MAPPING OUT THE JAPANESE MERGERS AND ACQUISITIONS PATTERN - THE INFLUENCE OF MACRO FACTORS ON M&AS

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- the influence of macro factors on M&As

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Abstract

Mergers and acquisitions (M&As) are not a new phenomenon in Japanese business. Especially after the end of the Allied occupation of Japan, the number of domestic M&As rose sharply due to the reconsolidation of former *Zaibatsu* firms broken up by the occupation authorities. During the Japanese post-war economic recovery, M&As between non-keiretsu firms became more and more common.

After the burst of the "bubble" economy in 1991 a new era of M&A started. Together with deregulations in a number of non-tradable sectors, a relatively large number of foreign firms have entered the Japanese market, using M&As as a tool of market entry. In many sectors, the sudden exposure to international competition has forced the incumbent firms in the formerly protected industries to restructure and streamline their operations in order to survive the new order. For the foreign firms, the opened-up economy has meant new business opportunities, and a chance to compete on more equal terms with the Japanese firms on their home market.

For Japanese firms, international M&As have become a viable alternative to domestic ones due to market liberalization and the economic realities of the 1990s. Furthermore, foreign firms have now discovered M&A as a cheaper tool to enter a new market and achieve market-specific knowledge, instead of trying to force a market entry through expensive greenfield investments and joint ventures.

Here, it is interesting to ask to what extent macro factors have influenced the M&A pattern in Japan. Does economic activity matter for the Japanese M&A activities, or have they lived "their own life"? What are the effects of institutional changes on the M&A pattern during the 1990's?

In this paper, the short-run pattern of Japanese post-bubble inward (cross-border) and domestic M&As is analyzed econometrically, using macroeconomic data and data on Japanese M&A.

Keywords: Mergers & Acquisitions, Japan.

JEL codes: F23, G34

1. Introduction

Mergers and acquisitions (M&As) are not a new phenomenon in Japanese business. Especially after the end of the Allied occupation of Japan in 1952, the number of domestic M&As rose sharply due to the reconsolidation of former *Zaibatsu* firms broken up by the occupation authorities. During the Japanese post-war economic recovery, M&As between non-keiretsu firms became more and more common.

However, after the burst of the "bubble" economy in 1991 a new era of M&As started. Along with deregulation in a number of non-tradable sectors, a large influx of foreign firms has occurred, using M&As as a tool of entering the Japanese market. In many sectors, the sudden exposure to international competition has forced the incumbent firms in the formerly protected industries to restructure and streamline their operations in order to survive the new order. For the foreign firms, the opened-up economy meant new business opportunities, and a chance to compete on more equal terms with the Japanese firms on their home market.

For Japanese firms, international M&As have become a viable alternative to domestic ones due to market liberalization and the economic realities of the 1990s. Furthermore, foreign firms have now discovered M&A as a cheaper tool to enter a new market and achieve market-specific knowledge, instead of attempting a market entry through expensive greenfield investments and joint ventures.

M&As as a phenomenon have interested scholars for many years, and have been studied at length. A special feature of M&As, namely the wave-like pattern of M&As, has been discussed at length in the literature. In fact, the wave pattern of mergers has been a topic within economics for about hundred years[1], starting with the great merger waves occurring in the United States during the last decades of the 19th century. Despite the emergence of modern financial economics, researchers have fallen short of developing a general theory of M&As and M&A waves. As a result of this deficiency on the theoretical side, most research has been empirical and ac-hoc in nature, where linear time series analyses have been prominently applied, and more recently, non-linear time series models and Markov switching-regime models (e.g. Town, 1992).

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[1] Resende, p. 85.

In the literature, there are also suggestions for psychological factors influencing M&A patterns, e.g. the "herd behavior". Due to the limited scope of this paper, psychological aspects of M&As, however interesting, will not be discussed here.

Further, this paper will be purely empirical in nature, employing a model inspired by Ali-Yrkkö (2002). Owing to the nature of the data available, the analysis of this paper is limited to the Japanese M&A pattern during the 1990's. The analysis focuses therefore on the influence of selected macroeconomic and financial variables on the pattern of M&As to see whether the Japanese economic activity can explain the most recent wave of M&As. In addition, dummy analysis is conducted in order to assess the influence of the 1998 Tokyo Big Bang reforms.

2. Previous studies

Why do a M&A? This question, or better to say the general motives for M&As, is discussed at length in the literature (see among others Ali-Yrkkö, 2002, and Chapman & Edmond, 2000, and Röller et al., 2000). However, the common wisdom of M&As, other things being equal, is that they are regarded as a tool for an acquirer to increase the value of his own company and to procure future cash flow of the acquired company (or so-called "due diligence"). On the other hand, for the acquired company, an M&A could mean a way out of a financially distressed situation or a mean to cash in a value increase for an entrepreneur. Apart from this ideal and general concept of M&As, other exogenous factors naturally affect the M&A decisions, such as macroeconomic variables and the state of the financial markets.

