce made a model code of associations in 1882. In the model code, the MPS for a cheating employee was included (Miyamoto[1976] pp.815-824). It suggests that the MPS was widely accepted as a governance mechanism at least of the employment relation.

Also, it is important to check whether the MPS was an equilibrium under the actual conditions in Edo Era Japan. Greif[1993] showed that the MPS is a subgame-perfect equilibrium under certain conditions, using an efficiency wage model. One of the conditions is that the probability that an unemployed honest agent will be rehired is not lower than the probability that an unemployed cheater will be rehired. If this condition holds, under the setting of Greif[1993], the optimal wage, namely the wage for which it is an agent's best response to play honest, is lower for an unemployed honest agent than an unemployed cheater, and hence the members who were not cheated will not hire the cheater. The difference of the optimal wages between an honest agent and a cheater is larger, if the difference of the probability of rehire between the two types of agents are larger, if the probability of an exogenous discharge is lower, if the outside option of an agent is lower, and if the discount factor is larger.

Referring to the Greif model, first we can point out that with respect to *kabu nakama*, the number of the players of the game were limited. As mentioned above, the average number of *kabu nakama* members were around 30. Also, the numbers of the transaction counterparts were limited, because they were brokers, employees and subcontractors, and not mass consumers. This condition made it easy to monitor the counterparts and identify cheaters. Second, there were information transmission mechanisms for delivering the information on cheating to all the members of the *nakama*. Many of the *nakama* codes include clauses concerning this issue. The *kabu nakama* members shared the information on cheating by circulating a letter (Indigo Brokers), by registration (Firewood Wholesale Merchants, Wool and Cotton Brokers, Bowl, Basket and Turnery Artisans), and by publication (Firewood Wholesale Merchant). In many cases, the *nakama* managers (*gyoji*) played the role of mediators of information transmission (Wool and Cotton Brokers, Bowl, Basket and Turnery Artisans, Indigo Brokers). These two conditions, arguably, contributed to lower the probability that a

cheater would be rehired.

Third, an honest counterpart could expect to continue transaction for a long time. Concerning this point, we can refer to Hayashi[1967], which examined the stocking of Kashiwaya, a major cotton wholesaler in Edo, in detail. In the middle of the seventeenth century, Kashiwaya expanded the areas to stock cotton clothes. Meanwhile, the number of the transaction counterparts, buyers of cotton clothes, increased. Since the 1770s and the 1780s, the number of the transaction counterparts of Kashiwaya became stable around 25. The membership of them was also stable, and Kashiwaya continued to stock from them until the end of Edo Era (p.121).

Finally, the outside options of the transaction counterparts were low, because *kabu nakama* had the privilege to monopolize a certain business in a certain area. Because a cheater could hardly find counterparts of trade other than *nakama* members due to the privilege, they should have expected substantial loss of future profit from the MPS. In this sense, it is worth stressing that the contract enforcement function of *kabu nakama*, on which we focus in this paper, was related to the monopoly function, which has been focused by a lot of historical literature including Miyamoto[1938], Tsuda[1961] and Hayashi[1967].

It is a separate issue for the MPS to be an equiliblium and to be selected among possible equilibria. Why the MPS was selected as an equilibrium in Edo Era Japan, as in the society of Maghribis traders (Greif[1994]) ? To address this question, we should take into account of historical path dependence. As mentioned above, the origin of *kabu nakama* is *za* in Medieval Japan. *Za* was a group of merchants and artisans, which was affiliated to a powerful aristocrat, temple or shrine (Miyamoto[1938] p.3-9; Wakita[1969]p.253). Arguably, the experience of *za* gave a collectivist focal point. Also, *kabu nakama* inherited a religious element from *za*. In many cases, members of each *kabu nakama* believed a common religion and they cooperated for the religious festivals, which strengthened the tie of *kabu nakama* (Miyamoto[1938] p.106).

4. Empirical examination of the function of *kabu nakama*: The Tempo Reform as a natural experiment

The *Bakufu*, which promoted *kabu nakama* in the eighteenth century, changed its policy in the 1840s. In the early nineteenth century, the *Bakufu*, whose major revenue source was a tax paid in terms of rice, came to be in financial difficulties, mainly because of the stagnation in the price of rice and the rise of other commodities' prices. The *Roju* Tadakuni Mizuno started the Tenpo Reform in 1841 to resolve this problem. As a part of the Reform, the *Bakufu* prohibited *kabu nakama*, because it regarded *kabu nakama* as a major cause of the inflation (Duffy and Yamamura[1971] p.399; Fujita[1989] pp.146–147). To put it concretely, the *Bakufu* not only abolished *kabu* (business license), but it also punished those who made collusion like *kabu nakama* (Koda[1928]pp.360-368). However, the prohibition was subsequently withdrawn in 1851 by the reason explained below (Miyamoto[1938]

pp.337–343)[9].

We can test the function of *kabu nakama* by comparing the economy in the period from 1842 to 1851, when *kabu nakama* was prohibited, with the economy before that period. From the hypothesis presented in the previous section that the *kabu nakama* played the role of enforcing contract, we have the implication that the prohibition of *kabu nakama* would cause disorder and contraction of trade. By confronting this implication with the actual data, we can test the above hypothesis.

