The Dojima Rice Market and the Origins of Futures Trading

When Tokugawa Yoshimune became Japan's shogun in 1716, he sought to reform the state's finances. Rice played an important role in his reforms, since it accounted for 90 percent of the government's revenues.[1] The shogunate also paid the bannermen (an important group of samurai who formed the civil and military administrations) fixed amounts of rice each year to secure their support.[a]

Low rice prices in the late 1720s strained the samurai's finances, which had already deteriorated significantly over the previous century. Potentially as a result of several good harvests, the price of rice in 1729 was only 40 percent of what it had been in 1721, and samurai incomes had thus dropped sharply.[2] In fact, since 1710 the nominal income of the bannermen had fallen by nearly 50 percent, and their real income had also decreased significantly, though less so since other prices had dropped as well.[3] (See **Exhibits 2** and **3**.)

Yoshimune considered a number of options for dealing with declining rice prices, but one that seemed particularly attractive was the legalization of the Dojima rice futures market. Although merchants had traded various types of rice bills for more than a century, the shogunate had generally discouraged these sorts of financial transactions, believing that they artificially increased rice prices.[4] In 1715, however, Yoshimune's predecessor had authorized the creation of the first official Rice Exchange, hoping that increased trading would raise the price of rice, which had fallen sharply that year. The Exchange was located in Dojima, a sector of Osaka, which was itself the rice capital of Japan (see **Exhibits 1a** and **1b**). When rice prices rose steeply from 1719 to 1721, Yoshimune closed the market and prosecuted a number of merchants who had traded types of contracts explicitly banned by the government.[5]

Now, however, an increase in the price of rice once again seemed desirable. Yoshimune thus gave silent—but not official—assent in 1724 to a form of rice futures trading that had always been prohibited. The following year he approved the creation of a new rice market (similar to that authorized by his predecessor), and he lifted the ban on futures transactions in 1728. Yet perhaps

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[a] To lessen the costs of transporting such great amounts of rice, the shogun often paid a portion of the samurai's stipends in silver, though the amount of silver was determined by the shogun's current (official) price of rice. See **Exhibit 4**.

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because the rules governing the Dojima market continued to prohibit futures transactions, trade in these instruments remained modest.

Despite Yoshimune's reforms, rice prices failed to rise as the shogun had hoped. Some merchants, meanwhile, began to petition for official authorization of a futures market at Dojima. Since many government officials believed that futures trading was associated with rising rice prices, they may have viewed this as an opportunity to address one of their main economic challenges at the time.

But critics pointed out a number of problems with this potential strategy. Perhaps most worrisome, if rice prices rose too rapidly, this could reduce the public's access to food. The shogunate and the samurai, moreover, had long considered the rice futures trade no better than merchant gambling, which contradicted Confucian ideals. This philosophy held merchants themselves in low regard, based on the belief that they created little of use. Merchants had already significantly improved their economic position in society relative to the samurai over the previous century, and official recognition of a futures market at Dojima could further enhance their power.

Yoshimune thus faced a difficult decision. Should he officially authorize the creation of such a market, eradicate futures trading altogether, or perhaps just continue to tolerate the unofficial—and rather limited—rice futures trading that had already emerged at the Dojima Exchange?

Social Structure in Tokugawa Japan

> "Know your station in life!"
> – Road sign notice common throughout Japan during the Tokugawa era.[6]

> "The offspring of a toad is a toad; the offspring of a merchant is a merchant."
> – Popular saying in Tokugawa Japan.[7]

These two popular sayings reflected the perceived importance of maintaining the rigid Tokugawa social structure in early 18th century Japan. The population of Japan at this time comprised four distinct classes: the samurai, the farmers, the artisans, and the merchants. Although artisans, farmers, and merchants sometimes became samurai prior to the establishment of the Tokugawa shogunate in the early 17th century and could conceivably do so afterwards, the new order made this considerably more difficult by more strictly enforcing the boundaries separating the samurai from common citizens.

The samurai themselves were divided into several subcategories based originally on wealth. Nobles in control of estates that produced at least 10,000 koku of rice[b] per year were called lords (daimyo). The shogun effectively owned all land and assigned approximately 75 percent of his holdings to be administered by the lords (the rest he controlled himself). As a result, a lord's allotment (and thus his income) was often based on his relationship with the ruling Tokugawa clan. Below the 200–300 lords were the bannermen (hatamoto) and the housemen (gokenin), who were considered the direct retainers of the shogun.[8] The bannermen were wealthier than the housemen and formed the administrative backbone of the shogun's government. The lords and the bannermen were expected to maintain a specified number of housemen based on the size of their stipends. In all, the samurai and their families generally comprised roughly 7 percent of the Tokugawan population,

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[b] A koku of rice was the amount of rice consumed by an average adult over the course of a year and amounted to approximately 180 liters. See Carl Hering, *Ready Reference Tables Volume 1—Conversion Factors of Every Unit or Measure in Use* (New York: John Wiley and Sons, 1904), p. 55.

which itself grew from about 12 million at the founding of the Tokugawan shogunate at the dawn of the 17th century to approximately 30 million at the time of Yoshimune's ascension in 1716.[9]

While the differences between the samurai and the three lower classes were stark, the distinctions between farmers, artisans, and merchants were less clear. Unlike the samurai, these three classes could engage in commerce at will. A farmer could become an artisan or a merchant if the economic opportunity presented itself, and many artisans who traded their goods were also considered merchants.[c] Farmers made up approximately 70 percent of the Japanese population by the early 18th century, with artisans and merchants accounting for about 16 percent and 7 percent of the island's inhabitants, respectively.[10]

Urban Development

One scholar, writing on the impressive urbanization that occurred after the founding of the Tokugawa shogunate, has suggested that "if any period of premodern history anywhere can properly be labeled urban-centered, it is this period from about 1600 to the 1720's in Japan."[11] The shogun centered his administration in the new capital city of Edo (modern-day Tokyo), and thus most bannermen established residences there. The shogunate also required that all lords reside in Edo every other year and leave their family members in the capital city whenever the lords themselves returned to their estates. This policy essentially held the families captive, guaranteeing the lords' loyalty, and was instituted to prevent the near-constant warfare that had preceded the establishment of the Tokugawan shogunate. Largely as a result of the shogunate's policies, Edo grew from an insignificant settlement in 1590 to a huge city of over a million residents by 1720, when it was probably the largest city in the world.[12] The Japanese scholar Eijiro Honjo describes the consequences of this urbanization:

> With the development of urban districts, the *chonin* [merchant/artisan] class gained increasing influence, and the currency economy made so much development as to challenge the supremacy of the land economy. That is to say, a new economic power, viz., the money power of the *chonin* class, sprang up, besides [sic] the agricultural economic power. Due to this remarkable economic change, it became impossible for the *samurai* class to maintain its livelihood under the old economic organisation. Nor was it any longer possible for the farmers to support the *samurai* class. In such circumstances, *samurai* finally bowed to the new economic power. They either besought the financial help of *chonin* or turned *chonin* themselves. On the other hand, the *chonin* class gained considerable influence in society by means of its money power.[13]

