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An Historical Institutional Analysis

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

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Abstract

This paper analyzes the role of the merchant coalition (*kabu nakama*) in Japan in the eighteenth and the first half of the nineteenth century, from the standpoint of Historical Institutional Analysis (Greif[1997]). The quantitative economic history literature has made clear that sustainable economic growth based on a market economy started in Japan at the end of the eighteenth century. On the other hand, from time to time the central government (*Bakufu*) legislated ordinances prescribing that suits on pecuniary matters would not be accepted (*Aitai Sumeshi Rei*). The implication is that the public system for third-party contract enforcement was not working well.

The activities of merchant coalitions substituted for public third-party enforcement in premodern Japan. Many of the merchant coalitions' codes prescribed 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 multiple punishment strategy (MPS), as formulated by Greif[1993]. The MPS of the merchant coalition reduced incentives for the players in the market to cheat, which in turn promoted development of a market economy. It is remarkable that the Japanese merchant coalition applied the MPS not only to ordinary commodity trade, but also to the putting-out system and employment.

We empirically tested the above hypothesis about the function of the coalition. In 1841, the *Bakufu* prohibited the coalition, intending to eliminate any monopoly. This event can be regarded as a natural experiment, suitable for an investigation into the role of the coalition. The above hypothesis implies that prohibition of the coalition lowered the performance of the market economy. This implication was examined using data on the money supply and commodity prices. As predicted by the hypothesis, we found that the growth rate of the real money supply contracted and that the efficiency of price arbitrage declined.

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Introduction

In this paper we re-examine the role of the merchant coalition (*kabu nakama*) in Japanese economic development in the eighteenth and the first half of the nineteenth century (hereafter, the Edo Era). There are three strands in the literature on this topic. 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 the institution, especially the public institution for protecting property rights, as a basis for modern economic development. Based on this, and collaborating withthe following economists developing the Comparative Institutional Analysis (Aoki[1998], and Hayami and Aoki eds.[1998]), Greif[1989, 1993, 1997] substantially expanded the perspectives of the institutional analysis of economic history. He developed the methodology of Historical Institutional Analysis (HIA), which analyzes the mechanism of the emergence of private institutions, using a game-theoretic framework.

The second theme is the literature on Japanese economic development in the Edo Era, which has been produced since the prewar period. This literature has made clear that the Edo society was based on a developed market economy. The research concerning quantitative economic history, especially since the 1970s, has provided new quantitative evidence of the development of a market economy (Sinbo[1978]; Sinbo and Saito[1989]; Ito[1993]; Wakita[1996]). Meanwhile, Iwahashi[1988] examined the institutional basis of economic development in the Edo Era, using North's framework. He stressed that institutions supporting economic development existed in the Edo Era, including a stable political regime, a land tax system providing peasants with production incentives, unified weights and measures, regulation dividing the people into classes of peasants, merchants and artisans, and so on.

The contribution of Iwahashi[1988], which focused on the institutional aspect of the premodern Japanese economy, should be stressed. However, it lacks a feature that is essential in North's framework. Namely, Iwahashi[1988] does not pay attention to third party enforcement of contracts by the public authorities. As we discuss in Section 2, the public system for contract enforcement had a serious flaw in the Edo Era. The coexistence of high economic development and a fragile public system of contract enforcement in the Edo Era presents a puzzle in North's framework. The main purpose of this paper is to resolve this puzzle.

The third theme is the literature on *kabu nakama*. We suppose that *kabu nakama* is the key to resolving the puzzle. There is a classic book on *kabu nakama* by Mataji Miyamoto in which he writes 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 premodern Japan, statutory commercial law had not yet been legislated and 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 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].

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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, research focused on the *kabu nakama* as a part of the political regime in the Edo Era (Tsuda[1961]; Hayashi[1967]; Nakai[1971]). In recent years, research has focused on the *kabu nakama* as a social group composing the city (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]

In this paper, following Miyamoto[1938], we analyze the contract-enforcement function of *kabu nakama*, using the Historical Institutional Analysis framework. We intend not only to present a new theoretical hypothesis on the function of *kabu nakama*, but also to test the hypothesis empirically. A weakness of the HIA is the small amount of previous empirical research, because of the difficulty common to other applied fields of game theory[2]. In this respect, our research focusing on Edo Era Japan is significant. 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 test a theoretical hypothesis on the role of *kabu nakama* with the quantitative data, as well as with descriptive documents.

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 a theoretical hypothesis on the role of *kabu nakama*. In Section 4, we test the hypothesis of the previous section, utilizing 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

Among the quantitative research on Edo Era Japan, Akashi[1989] 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 stock until 1790, since that year an upward trend of 0.7% per year on average emerged (Figure 1). 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 implication of his finding is substantial.

First, it supports the view that sustainable economic development started before the Meiji Restoration, an issue that other quantitative economic history literature has addressed. At the same time, it implies that the starting point of the sustainable growth was not around 1820 as that literature has supposed, but around 1790 (Akashi[1989] pp.47–48)[3]. That economic growth started around 1790 is significant for us, because it coincided with the so-called Tanuma Period, during which Roju (the head of the *Bakufu* bureaucracy) Okitsugu Tanuma implemented a policy promoting *kabu nakama*.