Miyamoto[1938] wrote that as a result of the *kabu nakama* prohibition, production decreased, the distribution system went into disorder, and a credit crunch occurred. The evidence he relied on was a memorandum of the governor of Edo (Edo *Machi Bugy*o) Kagemoto Toyama in 1848. In the memorandum, Toyama wrote that while the *kabu* was abolished, credit became difficult to obtain, prices did not fall, and the people became still more distressed (p.330). In the Edo Era, most of the wholesale transaction was based on credit as mentioned above, and *kabu nakama* governed the transaction with credit (Miyamoto[1938] pp.195-201). That is why credit crunch occurred after the prohibition[10].

Also, the governor of Osaka (Osaka *Machi Bugyo*) Masayuki Abe wrote "Since *kabu nakama* was prohibited and the people have become able to trade every commodity freely, trade has become disorganized, prices have been unstable, and monitoring has become difficult. Consequently, commodities have become unevenly distributed, local provinces are faced with inconvenience as to everyday goods, and it is possible to influence on the distribution to Edo" (Kawaura[1959] p.130–131). The withdrawal of the prohibition of *kabu nakama* in 1851 was the result of the *Bakufu's* accepting these opinions.

In 1856, after the withdrawal of the prohibition, the *Bakufu* made bureaucrats (*Shoshiki Gakari Myoshu*)[11] investigate the influence of the prohibition, and found that the distribution system was substantially malfunctioning during the prohibition period (Honjo[1931]). In addition, Honjo[1931] cited the following petition of the authority in charge of weavers and weaving in Nishijin, the center of

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[9] However, this measure did not completely restore the regime before 1841 in the following respects. First, the *Bakufu* did not issue the wooden card that certified the business privilege (*kabu fuda*), and did not collect tax (*myogakin*) from *kabu nakama*. Second, the *Bakufu* instructed *kabu nakama* to approve new memberships on request, and not to restrict their membership without an obvious reason (Miyamoto[1938] pp.324-338).

[10] Another reason of credit crunch relating to *kabu nakama* was, kabu was used as a collateral for credit (Miyamoto[1938] p.318).

[11] The Monitors of the Commodity Prices were appointed from the city managers (*myoshu*) by the *Bakufu* in 1843 (Koda[1928] p.373).

traditional silk weaving in Kyoto (pp.47–48):

> Nishijin weavings have been the most famous specialty of this region. However, in recent years, not only weavers but also people engaged in the distribution of yarns have been beset by difficulties. Consequently, the traditional discipline has waned, and some weavers sell scamped products, which has influenced on the weavers who keep the traditional discipline. The undisciplined weavers might scamp important weavings including those for *Bakufu* use. In particular, weavers who entered the industry after the prohibition of *kabu nakama* and do not have serious intentions learn dishonest manipulation, which will damage the reputation of the specialty of Nishijin.

This document indicates that the prohibition of *kabu nakama* damaged the governance of transactions in the Nishijin area, and, together with the materials above, supports our hypothesis.

Although a straightforward test is difficult, we can examine the hypothesis by some quantitative data. Figure 2 shows the sales of the Edo branch of *Echigoya*, a kimono shop managed by Mitsui Family. The sales declined sharply in 1842, just after the prohibition of *kabu nakama*, and stagnated at a low level after that. It is apparent that a structural change took place between 1841 and 1842. However, the sales by a certain enterprise might reflect influences specific to it, and especially in this case there might be a bias that *Echigoya* had enjoyed the privilege of being a member of a *kabu nakama*. In order to avoid these problems, it is desirable to test the hypothesis using sectoral or macro data.

For this purpose, we first focus on the real money supply data, referred to in Figure 1. Here, as a deflator, we use the average of the price indices in Edo and Osaka, explained below. Figure 3 shows the growth rate of real money supply and the famine index of Akashi[1989]. Akashi[1989] constructed this index, which classifies the agricultural harvest of each year into five categories, from "famine" (4) to "good harvest" (0), based on Mukoyama[1917] and Society Section of Education Department, Tokyo Prefecture[1975]. The index was 4 in 1836 and 1837, which are well known for the serious *Tempo* Famine. In a society like Edo Japan that depends heavily upon agriculture, supply shocks due to natural conditions might cause substantial influence on the economy. We use the famine index in order to control those supply shocks.

While the average growth rates of the real money supply in the period when *kabu nakama* was prohibited (1842–1850) was -0.28%, in the nine-year period just before the prohibition (1833–1841), it grew at the rate of -0.40% per year on average. Although the growth rate of real money supply was almost the same, but the period before the prohibition includes the two famine years whose famine index was 4. On the other hand, the period before the prohibition included no famine years.