Official Attempts to Maintain and Protect the Samurai

As Japan became more urbanized over the 17th and early 18th centuries, the economic situation of both high-ranking and low-ranking samurai deteriorated. The requirement that high-ranking samurai lords maintain two households (one in Edo and one on the samurai's estate) greatly increased the lords' expenditures, undercutting their privileged position in Tokugawan society. Less wealthy samurai also suffered at this time, and in 1632 the shogunate tried to force the bannermen to become more fiscally responsible by banning certain luxuries that had been causing them "to fall prey to money-lenders and to neglect the required military obligations of maintaining a specified

[c] Merchants were generally the least respected of the three lower classes. For more on the social position of Tokugawa merchants, see Charles D. Sheldon, "Merchants and Society in Tokugawa Japan," *Modern Asian Studies*, Vol. 17, No. 3 (1983): 477–488.

number of samurai-retainers."[14] The following year, the shogunate increased stipends by 200 koku to those bannermen who were receiving less than 1,000 koku annually.[15]

Despite the shogunate's attempts to maintain the dominant position of the samurai in the Tokugawan economy, the merchant class continued to increase its financial power. As merchants grew richer and began to flaunt their wealth, the samurai responded in kind, attempting to keep up. This proved feasible for many samurai during the Genroku period (1688-1703), when rice prices increased significantly while the prices of other consumer goods remained relatively stable.[16] However, when the price of rice dropped by more than 50% between 1702 and 1704, the samurai's income fell sharply and many discovered that their income was insufficient to support their heavy consumption of luxury goods.[17] Many samurai continued to live lavish lifestyles, but their debts to the merchants mounted rapidly. The merchants' power rose accordingly: "so powerful had the *chonin* [merchants/artisans] of Osaka . . . become that it used to be a common saying that the wrath of Osaka merchants could turn the 300 daimyos pale and make them tremble with fear."[18] Resentment toward the merchant class grew, and the shogunate began to confiscate the property of many wealthy merchants on the grounds that their displays of wealth were excessive.[19] Indeed, the shogunate routinely attempted to privilege the samurai at the expense of the merchants, in many cases by failing to enforce samurai debts to their merchant creditors:

> The Bakufu [shogunate] had refused to hear cases involving credit from as early as 1658 in order to alleviate the excessive case loads of the courts, and in 1685 it took advantage of this precedent and declared that it would no longer entertain *any* case involving credit-buying. This meant that the samurai who had bought on credit from merchants could not be prosecuted through the courts for goods already received. . . . In 1712, the Bakufu issued another decree which explicitly suspended most of the cases involving samurai loans, and again in 1719, it put all cases connected with samurai debts out of its purview.[20]

The most blatant case of debt cancellation was the shogunate's decision to confiscate the property of a powerful Osaka merchant named Yodoya (who hosted the rice market at his residence) and cancel debts owed to him in 1705. The official reason for prosecuting Yodoya was that he flaunted his wealth publicly. Some historians have argued that the shogun sought to destroy the rice market, while others believe that he wished to punish the merchant for too eagerly enforcing loans made to a number of influential lords.[21] Records suggest that Yodoya was owed more than 100 million ryo[d], which was much greater than Japan's entire national income at the time (according to retrospective estimates).[22] Although the 100-million figure is almost certainly an exaggeration, there is little doubt that a very significant amount of debt was erased.[23]

The Importance of Rice

> "No matter how much gold and silver one may possess, one cannot live, for a single day, on these metals. Rice is the one thing needful for one's livelihood."
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> "All wise rulers in all ages have valued cereals and despised money."
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> – Tokugawa-era idioms[24]

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[d] One golden ryo of this era was roughly equivalent to $122 in 2000 dollars. For more on these currencies, see William A. Spurr, "Business Cycles in Japan Before 1853," *Journal of Political Economy* (Oct., 1938): 653–687; Isao Soranaka, "The Kansai Reforms—Success or Failure?" *Monumenta Nipponica*, (Summer, 1978): 156; and Susan B. Carter et al., eds., *Historical Statistics of the United States, Millennial Edition* (New York: Cambridge University Press, 2006), vol. 3, part 3, Table Cc1-2, p. 158.

Rice not only formed the basis of the traditional Japanese diet, it also served as an important form of currency in the Tokugawan economy. The shogun compensated his bannermen and housemen in terms of a fixed amount of rice, which meant that the income of these samurai fluctuated with the price of rice in the marketplace.[25] The shogun's payments could be made in actual rice, in silver, or in some combination of the two. The amount of silver was based on the shogun's official price of rice, which generally fluctuated less than the market price, thus helping to ensure a more stable source of income for the samurai. Typically, the shogunate's price was slightly higher than the market price when the latter was low, and slightly lower when the market price of rice was high.[26] (For more on rice prices, see **Exhibits 2** and **4**.)

The daimyo lords received the bulk of their income from rice taxes they imposed on the farmers living on their estates. The tax rate was set as a percentage of the estate's expected yield, which the lord estimated based on the quality of the land.[27] The amount of rice taken by the daimyo remained constant (based on the estimated yield) regardless of the quantity of rice actually harvested. In principle, the shogun (who administered and taxed about a quarter of Japan's arable land) and the daimyo (who controlled their individual states) had the power to raise tax rates as they wished. Peasants often reacted violently to increases, however, which likely discouraged the daimyo from changing the rate very often. Although agricultural productivity rose significantly during the 17th and 18th centuries, the daimyo generally failed to update their yield estimates accordingly.[28] Some say the daimyo feared peasant riots. It is also possible that many samurai lacked the technical training to revise the estimates, or that the process was seen as too arduous.[e]

The Development of Forward Contracts

During the 17th century, merchants (whose economic position was improving relative to that of the samurai) began experimenting with all sorts of financial contracts, including basic forward transactions. A popular vignette tells the story of one of these early transactions:

> A rice merchant from Nagoya [to the south] frequently met a colleague from Sendai [to the north] on his business trips to Edo and exchanged information on harvest, weather conditions, etc., in their hometowns. One day the Nagoya merchant learned of an impending bad harvest in the northern parts of Japan which would reduce rice shipments to Edo by about 50%. At the same time he knew that the Nagoya area would have a good harvest. Recognizing the potential profit opportunity, the Nagoya merchant bought the future harvest of his region by paying approximately 10% to the farmers and writing drafts for the rest of the negotiated amount. These drafts were not to be presented for payment before the rice was actually sold. When the harvest came in, he stored it and after three or four months sold it with a profit of 30-40%, as prices had climbed in the meantime.[29]

(For a map of Tokugawa Japan, see **Exhibit 1a**.)