Besides the macro aspect, much literature has made clear that the Edo society was a society with a mature market economy. For example, Nishikawa and Akimoto[1977] have estimated the "Tableaux" of the Choshu Clan in the western part of Japan in the 1840s, and made clear that the division of labor and the trade with other clans were highly developed. In addition, it is well known that the development of commerce was based on credit (Miyamoto[1961] p.61; Fujita, Miyamoto and Hasegawa[1978]

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explored in the prewar period.

[2] We pointed this out in the comment on the invited lecture by Avner Greif at the World Congress of the Econometric Society in 1995. The lecture has been published as Greif[1997].

[3] Many quantitative economic historians suppose 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]).

pp.112 –113).

On the other hand, Iwahashi[1981] and Miyamoto[1988] examined the efficacy 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 from twelve local rice markets [4]. In this case, while the upward trend is not observed, the coefficients are as large as about 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.

Furthermore, Ito[1993] and Wakita[1996] tested the efficiency of the rice market with 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 mechanism for settling accounts as well as a membership system. Rice futures were traded during a certain period. Ito[1993] tested econometrically whether the price on the first day of the trading period was an unbiased estimator of the last day's price, as predicted by the efficient market hypothesis. Ito[1993] obtained a result that refuted the efficient market hypothesis. On the other hand, Wakita[1996] retested the hypothesis, splitting the data by season, to yield the 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 and using North's framework, we naturally would expect the public system for contract enforcement to have worked well in the Edo Era. However, as discussed below, this was not the case.

The legal system in the Edo Era has been investigated in the legal history literature. The law system in the Edo Era was composed of *Bakufu* law, *ryoshu* (lord) law, and *jito* (local lord) law. These three categories of law applied to the area directly administrated by the *Bakufu*, the area administrated by *han* (clan), and the area administrated by *hatamoto* (vassals of the *Bakufu*), respectively. The lords were allowed to legislate their own laws, and therefore *ryoshu* laws differed from each other. However, *Bakufu* law basically provided a standard for *ryoshu* law (Ishii[1960] p.368; Kasai[1994] pp.137–141). The description below concerns *Bakufu* law.

In the Edo Era, jurisdiction and administration were not separated, and the administration agencies of the *Bakufu*, namely the *Jisha Bugyo* (the chief secretary in charge of temples and shrines), the *Machi Bugyo* (the chief secretary in charge of Edo and Osaka) and the *Kanjo Bugyo* (the chief secretary in charge of finance) carried out the functions of jurisdiction. The *Jisha Bugyo* controlled the jurisdiction concerning temples and shrines. The *Machi Bugyo* controlled the jurisdiction concerning Edo and Osaka, and the *Kanjo Bugyo* controlled the jurisdiction of the area under the *Bakufu*'s direct administration. As the jurisdictional agency of the higher level, there was the *Hyojosho*, composed of the three chief secretaries and the *Metsuke* (the assistant to the *Roju*). The *Hyojosho* took charge of important criminal affairs and civil affairs across the borders of the three *Bugyo* (Takigawa[1985] pp.156–159; Kasai[1994] pp.147–148).

As at present, criminal affairs (*ginmi suji*) and civil affairs (*deiri suji*) were distinct, and were conducted by different

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

procedures. Concerning criminal affairs, whether there was accusation or not, the *Bugyo* arrested the criminal and placed him / her before a court. On the other hand, for civil affairs, the process of justice was initiated by a suit of the plaintiff (Fujiwara and Maki[1995] p.233). Hereafter, we focus mainly on civil affairs.

Civil affairs were classified into three categories, namely *honkuji*, *kanekuji* and *nakamagoto*. *Kanekuji* were suits concerning credit with interest and credit without collateral. *Nakamagoto* were suits concerning the distribution of profit within private organizations. *Honkuji* were civil suits other than *kanekuji* and *nakamagoto*. It is remarkable that the above classification contributed to the solidity of the protection of the plaintiff. The most rigidly protected by the jurisdictional authorities was the right concerning *honkuji*, while the other extreme was *nakamagoto*. Regarding *nakamagoto*, in principle, the jurisdictional authorities did not accept suits, on the grounds that they should be resolved within the organization. *Kanekuji* lay in between, and protection of the plaintiff's right was relatively weak, compared with *honkuji* (Maki and Fujiwara[1995] pp.241–242; Kasai[1994] pp.161–163).

The weakness of the plaintiff's right concerning *kanekuji* was symbolized by *Aitai Sumashi Rei*, a temporary act prescribing that the jurisdictional authorities would not accept any *kanekuji* suits. In Edo City, *Aitai Sumashi Rei* was promulgated in 1661, 1663, 1682, 1685, 1702, 1719, 1746, 1789, 1797 and 1843 (Ishii[1960] p.532), which means that this act was by no means extraordinary. *Aitai Sumashi Rei* did not deny the credit itself, but it is remarkable that the jurisdictional authorities from time to time suspended enforcement of contracts in the Edo Era. North's framework cannot consistently explain this fact, nor 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*

A *kabu nakama* is defined as "a group composed of members who have *kabu*." *Kabu* means a business license granted by the public authorities. Usually a *kabu* was embodied in a wooden card, and was an object of inheritance, loan, pawn and trade. If a member intended to sell his *kabu*, it was necessary to have the approval of the other members. Each *kabu nakama* had a members' meeting (*yoriai*) as a decision-making organization, and a manager (*gyoji*) as its executive (Miyamoto[1938] chapter 3).

