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**Some Evidence on the Re-Regulation of Japanese Equity
Derivatives Markets Between 1989 and 1993**

Ulrich Bongartz

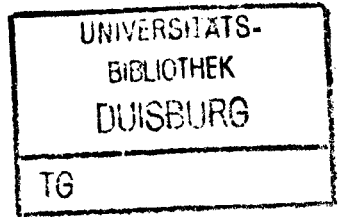
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Preface

Deregulation is one of the main topics in the ongoing debate on Japan's economy. Unfortunately, many observers somewhat subconsciously employ a rather "linear mode of thinking", i.e. they suppose that there is a simple, secular trend from regulation to deregulation. This may well be a mistaken image. There are at least two important reasons why the process of deregulation could be much more complicated, showing characteristics of an oscillating trial-and-error process of deregulation and re-regulation. The first reason is that any economy needs a certain amount of regulation, for instance in order to correct for market failures. The level of optimal regulation may be difficult to identify, and it may even be totally futile to hope for a stable "optimal" level. The second reason is that the authorised regulators may try to keep their power out of self-interest and seek to re-establish it, whenever circumstances allow.

In the following paper, Ulrich Bongartz exemplifies these issues with respect to the equity derivatives markets. In 1989, the inauguration of these markets was welcomed as a decisive step towards free financial markets in Japan. In the early 1990s, though, when some aspects of the market performance were deemed problematic, a number of steps were taken to re-regulate equity derivatives. Mr. Bongartz traces the problems, their reasons, regulatory measures, and the motives behind them. He also gives some hints as regards an ex-post evaluation of these developments in the light of the Barings debacle in early 1995. His careful analysis should be a fruitful step towards a more sober discussion of deregulation in Japan.

Duisburg, June 1995

Prof. Dr. Werner Pascha

Summary

Between 1989 and 1993, prolonged pressure from stock investors, Tokyo Stock Exchange officials and the Ministry of Finance, blaming the Nikkei 225 derivatives for creating excessive volatility in the stock market, keeping away investors and aggravating the market's slump led to changes in the regulatory framework of Japanese equity derivatives markets (EDM). Thus far, the discussion of the liberalization of Japanese financial markets has failed to take into account the effects of these regulatory measures. This paper analyzes the development of the EDM-regulations and their effects on EDM and on the stock market. The thesis of this paper is that the tight controls which have been enacted by public as well as private regulators lead to an overall re-regulation of EDM. With reference to the collapse of Barings in early 1995, the effectiveness of the regulatory controls is assessed.

Contents

| | page |
|---|------|
| 1. Introduction | 1 |
| 2. The setting | 5 |
| 3. Regulatory Restrictions on EDM | 6 |
| 3.1. Conflicts of interests and MOF-regulation of EDM | 6 |
| 3.2. The SQ-System | 8 |
| 3.3. Weekly disclosure of index arbitrage positions | 11 |
| 3.4. Variation of margins and commission rates | 12 |
| 3.5. Limit price changes and the <i>kehai</i> -system | 13 |
| 3.6. Modification of trading hours | 15 |
| 3.7. Modification of Nikkei 225 Options | 16 |
| 3.8. Changes in the Nikkei 225 Average | 17 |
| 3.9. Change of the underlying index: The Nikkei 300 | 20 |
| 4. Conclusion | 21 |
| References | 26 |

1. Introduction¹

In view of the necessity to offer investors a means of effective hedging against stock price fluctuations and the growing roles played by equity index derivatives trading in foreign financial markets, the Securities and Exchange Council as an advisory body to the Ministry of Finance proposed the introduction of index futures. On May 20, 1987, the amendment of the Securities and Exchange Law to provide for the introduction of equity index futures trading was enacted to the proposition of the government. In response, the Osaka Securities Exchange started trading Nikkei Stock Average futures on September 3, 1988. In June 1989, stock index options trading was launched in a move to consolidate and expand the futures and options trading. While the introduction of this so called equity derivatives trading was welcomed by the financial community in Japan and overseas as a further liberalization step of Japanese securities markets. "The Japanese securities industry is viewing futures and options these days like a cat watching a fishbowl: the temptation to pounce is irresistible. ... many securities houses are beefing up index futures and options departments"². Even the Exchanges in Tokyo and Osaka were competing fiercely to expand the trading of derivatives.³ However, it seems as if the initial euphoria diminished after the first years of trading. "When it comes to derivatives, Japan is suffering from a severe case of schizophrenia. Japanese bankers, corporate finance officers, and investors see interest rate futures as useful instruments ... but equity derivatives ... are bad news."⁴ Japanese securities houses blamed the sudden fall in stock prices in the 1990s on futures trading while the Tokyo Stock Exchange announced considering to cease stock index futures trading.⁵

By the early nineties it was obvious that the introduction of equity derivatives markets (EDM) in Japan did not proceed as hoped for.⁶ Though monthly trading volume of the popular Nikkei 225 futures at Osaka Securities Exchange (OSE) averaged 1,4 million contracts between January 1990 and December 1991, it shranked

1 This paper is based on a graduation thesis reviewed by Prof. Dr. Werner Pascha, Chair of Economics and East Asian Economics, Gerhard Mercator University, Duisburg, who encouraged me to write this short extract. I am indebted to Professor Pascha for reviewing and commenting on this paper.

2 Koyanagi, Takehiko: Firms cast hungry eye on futures

3 See Takahashi, Nobuo: Financial futures unification

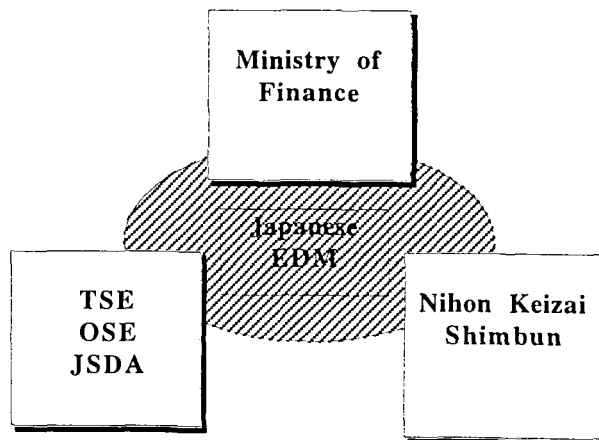
4 Shibata, Yoko: Relationship With Derivatives, p. 66

5 See Ikeya, Akira: Planned index

6 See Schoenfeld, Steven: First it was equities, p. 22, Koyanagi, Takehiko: Firms cast hungry eye on futures, and Shibata, Yoko: Relationship With Derivatives, p. 66.

to 0,8 million between January 1992 and August 1993. Following their introduction in late 1988, Japanese EDM based on the Nikkei 225 were alleged to have contributed heavily to the decline of the Japanese stock market. Index arbitrage and program trading linked to equity index futures and options (F&O) had come to have a very significant impact on the underlying cash market, particularly at the time of futures expiry. Beginning with spring 1990, very low volume in the equity market compounded the influence of EDM on the underlying Nikkei 225 index. The collapse of stock prices on the Tokyo Stock Exchange (TSE) in 1990 lead to a perceived crackdown on EDM trading by the Japanese Ministry of Finance (MoF).⁷

Figure 1: Regulators of Japanese EDM



In economic theory, regulators are conventionally considered as governmental representatives who intervene in cases of market failure by setting disincentives resp. incentives for market participants.⁸ Since we will be focussing on market participants' perception of regulation in the following, we will have to specify the notion of the 'regulator'. From the EDM participants' point of view, one can identify three types of agents intervening into the domestic derivatives market (see figure 1). Firstly, the Securities Bureau and the Securities and Exchange Council of the Ministry of Finance are empowered to supervise EDM and to provide administrative assistance. Secondly, the Japan Securities Dealers Association (JSDA) and the exchanges TSE and OSE, all of them autonomous but with a

⁷ See Abe, Yoshimi; Yamazaki, Junichi: Current Situation.