Although the merchant from Nagoya profited in the end, he faced a number of risks when he negotiated this "prolonged" contract, which presumably required that the farmers deliver the specified quantity of rice at a preset (forward) price. To begin with, an unusually bad harvest in the Nagoya area could have undercut his plan if the farmers with whom he contracted were unable to deliver the agreed quantity of rice. Of course, he also would have suffered a loss if, contrary to his

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[e] From an educational standpoint, the samurai may not have been particularly well prepared to revise the land-yield estimates. Typical samurai education in the 17th century did not include basic arithmetic. For more on samurai education, see Tetsuya Kobayashi, "Tokugawa Education as a Foundation of Modern Education in Japan," *Comparative Education Review* (October, 1965): 291.

expectations, the market price of rice had decreased rather than increased (e.g., if the North ended up having a good harvest rather than a bad one). Finally, it was possible that the farmers, seeing the higher market price at the end of the contractual period, might have reneged on their commitment to him and sold their rice at the higher price, keeping the proceeds for themselves. For their part, the farmers faced the risk that the price could rise (as it indeed did) or, if it fell, that the Nagoya merchant might conceivably fail to honor his end of the agreement.

The Emergence of Rice Bills

Although merchants issued drafts to farmers quite often during the early 17th century, these were not generally traded. As the century progressed, however, new instruments known as rice bills were actively (though often illegally) traded, particularly in front of the house of the prominent merchant Yodoya, located in a densely populated area of Osaka. By the end of the century, the market had moved to the city's newly settled island of Dojima.[30]

Rice bills took two general forms: "backed" bills that were based on rice that had already been harvested and was currently in storage, and "unbacked" bills that were based on rice from future harvests.

"Backed" Auction Bills

The first rice bills, which were introduced by warehouses in the first half of the 17th century and backed by their rice stores, were called "auction bills." In a typical transaction, a rice trader would purchase a receipt for 10 koku of rice from a warehouse at an auction by paying approximately one third of the auction bid[f] for the rice on the day after the trade. He could sell the receipt for a quick profit (if someone was willing to buy it for a higher price), or he could hold it and complete the payment himself. Either way, upon paying the balance seven to ten days later (depending on the warehouse), the trader (or whomever bought the receipt and paid the balance) would receive a backed auction bill that could be exchanged directly for rice. The deadline for subsequently exchanging an auction bill for rice was set at 30 days, although this deadline was often ignored in practice.[31] Sometimes, traders held these bills for up to a year before exchanging them for rice.[32] Auction bills allowed for lower transaction costs during the busy trading period following a harvest (since the bills could be held or traded without having to move physical quantities of rice) and enabled rice traders to purchase rice for resale or future consumption at a prearranged price without having to worry about storing the rice in the meantime.

"Unbacked" Prepayment Bills

By the middle of the 17th century, warehouses had introduced a second kind of rice bill that was not sold at auction and was not expected to be converted to actual rice. These instruments were unbacked "prepayment bills," which were issued to purchasers on the basis of rice that had yet to be harvested, and which committed the seller (generally a warehouse) to repay the purchaser with interest in one year. If warehouses were unable to make their cash payments, the prepayment bill would be converted into an auction bill, which could then be turned in for rice.[33] Thus, a "prepayment bill" was in effect a loan from a rice broker to a warehouse, which offered future rice

[f] Warehouses had different requirements for this down payment. Some required a percentage of the bid price (up to one third of this amount), while others charged a flat fee based on the amount of rice purchased. See Matao Miyamoto, *Market Economy of Modern Japan* (Tokyo: Yuhikau, 1988), pp. 179-182.

stores as security. As with other "unbacked" transactions, the trade of prepayment bills was officially prohibited by the shogunate.

The Evolution of Rice Futures Trading

During the final decade of the 17th century, Osaka merchants began to engage in a crude form of rice futures trading. A decree issued in 1693 by the governor of Osaka both described and prohibited the merchants' trading practices:

> We have recently heard that many people gather at rice wholesale stores, compete over the rise and fall of rice prices, and name this practice "tsumekaeshi." Store owners charge both sellers and buyers participation fees, as if it were a gambling dice game. This is outrageous behavior and we prohibit it. If we find out that people continue to engage in "tsumekaeshi," we will punish both participants and store owners.[34]

Three years later, the shogunate decided to issue its own prohibition of this practice:

> There are people who say they are just buying/selling rice, but instead set up a venue, invite many people, ask the participants to pay fees, set a due date, and speculate on prices in the market. As this is almost like gambling, we ordered them to stop this immediately. However, we have heard that these people are gathering again and frequently participating in this activity, which is totally outrageous behavior. . .[35]

In spite of repeated warnings, merchants continued to participate in "tsumekaeshi," and the practice evolved. In 1716, two Osaka merchants created the most highly organized futures market to date (most likely at Dojima), which numerous academics later identified as the world's first futures market. Participants agreed on a standard grade of rice, and they actively traded contracts. Each contract pertained to a specific quantity of standard-grade rice as of a particular (future) maturity date. Presumably, as new information arrived about supply and demand conditions for rice, the prices of these contracts rose and fell accordingly.

The market itself functioned from early January to late April, from early May to early October, and from mid-October to late December.[36] There were ten-day breaks between each term. No new positions could be taken in the final three days of a term, and all rice futures contracts were cashed in on the final day of a term.[37] As the volume of futures trading increased, individual settlement became inconvenient and a general manager was assigned to help keep track of participants' transactions.[38] In order to circumvent laws prohibiting futures trading, this general manager typically recorded futures transactions as spot transactions.

The Dojima Market

Even apart from the rice futures transactions, those who traded rice bills in the late 17th and early 18th centuries frequently found themselves on the wrong side of the law. Until 1715, the shogunate generally discouraged the trade of rice bills, viewing such transactions as a form of gambling that encouraged hoarding, thereby driving up the price of rice. Although it faced a number of limitations and prohibitions in the 17th and early 18th centuries, the rice market adapted and continued to expand.[39] The shogunate typically enforced its prohibitions strictly when the price of rice was high, but relaxed its enforcement when the price of rice was considered to be too low.

Merchants who had traded rice bills in front of Yodoya's residence shifted their activities to the newly settled island of Dojima in the northwest part of Osaka in 1697, and the Dojima market was born. It appears that many merchants continued to trade auction bills and prepayment bills and engage in tsumekaeshi at Dojima, much as they had prior to their move. Even after the shogunate prosecuted Yodoya in 1705 and more strictly enforced the prohibition on prepayment bills and futures transactions, trading persisted, though on a more limited basis.[40]

In 1715, one year before Yoshimune's ascension, the shogunate accepted a plea from the merchants of Edo to establish an *official* market for rice bills at Dojima. Rice prices had dropped significantly, and it appears that the shogun authorized the trade of rice bills in the hope of reversing the decline.[41] In fact, he seemed particularly willing to permit the Edo merchants to organize such a market, since they (unlike the Osaka merchants) had not engaged in futures transactions (which remained strictly forbidden).[42] The shogun evidently believed that rice prices could be increased by authorizing trade in backed auction bills, without resorting to the legalization of transactions which were not backed by actual rice. Still, in 1716 it appears that the newly created rice futures market (described on the previous page) was thriving at Dojima, despite the prohibition.