Kabu nakama emerged in the seventeenth century. In the early seventeenth century, the *Bakufu* prohibited the private collusion of merchants and artisans. However, its policy started to change in the middle of the century. As a part of the *Kyoho* Reform in the early eighteenth century, the *Bakufu* adopted a policy of 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 1780s, the *Bakufu* promoted *kabu nakama* still more actively to collect taxes, as well as to expand commerce (Inoue et al.[1988] p.823; Shinbo[1978] p.308).

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 in which we are interested 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 members should promise to suspend trade with the broker who has cheated."

Interestingly enough, the mode of conduct prescribed in the Code was essentially the same as the Multiple Punishment Strategy (MPS), which Greif[1993] formulated regarding the coalition of Maghribis traders in medieval Mediterranean society. If a *kabu nakama* took the MPS as prescribed in the Code, a cheating broker would lose future profit from trade not only with the cheated merchant himself but also with all of the other members of the *kabu nakama*. Therefore, the broker 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 limited to the example of the salt merchants mentioned above. Among the codes of *kabu nakama* that Miyamoto[1938] collected, we can find eleven cases prescribing the MPS concerning commercial trade, of which eight apply to wholesale merchant *nakama*, and four to a broker *nakama* (Table 2-A, B). Each of them prescribes that all the *nakama* members should suspend commercial trade with the offender who has cheated one of the *nakama* members. As for the punished member, nine of the eleven codes concerned non-payment or arrearage of price. Besides non-payment and arrearage of price, non-payment of commission (Case 2 of Table 2-A), non-delivery of the commodity (Case 3 of Table 2-A) and the provision of a poor quality commodity (Case 4 of Table 2-B) were regarded as cheating to be punished.

Kabu nakama played this role not only in ordinary commercial trade, but also in organizing production, namely in managing the putting-out system. The putting-out system has supposed to play the major role in the weaving industry in Edo Era Japan[5]. Landes[1969] focused on the putting-out system in the textile industry from a comparative institutional standpoint, and regarded the possibility of embezzling yarn as its inherent problem[6]. In other words, the relationship between the weaver and the subcontracting weaver can be regarded as a typical agency relationship with asymmetric information, and the weaver was always faced with the possibility of being embezzled by the subcontractor. Therefore, unless a certain mechanism for overcoming this possibility exists, the putting-out system cannot work. We suppose that in Edo Era Japan the mechanism was provided by *kabu nakama*.

As a case in which production was organized by the putting-out system, we focus on the silk weaving industry in Kiryu, which was in what is now the Gunma Prefecture. The silk weaving industry was started in Kiryu in the early eighteenth century. It is remarkable that *kabu nakama* began to be organized about the same time, 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 (Case 7 of Table 3) prescribed that "If a spinner or a subcontracting weaver returns products containing less yarn than the weaver supplied, the price of the yarn 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,

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[5] 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 a couple of important insights by compiling the information in the local histories and the histories of local industrial associations. First, in many places, production of weavings as merchandise 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 places that emerged after the latter half of the eighteenth century developed faster than the older places, and in many of those new places the putting-out system was used. These findings suggest that the putting-out system brought about the development of the new production places 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.

[6] 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).

all of the *nakama* members should not entrust yarn or weaving machines to the cheater."

The case of the Kiryu Weaver *Nakama* is remarkable in the followingways. First, the problem that it was intended to resolve was the embezzlement of yarn, namely thatwhich Landes[1969] called the problem inherent in the putting-out system. Second, the Kiryu Weaver *Nakama* adopted the strategy that all the members should suspend entrusting yarn and weaving machines to a subcontractor who cheated one of the *nakama* members. In other words, they used the MPS to resolve the inherent problem of the putting-out system.

A similar example concerning the putting-out system can be observed also in Osaka. The code of the Seven *Nakama* of Wool and Cotton (Case 5 of Table 3) 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 possibility of cheating inside the firm. For example, the weavers in Kiryu directly employed workers, besides sub-contractors, under the putting-out system. Concerning those employees, the above-mentioned Code of 1824 prescribed that "If male and female employees as well as temporary workers cheat one of the members, and it cannot beignored, the cheated member should report it to the *nakama* manager. We should write the cheaters' names on the black list, and never employ them." (Case 6 of Table 3)

Examples of the MPS concerning employment relationships can be found also in the codes of the merchant *nakama.* The Code of the Rice and Exchange *Nakama* in 1751 (Case1 of Table 3) prescribed that "If a member discharges servants, sales clerks or shop boys because of their cheating, he should announce it to the other members. The *nakama* members should not employ the cheaters, even if the ex-employer has no objection to their doing so."

Miyamoto[1938] interpreted this prescriptionas being intendedto prevent drain of the code, of skills and knowledge, and of the ex-employer's relationships with his/her 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 employees 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 the wish to avoid leakage of knowledge. It is more appropriately interpreted as the MPS.

The MPS is clearly observed inthe case of the Code of Domestic Raw Indigo Broker *Nakama* (Case 4 of Table 3). 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.