We check this result more formally by regressing the growth rate of real money supply on a

dummy variable, which equals to 1 if *kabu nakama* was prohibited in the year, and 0 otherwise (*PROHIB*), a dummy variable which equals to 1 if the famine index was 4 in the year, and 0 otherwise (*FAMINE*□), a time trend (*TIME*), and a constant. The expected sign of the two dummy variables are negative. Table 2 shows the result of an ordinary least squares regression. Observation years are from 1831 to 1852, just before General Perry came to Japan. The coefficients of *PROHIB* and *FAMINE*□ are negative and statistically significant at 5% level. In addition, the absolute value of the coefficient of *PROHIB* is 0.0718, which means that the growth rate of the real money supply was 7.18% lower in the period when *kabu nakama* was prohibited than in the other period. Instead of the famine dummy, we can use famine index directly (*FAMINE*□). While significance level is slightly lower than 10% (p-value=0.117), the sign of *FAMINE*□ is negative and its absolute value is substantial. Also, in case we exclude time trend ,which is not significant, the coefficient of *Famine*□ becomes significant at 10% level.

The decline of economic performance in the period of *kabu nakama* prohibition is confirmed from another standpoint. As stated in Section 2, correlations of the prices in different regional markets have been used to measure the development of the market economy of the Edo Era. On the other hand, the *kabu nakama*, arguably supported market transactions, especially transactions based on credit, using the MPS. Shinbo and Hasegawa[1988] pointed out that *kabu nakama* of merchants trading soy sauce from other regions was established in Kyoto in 1780, which formed a distribution system for the soy sauce from the other regions and brought about soy sauce production in Tatsuno (pp.262-263). This is an example indicating that *kabu nakama* contributed to form a distribution network. If *kabu nakama* supported the distribution network, we expect that the correlations of the prices in different regional market would decline in the period of *kabu nakama* prohibition. Focusing on the price correlations is also useful to discriminate between the contract-enforcement function and the conventional monopoly hypothesis.

Concerning the price correlations, Shinbo[1982] pointed out that the trend of the relative price in Osaka, compared with the price in Edo, substantially changed around 1840 (p.11), although he did not focus on the role of *kabu nakama*. While Shinbo[1982] used the price index of a five years moving average, it is appropriate to use the original series for the purpose of this paper. So we compile a new price index by the same method using the original sources on which Shinbo[1982] relied, namely Kin'yu Kenkyukai ed.[1937], Mitsui Bunko ed.[1952], and Miyamoto ed.[1963]. The commodities included are unpolished rice, polished rice, barley, soybeans, raw cotton, wax, muscovado, bean paste, soy sauce, and sake. The weight is 0.30 for unpolished rice and 0.07 for the other items. Figure 4 denotes the price indices in Edo and Osaka[12]. It is observed that while they were very closely

[12] Due to the data availability, Shinbo[1982] substituted the prices concerning bean paste, soy sauce, sake and polished rice in Kyoto for those in Osaka, and converted them into prices in terms of gold

correlated until the early 1840s, the correlation subsequently declined. The correlation coefficient was 0.961 in the period from 1833 to 1841, while it was 0.788 in the period from 1842 to 1850.

Focusing on the rice price, we can perform a similar test for many areas including Edo and Osaka. Iwahashi[1981] compiled time series of the rice prices for Osaka, Omi, Banshu, Fukuchiyama, Hiroshima, Bocho, Saga, Kumamoto, Edo, Nagoya, Shinshu, Aizu and Dewa. The series from Osaka to Kumamoto are in terms of silver, while the others are in terms of gold. We converted the series in terms of silver into ones in terms of gold, using the gold price in Osaka available in Shinbo[1978] (p.173).

Table 3 is the correlation matrix of those series for the periods 1833–1841 and 1842–1850. The averages of the correlation coefficients of those two periods were 0.824 and 0.487 respectively. Comparing each coefficient with its counterpart in the other period, we find that in 70 out of 78 cases, the coefficients decreased in 1842–1850. Concerning 11, 18 and 15 cases out of 70 cases in which the coefficients decreased, the differences are statistically significant at 1%, 5% and 10% levels respectively[13]. It is certain that the price arbitrage function of the market declined in the period of *kabu nakama* prohibition[14].

A more direct approach to discriminate the contract enforcement hypothesis from the monopoly hypothesis is to focus on the inflation rate. Not to speak of, the latter predicts that the inflation rate would decline, while the former predict that the inflation rate would rise. We regressed inflation rate on growth rate of money (*MONEY*), *PROHIB* and *FAMINE*□. Inflation rates are calculated from the price indices in Edo and Osaka explained above. The observation years are from 1831 to 1852. In case we use the average inflation rate in Edo and Osaka, the coefficient of *PROHIB* is positive and significant at 10% level, which is consistent with the contract enforcement hypothesis and not consistent with monopoly hypothesis. In case we use the inflation rate in Edo, that coefficient is positive and significant at 5% level. On the other hand, in the case of Osaka inflation rate, that coefficient is positive but not significant. These results reflect the difference of the two major cities. While Edo was characterized as a center of consumption, Osaka was a center of distribution (Takeuchi[1969] pp.128-129; Shinbo and Hasegawa[1988] pp.230-231). Therefore, while in Edo the disorder of distribution mainly resulted in decline of supply from other areas, in Osaka the disorder of distribution brought about decline of supply to other areas as well as decline of supply from other

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using the gold price in Kyoto, which is available in Miyamoto[1981]. We followed Shinbo[1982].

[13] After doing Z transformation to the correlation coefficients, we assume normal distribution.

[14] Miyamoto[1988] calculated the variation coefficients using the cross section data of rice prices in the same thirteen regions to find that the coefficients increased after the 1830s. He interpreted this as suggesting a structural change in the nation wide network of the rice markets. Although he did not mention *kabu nakama*, this finding is consistent with our hypothesis.

areas.