On the global level, the steel and chemical industries[2] have historically been stages for major M&A activity after the Second World War, as well as in the financial sector after far-reaching deregulation during the 1980's (for the U.S. and European cases). But the M&A waves have not been limited to these industries only. An example of studies in M&A patterns is found in Walter (1993), who has made a value ranking of M&A deals in U.S. and Europe during 1985 and 1991. He found a tendency that the bulk part of M&As were occurring in similar industries on both sides of the Atlantic,

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[2] Including the pharmaceutical industry.

involving all major industries. However, he does not discuss in depth the influence of the business environment on these firms or how it has affected the number of M&A deals. Further, a discussion on how external shocks have affected the pattern of M&A is also lacking.

For the European case, the pattern of M&As in the chemical industry has been analyzed in an event study by Chapman and Edmond (2000). They focus their study on the shift in ownership relations among the chemical firms in the European Union (EU), finding that companies from Northern Europe tend to acquire companies in Southern Europe. Again, the institutional framework of the chemical industry is not analyzed from the M&A point of view, and the question left unanswered is if the pattern of the European chemical industry is representative for the M&As that takes place in EU.

In another study, the U.S. M&A wave pattern is analyzed through Gaussian semiparametric and Exact Maximum Likelihood methods. The results of Barkoulas et al. (2001) reveal that post-wave effects on the U.S. M&A pattern, denoted by the authors as "long-memory process", have had long-lasting effects on the M&As during the subsequent periods. This "long-lasting memory" denotes a lagged process after shocks[3], and in addition to the influence these "shocks" have in the time periods immediately after, Barkoulas et al. also found that these "shock" effects were significant in the long run, that is, they influenced the subsequent M&A waves. The authors also discuss what mechanisms that might trigger merger waves. Following Gort's (1969) arguments, Barkoulas et al. mean that the underlying causes depend basically on different perceptions of corporate value. In other words, shareholders of a company value their stocks lower after a "shock" than the potential acquirer(s). After reaching a critical mass of M&As, a merger wave will start.

Thus, the studies of the kind we have seen above do not relate to the institutional framework or the business environment (neither on the macro level nor the micro level) for the industries concerned, nor do they analyze the effects of various types of shocks in explaining M&A patterns. To see the pattern in M&As more or less as

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[3] Unfortunately, the authors do not define clearly whether their meaning of "shocks" means disturbances on the industrial, country or global level; these do not necessarily affect firms in the same way.

isolated events in ownership change without regarding exogenous variables is not particularly rewarding, since there is a risk that important trigger mechanisms for M&As are missed.

The M&A pattern in Japan has been very similar to the U.S. and EU ones with deals occurring in the same industries. However, one major exception to this general picture does exist: the cross-border M&As have been virtually non-existent. Especially for international mergers, the number of deals has always been extremely low[4].

An attempt to address the external factors' influence on M&A pattern is Ali-Yrkkö's (2002) study, where the author has analyzed the pattern of M&As in Finland from macroeconomic variables. The time period under study was 1980-2001, during which Finland saw a boom and a sudden plunge in GDP growth. As in Japan, Finland experienced a "bubble", led by heavy international borrowing by the private sector, which fuelled private consumption. This was made possible by far-reaching liberalization of the financial markets and a reform of the tax system. Around the turn of 1980's, Finland experienced severe external shocks: the COMECON trade suddenly disappeared, and a speculative attack on the Finnish Markka occurred, resulting in a heavy drop in the private sector consumption. Obviously, this aggregate shock was clearly reflected on the Finnish M&A activities.

Ali-Yrkkö's results show the high explanatory power of the independent variables (GDP, market capitalization and the number of listed firms) on the European (and Finnish) M&As. However without drawing causal inferences, the author makes a three-level proposition. From the results, he suggests that the M&A decision can be seen as a top-down flow, where macro level factors causes shocks on the industrial level, to which managers on micro level reacts and make decisions whether or not to engage in M&A activity (see figure 1).

The factors chosen by Ali-Yrkkö are rather intuitive, and are to a large extent self-explanatory. The factors *Shocks*, *Economic motives*, *Managerial motives* and *Hubrid*

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[4] There are no reliable data on international mergers in Japan before 1985, but the occurrence has been low ever since the modernization of the country in the 19th century. The number of international mergers in Japan after 1993 has only been three, all initiated by Korean or Taiwanese firms. The preferred entry mode for foreign firms has been more traditional, such as through acquisitions, joint ventures or greenfield investments.