In general, a couple of conditions are neededfor the MPS to work well, or, more technically, to be an equilibrium of a game. One is the information transmission mechanism 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 (Case 8 of Table 3), by registration (Case 6 of Table 2-A, Case 5 and 7 of Table 3), and by publication (Case 5 of Table 2-A). In many cases, the *nakama* managers (*gyoji*) played the role of mediators of information transmission (Case 3 of Table 2-B, Case 7 and 8 of Table 3).

Second, if the cheater expected to earn substantial profit from the trade with merchants other than the *nakama* members, the MPS is not an equilibrium. Concerning this condition, the privilege of monopolizing a certain business in a specific area was significant for the *kabu nakama* in Edo Era Japan. Because the cheater could find few partners for trade other than *nakama* members due to the privilege, they should have expected substantial loss of future profit from the MPS. It is worth stressing that the *kabu nakama*'s function of governing transactions, on which we focus in this paper, was not independent of its monopoly function.

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

The *Bakufu*, which promoted the *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 Nizuno 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 (Fujita[1989] pp.146–147). However, the prohibition was subsequently withdrawn in 1851 as explained below (Miyamoto[1938] pp.337–343)[7].

We can test the function of *kabu nakama* by comparing the economy in the period from 1842 to 1851, when *kabu nakama* were prohibited, with the economy before that period[8]. From the hypothesis presented in the previous section that the *kabu nakama* played the role of governing transactions, the implication that the prohibition of *kabu nakama* would cause disorder and contraction of trade can be drawn. By confronting this implication with the reality, 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 Edo *Machi Bugyo* Kagemoto Toyama from 1848. In the memorandum, Toyama wrote that while the *kabu* was abolished, it is said that credit became difficult to obtain, prices did not fall, and the people became still more distressed (p.330).

Moreover, Osaka *Machi Bugyo* Masayuki Abe wrote "Since *kabu nakama* were 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 of the bureaucrats.

In 1856, after the withdrawal of the prohibition, the *Bakufu* made *Shoshiki Gakari Myoshu* (the monitors of the commodity prices)[9] investigate the influence of the prohibition, and found that the distribution system was substantially malfunctioning

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[7] 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).

[8] It is more appropriate to compare with the period before the prohibition than with the period after the withdrawal of the prohibition, because, as mentioned in the previous footnote, the withdrawal did not completely restore the earlier conditions.

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

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 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 yarn have been beset by difficulties. Consequently, the traditional discipline has waned, and some weavers sell scamped products, which has an influence 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 above descriptive materials, supports our hypothesis.

We now try to test our hypothesis with quantitative data. Figure 2 denotes the sales of the Edo branch of *Echigoya*, a kimono shop managed by Mitsui. 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, 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 use the real money supply data, referred to in Figure 1. Figure 3 magnifies the data, focusing on the period from the 1830s to the 1850s. The bar diagram in the figure denotes 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 *Tenpo* Famine. In a society like Edo Japan that depends heavily upon agriculture, supply shocks due to natural conditions might cause substantial effects on the whole economy. We refer to the famine index in order to control those supply shocks.

The growth rates of the real money supply were negative in seven of the nine years in the period when *kabu nakama* was prohibited (1842–1850), and the average growth rate was -2.29% per year. On the other hand, in the nine-year period just before the prohibition (1833–1841), it grew at the rate of 0.571% per year on average. As expected, after the prohibition of *kabu nakama*, the growth rate of the money supply decreased. Furthermore, while the period before the prohibition includes the two famine years whose famine index was 4, the period of prohibition includes no famine years.

We check this result formally by regressing the growth rate of real money supply on a dummy variable, which is 1 if *kabu nakama* was prohibited in the year, and 0 otherwise (*PROHIB*), a dummy variable which is 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 is negative.

Table 4 shows the result of an ordinary least squares regression. The coefficient of *FAMINE* is negative and statistically significant at the 1% level. It should be stressed that the coefficient of *PROHIB* is negative and its p-value is 0.0676. If we omit *TIME*, which is not statistically significant in equation (1), the coefficient of *PROHIB* is statistically significant at the 5% level (equation (1)). In addition, the absolute value of the coefficient of *PROHIB* in equation (1) is 0.1414, which means that the growth

rate of the real money supply was 14.14% lower in the period when *kabu nakama* was prohibited than in the other period.

Next, we test the decline of economic performance in the period of *kabu nakama* prohibition 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. If the prohibition of *kabu nakama* damaged the market mechanism, the correlations of prices would be expected to have decreased. It is notable that Shinbo[1982] pointed out that the trend of the relative price in Osaka, compared with the price in Edo, changed substantially 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[10]. It can be observed that while they were very closely 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 rice, we can perform a similar test for many areas around Japan besides Edo and Osaka. Iwahashi[1981] compiled time series of 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 6 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 coefficient decreased in 1842–1850. It is certain that the price arbitrage function of the market declined in the period of *kabu nakama* prohibition[11].

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 methods. All of the methods and analyses indicate that the performance of the economy and market mechanism declined in the period of *kabu nakama* prohibition, compared with the period before it. Those results support our hypothesis that *kabu nakama* played the role of transaction governance[12].

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

[11] 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 1830's. 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.