Finally, one might wonder that the decline of the economic performance in the period of prohibition was due to a "sabotage" by ex *kabu nakama* merchants to resist the policy of the *Bakufu*. There is no descriptive evidence to support this interpretation. Also, this hypothesis is not consistent with the real wage data. Saito[1998] shows the real wage of day workers in Edo, construction workers in Edo, carpenters in Edo, carpenters in Kyoto and Osaka, and soy sauce brewery workers in Choshi (pp.182-190). We regressed these real wages from 1830 to 1852 on *PROHIB* to find that the with respect to real wage of construction workers in Edo, carpenters in Kyoto and Osaka, and brewery workers in Choshi, the coefficients of *PROHIB* are positive and significant (Table5). While this result is a direct implication of the efficiency wage model of Greif[1993], "sabotage" hypothesis cannot explain it.

In this section we have examined the performance of the Japanese economy in the period of *kabu nakama* prohibition, using quantitative data as well as descriptive materials. All of the results indicate that the performance of the economy and market mechanism declined in the period of *kabu nakama* prohibition, compared with the period before it. It is true that *kabu nakama* had a monopoly function as the preceding literature has argued, but those results support our hypothesis that *kabu nakama* played the role of contract enforcement[15]. Also, from Table 2 and Table 4, we can see which effect outweighed, the positive one (contract enforcement) or the negative one (monopoly). The contract enforcement hypothesis predicts that prohibition of *kabu nakama* would result in rise of inflation rate and decline of growth rate, while the monopoly hypothesis predicts that it would result in decline of inflation rate and rise of growth rate. As Table 2 and Table 4 indicate, after the ban in 1841, inflation rate rose and growth rate declined, which implies that the positive effect of *kabu nakama* was larger than its negative or monopolistic effect.

5.Concluding remarks

Economic growth started around 1790, before the Meiji Restoration, in Japan. At the same time, *Aitai Sumashi Rei*, promulgated repeatedly, implies that public third party enforcement of contracts did not work well. In this sense, the pre-modern Japanese economic development provides a significant counter-example to the view that a public system of third party contract enforcement is a prerequisite for economic development.

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[15] To compare the economic performances of the periods before and after *kabu nakama* was established is another important strategy for testing our hypothesis. The facts that the sustainable growth of real money supply started around the Tanuma Period (Section 2), and that the putting-out system and the merchandise production began in many cotton-weaving places at about the same time (Section 3) are consistent with our hypothesis.

Kabu nakama, a coalition of merchants or artisans, played the role of contract enforcement, substituting for the public authority. In other words, the role of *kabu nakama* was significant, because a public system of contract enforcement did not work well. Many of the codes of *kabu nakama* included articles prescribing that all of the *nakama* members should suspend trade with a person who has cheated one of their own. It implies that *kabu nakam*a in Edo Era Japan adopted the Multilateral Punishment Strategy (MPS), which Greif[1993] formulated concerning the coalition of Maghribis traders in medieval Mediterranean society. As Greif[1993] addressed, the MPS of Maghribis traders reduced the incentive for the trade counterpart to cheat, and through it enabled expansion of trade under the condition that third party enforcement by the public authority was insufficient. *Kabu nakama* in Edo Era Japan adopted the MPS not only for ordinary commercial transactions, but also for the putting out system and employment, and thereby, it contributed to organizing production as well as to expanding commerce.

In Edo Era Japan, there were conditions which made the MPS by *kabu nakama* to be an equilibrium. The number of the players of the game were limited. Not only the average number of *nakama* was around 30, their transaction counterparts were limited number of brokers, employees and subcontractors, which enabled *nakama* members to monitor the counterparts and identify cheaters. Also, *kabu nakama* had information transmission mechanisms for delivering the information among the members. These conditions contributed to lower the probability that a cheater would be rehired. On the other hand, an honest counterpart could expect to continue transaction for a long time. Finally, the outside options of the transaction counterparts were low, because *kabu nakama* had the privilege to monopolize a certain business in a certain area, and a cheater could hardly find counterparts of trade other than *nakama* members due to the privilege.

We empirically examined the hypothesis that *kabu nakama* had a function of contract enforcement, using an opportunity of a natural experiment provided by the prohibition of *kabu nakama* in the Tenpo Reform. We have historical documents which indicate that the distribution system was disordered and the quality of production was in decay during the *kabu nakama* prohibition. Also, quantitative data support the contract enforcement hypothesis. First, growth rate of the real money supply declined in the period of *kabu nakama* prohibition. Second, the price arbitrage function of the market declined in the period. Third, inflation rate was higher in that period. Finally, some real wages were also higher. These results support the contract enforcement hypothesis on the function of *kabu nakama*.