⁸ See Kaufer, E.: Theorie der öffentlichen Regulierung, pp. 1-3

public nature, function as bodies of market self-control.⁹ Thirdly, Nihon Keizai Shimbun (NKS), which supervises and manages the Nikkei Stock Average, undertakes changes in the components of the index.¹⁰ In the following, we will be referring to MoF, the exchanges and the NKS as 'regulators'.

Regulators blamed arbitrage trading for increased cash market volatility and for driving retail investors away from the Japanese securities markets. Some critics insisted that it was the creation of EDM which increased volatility and depressed prices in the stock market. To limit the effect of EDM activity on the cash market, regulatory controls were hastily instituted. Table 1 shows the major regulatory controls between 1989 and 1993.

This paper aims to analyze the different regulatory controls that have been imposed between 1989 and 1993. In doing so, we shall focus on three questions:

1. How were these regulatory measures motivated?
2. What effect did they have on EDM and cash market trading?
3. How effective were the controls?

We will follow these questions in order to find arguments supporting the main hypothesis: The overall trend in supervision of Japanese EDM between 1989 and 1993 was biased towards re-regulation of the derivatives market.

After a brief introduction in this section, section 2 will describe the market situation in the early nineties, particularly concerning the implicit market problems. In section 3, we shall attempt to analyze the regulatory measures. In doing so, we will first have a look at each individual measure and how it was motivated and then consider its impact. Finally, the main findings will be summarized in section 4.

⁹ See Japan Securities Research Institute: Securities Market, pp. 248-257 and Isaacs, Jonathan: Japanese Equities Markets, pp. 218-221 for a more detailed description.

¹⁰ Moreover, NKS has granted licences to the exchanges in Singapore (SIMEX) and Chicago (CME) to trade Nikkei derivatives. Hence, it has a substantial influence on the breath of the Nikkei derivatives market in international terms.

Table 1: Major regulatory controls over Nikkei 225 EDM: 1989-1993

| | |
|----------------|--|
| September 1989 | - Final Settlement price of the futures is determined by the Special Quotation (SQ) |
| April 1990 | - Disclosure of the cumulative cash position related to index arbitrage |
| August 1990 | - Increase in initial margin from 9% to 15% - Change in <i>kehai</i> limits to 50 points within 6 minutes |
| October 1990 | - Shortening of the trading hours by 15 minutes in the morning session and 5 minutes in the afternoon session |
| January 1991 | - Increase in initial margin from 15% to 20% |
| April 1991 | - Disclosure of programme trading buying and selling - Extension of the trading hours by 30 minutes in the afternoon session |
| June 1991 | - Increase in initial margin from 20% to 25% - Change in <i>kehai</i> limits to 30 points within 5 minutes - Weekly reporting of the 15 most active arbitrage trading companies |
| October 1991 | - Change in Nikkei 225 component stocks (elimination of 6 stocks) |
| December 1991 | - Increase in initial margin from 25% to 30% - Change in <i>kehai</i> limits to 20 points within 5 minutes after 3 p.m. |
| February 1992 | - Final Settlement price of the options is determined by the Special Quotation (SQ) - Daily disclosure of the 20 most active arbitrage trading companies - Shortening of the trading hours by 10 minutes in the afternoon session - Change of options to European style |
| September 1992 | - Change in <i>kehai</i> limits to 30 points within 3 minutes - Change in Nikkei 225 component stocks (elimination of 1 company) |
| October 1992 | - Change in Nikkei 225 component stocks (elimination of 3 stocks) |
| December 1992 | - Increased disclosure requirements of futures arbitrage - Announcement of the replacement of the Nikkei 225 futures contracts by new contracts based on a capitalization-weighted index |
| October 1993 | - NKS calculates a capitalization-weighted Nikkei 300 on a daily basis |

2. The setting

Trading in equity index futures became particularly active starting in 1990. However, hedgers have kept a relatively low profile, forcing arbitrageurs to make up for a shortage of sellers. Arbitrageurs exploit price differences between derivatives and the underlying cash market. One way to arbitrage is to simply simultaneously sell futures and buy underlying stocks and later on reverse this position. This, in turn, raised worries about potential selling pressure when arbitrageurs unwind their long positions on the basis of the quarterly SQ. Some observers were critical of the practice by foreign securities houses of conducting arbitrage trading just before the close of the market, something the Japanese houses had refrained from doing. Furthermore, the majority of profits reaped by foreign brokers were those of only a handful of leading arbitrageurs and derivatives traders. These firms had excelled at derivatives trading using complicated mathematical models and basket trading through computer systems. The foreign brokerages's competitive edge involved skills developed in their home countries, where EDM had been around longer than in Japan and deregulated commissions forced them to devise innovative revenue sources. In addition, some of them had superior computer-driven derivative technology to Japanese competitors.¹¹

Between 1990 and 1993, in many instances, price changes occurred first in the futures market, so as if EDM leapfrogged the stock market. However, this does not mean the futures actually *caused* price changes in the stock market. It is merely evidence that investors preferred futures to stocks. Held as an outright position, both are investment vehicles that are in economic terms essentially the same. Moreover, compared to the cash market, transaction costs in the futures market were up to 75% lower. Hence, Japanese institutional investors generally bought futures to maintain long equity positions, thereby pushing the futures prices up and causing mispricings in the futures markets. Since futures consistently traded well above their theoretical value (fair value)¹²⁺¹³, they became extremely attractive for

11 See Nakamae, Hiroshi; O'Toole, Thomas P.: Foreign brokerages near top, and Schmerken, Ivy: Japan scrambles.

12 See Arai, Tomio et al.: Problems and Prospects, pp. 42-44, Goldman Sachs: Stock Index, pp. 7-9, Baring Securities: Index F&O, pp. 11-14.

13 Theoretical value depends on interest rates, time to expiry and dividends. Since the futures price, by definition, will be set equal to the value of the underlying shares at expiration, the two values should move together closely. Theoretically, however, there should be a price difference between those two values, because of the different costs involved in purchasing and holding one versus the other. As a futures contract approaches expiry the theoretical premium, which is the difference between the futures price and the index level, approaches to zero.

arbitrageurs. In order to capture the price differentials, arbitrageurs accumulated long cash, short futures positions. Because the futures rarely traded at a discount to their fair value, these arbitrage positions could not be unwound prior to the futures expiry. Thus, the unwinding of arbitrage positions was fairly concentrated on the expiry dates, causing a substantial impact on the cash market.