[12] 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. Also, Shinbo and Hasegawa[1988] pointed out that *kabu nakama* of merchants trading

Concluding remarks

Sustainable growth in the market economy started somewhat prior to 1790, before the Meiji Restoration in Japan. At the same time, *Aitai Sumashi Rei*, promulgated repeatedly, implies that third party enforcement of contracts did not work well. In this sense, premodern Japanese economic development provides a significant counter-example to North's view that a public system of third party contract enforcement is a prerequisite for sustainable economic development.

Kabu nakama played the role of contract enforcement, substituting for a public authority. 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 nakama* in Edo Era Japan adopted the Multiple Punishment Strategy (MPS), which Greif[1993] formulated concerning the coalition of Maghribis merchants in medieval Mediterranean society. As Greif made clear, the MPS reduces the incentive for the trade partner to cheat, and through it enables expansion of trade under the condition that third party enforcement by the public authority is 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. In other words, the MPS of *kabu nakama* contributed to organizing production as well as to expanding commerce.

Kabu nakama provided conditions making the MPS effective, or more precisely, an equilibrium of a game. First, *kabu nakama* provided an internal information transmission mechanism. Information about the cheater was shared among the *nakama* members by means of registration in a document, circulation of a letter, or public announcement, with the manager of the *nakama* as a mediator. The second condition was the monopoly on business in a certain area. This monopoly reduced the expected value of the future profit of the cheater who was punished, which in turn made the MPS effective.

We tested the theoretical hypothesis that *kabu nakama* functioned as the institutional basis of a market economy, using the opportunity of a natural experiment that was provided by the prohibition of *kabu nakama* in the Tenpo Reform. First, some documents indicate that the distribution system was disordered and the quality of production was in decay during the *kabu nakama* prohibition. Second, the growth rate of the real money supply declined in this period of *kabu nakama* prohibition, and the decline was statistically significant. Third, the price arbitrage function of the market declined in the same period. These results support the above hypothesis about the transaction governance function of *kabu nakama*.

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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).