By this time, the Dojima market had emerged as a vital financial nexus, facilitating transactions, payments, and a continual flow of information about the creditworthiness of the players and about the supply and demand for rice. In fact, it has been said that elaborate communications systems based on smoke signals, flag signals, and carrier pigeons enabled the traders and brokers to transmit information between Dojima and other cities with great speed.[43] (For more on such long-distance communications, see the **Appendix**.) The flow of information was also enhanced by a number of financial institutions that supported the use of auction bills, prepayment bills, and futures contracts at Dojima, though the latter two remained officially proscribed.

Warehouses

The most basic institution of the early rice trade was the warehouse, which accepted rice from the lord's domain, sold it to rice traders, reimbursed the lord, and recorded all transactions.[44] While the lords officially owned and maintained these warehouses, they entrusted their daily operations to the warehouse superintendent and financial agent, two positions that were generally filled by merchants. One portion of the revenue from the warehouse's sales was sent to the lord's household in Edo, another was sent to the estate, and the rest remained in the care of the financial agent until the lord needed it.[45] Financial agents made great profits by investing the funds that were normally entrusted to them interest-free, and not infrequently grew richer than their employers. If the lord's financial situation deteriorated, he often turned to his financial agent for additional funds. In some cases, the agents lent directly to their lords, typically at interest rates of 12 to 15 percent (but sometimes considerably higher) and with the lords' future rice crops as security. In other cases, the financial agents arranged for the lords to receive loans from other sources (either by issuing prepayment bills, or by obtaining loans from other merchants). As these financial agents, who were employees of the lords, gradually emerged also as their creditors, the relative balance of power between lords (daimyo) and agents (merchants) inexorably shifted toward the latter. In fact, this shift in power enabled "the financial agents of the daimyos to blacklist any offending daimyo and collectively deny any credit until and unless amends were made."[46]

Credit Houses (Irikuri-Ryogae)

Credit houses, which may not yet have been fully developed by the 1720s, were typically run by affluent merchants who financed margin transactions by extending credit against prepayment bills, auction bill receipts, or any other assets that were considered appropriate collateral.[47] The credit houses are thought to have collected processing fees and charged interest on loans, sometimes at a daily rate as high as 2.5 percent.[48] The availability of credit allowed traders to leverage their positions. Because information on defaults was actively exchanged at the rice market, a trader who failed to make good on his loan could quickly find his reputation—and his trading prospects—greatly diminished or ruined.

Clearinghouses (Yarikuri-Ryogae)

As futures trading at Dojima became too extensive for individual general managers to supervise, clearinghouses apparently emerged to serve the needs of traders who had difficulty tracking all of their transactions and monitoring their trading partners. When dealing with rice futures contracts, clearinghouses required their clients to maintain a trading account and pay a small fee for each transaction undertaken. In return, these institutions kept a record of the traders' transactions, monitored their trading partners, and facilitated payments.[g]

Imagine, for example, that merchant A bought a rice contract for 95 silver coins and sold it to merchant B for 99 silver coins, that merchant B then sold the same contract to merchant C for 105 silver coins, and that merchant C subsequently sold it to merchant D for 102 silver coins. If the merchants wished to complete these transactions on the spot, they would have to carry large amounts of cash (silver coins). Alternatively, if they accepted promises to pay in lieu of cash, they would have to draw up contracts and check into the creditworthiness of their trading partners. Instead, merchants frequently relied on clearinghouses to settle the transactions. The Dojima clearinghouses required all traders to register their trades daily and to settle their accounts on a regular basis. In dealing with the above-described A-B-C-D transaction, for example, the clearinghouse would credit 4 silver coins to merchant A's account (since he bought at 95 and sold at 99) and 6 silver coins to merchant B's account, and would debit 3 silver coins from Merchant C's account and 102 silver coins from merchant D's account (since merchant D bought the bill for 102 but hadn't yet sold it). In this way, clearinghouses greatly simplified the payments process.

The clearinghouses also assigned a value to each rice futures position based on the instrument's market price (which was determined at the end of each trading day), and secretaries from the clearinghouses generally met to assess the positions of their traders and brokers every three days.[h]

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[g] There is some disagreement about whether the Dojima clearinghouses guaranteed both parties to the transaction. In a modern exchange (such as the Chicago Board of Trade), a clearinghouse is a counterparty to every transaction and guarantees the fulfillment of each contract. This enables participants to buy or sell without worrying about their counterparties defaulting, and thus greatly expands the scope of trade.

[h] Ulrike Schaede offers the following description of how the Dojima Exchange set the official closing and settlement prices each day (although she does not identify exactly when these methods developed):

> A wooden box containing a fuse cord was hung at the ridgepole of the exchange building. Exchange officials put fire on the cord and allowed trading to continue as long as the box was on fire. The prevailing price at the moment the fire went out became the day's official closing price, called the 'fuse cord price' (*hinawa-nedan*). However, traders were little impressed by the official closing of the market and had to be stopped from continuing their transactions by the 'watermen' (mizukata) who splashed water all over the market place in order to disperse the trading crowd. Because splashing was also of limited effectiveness, in their second attempt the watermen would dash whole buckets of water over the crowd, which usually stopped the day's trading. The prevailing price at this time, the 'bucket price' (okenedan), was the actual daily trading price which was registered in the books and used for mark-to-market or settlement. On the other hand, the official fuse cord price became the opening price of the following day's session. This price fixing system included a settlement obligation: if no price was found at the time the fire went out, or if the box did not burn down completely by itself for some reason, all transactions of the day were declared void and open positions that had been kept overnight had to be cleared by the fuse cord price of the preceding trading day.

Each clearinghouse would then disburse funds to traders who had either made advantageous trades (selling higher than they bought) or held positions that had appreciated in value. Traders who had either made disadvantageous trades or seen the value of their positions decline in value would be asked to refill their trading accounts to make up for the losses.[49] As a result of this ongoing settlement process, counterparty risk (i.e., the risk that one party to a transaction would be unable to fulfill his commitment under the contract) was presumably diminished.