Furthermore, some regulators and industry officials were also concerned that derivatives trading increased overall stock market volatility and frightened off small investors. The following section points out the various rules changes that were designed to reduce those negative impacts of EDM on the stock market.

3. Regulatory Restrictions on EDM

3.1. Conflicts of interests and MoF-regulation of EDM

The debate on the impact of EDM trading triggered frictions between large and small brokerages, Japanese and foreign houses, some of which made large profits from EDM, and between TSE and OSE.¹⁴ Since the market crashed in 1990, some Japanese officials have blamed foreign brokers, the most adept in derivatives trading. Additionally, due to the lack of expertise or capital, smaller Japanese houses have indicated resentment towards the larger houses.¹⁵ Finally, conflicts between the exchanges presumably arose from diverging commission incomes at OSE and TSE: TSE relied for most of its revenue on equity transactions commissions. With the prolonged slump in the equity market, TSE posted losses while OSE managed to post profits due to active EDM trading. EDM on the OSE attracted investors, because the volatility of the Nikkei 225 appeared to offer greater prospects for quick profits than the stock market in Tokyo. Hence, TSE, supported by MoF, imposed pressure on OSE to curb EDM activity in general and index-arbitrage in particular.¹⁶ Resistance from OSE prevented TSE and MoF from taking stricter measures. In general, MoF almost always intervened when the exchanges' self-control and regulatory measures were ineffective, as the following four cases indicate:

- i. The Nikkei warrant case: Fearing that warrant transactions might depress stock trading in Tokyo, Japanese regulators pressured the American Stock Exchange

14 See Nakamae, Hiroshi; O'Toole, Thomas P.: Foreign brokerages near top; Hardy, Quentin: Foreign Securities Firms; Sender, Henny: Salomon's Trading Tutorial; and Holden, Ted: An Onslaught and Holden, Ted: Strong-arming U.S. Rivals.

15 See Holden, Ted: Is Tokyo Getting Tough.

16 See O'Toole, Thomas P.: Osaka's tighter grip.

in 1990 to delist Nikkei 225 warrants which were among the most heavily traded instruments on the exchange. Instead of those warrants and with Japanese approval, the exchange introduced less popular, short term options on the Tokyo stock market. Their appeal was limited because their three-month duration curbed their use in hedging. When the New York, Philadelphia, Midwest and Pacific Stock Exchanges planned to introduce similar Nikkei 225 warrants in 1992, they were asked by TSE and MoF officials to cease trading Japanese stock index warrants.¹⁷

- ii. *The Morgan Stanley audit: Morgan Stanley Japan Ltd. has been one of the major players in the index arbitrage business and derived large profits from index-linked trading. Every week the firm ranked at or near the top of the industry in arbitrage volume. In February 1992, MoF launched a separate study of index-futures arbitrage at Morgan Stanley which seemed to go well beyond the parameters of a typical audit. The week after the audit began, the firm's arbitrage trading fell to 5,6 million shares from an average of 22 million in the weeks before.*¹⁸
- iii. *Negotiations with SIMEX: Alarmed by a rapid flow of index futures trading offshore to the Singaporean SIMEX, where similar Nikkei derivatives were traded, Japanese officials prodded SIMEX to bring its trading regulations more in line with those in Japan. They were concerned that trading Japanese F&O in Singapore might affect the Tokyo spot market and therefore sought tighter trading restrictions on the SIMEX market. Discussions on the subject of market coordination were initiated in autumn 1992 and continued in spring 1993 but no agreement could be reached.*¹⁹
- iv. *Restrictions on index arbitrage activity: The rapid shift toward arbitrage and derivative trading led some officials to worry that the arbitrageurs were going too far. In February 1990, as a futures-contract expiration approached and threatened to trigger a round of program trading, MoF called on foreign houses to curb their program trading activities.*²⁰ *Tensions arose as Japanese newspapers alleged that program trading by foreign houses was forcing the Nikkei average down. Guidance from the MoF in August 1992 initiated the shrinking of trading volume in EDM. In an effort to stabilize the cash market, the MoF*

17 See Inose, Hijiri; Tomomatsu, Hidetaka: Japan asks U.S.

18 See: O'Toole, Thomas: Morgan Stanley audit.

19 See NN: Simex and Tokyo Exchange Fail To Reach Pact on Nikkei Futures; NN: Tokyo Market; and NN: TSE to water down Simex demands.

20 See Holden, Ted: U.S. Broker's Stock is rising.

asked banks to refrain from selling futures to hedge their cash stocks.²¹ Furthermore, in December 1992 MoF prohibited front running as a manipulative trading technique and limited proprietary trading.

These four cases indicate the complexity of the EDM problem in Japan. While MoF has been regulating EDM on a more aggregate level, TSE and OSE have been involved in a variety of measures to curb the influence of EDM on the cash market as the following subsections will show.

3.2. The SQ-System

Prior to September 1989, the settlement price of the futures was based on the previous day's closing level of the Nikkei 225. This settlement modus caused significant volatility due to the unwinding of arbitrage positions at the close of the trading session. In order to avoid this volatility, changes in the calculation of the settlement price of the futures were implemented. Since September 1989, settlement at OSE is made according to a special quotation (SQ) based on the opening price of all the components of the Nikkei 225 average on the day after the last trading day. Although most of the stocks usually open fairly quickly, it is also likely that some stocks may not open for some time, or in an extreme case not at all.²² Therefore, the SQ differs from the opening price of the index, which uses the last traded share prices and the current indicated prices for its calculation.

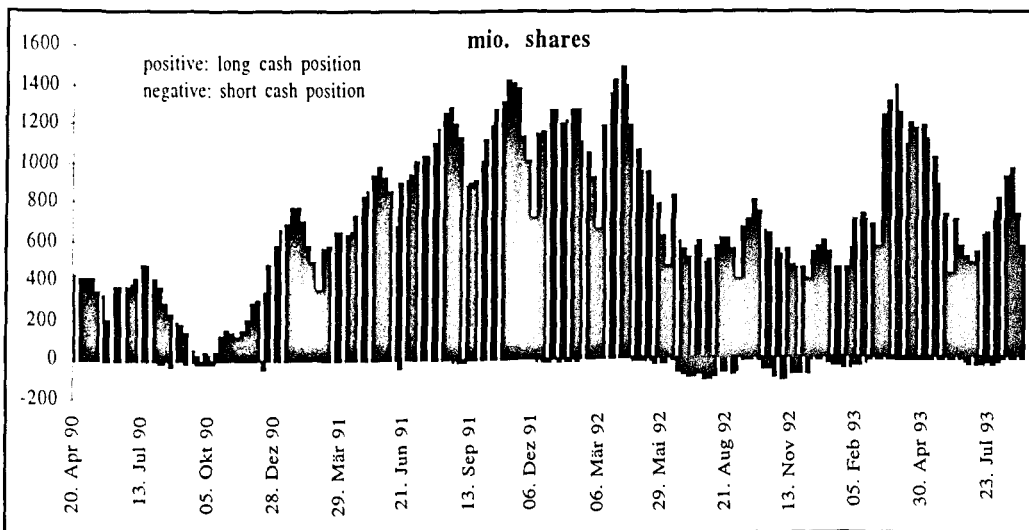
How effective has this regulatory measure been? The SQ method was adopted by OSE and TSE to avoid large index moves at the close of the final trading day of the futures contracts. However, the experience within our period of analysis proves that the SQ system did not prevent large price moves on the F&O expiries, and one could even argue that it actually magnified the size of such moves. Surprisingly, as index arbitrage became more and more popular, the deviation of the SQ level from the previous day's closing level increased dramatically. An increasing demand by Japanese investors drove futures prices up, which in turn allowed arbitrageurs to sell the overly expensive futures against their long equity positions. As mentioned before, the typical position of arbitrageurs in the period we focus on was long cash and short the corresponding futures (or an synthetic futures position created by using options with a similar strike price: If the strike on the put equals the strike on

²¹ See Ikeya, Akira: Institutions slash stock futures activity.