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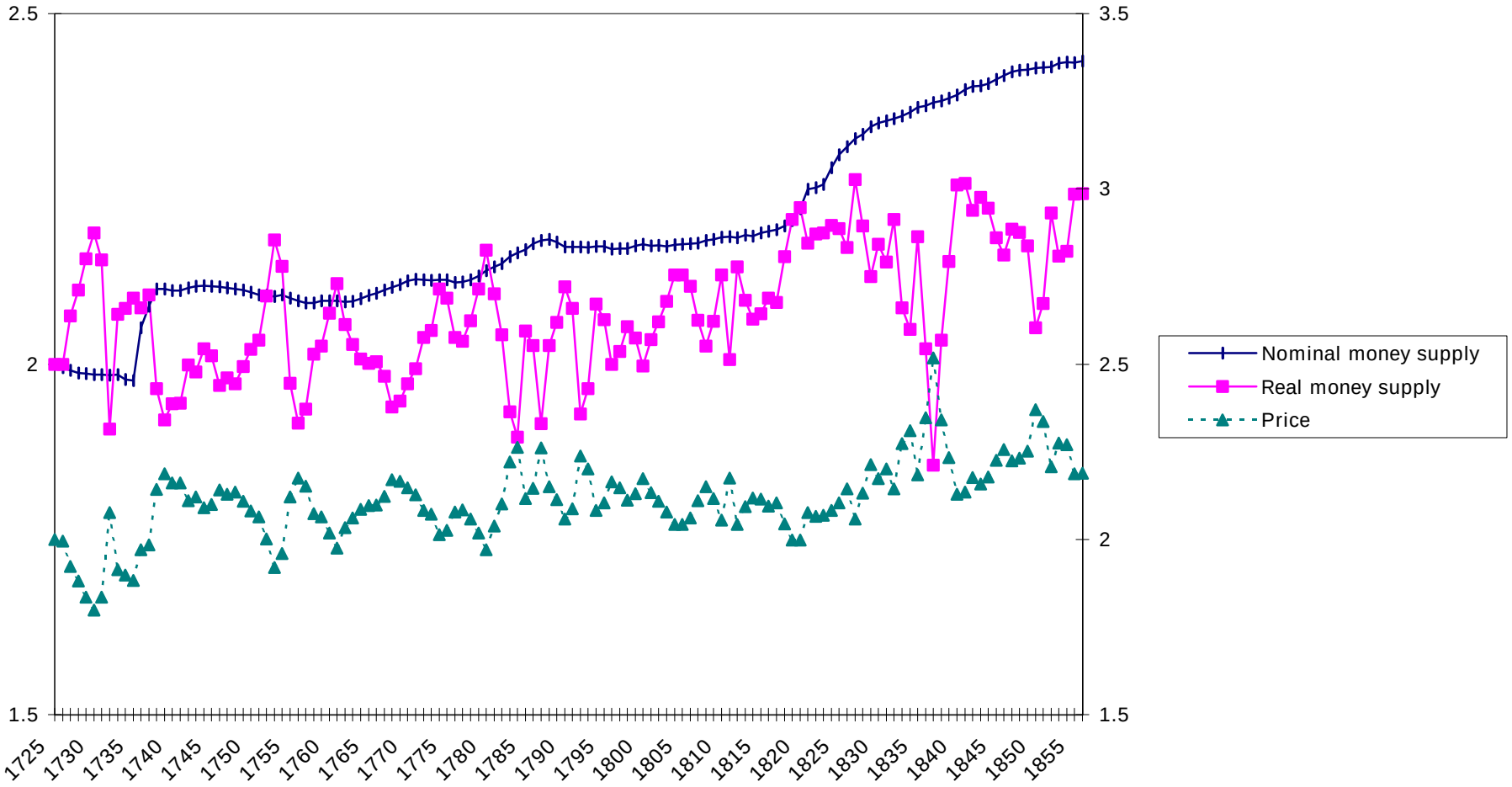
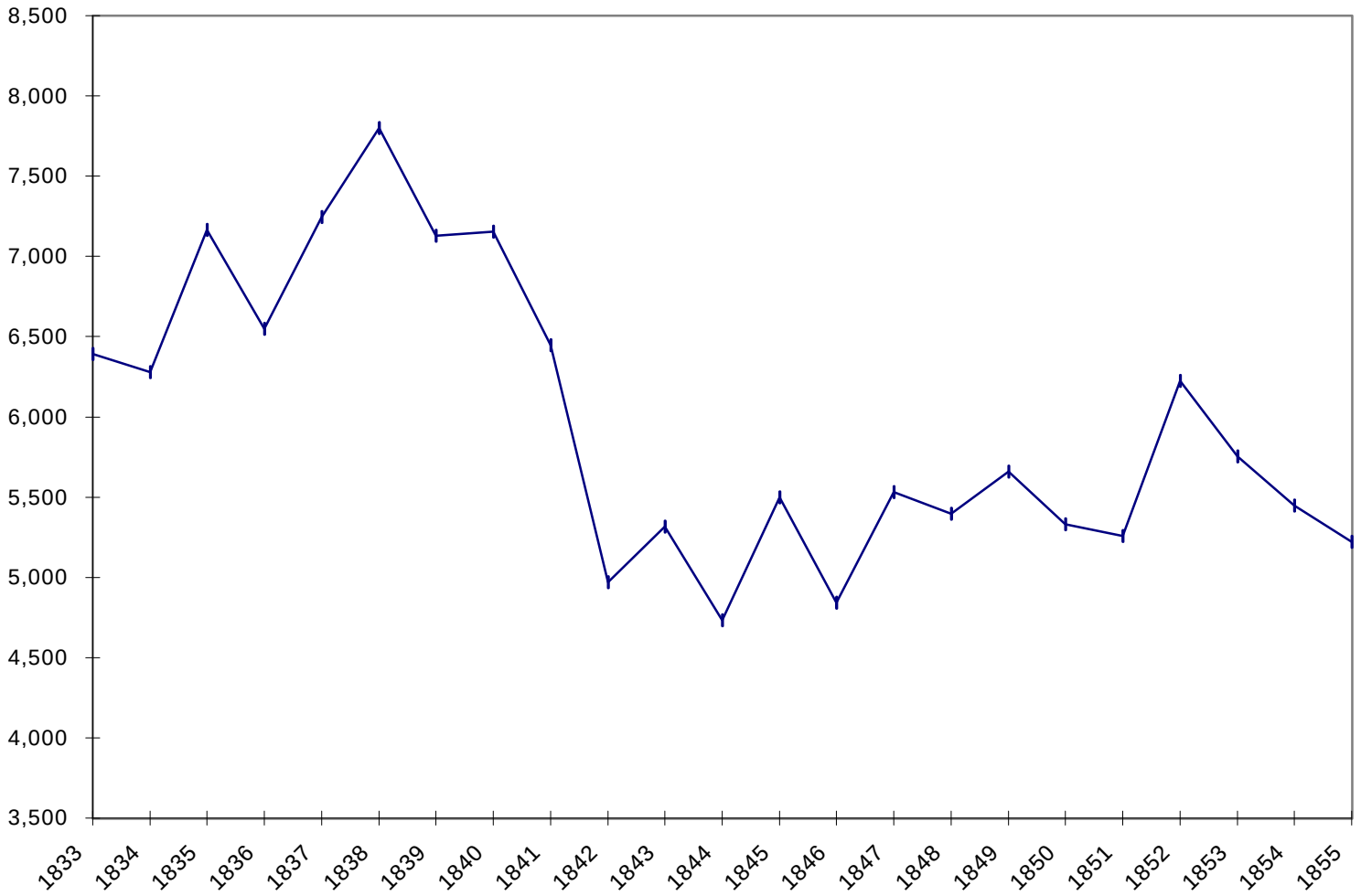
Figure 1 Macro-economy of Japan in 18th and 19th Century



Source: Akashi[1989].