The Original Dojima Exchange

Much like each of the institutions and practices discussed above, the original Dojima exchange developed mostly without governmental regulation or support. Even after the shogunate officially recognized the first official rice market in 1715, this body operated as "an autonomous. . . association of its members, and its main function was supervising everyday trading, so it regulated brokers and auctions, settled disputes, registered official daily closing prices, and collected fees for its operations."[50] Exchange members elected the directors, who were not permitted to make their own trades.[51]

Yoshimune's Reforms

Taking power in 1716, Yoshimune proved to be an innovative ruler who implemented numerous reforms. To begin with, he greatly improved the shogunate's financial position by developing new rice fields, which generated significant taxable output, and by overhauling the state's tax policy.[52] He also refused to hear any cases involving samurai debt to merchants, set a ceiling on interest rates at 15%, and issued a list of prohibitions on consumption in order to curtail merchants' lavish spending practices.[53]

Like his predecessor, Yoshimune worried about fluctuations in the price of rice. A currency reform caused the price (as expressed in terms of official money) to drop drastically in 1718, but rice prices subsequently more than doubled over the next few years. Although poor harvests in 1720 and 1721 most likely contributed to this increase, Yoshimune reportedly attributed the surge to the illegal rice futures transactions that were common at the market his predecessor had authorized.[54] The shogun summarily closed the entire market (effectively abolishing the original Dojima exchange), arrested a number of prominent merchants involved in trading the offending bills, and insisted that any trader later found to have participated in the market would be severely punished.[55]

However, once rice prices began dropping after 1721, Yoshimune quickly reversed course. In 1722, he permitted futures trading on a limited basis. In 1724, his administration indicated that it would relax "the regulations of, or give silent consent to the prolonged [futures] transaction when the rice prices dropped."[56] In conveying this unofficial announcement, the shogunate apparently made clear that it was only a temporary change, and that the futures exchange would again be prohibited as soon as rice prices rose.[57] A year later, in 1725, the shogun officially authorized another group of Edo merchants to establish a new Dojima Exchange similar to the one he had closed several years earlier. Like his predecessor, he did not authorize rice futures transactions at the Exchange. Finally, in 1728, the shogun lifted the ban on these futures transactions, but again without officially sanctioning such transactions at the Dojima market in particular.

See Ulrike Schaede, "Forwards and Futures in Tokugawa-era Japan: A New Perspective on the Dojima Rice Market," *Journal of Banking and Finance* (Issue 4-5, 1989): 503–504.

In spite of Yoshimune's efforts, futures trading remained quite limited. The Edo merchants in charge of the Dojima Exchange still ostensibly barred futures transactions, which most likely limited their growth. It also seems likely, as one modern scholar has suggested, that futures "transactions did not thrive" as a result of "lingering fear from repeated arrests."[58] In any case, the price of rice remained low throughout the decade, causing additional financial hardship for the samurai.

In 1729, an influential scholar named Dazai Shundai published a book arguing that commerce and trade should be embraced by the shogunate.[59] If the state truly wished to improve its finances, it should encourage, regulate, and participate in trade.[60] The author drew particular attention to the importance of the price of rice, claiming that a low rice price not only hurt farmers and the samurai, but had a negative effect on all of society:

> Samurai are jubilant when the price of rice is high, while they are distressed when it is low. They have no aptitude for money-making, nor are they thrifty by habit. When they find themselves in possession of much money, they soon squander it in temporary pleasures and luxury, and the money they spend finds its way into the pockets of artisans and tradesmen. Even when artisans and tradesmen have to buy dear rice, the amount of rice which they need for their daily sustenance is, after all, relatively small, while the profits which they can make are relatively much greater. The high price of rice does not, therefore, affect them seriously. On the other hand, the profits which they can make when the price of rice is low are somewhat meagre, as the samurai then have little money to spend. A sharp decline in the price of rice nowadays, therefore, causes far greater distress to all four classes of people than it used to do in the old days.[61]

The shogun was so impressed with Dazai Shundai's commentary that he requested the author donate a handwritten copy of the manuscript.[i] Although it does not appear that Dazai Shundai made explicit recommendations regarding a rice futures market, his focus on commerce may have helped give it new legitimacy in the eyes of the shogun. In fact, it was around this time that Yoshimune received an urgent request from Osaka merchants asking him for official authorization to replace the current Dojima exchange (still run by Edo merchants) with a newer market that would permit futures trading.[62]

Although Yoshimune had already significantly liberalized his policies regarding futures transactions over the previous eight years, the establishment of a new market at Dojima—this one run by Osaka merchants—had the potential to revitalize the practice. If Yoshimune chose this course, he would also have to determine what role the shogunate should play in the market—whether to regulate it actively (by requiring all participants to obtain licenses, for example) or to allow it to function mainly on its own, on the basis of its own rules. But the first and most important decision was whether to authorize the new market at all. Yoshimune had elicited the advice of numerous experts, but ultimately the decision was his and his alone.

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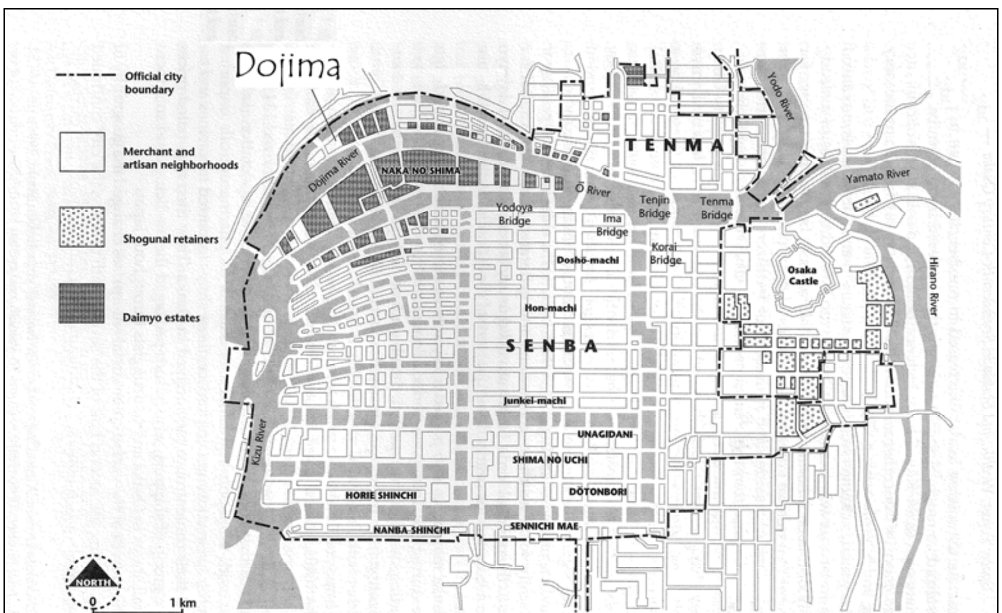
[i] Shundai refused this request, claiming his handwriting was too poor to be submitted to Yoshimune and that he was "ashamed" the request had come through a "lower-ranking official." See Yoshito Takebe, *Dazai Shundai—Tenkanki no keizai shiso* [Dazai Shundai—Economic Thought in a Period of Transition] (Tokyo, Ohanomizu Shobo, 1991), pp. 43–44.