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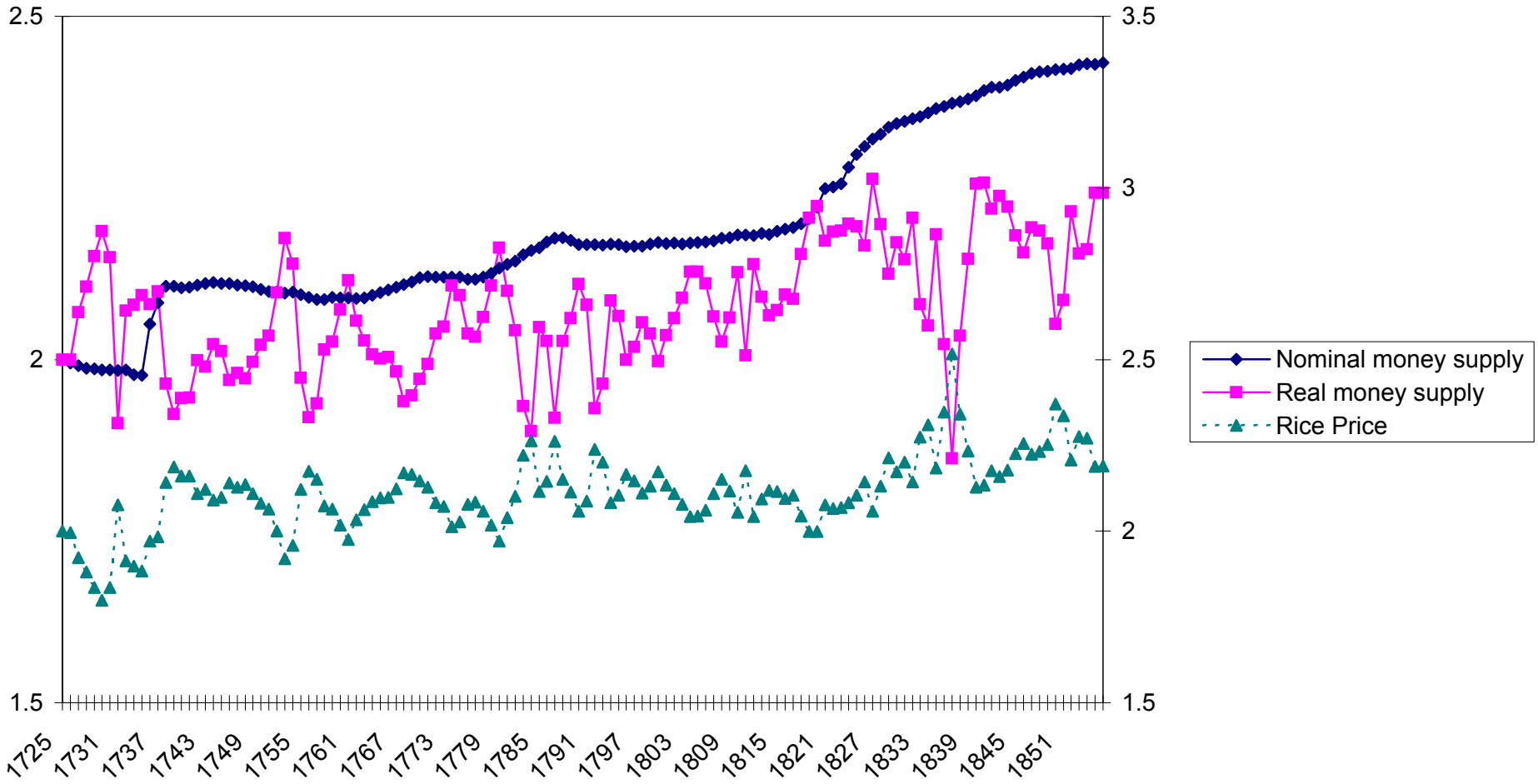
Figure1