(sic!) motives do require some comment. *Shocks* can be defined as a sudden revaluation of the current order. Good examples are the Oil crises of the 1970's or the IT revolution in the 1990's, but also revaluation in values (e.g. globalization) and change in legal framework (e.g. deregulation) can have extensive influence on an individual firm's M&A decision. *Economic motives* are factors like cost efficiency and increased market shares. *Managerial motives* are defined by Ali-Yrkkö as being "hidden" and opportunistic behavior of managers, much in line with what is discussed in the literature on moral hazard. *Hubrid motives* are a set of irrational (economic) motives for carrying out an M&A, such as overoptimistic expectations on a particular deal. However relevant in studies of M&A, variables such as *Hubrid motives* have to be defined carefully in order to be employed in a quantitative analysis such as found in this paper.
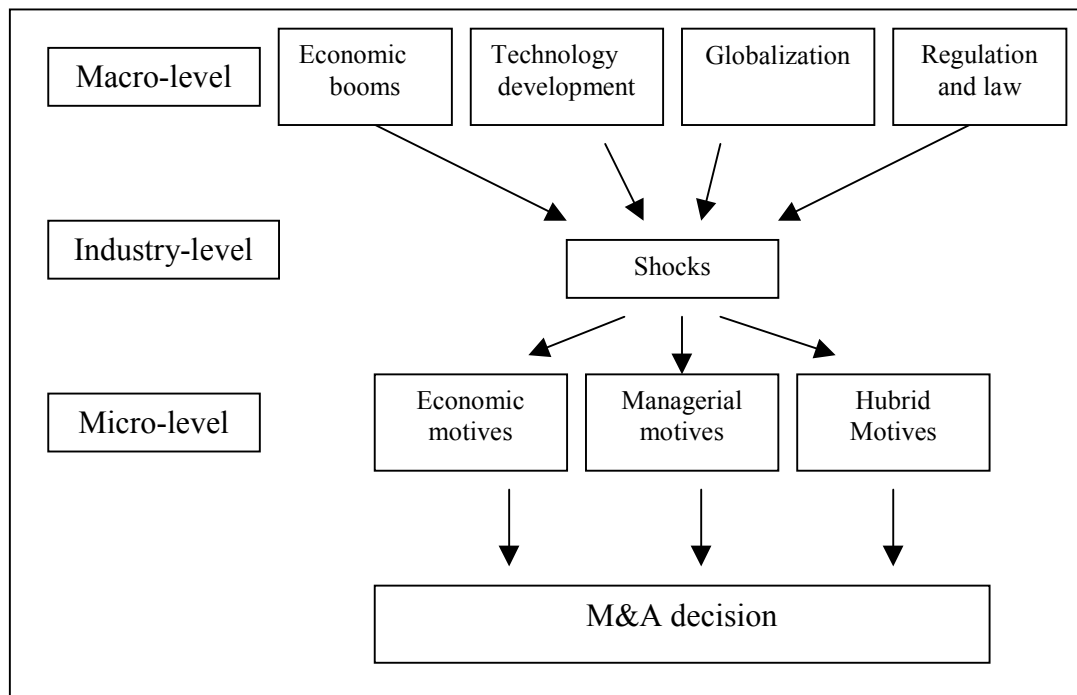

Figure 1. Causes of mergers and acquisitions (From Ali-Yrkkö, 2002, p. 25)**.**

Industrial shocks as a trigger to M&A activity is consistent with the analyses made using longer time series on M&A. In a sectoral study on the M&A wave pattern in the UK, Resende (1999) found through Markow switching models that the shock effect on M&A waves was significant, and were more profound on an aggregate level than on a sectoral level. Resende found three interesting properties in the data. First, the existence of merger waves in the data sample was significant. Second, the random

walk specification was strongly rejected, thus indicating that endogenous shocks indeed influence the M&A pattern. The third, although weaker, finding is that M&A waves in one sector appear to display co-movements with other sectors.

Using U.S. data, Town (1992) has also found evidence of external shocks influencing the M&A pattern. However, focusing primarily on finding appropriate models describing long time series of M&As, Town discusses the triggers to U.S. merger waves since the end of the 19th century. It is clear that the merger waves coincide with important institutional changes or external shocks, but it is not obvious *a priori* whether these exogenous factors or shocks have a positive or negative effect on M&As. An example of this is the Great Depression in the U.S., which should have had a tremendous depressive effect on the number of M&As if the hypothesis that M&A waves coincide with business cycles was true (see e.g. Nelson, 1959). As a matter of fact, the opposite was true in the case of the Great Depression – the number of M&As increased. Therefore, there has to be more to M&As than merely being influenced by business cycles.

This is potentially a hard nut to crack for anyone doing research on M&A. However, one solution to this paradox might be to analyze the problem from two different angles. On the one side, from the perspective of the buyer, there are several modes of M&A. Traditionally, a "pure" merger (apart from mergers that are *de facto* acquisitions) is conducted by swapping shares or setting up completely new legal entities, whereas an acquisition is carried out mainly through cash deals. From the 1980's and onwards, acquisitions involving share issuing have become more and more common in all major industrialized countries, including Japan. But again, in terms of absolute numbers, the number of deals involving share swapping is very low compared to the U.S. and Europe. This is a reflection of the structure of the Japanese M&As, which for example during the 1995-2001 period, to a large degree involved firms that were not listed[5].

For M&As, where shares play an important part in the deal settlement, the same rationales as for share issues come into consideration. This type of M&As are rare

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[5] The non-listed firms' share (mostly SMFS) of the total number of M&As was between 56% and 70% (MARR, July 2001, p. 40).

during economic activity downturns, since the stock market trading gets lower in terms of price, traded volume and number of calls. Under such conditions, an attractive take-over bid (TOB) can suddenly become unattractive and as long as a M&A deal is dependent on share swapping or share issuing, that particular deal will become hopelessly futile. On the other hand, the cash deals are rather straightforward and uncomplicated compared to share swapping deals. This type of deal is common during recessions, when companies with ample cash reserves or funding possibilities[6] typically acquire financially distressed companies. For the Japanese case, this is the most frequently occurring type of firm acquisition.