Exhibit 1a Map of Tokugawa Japan

Source: Courtesy Byron Hussie.

Exhibit 1b Map of Early 18th Century Osaka



Map 9. Osaka at the beginning of the eighteenth century

Source: James L. McClain, “Space, Power, Wealth, and Medieval Urbanism in the Osaka Region,” in *Osaka: The Merchants Capital of Early Modern Japan*, eds. James L. McClain and Wakita Osamu (Ithaca, NY: Cornell University Press, 1999), p. 66.

Exhibit 2 Rice Prices in Japan, 1713–1730

Year	Price (Silver Monme per Koku)	Consumer Price Index (1710 = 100)
1713	155.0	139.7
1714	155.2	
1715	115.5	
1716	98.8	209.5
1717	110.9	
	[Significant Currency Reform Takes Effect][a]	
1718	33.0	
1719	42.2	
1720	68.2	
1721	75.0	
1722	44.5	
1723	41.5	
1724	47.4	
1725	55.5	
1726	56.9	64.4
1727	40.6	63.2
1728	40.6	62.9
1729	30.4	61.9
1730	32.9	59.7

Source: Compiled from Mark D. West, "Private Ordering at the World's First Futures Exchange," *Michigan Law Review* (August, 2000): 2583; Kozo Yamamura, *A Study of Samurai Income and Entrepreneurship* (Cambridge, Massachusetts: Harvard University Press, 1974), p. 54.

[a]The currency reform may account for part of the decline in prices from 1717–1718. See Conrad Totman, *Early Modern Japan* (Berkeley: University of California Press, 1993), p. 295.

Exhibit 3 Income of Bannermen in Tokugawa Japan (index)

Year	Nominal Income	Real Income[a]
1675	100.0	
1680	109.0	
1691	75.1	
1695	119.3	
1698	163.1	
1702	167.1	
1704	75.6	
1708	119.4	
1710	121.7	121.7
1711	111.6	117.2
1715	120.2	
1721	119.4	
1723	87.8	
1726	108.8	168.9
1729	61.5	99.4

Source: Adapted from Kozo Yamamura, *A Study of Samurai Income and Entrepreneurship* (Cambridge, Massachusetts: Harvard University Press, 1974), p. 32.

[a]For an explanation of how real income was calculated, see Yamamura, A Study of Samurai Income and Entrepreneurship, pp. 26–35.

Exhibit 4 Shogunate's Official Rice Price

	Spring Price in Monme (portion paid in cash)*	Summer Price in Monme (portion paid in cash)*	Winter Price in Monme (portion paid in cash)*
1675	Market Price (0)	Market Price (0)	64.5(2/3)
1680	Market Price (0)	55.8 (1/2)	76.7 (1/2)
1691	Market Price (0)	41.8 (1/3)	97.6 (2/3)
1695	Market Price (0)	49.6 (1/2)	49.6 (2/3)
1698	Market Price (0)	64.4 (2/3)	62.9 (1/2)
1702	Market Price (0)	78.2 (1/2)	68.4 (2/3)
1703	Market Price (0)	79.5 (1/2)	66.3 (2/3)
1704	Market Price (0)	71.3 (1/2)	72.9 (1/2)
1705	Market Price (0)	58.1 (1/2)	59.8 (1/2)
1706	Market Price (0)	58.0 (1/2)	69.6 (1/2)
1708	Market Price (0)	69.6 (1/2)	61.3 (1/2)
1709	Market Price (0)	61.5 (1/2)	54.8 (2/3)
1710	Market Price (0)	65.4 (3/4)	55.1 (2/3)
1711	Market Price (0)	63.0 (2/3)	69.6 (3/4)
1712	90.5 (1/2)	92.7 (2/3)	119.2 (2/3)
1713	Market Price (0)	123.2 (2/3)	123.2 (1/2)
1714	Market Price (0)	121.1 (1/2)	150.3 (1/2)
1715	Market Price (0)	119.1 (1/2)	84.4 (1/2)
1717	Market Price (0)	144.9 (1/2)	133.9 (1/2)
1718	120.6 (1/2)	107.2 (1/2)	116.1 (2/3)
1719	33.6 (1)	31.3 (1/2)	38.2 (2/3)
1720	41.2 (1)	45.3 (1/2)	56.3 (2/3)
1721	62.2 (1)	65.4 (1)	73.3 (1)
1722	97.9 (2/3)	85.8 (2/3)	57.8 (1/2)
1723	53.4 (1/2)	44.8 (1/2)	63.7 (1/2)
1724	39.5 (1/2)	39.3 (1/2)	37.7 (2/3)
1725	42.7 (1/2)	41.1 (1/2)	42.7 (1/2)
1726	54.1 (1/2)	54.1 (1/2)	47.3 (1/2)
1727	47.2 (1/2)	47.2 (1/2)	43.9 (1/2)
1728	44.0 (1/2)	41.3 (1/2)	44.0 (2/3)
1729	42.2 (1/2)	40.5 (1/2)	40.5 (1/2)
1730	42.9 (3/4)	32.6 (0)	44.6 (2/3)

Source: Adapted from Yamamura, *A Study of Samurai Income and Entrepreneurship*, p. 61.

[a]Payments from the shogun to the samurai were made either in rice, in silver, or in some combination of the two. These payments were set in terms of fixed amounts of rice, and distributions of silver were based on the shogun's official price of rice. In 1723, a Captain of the Escort Guard with a yearly stipend of 1000 koku (i.e., 180,000 liters of rice) would receive ½ of his spring payment in silver (based on the official spring price of 53.4) and ½ in rice. For more on the samurai and their pay, see Yamamura, *A Study of Samurai Income and Entrepreneurship*, pp. 14–15.

Exhibit 5 Timeline of Selected Official Decisions regarding the Rice Market in Japan, 1715–1730

Year	Decision
1715	Yoshimune's predecessor officially authorizes Edo merchants to establish a market at Dojima for the trade of "backed" auction bills.
1721	After blaming high rice prices on illegal futures transactions at the Dojima Exchange, Yoshimune subsequently closes the market, prosecutes a number of merchants who engaged in the futures exchange, and warns other merchants that they will be similarly punished if they engage in such behavior in the future.
1722	Yoshimune allows futures transactions on a limited basis (i.e., no trades involving more than 1000 koku of rice).
1724	The shogunate announces that it will relax restrictions on the futures market when the price of rice drops. However, the governor of Osaka states that the previous restrictions would return if the price of rice rises again.
1725	The shogunate authorizes Edo merchants to create a new Dojima Exchange. This market, like the previous one established in 1715, prohibits the exchange of futures contracts.
1728	The shogunate lifts the official ban on futures transactions (but without authorizing a new market at which they can be traded).
1730	Osaka merchants petition the shogun to authorize them to establish a new Dojima Exchange at which futures transactions would be permitted.