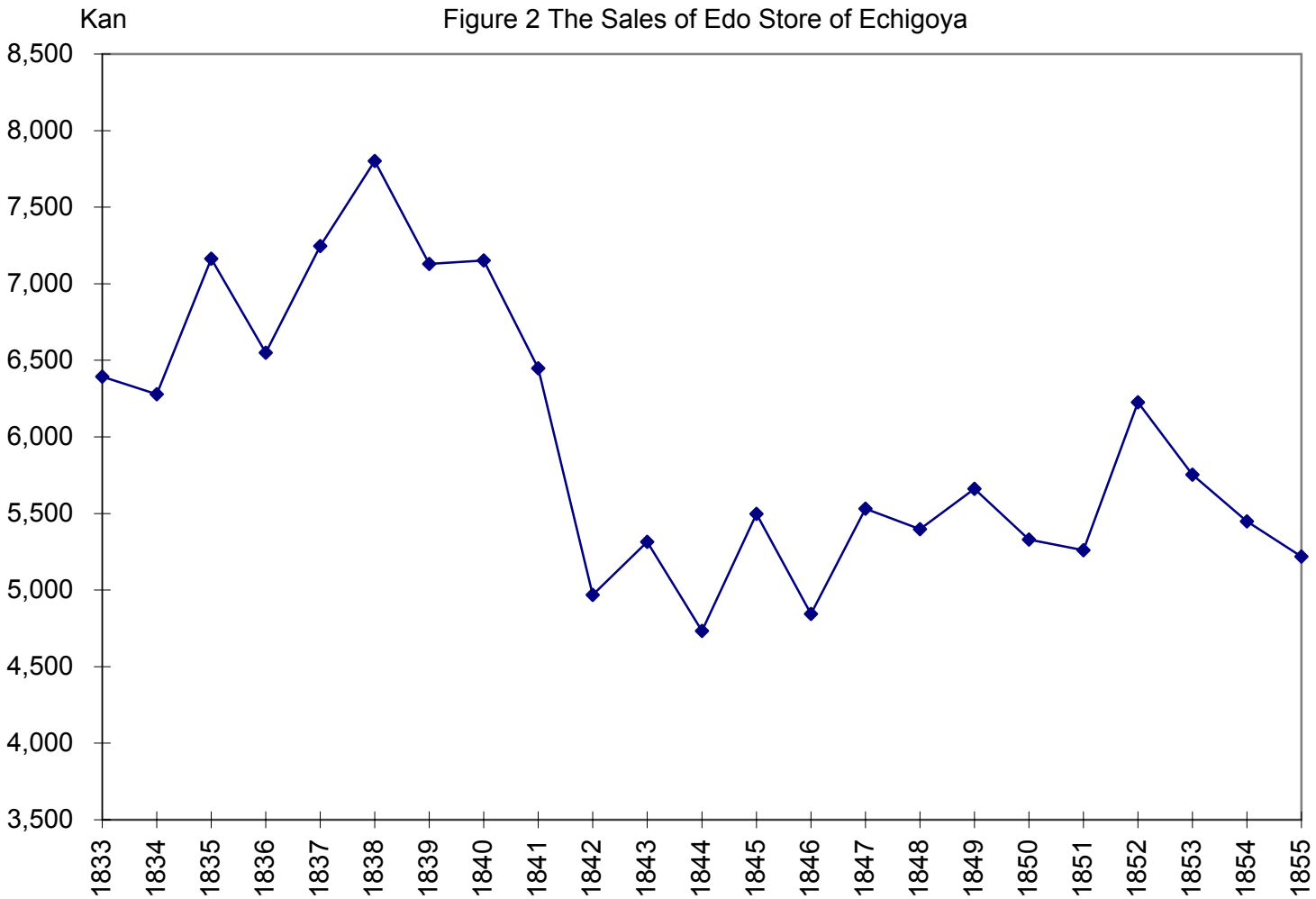
Figure 1 Macro-economy of Japan in 18th and 19th Century



Source: Akashi[1989].

Note: Each series is a logarthm of the index 1725 base.