A seller's motives for engaging in M&As are more diverse and difficult to pinpoint. Therefore, it is again fruitful for this analysis to separate the boom and recession situations. Connecting to the earlier observations that M&A deals that involve share issuing or swapping tend to take place during booms, a seller might benefit from this type of offer by acquiring securities in the post-M&A entity. On the other hand, cash offers might be a tempting option for the selling side during recessions in order to bail out from business, or in other words, get the most out of the remaining value of the firm before "it's too late"[7].

Other studies where macroeconomic variables have been used in order to explain M&A activity are Shea (1991) (bond yields), Sowell (1992) (GDP), Baillie and Bollerslev (1994) (interest rate differentials), and Diebold and Lindner (1996) (real interest rates).

In this study, the pattern of the M&As that have occurred in Japan between January 1994 and March 2002 is analyzed on an aggregate level in order to see whether the M&A activity can be estimated using macroeconomic variables. In addition, dummy analysis is employed to assess the between-group differences and the effects of one-time shocks on the M&A pattern.

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[6] For example, investment funds or through bank loans or bond issues.
[7] Here, we have the problem of asymmetric information. A buyer or a seller might not have exactly the same information as the counterpart, leading to opportunistic behavior and wrong valuation of assets and future cash flow. However, the problem of corporate valuation *per se* is not discussed in this paper.

3. The model

As implied above, the development of a merger theory is still in its infancy. There exist few theoretical papers on this topic compared to the abundant number of empirical papers. On the other hand, the methodology of M&A analysis has developed rapidly during the 1990's, owing much to the long and complete series of U.S. statistics on M&As. However, there is still lively discussion in the literature about the variables that should be used to explain M&A patterns. The research on M&A has therefore been, and still is, based on trial and error, and the quest for variables that give a good fit in econometric analyses will probably continue for the foreseeable future.

Having said this, there are good reasons to believe that macroeconomic variables are important factors in explaining M&A patterns and the M&A decision making in firms. In the European setting, cross-border M&A has often been a matter for larger corporation. But as we have seen above, the number of cross-border M&As is dwarfed by the much more frequently occurring domestic M&As. Even within the EU, which supposedly has abolished all hindrances to free capital movement, the number of cross-border M&As is still low. Japan constitutes no exception to this picture, and in comparison with the European figures, one may say that the cross-border out-in M&As in Japan are almost non-existant.

Historically, the trigger for many M&A decisions in Japan has been a matter of timing and future ownership structure (such as difficulties in finding a successor to the family business) rather than a long-term business development strategy[8]. Even though this primarily applies to SMFs, the large firm M&As have also been characterized by more arbitrary than systematic decisions. Therefore, by looking at past M&As, there are reasons to believe that the M&A pattern in the short run is rather unsystematic for an individual firm. In addition, it is hard to separate M&A deals that are results of profound analyses from deals that have been carried out due to governmental pressure and other non-rational reasons[9]. In this context, it is worth noting that concepts such

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[8] Interviews with Katsushi Harada and Osamu Yasuda fall 2001.
[9] M&As of this kind have occurred mostly within the financial sector and especially among the savings associations and the savings unions.

as due diligence only recently have become common in Japanese management and normative M&A literature in Japan.

The rationale for the choice of variables is as follows. For a firm considering an M&A, several considerations have to be taken before a deal is settled. Within the firm, factors like financial and business situation are of course crucial. Relating to the Ali-Yrkkö model (see figure 1), these are the micro level factors in M&A decisions. These micro level factors are in turn influenced by the context in which the firm is doing business, that is, the macro level factors. Besides being the common macroeconomic indicators such as (real and nominal) GDP, interest rate, and exchange rate, there are also institutional factors such as the legal structure, industrial regulations, and commonly accepted business practices.

Earlier research has shown that shocks are important triggers to M&As. As seen in figure 1, examples that are given by Ali-Yrkkö are economic booms, technology development, globalization and changes in regulations and law. For Japan, the financial industry is an interesting example of how an industry was exposed with a "shock", although this is not representative for all industries. In 1998, the first steps in the most extensive deregulation reform so far in Japan were taken. Rather suddenly, the domestic actors were faced with liberalized competition from both domestic and foreign firms. New competitors tried to introduce new business methods such as new technology (i.e. internet banking), franchising, and new financial products in order to increase revenues and cut costs. The domestic financial firms' counter-move was to engage very actively in M&As and to emulate the competitors' technology and business ideas. It is clear that changes in institutional framework, or "shocks", forced the formerly protected financial firms to behave in a way they would have neverdone otherwise.

The starting point for deriving a prediction model for the M&As occurring in Japan has been to consider the context in which a manager or the board of a company is found when an M&A decision is made. While simultaneously considering the micro and macro level factors, it is assumed that a manager has the power of calling off a potential deal at any time. Further, it is also assumed that a manager has perfect information about the current business situation both within the industry and for the country in general. If these assumptions hold, the macroeconomic variables that

should influence managers in M&A decisions (when such an opportunity appears) should be the current aggregate economic environment (such as GDP growth, exchange rate and changing institutional settings, in period *t*) and the situation on the financial markets in period *t*.

Because of the limited time period for the data series (discussed below), OLS estimation was used for the analysis. Even though more sophisticated methods are employed in earlier research, there are two major reasons for the choice of OLS estimation. Firstly, there is no M&A time series data available for Japan of the kind that is available for U.S. Secondly, even though the OLS method is rather blunt, the estimation that is obtained gives a fairly good indication of the structure of the phenomena under study.