²² See Baring Securities: Index F&O, p. 13.

the call, the whole position is a synthetic long future). This implies that baskets of stocks replicating the Nikkei 225 index had to be sold at the moment of the unwinding of the arbitrage position. The net impact of this basket selling on the SQ day reached a maximum deviation of 4.97 percent at the December 1991 futures expiry. Those changes between the closing level at the last trading day and the SQ level averaged 0.08 percent between September 1989 (the first expiry) and September 1993, with a statistical standard deviation of 1.48 percent change from the closing level. However, on several occasions, huge differentials occurred: On the downward side, the SQ level was 2.89 percent lower than the previous day's close at the December 1990 futures expiry. On the upward side, deviation reached a peak of 4.97 percent at the December 1991 expiry.²³ Figure 2 shows the arbitrage activity that has occurred on a weekly basis since the beginning of such reporting in April 1990 (see subsection 3.3.). It visualizes the total outstanding cash positions held against short positions in the futures. The height of the bars shorten when arbitrage positions are closed by unwinding the stock positions.

Figure 2: Weekly cash position for index arbitrage 4/90 - 9/93



Source: Own Calculations based on OSE data

Hence, it seems the SQ made it easier for arbitrageurs to profit from price differentials between the cash and the derivatives markets. If arbitrageurs placed orders to sell their shares at market before the opening of the SQ day, each stock would trade at the opening price. Price movements of the individual stocks do not have any effect on the outcome of the arbitrage process, since the opening level of every

23 Own Calculations, based on OSE data.

stock is included in the calculation of the SQ and the final settlement price of the arbitrageurs' short futures position. The impact of cash basket transactions on the SQ morning is included in the SQ computation, so that arbitrageurs can avoid the market impact cost they would incur if they unwound their positions prior to the futures expiry. Nevertheless, unwinding on the SQ morning is not completely riskless. Consider the following: Some stocks may never open on the SQ day, which means SQ is calculated using the last special indication price for those shares (or the prior day's closing level if there is no special indication price), even though those shares never actually traded. In such cases the arbitrageurs have to sell the remaining shares from their basket on the following day. The price they get for these shares then might be considerably lower than the hypothetical price used to calculate the SQ level. However, in general terms the SQ system ensures that futures prices and the value of the cash basket will converge. In this sense, the SQ-system undoubtedly made index-arbitrage easier.

Did the SQ-system actually decrease the index fluctuations at futures expiry? Apparently, futures expiry still seems to influence the Nikkei 225 though the intensity of the index fluctuations decreased by early 1992. This is due to the fact that beginning in February 1992 contrary arbitrage positions were created.²⁴ This means that arbitrage-related buying and selling in the cash market were mutually offsetting each other's impact so that the overall effect was, at least partly, neutralized. Between April 1990 and September 1993, the actual net effect of index arbitrage on the cash market was positive: On average 820 thousand shares per week were bought. Yet, a more detailed analysis on a one-year basis reveals that in 1991 an average of 13.24 million shares per week were bought, while the effect in the following year was negative, since 14.10 million shares were sold every week. In 1993, between January and September 1.18 million shares per week were bought.²⁵ However, in these months, the minimum and maximum values reached their highest levels of the overall period. Apparently, changing the calculation of the settlement price did not actually dampen arbitrage activities and index fluctuations in particular. These goals could only be reached by intervening into the market mechanisms, i.e. by limiting the creation of arbitrage positions and influencing price mechanisms. The following subsections deal with such efforts.

24 See Baring Securities: Index F&O, pp.32-34.

25 Own Calculations, based on OSE Research Department data.

3.3. Weekly disclosure of index arbitrage positions

In order to improve transparency in the marketplace, TSE asked its members in April 1990 to disclose their cumulative cash position related to index arbitrage on a weekly basis. In spring 1991 MoF launched an initiative to prevent manipulation of prices on cash and futures markets.²⁶ When the value of outstanding arbitrage positions reached an amount of 845 million Yen, which was double the daily turnover of TSE First Section at that time, arbitrageurs had to report all outstanding arbitrage positions, not just those against the near futures contract.²⁷ In addition, the names of the 15 biggest arbitraging brokerages and their program trading activities were disclosed beginning in February 1992.

The objective of the intensified disclosure was to improve transparency and to allow investors to anticipate the impact of arbitrage activities on the stock market. However, this implies that the arbitrageurs themselves could anticipate their competitors' strategies which may even lead to manipulative trading strategies since the number of arbitrageurs is limited. The last week of January 1993, four brokers accounted for 52 percent of the outstanding arbitrage positions, and fifteen firms accounted for 96 percent.²⁸ Although only net positions are disclosed so that commission and proprietary positions cannot be identified, it is however possible to figure out the competitor's strategies by observing the equity index options positions. These positions tend to be rather sophisticated as far as foreign brokerages are concerned. Thus, one would hardly find outright positions in options. It is more likely that these positions are synthetic futures. While the options positions also include positions held in commission, the latter are increasingly unwound or rolled over into the next contract as the expiry date approaches. The remaining position reveals the competitors' position at expiry. Thus, the disclosure system enabled the arbitrageurs to anticipate their rivals' strategies. One might therefore argue that the rules changes designed to reduce arbitrage allowed the arbitrageurs to reduce market impact risk of their transactions. Moreover, in terms of efficiency, this measure proved to be inefficient, since it did not significantly reduce arbitrage activities.

26 See NN: Ministry calls on brokers.

27 See Tomomatsu, Hidetaka: Increased margins.

28 See TSE: *kaiin betsu saitei torihiki no jōkyō*.

3.4. Variation of margins and commission rates

Beginning in August 1990, TSE and OSE tried to influence EDM pricing mechanisms by raising margin requirements and commission costs. Margin is required when futures are traded and options are sold. Initial margin has to be deposited with the exchange to act as collateral against loss for the derivatives position. Positions are marked to market daily and any loss or profit is added to the margin account. If losses exceed a certain limit, the investor will be called to reimburse the margin account.²⁹

When EDM trading started in 1989, the margin was 6 percent of the trading value for members of the exchange and 9 percent for customers respectively. Furthermore, one third of customers' margin had to be deposited as a non-interest-bearing cash deposit. Members' margin was raised to 10 percent in August 1990 and customers' margin to 15 percent (with one third in cash). Until December 1991, the initial margin rate was raised by 100 percent for customers and 150 percent for members. With respect to customer margin deposits, investors had to put down 30% instead of the previous 25%. Of this amount, 13% had to be cash compared with 8% under the prior regulations. Total amount of members' margin reached 25% or 1.5 times the numbers of August 1990. The cash deposit was increased to 10%.³⁰ This move on the part of the exchanges was an attempt to induce cash market buying by effectively raising the cost of dealing in derivatives. Since opportunity costs of margin deposit are positively correlated with the amount of cash margin, the overall cost of EDM activities was increased.