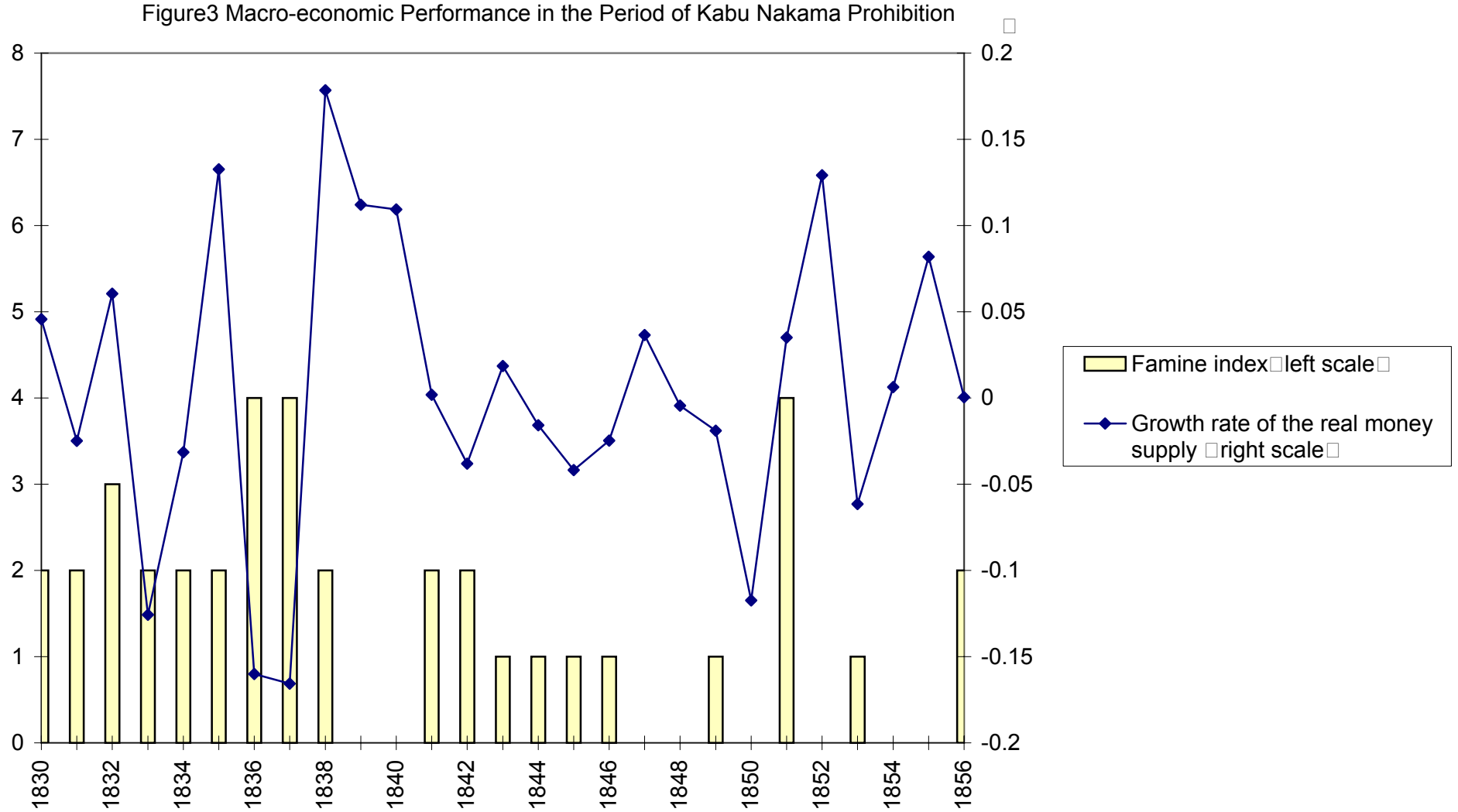
Figure2



Source:The accounting books of Echigoya (Mokuroku Ginmi Yori) of various years, possesed by the Mitsui

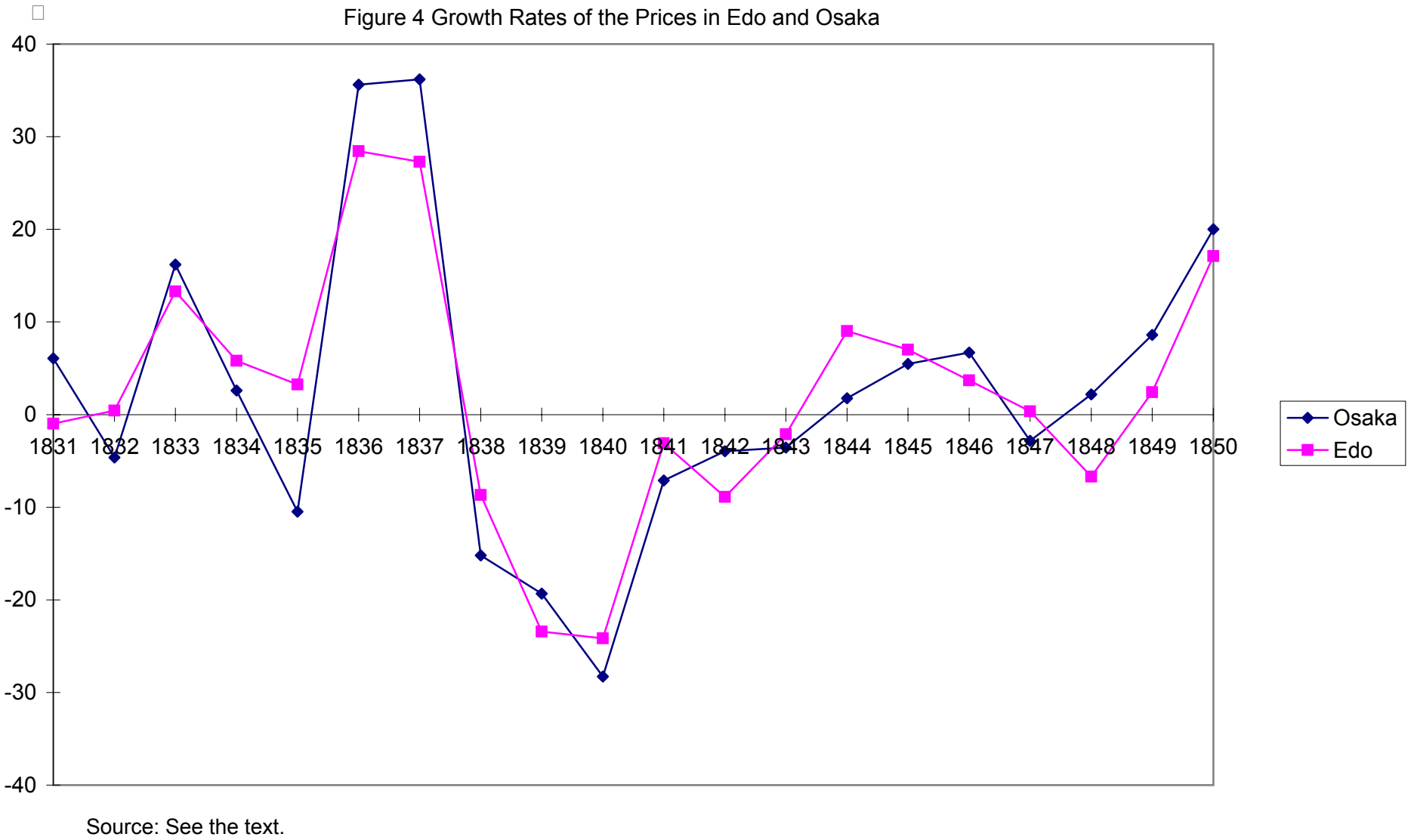
Note: We owe the data to Takayuki Kagawa and Kurato Kumon.

Figure3



Source: Akashi[1989].

Figure4



Source: See the text.