A pilot model, including the JPY/USD exchange rate as a proxy for measuring the out-in M&A, was formulated to see whether this particular variable had some influence on the M&A activity. However, there are problems with including such variable, because it is highly probable that the exchange rate is explaining not only the dependent variable, but also the other macroeconomic variables that are included as independent variables. However, the purpose was to see the extent of disturbances the exchange rate had in the model, and as such, it became an interpretation tool for the results from the final models. Not surprisingly, tests indicated serious multicollinearity in the pilot model, and neither the coefficient of determination nor the parameters were significant. As a result, this variable was dropped.

The final model chosen was:

$$\ln M\&A_t = \beta_1 + \beta_2 \ln GDP_t + \beta_3 \ln Topix_t + \varepsilon_t,$$

where (all variables were transformed to natural logarithms):
$\ln M\&A$ = the total number of M&As (out-in and in-in) in period *t*,
$\ln GDP$ = the Japanese nominal GDP (seasonally adjusted quarterly observations; in 1995 prices, denominated in JPY) in period *t-1*,
$\ln Topix$ = the average Topix index in period *t*,

β are the parameters, *t* denotes time period and ε is the error term.

The choice of the GDP and the Topix index as independent variables are quite simple and straightforward. GDP was chosen as an indicator for the general economic activity. As mentioned above, the choice of variables was made considering the viewpoint of a manager, and therefore the nominal GDP was chosen in favor of the real GDP. The same rationale applies to the choice of the Topix index as an indicator for the security market conditions. This variable is assumed to follow a random walk pattern.

4. The data

The history of data recording relating to mergers and acquisitions in Japan is very short. A more reliable recording of M&As was initiated only in 1985. However, due to heavily restricted access to the earliest data, only the M&A data published in MARR magazine from January 1994 to March 2002 was obtained. These limitations in time dimension have restricted this study to a short-run M&A pattern analysis instead of a long-run analysis, such as for the M&A waves studies mentioned earlier[10]. The data for the other variables used in the model was obtained through OECD Main Economic Indicators and the EcoWin database.

The data is organized to form a quarterly time series, covering the period of January 1994 (94-1) to March 2002 (02-1), forming a total of 33 observations[11].

As seen in figure 2, the absolute number of M&As in Japan during the first quarter of 2002 has increased about eight times since the beginning of 1994. Most evident is the development after the so-called "Tokyo Big Bang" reforms of April 1998. Included in the reform package were not only the reformation and deregulation of the financial markets, but also tougher requirements on transparency in bookkeeping and corporate governance, which should be a positive factor so far as M&As are concerned. The reform package was meant to be implemented over a two year period (however, some stages are still waiting to be enforced at the time of writing), but evidently, the number of M&As increased dramatically already during the first quarter following the

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[10] Based on U.S. data, Golbe and White (1993) have hypothesized that a length of a merger wave is about forty years. This is probably not directly applicable to the historical M&A pattern of Japan, but it gives an indication of the time horizon that is necessary in studying M&A waves.
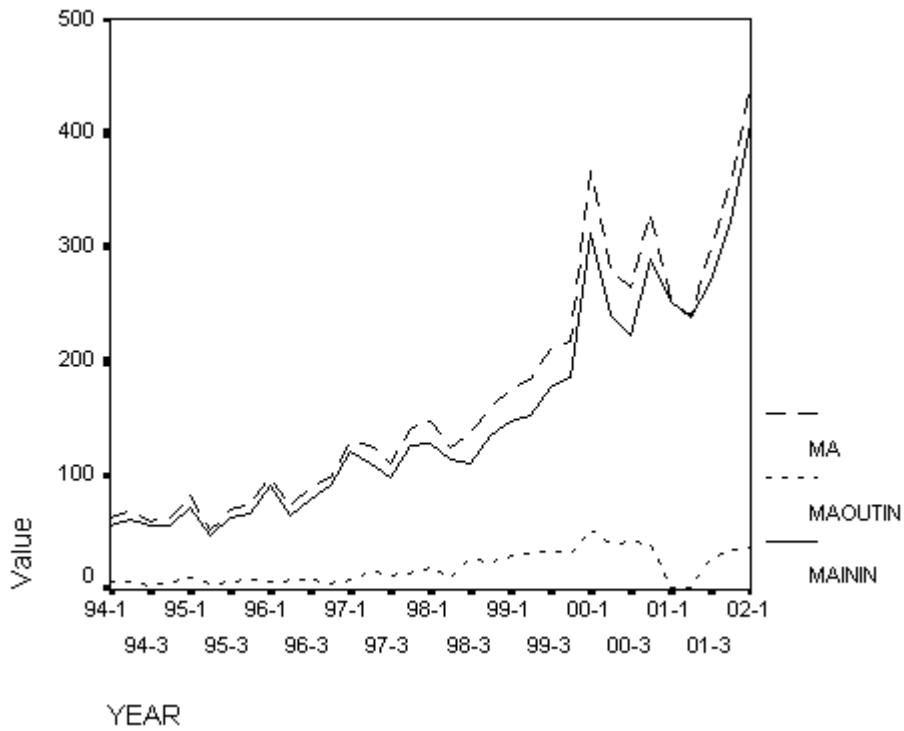[11] For bivariate and partial correlations, please see the appendix.