Source: Compiled from Matao Miyamoto, *Market Economy of Modern Japan* (Tokyo: Yuhikau, 1988), pp. 197–202; and Shohei Suzuki, *History of Dojima Rice Exchange* (*Dojima kome shijo shi)* (Tokyo: Nihon Hyoronsha, 1940), pp. 17–53.

Glossary

Bannermen: Important group of samurai who received yearly payments from the shogunate and formed the backbone of the civil and military administrations.

Chonin: Japanese term for "people living in the city," which included merchants and artisans.

Daimyo Lords: Wealthiest group of samurai, numbering about 200–300 throughout the Tokugawa era.

Dojima: Island in the northwestern section of the city of Osaka, and location of the rice market after 1697.

Edo: Modern-day Tokyo, the capital city of the Tokugawan shogunate.

Gokenin: Japanese term for "houseman."

Hatamoto: Japanese term for "bannerman."

Housemen: Lowest ranking samurai who were maintained by (and in turn worked for) both the shogunate and higher-ranking samurai.

Koku: The standard trading unit of rice, equivalent to approximately 180 liters.

Monme: Silver coin worth approximately 1/60th of a golden ryo, or about $2 in 2000 dollars.

Osaka: The commercial capital of Tokugawan Japan (currently the second largest city in Japan after Tokyo).

Ryo: Golden coin worth 60 monme, or approximately $122 in 2000 dollars.

Shogun: Title for the military leader who ruled Japan during the Tokugawa era.

Shogunate: Official term for the shogun's government.

Tokugawa: Surname of the family of shoguns that ruled Japan from 1600–1867.

Yoshimune: The 8th shogun of the Tokugawa clan; he ruled from 1716–1745.

Appendix

Bunryu Nishiki, *Kumagae Onna Amigasa* (*Kumagae Lady's Hat*), written in 1706, translated by Mayuka Yamazaki.

There was a merchant named Yozaemon Sumiya who had lived in the town for a long time. He had run a liquor business and recently started a wholesale business selling clothes. He was one of the three most influential figures in the town. Yozaemon's first son, Yomiji, was 23 years old and said to be the most dexterous person in the country. . . . One day Yomiji told his father Yozaemon, "Recently, neither the liquor nor the clothes business is making much money. The margins on these businesses are not high. . . . What I have been thinking is that it would be impossible to make my own way in life without being involved in a large-scale business. As a start, I would like to visit a wholesaler in Koriyama and examine the rice business there." Yozaemon thought what Yomiji said made perfect sense. . . . Yozaemon collected all the money he possessed, gave Yomiji 600 ryo of gold, and dispatched his son to Koriyama.

As soon as Yomiji arrived at the wholesaler in Koriyama, he started a moneychanging business. In order to get information about daily prices at the rice exchange, Yomiji hired a regular express messenger (*hikyaku*) and another messenger. A minute after the rice exchange started the business of the day in Osaka, the [second] messenger wearing red hat and red gloves ran like a flying bird and arrived at Kuragari Pass. He stood by a landmark pine tree and tried to regain his breath. If he raised his left hand by 1 degree, it meant the rice price increased by 1 bu of silver. If he raised his right hand by 1 degree, it meant the rice price decreased by 1 bu of silver. His role was to inform Yomiji of the increases and decreases of rice prices. Yomiji saw the person's signals from the second floor of the wholesale store using a telescope which had a range of 10 miles, and bought or sold rice taking these price changes into consideration. After that, Yomiji [publicly] dispatched the express messenger to Osaka to obtain the rice prices there. As Yomiji knew the rice prices earlier than anyone when the information was delivered to Kuragari Pass, there was not a single day that Yomiji did not make money. Other merchants had no idea about his scheme. They gave Yomiji the nickname "Forecasting Yomiji" and rice prices in Koriyama came to be greatly influenced by Yomiji's transactions.

One day, when the messenger was running to give Yomiji his signals, he met a merchant returning from the Yamato region by the name of Sogen Nakamachimaruya. . . . Sogen was in a good mood after having a few glasses of sake and he asked the messenger to have a few drinks with him. The messenger, feeling great after a few glasses of cold sake, recounted various stories he had heard during his 10-day stay in Osaka. . . . He had another two to three glasses of sake. The messenger then parted with Sogen, saying that he would treat Sogen in the future, and started to run again. The road was rough. . . . He was late. He made his best effort to run as fast as he could, swinging both his hands like a crab, but ended up arriving at the pine tree four hours later than planned, as 7–8 glasses of sake had broken his stride. Yomiji was waiting and waiting, sitting on the second floor of his wholesale store and constantly looking into his telescope. . . . Finally the messenger in a red hat and red gloves appeared and stood by the landmark pine tree. The 7–8 glasses of sake greatly affected his memory, and he did not recall whether he should raise his left hand or right hand. He tried hard to recall, but he could not remember anything. . . . Finally he raised his left hand by 6 degrees, and Yomiji bought 30,000 koku of rice, believing that the rice prices had increased by 6 bu of silver. . . Actually the rice price was down by 7–8 bu of silver on the day and the express messenger soon brought the news. . . . Yomiji realized he had made a losing transaction, but it was already too late. The loss cost him 24 kan (90kg) of silver.

Endnotes

[1] Grace H Kwon, State Formation, Property Relations, and the Development of the Tokugawa Economy (New York: Routledge, 2002), p. 62.

[2] Mark D. West, "Private Ordering at the World's First Futures Exchange," *Michigan Law Review* (August, 2000): 2583.

[3] Kozo Yamamura, "The Increasing Poverty of the Samurai in Tokugawa Japan," *Journal of Economic History* (June 1971): 388.

[4] Ulrike Schaede, "Forwards and Futures in Tokugawa-era Japan: A New Perspective on the Dojima Rice Market," *Journal of Banking and Finance* (Issue 4-5, 1989): 494.

[5] Matao Miyamoto, *Market Economy of Tokugawa Japan* (Tokyo: Yuhikau, 1988), p. 201.

[6] Charles D. Sheldon, "Merchants and Society in Tokugawa Japan," *Modern Asian Studies 17.3* (1983): 478.

[7] Sheldon, "Merchants and Society in Tokugawa Japan," p. 478

[8] Eijiro Honjo, *The Social and Economic History of Japan* (Kyoto: Institute for Research in Economic History of Japan, 1935): 190.

[9] Matao Miyamoto, "Quantitative Aspects of Tokugawa Economy," in *The Economic History of Japan: 1600-1990: Volume 1: Emergence of Economic Society in Japan, 1600-1859*, eds. Akira Hayami et al. (New York: Oxford University Press, 2004), p. 37.

[10] James A. Michener, *The Floating World* (Honolulu: University of Hawaii Press, 1983), pp. 17-18.

[11] Gilbert Rozman, "Edo's Importance in the Changing Tokugawa Society," *Journal of Japanese Studies* (Autumn, 1974): 98.