Additionally, the commissions on EDM-trading were doubled in March 1992. Prior to this, transaction costs in EDM accounted for only 3.5 to 15% of transactions costs in the stock market. After March 1992, EDM transactions were still relatively cheap, with transaction costs reaching a maximum of 30% of stock market transaction costs. However, due to increased net prices, the break even point of EDM positions was increased as well. This actually only concerned customer positions and did not interfere with member trading activities, which accounted for slightly more than half the total trading volume. Hence, proprietary trading has not been influenced by this measure. Also, raising margin deposits did not really affect trading strategies of exchange members. Instead, long-term hedgers, i.e. customers who want to hedge stock portfolios, have been affected by this measure. The effectiveness of these measures is therefore at least questionable.

²⁹ See OSE: *Nikkei 225 sakimono*.

³⁰ See OSE: *sakimono opushon shijô ni kansuru*; and O'Toole, Thomas P.: *Osaka fee hike*.

3.5. Limit price changes and the *kehai*-system

In a more dirigistic approach, regulators tried to influence pricing mechanisms in the EDM by slowing the speed at which the indicated price can move and narrowing the maximum width of one indication move when futures trading is suspended. Practically, since the beginning of EDM trading in 1989, Nikkei 225 EDM are subject to maximum price changes from the previous day's close, or the closing indication level respectively if there is no trade at the close. If the futures prices exceed the maximum, trading will be suspended. In 1990, there were a number of occasions when the futures reached their limit prices.³¹ The cash index on the other hand does not have a sole limit, though each individual stock is subject to separate price limits, which in sum can result in a larger overall index move. Hence, on days when the futures have stopped trading, the futures premium, which is calculated by subtracting the futures price from the index level, can differ substantially from the theoretical premium. Assuming that volatile EDM would simultaneously lead to a volatile cash market, regulators decreased the maximum indicated price move (*kehai*) of EDM during periods of order imbalances.³² Whereas originally, the indicated futures price could theoretically move 90 points in every 5 minutes, in August 1990, the maximum move was reduced to 50 points in 6 minutes, and in June 1991, it was further reduced to 30 points in 5 minutes. Then, in December 1991, the *kehai* limit was reduced to 20 points in 5 minutes after 3 p.m. Finally, in September 1992, the *kehai* limit was changed to 30 points within 3 minutes.

Moreover, OSE's electronic order-matching system aggravated the problem of tight price limits. The Singapore Monetary Exchange (SIMEX), by contrast, relies on open outcry, in which prices are set by locals yelling at each other in a trading pit. This procedure allows smooth matching of buy and sell orders. Since futures trading throws up far more orders than trading in equities, OSE's electronic matching system could not cope with the rush of orders and the result were frequent imbalances. This would matter less if prices moved sufficiently to clear the market, but they are not allowed to do so. Therefore, the decrease in the speed and size of the movement at which the F&O prices can change made it difficult to execute trades in a rapidly moving market. Imbalances between the number of buy and sell orders at the last indicated price often led to temporary suspensions in trading. During periods of rapid cash movements, OSE futures ceased to trade, because the market

31 See Shin Nihon Shôken: *kabu shisû sakimono torihiki*, p. 37.

32 See OSE: *sakimono opushon shijô ni kansuru ki seisochitô ni tsuite*.

lacked sufficient orders to clear the imbalance, since the price had moved out of line with the cash. Accordingly, while the cash market moved several hundred base points, futures trading was suspended, creating mispricings between cash and futures market.³³ In addition, far from decreasing the volatility in the cash market, the *kehai* limit caused confusion among investors. The failure of the futures to find a reasonable level quickly when the market was moving rapidly, and the simultaneous imbalance of buy and sell orders unsettled investors in the cash market.³⁴ The constraints on price movements had a negative effect on investors' strategies: They could not hedge their portfolio with an appropriate timing and had occurred losses on long stocks positions. Consequently, a natural outflow of trading began from OSE into the less regulated market in Singapore.³⁵ This was mainly due to four reasons: Firstly, the SIMEX open outcry system allowed smooth matching of buy and sell orders whereas in the electronic order execution system on OSE, high order frequency often caused order imbalances and therefore impeded price indications. Secondly, SIMEX did not impose limits on daily price fluctuations, while the OSE limits daily movements to 3 percent from the previous day's closing level. Thirdly, SIMEX offered a mutual offset margin system that reduced required margins by balancing risks in long and short positions. OSE on the other hand demanded margins for both, regardless of whether a trader's total exposure was reduced through simultaneous long and short holdings. Last but not least, SIMEX had been promoting Nikkei 225 derivatives trading aggressively. Even as SIMEX raised margin requirements for its Nikkei 225 futures contract to about 15% from 11%, the highest margin for any futures contract at the exchange, trading volume still increased. Some rumours could be heard in the financial world alleging that the tightened regulations were enacted under pressure from the TSE and MoF to reduce index-linked arbitrage. TSE requested negotiations over listing terms on SIMEX. Presumably, Tokyo wanted SIMEX to curb Nikkei F&O trading by increasing margins and commissions to the OSE level.

How effective has the *kehai*-limit been in terms of dampening cash market volatility? If the futures market was responsible for the volatile conditions in the stock market, stock market volatility should significantly decrease during futures trading suspensions. However, analyzing implied volatility of option prices as a proxy for cash market volatility suggests the opposite because options' implied volatility during periods of futures trading suspensions was increased. For instance, implied

33 See Shibata; Yoko: Japan's Futures Problems; and NN: Call to relax rules.

34 See NN: Call to relax rules.

35 See O'Toole, Thomas P.: Nikkei futures arbitrage trade.

volatility of puts jumped from a common 20-30 percent to 38 percent in January 1991 and to 56 percent on April 8, 1992.³⁶ This, in return, indicates that even after the *kehai*-limit was enforced, there was massive cash market volatility.

3.6. Modification of trading hours

Another measure was the modification of the trading hours. While there have been three changes since the introduction of EDM in 1988, total trading time was only changed marginally. In 1988, the morning session lasted from 9.00 to 11.15 and the afternoon session from 13.00 to 15.15 respectively. Beginning with October 2, 1990, the morning session ended at 11.00 and the afternoon session at 15.10. In a move to bring EDM trading hours further in line with those of the cash market, the exchanges agreed to start the afternoon session at 12.30 since April 30, 1991. Finally, on February 6, 1992, the afternoon session was shortened by ten minutes to end at 15.00, and trading hours in the cash and equity derivatives markets were identical from then on.³⁷

As to the effect of this regulation, it actually abolished any opportunity to trade derivatives after the closing of the cash market at 15.00 and was intended to have a detrimental effect on arbitrage activities. Prior to this measure, arbitrageurs could either use the opening or the close of the cash market to execute basket transactions. Both, opening and close are normally fairly liquid, so that the market impact risk of the basket transactions is somewhat limited. If an arbitrageur completed buying a Nikkei stock basket at the market close prior to February 6, 1992, he still had 10 minutes trading time remaining in the EDM to establish the corresponding derivatives position. While this strategy could not be executed any more in Japan after the measure was taken, it was still possible to do so in Singapore, where the SIMEX market did not close until 15.15 Japan Standard Time.³⁸ The effectiveness of this regulatory measure is therefore at least questionable. Additionally, after its introduction no homogenous impact on the arbitrage activities could be observed.