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

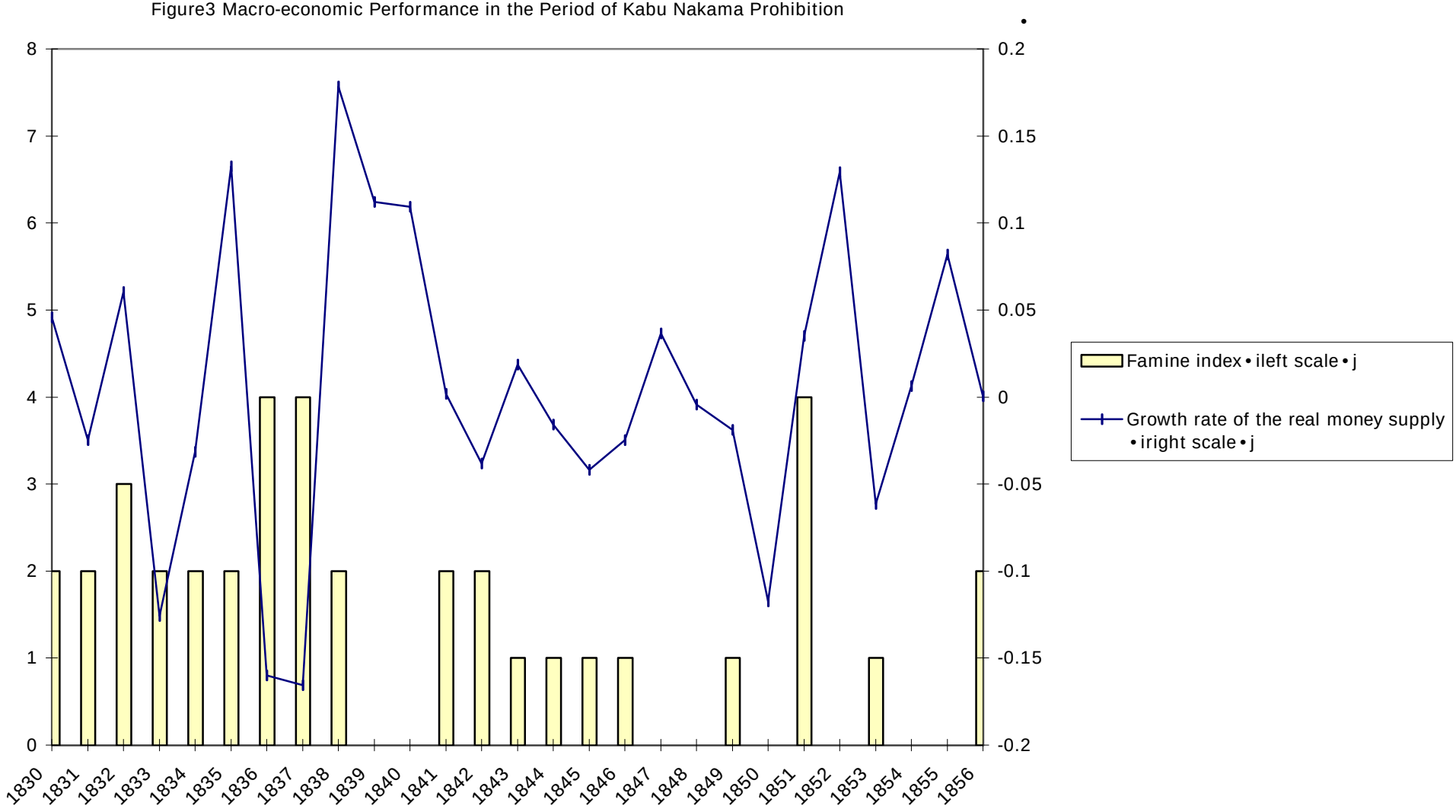
Figure 2 The Sales of Edo Store of Echigoya



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

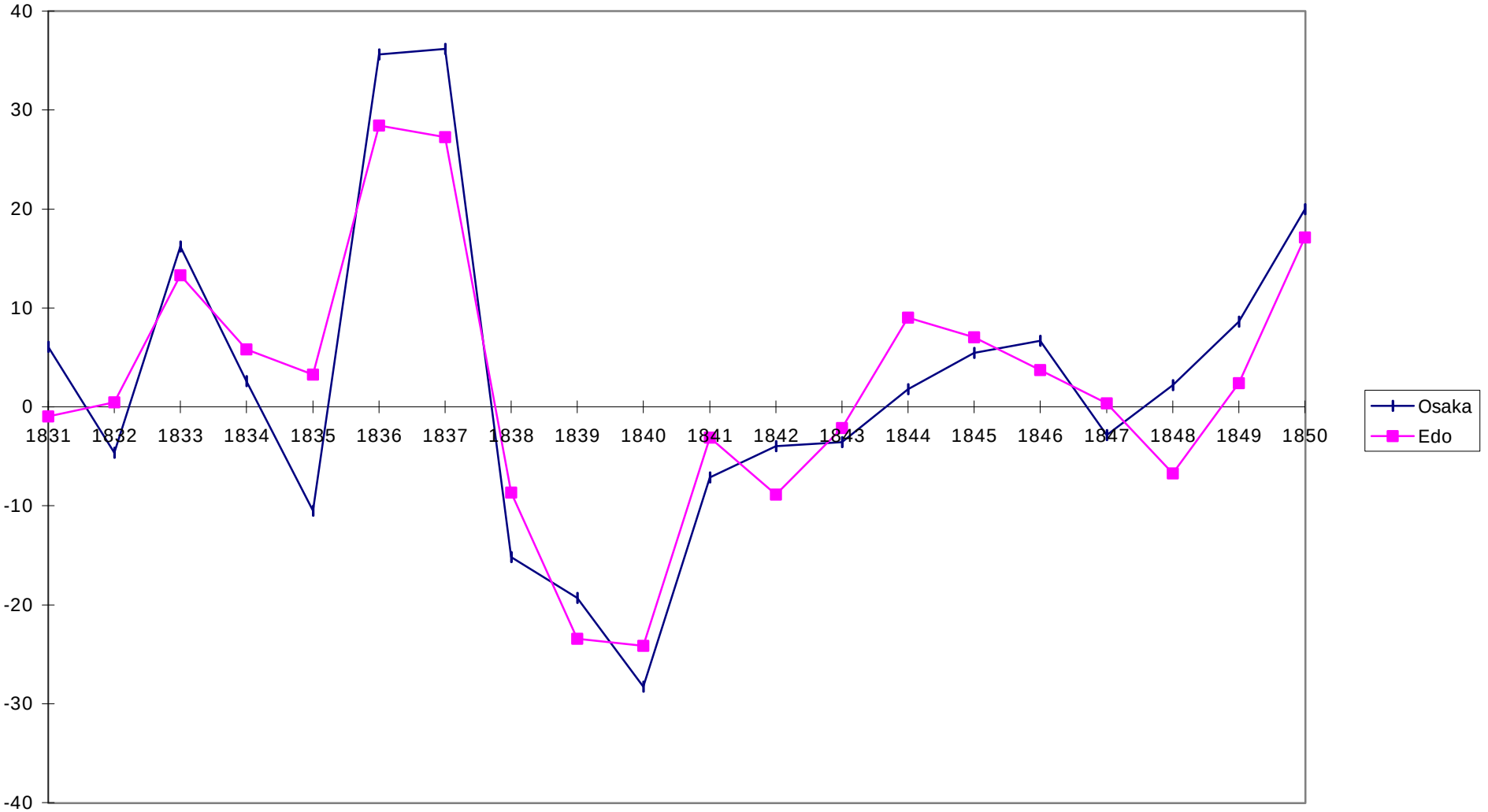
Note: We owe the data to Takayuki Kagawa and Kurato Kumon.