[12] Rozman, "Edo's Importance in the Changing Tokugawa Society," pp. 93–94

[13] Eijiro Honjo, "Economic Ideas in Tokugawa Days," *Kyoto University Economic Review* (October, 1938): 6.

[14] Yamamura, "The Increasing Poverty of the Samurai in Tokugawa Japan," p. 394.

[15] Yamamura, "The Increasing Poverty of the Samurai in Tokugawa Japan," p. 394.

[16] Yamamura, "The Increasing Poverty of the Samurai in Tokugawa Japan," p. 395.

[17] Kozo Yamamura, *A Study of Samurai Income and Entrepreneurship* (Cambridge: Harvard University Press, 1974), p. 49.

[18] Yanaga, "Transition from Military to Bourgeois (chonin) Society in Japan," p. 125.

[19] Donald H. Shively, "Sumptuary Regulation and Status in Early Tokugawa Japan," *Harvard Journal of Asiatic Studies 25* (1964–65): 128.

[20] Yamamura, "The Increasing Poverty of the Samurai in Tokugawa Japan," pp. 395–96.

[21] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 494; West, "Private Ordering at the World's First Futures Exchange," p. 2582.

[22] E.S. Crawcour, "Changes in Japanese Commerce in the Tokugawa Period," *Journal of Asian Studies* (August, 1963): 392.

[23] Charles D. Sheldon, "Review of Studies in the Institutional History of Early Modern Japan, ed. John W. Hall and Marius B. Jansen," *Pacific Affairs 42.4* (1969–1970): 528.

[24] Honjo, "Economic Ideas in Tokugawa Days," p. 5.

[25] Kozo Yamamura, "The Increasing Poverty of the Samurai in Tokugawa Japan, p. 379.

[26] Kozo Yamamura, A Study of Samurai Income and Entrepreneurship, pp. 49–63.

[27] Thomas C. Smith, "The Land Tax in the Tokugawa Period," *Journal of Asian Studies* (November, 1958): 4.

[28] Thomas C. Smith, "The Land Tax in the Tokugawa Period," p. 5

[29] Schaede, "Forwards and Futures in Tokugawa-era Japan," pp. 498–499. Mark West provides another version of this story that differs significantly from Schaede's:

> "Dojima's story begins in 1616—four years before the *Mayflower* left England, and fifteen years after the arrival in Japan of Englishman William Adams (the character fictionalized in James Clavell's *Shogun*)—when a rice merchant from Nagoya (located halfway between Osaka and Edo) named Chozaemon takes a trip to Edo. According to the traditional—which does not necessarily mean historically accurate—story, along the way to Edo, Chozaemon stops at an inn where he meets a traveler from Sendai (north of Edo). Chozaemon strikes a deal with the man: you tell me if there's a rice shortage up North; I'll tell you if there's one down South. Five years later, on his pilgrimage to the Ise Shrine, the man from the North visits Chozaemon in Nagoya and informs him that this year's northern harvest looks bleak; next year it looks as if the North will send to Tokyo only half of its usual crop. Chozaemon begins hoarding rice from that year's southern bumper crop. A fellow Nagoyan named Ichizaemon hears of Chozaemon's efforts and asks him to purchase 500 *ryo* worth of rice on his behalf. Chozaemon is eager to help, but because he has no warehouse to store that much rice on top of his own, he makes a deal. Pay me just 60 *ryo* now, and when I sell the rice next year, you'll pay me the remaining 440 *ryo* along with interest at the rate of 3 *sho* (about a pound) of rice, and I'll give you the profits. But if the price of rice falls, and it's not profitable to sell, I'll keep your 60 *ryo*. Fortunately for both, the price skyrockets" (West, "Private Ordering at the World's First Futures Exchange," p. 2580).

[30] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 499; West, "Private Ordering at the World's First Futures Exchange," p. 2581.

[31] Miyamoto, Market Economy of Tokugawa Japan, p. 184.

[32] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 499.

[33] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 493.

[34] Masahiko Sugie, *Theory of Speculation and Futures Trading* (Tokyo: Chikura Shobo, 1985), pp. 12–14.

[35] Sugie, Theory of Speculation and Futures Trading, pp. 14–17.

[36] West, "Private Ordering at the World's First Futures Exchange," p. 2585.

[37] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 502.

[38] Sugie, Theory of Speculation and Futures Trading, pp. 20–23.

[39] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 494.

[40] West, "Private Ordering at the World's First Futures Exchange," p. 2582.

[41] Miyamoto, Market Economy of Tokugawa Japan, p. 199.

[42] Miyamoto, Market Economy of Tokugawa Japan, p. 199.

[43] West, "Private Ordering at the World's First Futures Exchange," p. 2586.

[44] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 491.

[45] Sydney Crawcour, "The Development of a Credit System in Seventeenth-Century Japan," *Journal of Economic History*, Vol. 21, No. 3 (September, 1961): 350.

[46] Chitoshi Yanaga, "Transition from Military to Bourgeois (chonin) Society in Japan," *Oriens*, Vol. 8, No. 1 (October, 1955): 125.

[47] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 501

[48] "O-Edo keizai-gaku: Osaka Dojima kome kaisho (Edo economics: Dojima rice market in Osaka)," http://www.h6.dion.ne.jp/~tanaka42/doujima.html#4, accessed December, 2007.

[49] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 505.

[50] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 496.

[51] Schaede, "Forwards and Futures in Tokugawa-era Japan," p. 497.

[52] Eijiro Honjo, *The Social and Economic History of Japan* (Japan: Institute for Research in Economic History of Japan, 1935), p. 272.

[53] Shively, "Sumptuary Regulation and Status in Early Tokugawa Japan," p. 129; Sheldon, *The Rise of the Merchant Class in Tokugawa Japan*, p. 107.

[54] Conrad Totman, *Early Modern Japan* (Berkeley: University of California Press, 1993), p. 295; Miyamoto, *Market Economy of Tokugawa Japan*, pp. 200–201.

[55] Suzuki, History of Dojima Rice Exchange, pp. 17–53.

[56] Miyamoto, *Market Economy of Tokugawa Japan*, p.201, translated by Mayuka Yamazaki.

[57] Miyamoto, Market Economy of Tokugawa Japan, p. 201.

[58] Suzuki, History of Dojima Rice Exchange, pp. 32–33.

[59] Tetsuo Najita, "Political Economism in the Thought of Dazai Shundai (1680-1747)," *Journal of Asian Studies* (August, 1972): 835.

[60] Najita, "Political Economism in the Thought of Dazai Shundai (1680-1747)," p. 832.

[61] Eijiro Honjo, "The Economic Thought in the Middle Period of the Tokugawa Era." *Kyoto University Economic Review* (October, 1940): 17–18.

[62] Miyamoto, Market Economy of Tokugawa Japan, pp. 201–202.