Figure 2. Number of M&As in Japan (MA denoting the total number of Out-In and In-In M&As) between first quarter of 1994 and the first quarter of 2002.
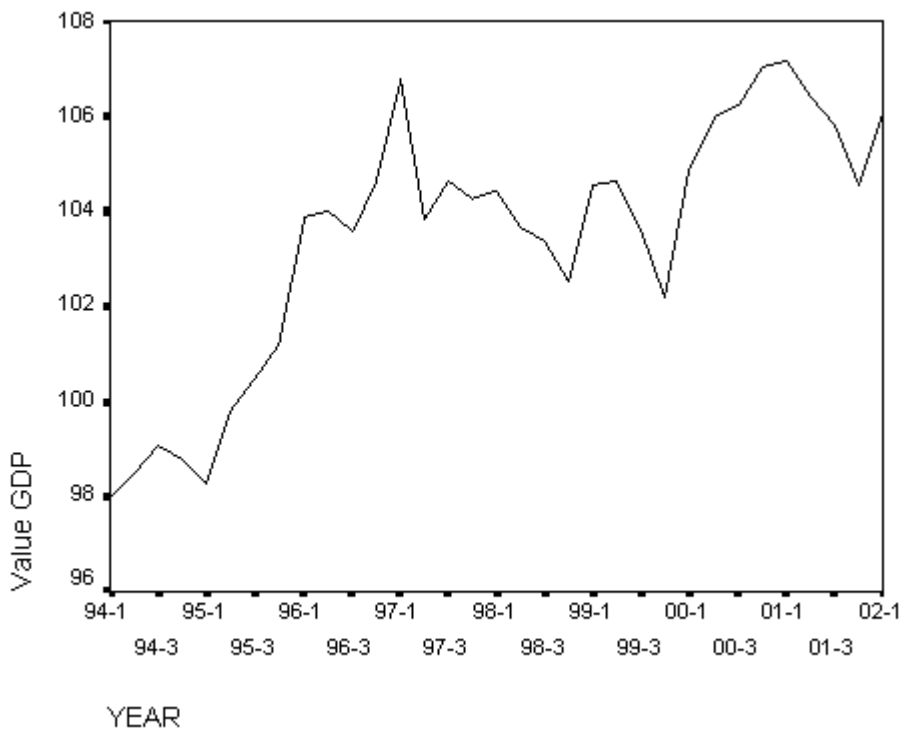

Figure 3. Index of the nominal GDP between first quarter of 1994 and the first quarter of 2002 (100 = 1995).
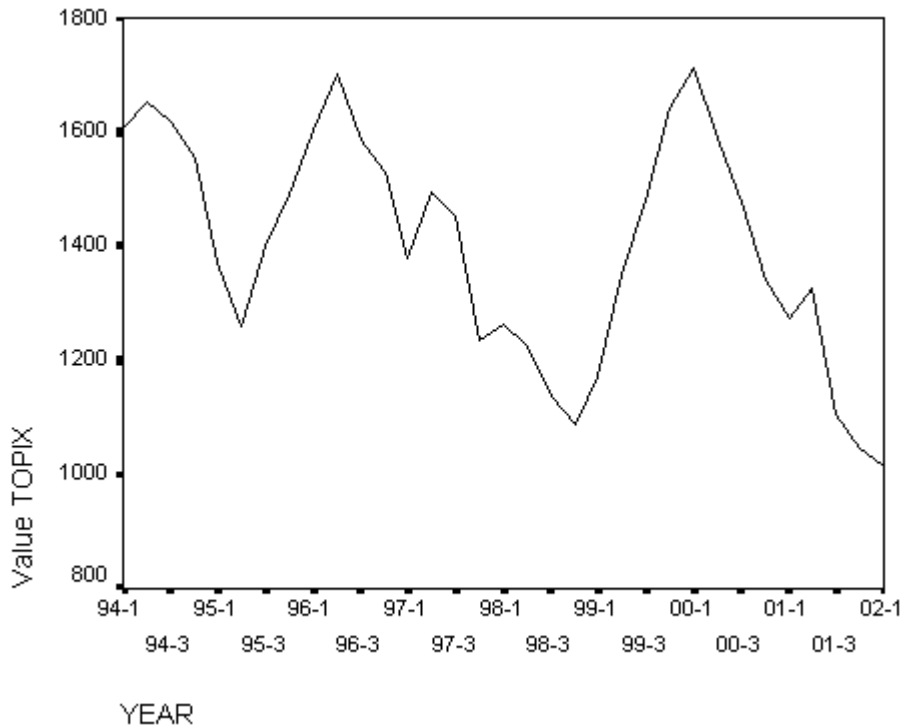
Figure 4. The Topix index between first quarter of 1994 and the first quarter of 2002.

introduction of the reforms.

The quarterly GDP (figure 3) has had an uneven growth during the period. Even if the yearly average records positive growth during the period concerned for this study, the quarterly variation in growth has something of a stop-go pattern. This reflects the depth of the GDP growth problem for Japan during the 1990's, and should be reflected in the short-run M&A pattern if the assumptions specified in section 3 hold.