Figure3 Macro-economic Performance in the Period of Kabu Nakama Prohibition



Source: Akashi[1989].

Figure 4 Growth Rates of the Prices in Edo and Osaka



Source: See text.

Table 1 Correlation coefficient 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 text.

Table 2 List of the Kabu Nakama Codes including the MPS concerning the Commercial Trade

A. Kabu nakama of the wholesale merchants

Number	Year	Name of the codes	Source
1	1741	The Code of the Salt Wholesale Merchants	Miyamoto[1938], pp.189-190
2	1741	The Code of the Irand Salt Wholesale Merchants	Ibid, p.190
3	1773	The Code of the Yodobashi Rice Wholesale Merchants Nakama	Ibid, p.189
4	1781	The Code of the Chacoal Wholesale Merchants Nakama	Ibid, p.189
5	1781	The Code of the Firewood Wholesale Merchants	Ibid, p.192
6	1785	The Code of the Firewood Wholesale Merchants	Ibid, p.190
7	1787	The Code of the Three Town Salted Fish, Dried Fish and Dried Bonito Wholesale Merchants Kabu Nakama	Ibid, p.190
8	1818	The Code of the Raw Fish Wholesale Merchants	Ibid, p.193

B. Kabu nakama of the brokers

Number	Year	Name of the codes	Source
1	1781	The Code of the Suger Brokers	Miyamoto[1938], p.191
2	1809	The Code of the Indigo Brokers	Ibid, p.192
3	1816	The Code of the Seven Nakama of Wool and Cotton Brokers	Ibid, p.191

Table 3 List of the Kabu Nakama Codes including the MPS concerning the Organization of Production

Number	Year	Name of the codes	Source
1	1751	The Code of the Rice and Exchange Merchant Nakama	Miyamoto[1938], p.227
2	1753	The Code of the Dried Food Merchants	Ibid, p.227
3	1789	The Code of the Sanjo Cotton Wholesale Merchant Nakama	Ibid, p.227
4	1809	The Code of the Domestic Indigo Brokers	Ibid, p.227
5	1816	The Code of the Seven Nakama of Wool and Cotton Brokers	Ibid, p.200, 227
6	1824	The Code of Kiryu Weaver Nakama	The Editorial Board of the History of the Kiryu Wavings[1934], pp.368-369
7	1832	The Code of the Bowl, Basket and Turnery Artisan Nakama	Miyamoto[1938], p.228-229
8	1834	The Code of the Indigo Brokers	Ibid, p.195

Table 4 Influence of the Prohibition of Kabu Nakama

	(1)	(2)
Constant	0.0333	0.0625
	(0.780)	(2.060)
TIME	0.0065	
	(0.972)	
PROHIB	-0.1414	-0.0830
	(-1.981)	(-2.160)
FAMINE	-0.2254	-0.2254
	(-3.704)	(-3.711)
adR2	0.418	0.421

Note: See text.
t-values in parentheses.

Table 5-A Correlation Matrix of the Growth Rates of the Regional Rice Prices 1833-1841

	Osaka	Omi	Banshu	Fukuchiyan	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 text.

Table 5-B Correlation Matrix of the Growth Rates of the Regional Rice Prices 1842-1850

	Osaka	Omi	Banshu	Fukuchiyan	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 text.