Table 1 Correlation coefficients of the growth rates of the rice prices across regions

	5 regions	12 regions
1651-1700	0.566	-
1701-1750	0.606	0.715
1751-1800	0.641	0.664
1801-1850	0.720	0.684

Source: Miyamoto[1988] p.398.
Note: See the text.

Table 2 Influence of the Prohibition of Kabu Nakama on Economic Growth

Constant	0.0009	0.0634	0.0656
	(0.0429)	(1.866)	(2.747)
TIME	0.0042	0.0002	
	(2.176)	(0.094)	
PROHIB	-0.0718	-0.0457	-0.0445
	(-2.738)	(-1.644)	(-1.856)
FAMINE I	-0.1309		
	(-4.206)		
FAMINE II		-0.0302	-0.0304
		(-3.088)	(-3.327)
adR2	0.435	0.267	0.305
N	22	22	22

Note: See the text.
t-values in parentheses.

Table 3-A Correlation Matrix of the Growth Rates of the Regional Rice Prices 1833-1841

	Osaka	Omi	Banshu	Fukuchiyar	Hiroshima	Bocho	Saga	Kumamoto	Edo	Nagoya	Shinshu	Aizu	Dewa	Average
Osaka	1.000													0.892
Omi	0.969	1.000												0.853
Banshu	0.937	0.909	1.000											0.877
Fukuchiyama	0.974	0.962	0.979	1.000										0.893
Hiroshima	0.976	0.964	0.956	0.973	1.000									0.894
Bocho	0.969	0.910	0.941	0.966	0.951	1.000								0.888
Saga	0.937	0.895	0.977	0.975	0.944	0.952	1.000							0.873
Kumamoto	0.821	0.776	0.911	0.889	0.876	0.875	0.903	1.000						0.815
Edo	0.892	0.940	0.864	0.916	0.886	0.819	0.830	0.777	1.000					0.797
Nagoya	0.992	0.972	0.912	0.961	0.955	0.941	0.909	0.790	0.924	1.000				0.874
Shinshu	0.341	0.123	0.356	0.280	0.336	0.418	0.379	0.481	0.108	0.302	1.000			0.325
Aozu	0.947	0.889	0.900	0.915	0.962	0.951	0.885	0.860	0.811	0.918	0.511	1.000		0.874
Dewa	0.943	0.928	0.879	0.929	0.952	0.960	0.888	0.824	0.800	0.909	0.268	0.941	1.000	0.852
Average														0.824

Note: See the text.

Table 3-B Correlation Matrix of the Growth Rates of the Regional Rice Prices 1842-1850

	Osaka	Omi	Banshu	Fukuchiyar	Hiroshima	Bocho	Saga	Kumamoto	Edo	Nagoya	Shinshu	Aizu	Dewa	Average
Osaka	1.000													0.642
Omi	0.867	1.000												0.572
Banshu	0.893	0.888	1.000											0.676
Fukuchiyama	0.829	0.807	0.939	1.000										0.659
Hiroshima	0.458	0.259	0.450	0.663	1.000									0.400
Bocho	0.851	0.819	0.924	0.971	0.631	1.000								0.667
Saga	0.603	0.633	0.789	0.912	0.736	0.921	1.000							0.569
Kumamoto	0.702	0.695	0.779	0.832	0.765	0.847	0.874	1.000						0.582
Edo	0.086	-0.212	0.037	-0.014	0.144	-0.044	-0.069	-0.092	1.000					0.001
Nagoya	0.481	0.284	0.274	0.216	0.281	0.316	0.189	0.310	0.646	1.000				0.237
Shinshu	0.624	0.691	0.634	0.430	-0.095	0.532	0.316	0.442	-0.379	0.041	1.000			0.373
Aozu	0.649	0.616	0.763	0.605	0.149	0.567	0.400	0.449	-0.088	-0.100	0.750	1.000		0.468
Dewa	0.656	0.518	0.735	0.719	0.359	0.673	0.524	0.385	-0.003	-0.090	0.494	0.852	1.000	0.485
Average														0.487

Note: See the text.

Table 4 Influence of the Prohibition of Kabu Nakama on Inflation Rates

	Average of Edo and Osaka	Edo	Osaka
Constant	-0.1294	-0.1530	-0.1070
	(-1.879)	(-2.036)	(-1.542)
MONEY	-1.9670	-3.0540	-0.9640
	(-0.361)	(-0.514)	(-0.176)
PROHIB	0.1059	0.1339	0.0794
	(1.872)	(2.167)	(1.396)
FAMINE II	0.0709	0.0819	0.0605
	(3.296)	(3.485)	(2.799)
adR2	0.277	0.188	0.314
N	22	22	22

Note: See the text.
t-values in parentheses.

Table 5 Influence of the Prohibition of Kabu Nakama on Real Wages

	Edo			Choshi	Kyoto and Osaka
	Day worker	Construction worker	Carpenter	Brewery worker	Carpenter
Constant	91.454	91.138	96.177	83.238	78.131
	(21.200)	(20.443)	(19.009)	(20.899)	(40.975)
PROHIB	3.516	12.252	5.593	11.472	21.694
	(0.537)	(1.812)	(0.729)	(1.899)	(7.502)
adR2	-0.033	0.094	-0.0218	0.106	0.715
N	23	23	23	23	23

Note: See the text.
t-values in parentheses.