For the Topix index, figure 4 suggests a random walk pattern. The Dickey-Fuller Test on 5% level gives on hand that this pattern indeed is non-stationary, or follows a random walk pattern (tests not shown here). Again, if the assumptions specified in section 3 hold, the Topix index should also be a factor influencing a firm's M&A decision, whether it is fruitful to carry through an M&A deal or not.

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5. Results of the analysis

As mentioned earlier, the analysis uses OLS estimation. The dummy models are estimated with Maximum Likelihood (ML) method. The results from the econometric analyses are presented in tables 1 and 2.

As seen in the table 1, the results from regression analysis suggest that the Japanese M&A pattern can be explained to a high degree by the chosen independent variables, that is, the nominal GDP and the Topix index. The parameters are significant, and the signs are the expected ones. It is statistically clear that the nominal GDP has a strong influence on the M&A pattern, and the variation of the dependent variable follows the variation of the nominal GDP. On the other hand, the same results suggest that the influence of the Topix index is somewhat limited, and varies negatively with the total M&A. This result is opposite to what Ali-Yrkkö found in his study for European conditions. Given that the variable "Market capitalization"[12] in his model is equal to the market value of listed securities, Topix should be, as the broadest indicator of securities' average value at the Tokyo Stock Exchange (TSE), a comparable variable to measure the same phenomena. If this assumption holds, there are interesting differences between European M&As and Japanese M&As. As already mentioned, the sign was positive for European conditions, while the sign is negative for all four models in this study (see tables 1 and 2). There are several possible reasons for this diversity in results. First of all, the time period for both studies is short. If a longer time series were available, more significant results would probably have emerged. Secondly, given that the parameters of the regression analyses in this paper *are* valid, the difference in sign could emerge from unique patterns in the composition of M&A deals. Ali-Yrkkö shows only the Finnish conditions[13]. For Japan, however, most M&As deals are settled in cash between SMFs, or between SMFs and larger firms. Therefore, since few SMF shares are traded on the TSE, the development on the stock exchange might be reduced to a more general indicator of the business and the financial situation for firms. If European M&As mostly consist of deals between

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[12] See page 5 of this paper.
[13] Ali-Yrkkö, p. 18.

larger listed firms, the total market value of listed stocks should affect the number of M&A deals in a more direct manner.

Table 1. Regression results

***,**,* significant at 1%, 5% and 10% level respectively.

	(1)	(2)
	Basic OLS model	ML estimation model (adjusted for autocorrelation)
	Dep variable: lnM&A	Dep variable: lnM&A
Constant	-201.46***	-56.23
	(-7.64)	(-1.29)
lnGDP	16.12***	4.79
	(8.35)	(1.46)
lnTopix	-0.77**	-0.25
	(-1.97)	(-0.52)
Adj R^2	0.737	0.848
N	33	33
F-statistics	45.88***	90.09***

Figures in parenthesis are t-values.

Table 2. Dummy (pooled) regression results

***,**,* significant at 1%, 5% and 10% level respectively.

	(3)	(4)
	Dummy model	Dummy model
	ML estimation	ML estimation
	Dep variable: lnM&A	Dep variable: lnM&A
Constant	-106.33*	-68.24
	(-1.77)	(-1.09)
lnGDP	9.10**	5.89
	(2.07)	(1.25)
lnTopix	-1.18	-0.65
	(-1.46)	(-0.82)
Dummy ($M\&A_{OUT-IN}$ = 1)	-2.22***	-2.24***
	(-7.71)	(-8.91)
Dummy (Big Bang = 1)		0.54*
		(1.75)
Adj R^2	0.801	0.806
N	66	66
F-statistics	88.08***	68.40***

Figures in parenthesis are t-values.

Having said this, the results of the basic model should be taken with some caution due to the limitations in the data material and the nature of the chosen variables. Therefore, I will not make any extensive interpretations of the magnitude of the variables' influence on the total M&As for the specific period between the 1st quarter of 1994 and the 1st quarter of 2002, suggested by the parameters.

On the other hand, the results of the dummy models are more interesting than the results from the basic model. The first dummy model was designed to see whether there are differences in the intercept between In-In M&As and Out-In M&As. T-test showed[14] that the difference in the intercept is statistically significant. For the second dummy model, an additional dummy was augmented to see differences in the intercept for each of M&A categories given the pre- and post-Big Bang period. Also here, t-test showed[15] that the differences in the intercept are statistically significant.

As expected, the differences in the intercept were substantial. All other things being equal, the level of Out-In M&A was on average 12%[16] of the In-In M&A level during the period. As mentioned above, this difference was statistically significant on the 5% level. Further, looking at figure 2, there are good reasons to believe that the Tokyo Big Bang reforms have had some effects on the short-run M&A pattern. To test this, a model incorporating a dummy variable for Big Bang reforms was constructed. The results of this regression indicate that there was a sharp rise in the number of M&A deals, however significant only on 10% level. The difference in the intercept between pre- and post-Big Bang period was not as dramatic as the one between the M&A categories, but for both Out-In and In-In M&A, the number of deals in the post-Big Bang reform period was on average 71% more than for the pre-reform period, all other things being equal.