36 See Henry, Stuart: "Do not disturb" Sign, p. 50.

37 See OSE: Fact Sheet 1991, p.15.

38 See SIMEX: Market Update.

3.7. Modification of Nikkei 225 Options

On February 2, 1992 OSE decided to replace its "pseudo" American-style Nikkei 225 options contracts that could be exercised once a week on every Thursday, with European-style versions, which means they could only be exercised at the expiration date from then on.³⁹

What effect did this measure have? Even before the modification, options have hardly been exercised before expiry. Thus, options trading did not have a severe impact on the cash market before options expiry. Synthetic futures could be created using options contracts, i.e. by selling a put and buying a call at the same strike price. The profit and loss exposure of such a position is essentially the same as a long futures position. A common way to arbitrage mispricings between futures and options markets is to create synthetic futures using options and take the opposite position in the futures. Furthermore, it is also possible to arbitrage mispricings between the cash and options markets by using synthetic futures. Since the Nikkei options could be exercised before expiry, sellers of options were confronted with a substantial exercise risk which would have prevented them from profiting from index arbitrage. However, changing the settlement of Nikkei 225 options from American- to European-style made arbitrage easier and less expensive, because the seller of an option did not have to incur exercise risk prior to expiry any more. One major advantage of such a synthetic future is their cost advantage over futures: Synthetic futures are subject to margin requirements of the options market. Since there is no cash margin deposit in the options market, margins can be fully deposited in securities. Hence, opportunity cost of cash margins in the futures market can be saved. In addition, *kehai*-limits were less often exceeded in the options market, so that options represented the only opportunity to trade Nikkei 225 derivatives in Japan while the futures market was suspended.⁴⁰

Thus far, we have concentrated on measures that have been aimed at and implemented in the EDM exclusively. However, it was the Nikkei 225 index itself that was part of the problem: The Nikkei 225 is a price-weighted index of 225 stocks listed on the First Section of the TSE. Its price-weighted structure implies that stocks with high prices have a heavy weighting in it. This structure makes the Nikkei 225 easier to replicate and more susceptible to manipulative trading.

39 Since real American type options can be exercised anytime prior to expiry, we refer to the former Nikkei option type as "pseudo" American-style.

40 See Henry, Stuart: "Do not disturb" Sign, p. 50.

Accordingly, a number of regulatory measures was aimed at changing the structure of the index. These measures will be analyzed in the following subsections.

3.8. Changes in the Nikkei 225 Average

As the EDM controversy proliferated, the function of Nihon Keizai Shimbun (NKS) to review the Nikkei 225 was also criticized.⁴¹ The data-bank bureau of NKS acts as calculator and manager of the Nikkei Stock Average. The components used to calculate the Nikkei 225 have remained fairly constant since the 1950's. Hence, the index includes a number of stocks which may not be best suited for a benchmark index mirroring today's Japanese economy. Some of these stocks belong to a group of rather illiquid shares which tended to outperform the Nikkei 225 when the index was rising and to underperform when the index was falling. In particular, during 1990 those low volume index shares were greatly affected by index arbitrage: When arbitrageurs bought cash baskets against futures positions to capture the profits from expanding futures premiums, they drove the prices of the most illiquid shares significantly higher. Selling of cash baskets had the opposite effect on the illiquid stocks.⁴²

Therefore, the core problem of EDM in Japan is the construction of the underlying index itself. The Nikkei 225 is a simple average of 225 leading stocks and does not take into consideration the number of stocks outstanding. Since it is not weighted to allow for differing stock prices or numbers of shares outstanding, the same amount of money invested in certain shares has a wildly disproportionate effect on the index.⁴³ Hence, a trader could distort the index and then take advantage of temporary price discrepancies between the cash market and the EDM. Concern that the Nikkei 225 can be manipulated led to suggestions of possible changes in its method of construction, such as reducing the number of its component stocks or changing it to a capitalization-weighted index. In an attempt to make the index both more representative of the Japanese industry and more liquid, the NKS changed some of the component stocks as of October 1991 and 1992. On October 1, 1991, NKS implemented a new set of rules, the so-called New Deletion/Addition Standard.⁴⁴ On the same day, six component changes were announced. The announcement of the changes had a strong impact in terms of stock prices of the

41 See Hunter, Kim: *Nikkei meets its nemesis*, p. 41.

42 See Baring Sec. Ltd. (ed.): *Index F&O*, pp. 36-37.

43 See Akita, Masâki: *indekkusu baibai*; and NKS: *NEEDS tokubetsu ripôto*, pp. 11-19.

44 See NKS: *deetabukku*, p. 11.

relevant shares, because in the run-up to the changeover date the deletions suffered massive price declines, whereas the additions experienced large price increases.⁴⁵ The New Deletion/Addition Standard ensured that the Nikkei 225 index was composed of relatively liquid stocks. The index is reviewed on an annual basis and, according to the rules, up to six components may be replaced. Besides the changes in October 1991 another four stocks were replaced the following year, all of them with a market capitalization of 35 to 220 million shares, far below the 1993 average market capitalization of all Nikkei 225 components at about 892 million shares. The shares replaced in October 1991 accounted for an average volatility of 54,43% between November 1, 1990 and September 30, 1991 whereas the average volatility of the Nikkei 225 was 37,77%.⁴⁶ Therefore, one effect of the replacement was a reduction in the volatility of the Nikkei 225. In October 1992, another three stocks which had been repeatedly used for manipulative trading activities were deleted. Those three stocks have been particularly traded on SQ-dates to move the index: The fact that approximately 14% of the total turnover of these stocks between December 1991 and August 1992 occurred on the five SQ days within this period supports this argument.

What was the impact of this measure? In 1991, the index changes were already disclosed three days prior to the reconstitution date so that the market participants could discount the changes. Investors holding index-linked portfolios aggressively sold the deletions and bought the additions. Hence, large sell and buy imbalances occurred. Since the additions were to be implemented at the closing price on the last trading day before the changes, investors who wanted to avoid any tracking error in their portfolios had to execute these transactions as market-on-close orders on that day. This actually enforced the imbalances. Similar manoeuvres were executed the following year, when the deletions were traded with a volume of about ten times their normal turnover. After being deleted from the index, the average daily turnover of those shares plummeted, as the example of Daito Woolen, which was replaced in October 1992, indicates: Prior to the deletion it was traded at a daily average of 226 thousand shares, afterwards daily volume shrank to 41 thousand shares in January 1993.⁴⁷

How effective has this measure been? How well has it performed in functional terms? In order to answer these questions we have to consider two arguments: Firstly, the liquidity of the Nikkei 225 index was undoubtedly improved. This im-