Dummy models testing for differences not only in the intercept but also in the regression line were also constructed. However, given the results of the t-tests[17], it was not possible to reject the null hypothesis, or in other words, there was no indication that the regression lines were different for the M&A categories, with or

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[14] Results not shown here.
[15] Ibid.
[16] Antilog of the dummy parameter minus one, following Halvorsen's and Palmquist's (1980) suggestion for obtaining the relative change in the mean of the dependent variable.
[17] Results not shown here.

without the dummy for pre- and post-Big Bang period. Therefore, only the results from the dummy models testing for differences in the intercept are discussed here.

6. Discussion and conclusions

The purpose of this paper has been to study the influence of selected macro variables on the Japanese M&A pattern, using a model inspired by another study on the European short-run M&A pattern, made by Ali-Yrkkö (2002). Due to limitations in the data material, however, I refrain from interpreting the regression results in this study extensively. Having said this, the estimations in general and the dummy analyses in particular still give interesting indications of the nature of the Japanese M&As during the relatively short period of 1994 to 2002.

The regression results indicate the relevance of macro variables in explaining M&A patterns also in the Japanese setting. The same results also suggest that there is a possibility that other variables can explain Japanese M&A better, such as other macro- and microeconomic variables or qualitative variables like managerial motives, irrational behavior and cultural values.

Thus, the results of this analysis are in line with parts of Ali-Yrkkö's results and model (figure 1), by indicating that macro variables (in this context the GDP, the Topix index and the Big Bang reform) can be important factors in explaining short-run M&A patterns. However, what Ali-Yrkkö calls "Economic booms" in his model, might better be rephrased as "Economic growth". From the regression results, there is a significant indication that the economic growth does affect the M&A pattern in the short run. Considering that Japanese economic growth has anything but "boomed" in the 1990's, these results are particularly interesting. In order to clearly establish the connection between GDP growth and the M&A pattern, a longer time series is of course needed in order to see if this relationship is valid also in the long-run perspective (e.g. over the pre-bubble period or post-war period).

In addition, it is also important to consider the "softer" sides of M&A decisions that are hard to capture in quantitative data. As already mentioned, there are many decision variables for a manager to consider before an M&A deal is settled, and apart from managerial motives, irrational behavior and cultural values, events such as

unexpected disclosure or access to hidden information (about persons or the firms involved) on either side can be decisive factors for the outcome of a deal.

Connecting to Nelson's (1959) arguments vs. those of Town (1992), the results of the regressions in this paper are not transparent and it is hard to evaluate from this limited sample whose arguments are most consistent with the situation in Japan. The record-long recession in Japan during the 1990's with falling stock indices has coincided with increased number of M&As. However, the M&A pattern has also varied positively with the GDP growth. Therefore, further research is needed to establish the relation between macro variables and the M&A pattern for the Japanese case.

Additional suggestions for future research are the collection of longer time series and between-group analyses. Long-term time series would undoubtedly be of great value for a profound analysis of the Japanese M&A pattern and in constructing robust models. In such an analysis, not only the significance of the regression results would increase, but it would also allow for extensive testing of the effects of important "shocks", such as the ones discussed above. Another analysis improvement would also be to divide the data into subcategories based on the size of firms (in terms of capital, turnover, number of personnel, etc.) and size or payment type (cash or share swapping) of M&A deals. In any case, there is much more to do in this specific study area, and the main future challenge for researchers is probably to formulate a robust theory of M&A. In addition, as far as Japanese M&As are concerned, yet another challenge is to find high quality data, or to have access to data that is strictly kept by firms and organizations.

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Appendix

Correlations

		LNMA	LNGDP	LNTOPIX
LNMA	Pearson Correlation	1	,850**	-,425*
	Sig. (2-tailed)	,	,000	,014
	N	33	33	33
LNGDP	Pearson Correlation	,850**	1	-,300
	Sig. (2-tailed)	,000	,	,090
	N	33	33	33
LNTOPIX	Pearson Correlation	-,425*	-,300	1
	Sig. (2-tailed)	,014	,090	,
	N	33	33	33

**.· Correlation is significant at the 0.01 level (2-tailed).

*.· Correlation is significant at the 0.05 level (2-tailed).

Table 3. Bivariate correlations of the variables included in the model.

```
Controlling for..    LNTOPIX

              LNMA        LNGDP

LNMA         1,0000         ,8362
            (     0)    (     30)
            P= ,          P= ,000

LNGDP          ,8362      1,0000
            (    30)    (      0)
            P= ,000        P= ,

(Coefficient / (D.F.) / 2-tailed Significance)
```

Table 4. Partial correlation between the dependent variable and lnGDP, controlling for lnTopix.

```
Controlling for..    LNGDP

              LNMA      LNTOPIX

LNMA         1,0000      -,3382
            (     0)    (     30)
            P= ,          P= ,058

LNTOPIX       -,3382      1,0000
            (    30)    (      0)
            P= ,058        P= ,

(Coefficient / (D.F.) / 2-tailed Significance)
```

Table 5. Partial correlation between the dependent variable and lnTopix, controlling for lnGDP.

```
Controlling for..    LNMA

             LNGDP     LNTOPIX

LNGDP        1,0000       ,1279
           (     0)    (    30)
           P= ,         P= ,486


LNTOPIX       ,1279     1,0000
           (    30)    (     0)
           P= ,486     P= ,

(Coefficient / (D.F.) / 2-tailed Significance)
```

Table 6. Partial correlation between the independent variables, controlling for the dependent variable.