45 See Koyanagi; Takehiko: Nikkei index change.

46 See Goldman Sachs Intl. Ltd. (eds.): Changes, p. 7.

47 See TSE (eds.): Monthly Statistics, 01/93, p. 9.

plies on the other hand that the liquidity of Nikkei 225 baskets was improved as well. Therefore, arbitrage and index-related trading strategies became easier to execute. Secondly, although the liquidity of the Nikkei 225 has been improved in relative terms, the index was still composed of some fairly illiquid components. In January 1993, these were shares with prices exceeding the average price of the Nikkei 225 constituents. Out of the Nikkei 225 components, those ten shares with the highest prices account for an index weighting of 14.84 percent. This implies that they had an extremely high impact on the volatility of the Nikkei 225. Thus, albeit the reconstitutions, the Nikkei 225 still comprised a number of low volume shares with a high impact on the index movements. In October 1992, NKS could not replace the maximum number of six shares because the New Deletion/Addition Standard is understood in relation to all the TSE First Section shares. In this context, even the low volume constituents of the Nikkei 225 were, due to the increased proportion of index-arbitrage linked basket trading, relatively liquid compared to the remaining TSE First Section shares. The actual problem was and still is the large amount of low volume shares in the TSE First Section. Out of these 1,200 different stock titles, only about 100 were sufficiently liquid. A NKS study shows that all Nikkei constituents belong to a group of TSE First Section shares with the highest quotation and order execution probability and the highest float ratio.⁴⁸ The float ratio is calculated by dividing the total turnover volume of a certain share with the number of outstanding shares. It is therefore a proxy of market liquidity of a certain share. However, if only sufficiently liquid stocks were to be included in the Nikkei 225 index, the number of constituents would have to be reduced significantly. Own calculations on the basis of January 1993 data indicate, that an index comprising only about 125 components of the Nikkei 225 could not be manipulated as easily as the Nikkei 225 by enforcing transactions in the illiquid stocks. Naturally, such a leaner index would neither represent the Japanese economy as a whole nor track the overall performance of the market the same way the Nikkei 225 does. Yet, the modification of the equity index underlying the derivatives market remained a promising measure for the market regulators.

48 See NKS: NEEDS tokubetsu ripôto, pp. 49-64.

3.9. Change of the underlying index: The Nikkei 300

In fact, it was local criticism that EDM trading created volatility in the underlying cash market which prompted MoF's move to review the Nikkei 225 index.⁴⁹ The MoF proposed a capitalisation weighted index, which takes the number of outstanding shares into account. Consequently, on December 22, 1992, Japan's finance minister announced the long-term replacement of the Nikkei 225 futures contract traded on OSE by a new contract based on a capitalization-weighted Nikkei 300 index.⁵⁰ In early 1993, NKS released a new Nikkei 300 stock capitalization-weighted index on the Japanese market. MoF appeared to be keen to promote the new index which has 155 stocks in common with the Nikkei 225.⁵¹ However, the introduction of the new index created friction between the Japanese and the overseas exchanges SIMEX and CME, for which the Nikkei 225 derivatives were lucrative products. It was decided to continue trading of Nikkei 225 derivatives for at least two and a half years and to cease trading only if the new derivatives had the dominant market share of the derivatives market in Japan.⁵² In asking for a new cap-weighted index, the MoF has been seeking to replace Nikkei 225 futures with a less volatile contract designed to provide fewer opportunities for such trading techniques as stock-index arbitrage. Nevertheless, using a capitalization-weighted Nikkei 300 does not necessarily imply that this index is considerably less vulnerable to manipulation. For instance, its ten shares of the banking sector do account for a total index weight of 24.2%.⁵³ This is due to the fact that the new index does not take into consideration the amount of cross-shareholding which is traditionally high within the banking sector. In Japan, bank stock liquidity is very low relative to market capitalization because many bank shares are not freely traded. Transactions in those high-priced stocks could therefore have a disproportionate effect on the index, which makes the Nikkei 300 also susceptible to market maneuverings aimed at moving its level through massive trading of the rather illiquid shares.

For the time being, the Nikkei 225 derivative and the new Nikkei 300 derivative contracts coexist, with a significantly higher trading volume in the Nikkei 225 derivatives. The impact of introducing F&O based on a cap-weighted stock index strongly depends on how the new contract is received by market participants and

49 See Hardy, Quentin: Anticipating New Nikkei Contract; NN: OSE plans '94 debut; and Terazono, Emiko: Japan plans new futures index.

50 See Wilson, Neil: Osaka responds.

51 See Ikeya, Akira: Weighted stock index and Hardy, Quentin: New Index Could Eclipse.

52 See Ikeya, Akira: Planned index.

53 See Daiwa Europe: Nikkei 300, Appendix 4.

investors. A look at turnover shows that market participants have only reluctantly accepted the new contracts. Thus far, trading activity has been negligible compared to the popular Nikkei 225 EDM. Moreover, as long as Nikkei 225 derivatives are traded on the offshore exchanges SIMEX and CME, trading could shift offshore. If the replacement of the underlying index was to be successful, Japanese EDM regulators would need to request overseas exchanges to switch to the new index as well. As far as SIMEX is concerned, the exchange has been interested in renewing the licensing agreement with NKS which expired in May 1995, because the Nikkei 225 futures trading comprised a large amount of SIMEX's total volume.

In addition, even if the Nikkei 300 derivatives attain a dominant market share, the Nikkei 225 derivatives cannot be phased out for at least one year and three months thereafter, which is the expiry of the furthest existing contract month. In the follow-up, a short-term negative impact on stock prices is more than likely. The reasons for this are twofold: Firstly, if the Nikkei 225 derivatives are to be abolished, market players will not need to keep holding thinly traded Nikkei 225 components. If they simultaneously sell such shares, the Nikkei average may decline and further dampen the overall market sentiment in the stock market. Secondly, the replacement of the Nikkei 225 will cause confusion in international financial markets, because many investment instruments are linked to the Nikkei 225 Average. Trading of such instruments will be difficult at best without EDM based on the same index.

On the other hand, replacing Nikkei 225 EDM with a cap-weighted Nikkei 300 would be a considerable step towards dampening index arbitrage, since it would be much more difficult to create a stock basket with a low tracking error. Yet, the problem of finding an appropriate measure of the liquidity of every share in order to identify its weighting remains to be solved. Additionally, market participants will have to be motivated to accept the new index. "It has already been proved that government-led indices, such as ... TOPIX, are unlikely to establish their own market."⁵⁴

4. Conclusion

This paper analyzed the different regulatory controls that have been imposed between 1989 and 1993. We have followed the question of how they were motivated.

⁵⁴ Hunter, Kim: Nikkei meets its nemesis, p. 41.

The result was that between 1989 and 1993, prolonged pressure from stock investors, TSE officials, and Japan's MoF, blaming the Nikkei 225 derivatives for creating excessive volatility in the cash market, keeping away investors and aggravating the market's long-lasting slump led to changes in EDM regulations. Therefore, these changes were predominantly made in response to problems in the cash market.

We then tried to identify the effect of the regulatory controls on EDM and cash market trading. Basically, the controls have reduced liquidity and limited price movements in the OSE derivatives contracts and provoked a shift of trading into a less regulated Singaporean SIMEX-market. Consequently, SIMEX recorded high increases in volume and market share of Nikkei 225 EDM trading. To summarize our findings: There were three overall negative effects of the regulatory measures that have been imposed to Japanese EDM.

- i. Continued efforts of the Japanese financial authorities to restrict derivatives trading triggered the shrinking of the EDM trading volume in Osaka and encouraged gradual migration to overseas markets like SIMEX. Tighter regulation made futures trading more costly in Osaka and trading conditions became less favorable. In particular, due to lengthy suspensions of trading when order imbalances occurred and to the increase of transaction costs, daily Nikkei 225 futures volume on the OSE dropped by 46 percent between 1991 and 1992. SIMEX's advantages over OSE were considerably lower transaction costs and smoother order matching due to the open outcry system. The shift from OSE to SIMEX weakened OSE's major advantage, the provision of a sufficiently liquid market.⁵⁵
- ii. Secondly, Nikkei 225 options trading volume shifted to the OTC market. Turnover of those products is now concentrated in Japanese trading hours and major players are Japanese and US securities companies in Tokyo, booking their transactions in London.⁵⁶
- iii. Finally, it seems as if Japanese EDM supervisors were increasingly losing control over the EDM. They were confronted with the problem of a shift of volume to offshore and OTC markets. The growing importance of those markets complicated the supervision of the domestic EDM. However, EDM supervision

55 See Rolle, James: *Simex's Star*; Shibata, Yoko: *Relationship With Derivatives*, p.67; Rowley, Anthony: *Tail wags dog*; Wilcock, Christopher B. et al: *Simex Futures, Spurning Tokyo*; and O'Toole, Thomas P.: *Nikkei futures arbitrage*.

56 See Hunter, Kim: *Nikkei meets its nemesis*, p. 42.

only makes sense if regulatory measures are comprehensive in scope. From a regulatory point of view, it is therefore indispensable to regain control over the majority of EDM volume.

To a certain degree it seems, as if financial authorities' efforts to reduce index-futures arbitrage-trading actually impeded the efficiency of EDM. Particularly the *kehai*-regulation caused problems since it was the main reason for the poor tradability of the futures contracts when the underlying markets were volatile. Suspended trading led to an increase in the number of market orders, which in turn led to longer suspensions. In functional terms, it was because of this vicious circle that EDM did not always perform as an effective hedging device. Yet, one major precondition of F&O as effective hedging instruments is the ability of F&O prices to converge quickly to their theoretical level. As mentioned before, this was not always possible in the Japanese EDM.

In addition, it seems as if the measures did not achieve their goal to induce activity in the stock market. This refers to our final question of how effective the controls were. "Regulatory changes aimed at supporting Tokyo's floundering stock market ... are hurting futures trading without helping stocks."⁵⁷ However, without any contribution from the EDM regulators, greater competition between the arbitrage players made the market more efficient and balanced it. Also, Japanese securities houses are increasingly participating in arbitraging and proprietary trading activities.⁵⁸ Due to the increased number of players in the market, futures are not easily moving with the baskets traded in the market any more. Finally, higher commissions and a growing reluctance among domestic institutions to trade in futures instead of stocks decreased volume and moved futures trading range more in line with their theoretical value.⁵⁹ Accordingly, profit opportunities in arbitrage and other niche areas are evaporating due to lower volume and narrower spreads between the cash and futures markets.⁶⁰ As a consequence, lower profit margins mean fewer new positions will be established, so that the market is becoming more efficient and the negative impact on the cash market is reduced by market forces instead of regulatory measures.

However, in terms of effectiveness there is another aspect of the regulations implemented by MoF and the exchanges that has not been investigated yet. The finance ministry has always defended the regulations by claiming they provide superior in-

57 O'Toole, Thomas P.: New Osaka rules.

58 See O'Toole, Thomas P.: Tighter market.

59 O'Toole, Thomas P.: Short arbitrage.

60 O'Toole, Thomas P.: Index arbitrage losing.

vestor protection.⁶¹ Have these investor protection measures proven effective? Consider the collapse of Barings, the British merchant bank, in February 1995: Barings had been amassing a substantial position in Nikkei futures on the OSE and on SIMEX. The bank's derivatives trader, Nick Leeson, accumulated huge numbers of Nikkei 225 futures contracts between January and February 1995. Leeson deceived Barings by telling directors he had a matched position. However, he booked unmatched trades on an error account building up a futures position which was unhedged and would turn out to be fatal to the company. In fact, he was running a huge risk by taking this unmatched US-\$7 billion position on the Nikkei which fell in value as the index fell.⁶² The bank continued to fund Leeson's activities in the four weeks leading up to the collapse. By the time internal auditors finally suspected some irregularities, the amount of credit extended to cover the open positions had exceeded the bank's capital.

It seems likely that some of the restrictive rules under which Barings operated in Japan may have prevented a more frightening collapse. The cautious attitude towards liberalization of EDM trading, and the high margin requirements of 30 per cent in particular, had been harshly criticized by the foreign financial community. As a result, large volumes of futures trading have moved from OSE to SIMEX since 1992. Yet when an institution fails and is unable to meet its obligations, market participants are better protected by the Japanese regulations. The large margin payments on the OSE meant the exchange was comfortably able to finance the losses without having to demand support from the members of the exchange - other (mostly Japanese) securities houses. Thus, the expensive margin system was effective in containing the consequences of the Barings collapse.

In spite of the cautious attitude towards EDM trading in general, Japanese regulators, as well as their counterparts in Singapore and London, did little about the warning signs Barings was giving off. The accumulation of a huge open position in Nikkei futures should have caused particular concern for the Japanese authorities because it carried a substantial threat for the whole Japanese financial system. Were those long positions to be unwound quickly the consequent slump in the stock market would have been to weaken further Japan's banks by reducing the value of their shareholding. So the Japanese had more reason than most to keep a close watch on Barings' long positions. Though the central bank had reportedly

⁶¹ See Baker, Gerard: Muted bark

⁶² See Chua-Eoan, Howard G: Going for Broke and Gappner, John/Montagnon, Peter/Cooke, Kieran: Barings transferred cash

approached the OSE and Barings on two occasions in February 1995 to ascertain the safety of the positions being built, there is no evidence that the Japanese regulators alerted other authorities about what it knew until it was too late.⁶³ Hence, one might argue that Japan's regulators acted somewhat reluctant within the international regulatory framework and that coordination had been insufficient.

Nevertheless, the effectiveness of the close controls exercised by Japanese authorities is twofold: First, as the Barings case indicates, these regulations have proven to be an effective means to secure the national financial markets from a much more severe crisis (the collapse of EDM, stock market and, as consequence, the banking system). Second, evidence suggests that the information generated by the tight controls has not been used to alert regulators in Singapore and London, which implies that thus far the Japanese EDM regulation has been rather ineffective in terms of an international regulatory framework.

Summing up, Japanese regulators showed a cautious attitude towards liberalization of EDM trading in the past. Supervision of EDM has been strict, regulators intervened into the market on several occasions and tight controls have increasingly been imposed. Reflecting the various steps taken by the regulators, one might get the impression that Japanese EDM have been re-regulated. However, as the Barings case indicates, this had a positive impact on Japanese financial markets since the regulatory measures protected these markets from being deteriorated by the Barings collapse.

⁶³ See Denton, Nicholas/Gapper, John: *The Barings crisis*, p.3

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