

Single currency and the liquidity in corporate assets market



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The single currency was adopted in 1999. It gave a huge impact on financial system. In this study, we focus on the single currency impacted to the liquidity in the corporate assets market, market whereby the mergers and acquisitions occurred. The studies found that the single currency had positive effect to the liquidity index in the corporate asset market measured by the intensity of the market transactions in each industry. This increasing in the liquidity mainly from the cross-border deals from the countries that stayed outside the eurozone. Moreover, we found that single currency had positive effect to acquirers to initiate more deals. The acquirer-initiated positive effects stayed with the mergers and acquisitions that happened in eurozone, no empirical evidence was found on the mergers and acquisitions that acquirer was from outside euro area.

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# Chapter 1

## Introduction

Back in 1999, one of the biggest currency unions had occurred. This union united eleven countries' currency into a single currency known as Euro (Communities, 1998). This newborn currency gave a significant impact on the financial system. Starting from January 1, 1999, Electronic forms of Euro were launched. All transactions made in legacy currencies, such as German mark, French franc, and so on., were transferred to Euro using the fixed exchange rates. Two years after, January 1, 2002, its physical forms such as coins and banknotes were adopted and replaced all physical forms of money in Eurozone (eleven countries that agreed to use Euro as their official currency). These adoptions of the Euro had a significant impact on the financial system, which could be summarised into three main topics. First, the Euro become the international currency using worldwide (Detken & Hartmann, 2000). In other words, the Euro became the currency of choices of either the countries in Eurozone or outside Eurozone using for financing, investing, or even using Euro as reserved currency. Secondly, the single currency eliminated the currency risk that typically occurred in cross-border transactions, such as international trade, foreign investment, and so on. Without the currency risk that is one of the CAPM components, the firm value would go up (Bris et al., 2009). Third, the presence of Euro, also reduced the transaction costs related to currency exchange processes, such as cost that paid for exchanging currencies or cost to hire an expert to incorporate the exchange rate factors in financial transactions (Rose, 2000).

On the market side, the Euro affected the financial market, such as money market, bond market, and the stock market. Many research papers like (Hartmann & Issing, 2002), (Galati & Tsatsaronis, 2003), (Santillan Fraile et al., 2000), ((ECB), 2001b), ((ECB), 2004b), and (Santos & Tsatsaronis, 2003), gave empirical evidence of the Euro effect on those markets. They found the same positive trends in the volume of each

market. However, in order to make a financial decision, there is another significant indicator: liquidity, that had more weight over the volume. Liquidity represents a capability that the market can absorb large volume and reflect it in their prices while the volume represents only the amount and number of transactions that occurred in the market. Without the liquidity, buyers had to give more premium to sellers if they want to buy and vice versa, sellers have to give a deep discount to attract the buyers (Schlingemann et al., 2002). In the worst case, there will be no transaction at all.

This paper aims to study the impact of the Euro, single currency, to the market liquidity. However, we focused only on the liquidity in the corporate asset market. The market whereby selling and buying firms occurred, as this market in our area of studying and the activities in this market, mergers and acquisitions, create the massive capital flow in the financial system. The research question is "the single currency positively affected the liquidity on the corporate assets market or not?". If there was the liquidity in the market after emerging of Euro, we further study on how the single currency effect deal-initiated party which are target-initiated and bidder-initiated. So, the following sub-question is constructed in order to answer: "is the deal initiated more from targets (sellers) or acquirers (buyers) after euro emerging?". The result can lead to the understanding on how the liquidity effect by the single currency as the deal-initiated party could represent the motives behind the deals.

This study structured into five chapters, beginning with chapter one the introduction. Chapter 2 literature review, this chapter investigates relative papers and research about the effect of the single currency, financial market which included money market, bond market, and stock market after emerged of Euro and then investigates the corporate asset market on what could be affected from the Euro. In chapter three Hypothesis development, this part stated the hypothesis to each research question, (1) single currency increased the liquidity in corporate assets market and (2) mergers and acquisitions were more initiated from buyers (or acquirers) or sellers (targets). Chapter

four is data and sample selection. This part reveals the critical research data, criteria of selection, and how to develop the dependent variables of the research. Chapter five present the approach that this paper use to assess those two hypotheses which the results are presenting in Chapter six. Finally, Chapter 7 present the conclusion of our studies.



## Chapter 2

### Literature Reviews

#### 2.1 Single currency and effect of the single currency

History of the Euro began in 1999 when eleven countries agreed to use the Euro as their currency; those countries called the Euro area. Euro area included Germany, France, Italy, Spain, The Netherlands, Belgium, Austria, Finland, Portugal, Ireland, and Luxembourg (Communities, 1998). After Euro was officially used on January 1, 1999, it became the world second large currency, considered only accumulated the economic sizes of the euro area that measured by their GDP in US dollar, (Portes & Rey, 1998) and (Deloitte\_Insight, 2016). To give more exact figure, In 1998, Euro GDP worth at least \$6,914 billion after USA (GDP: \$9,063 billion) and before Japan (GDP: \$4,033 billion) (WorldBank, 1998). The emerges of Euro considering only by its size gave a massive impact on the financial system. Several studies about the effects of Euro adoption and the changes in the financial system had been gathered and categorised into three groups.

- I. Euro became the international currency using for both investing and financing purposes. In other words, the Euro became the currency of choices of both non-resident and resident countries that issuing the currency (Detken & Hartmann, 2000). They show empirical evidence that the usage of the Euro not just replaced their use in legacy countries. However, usage volume was increased among the Non-Euro area, especially in financing activities. (Hartmann & Issing, 2002) explained the mechanism behind this international role. They said that the Euro internationalise factors were its size, liquidity, and the developed market of the Euro area. As the large size and liquidity mean low transaction cost and the developed of the market is the market that provided a broad range of financial instruments such as hedging instrument or other

derivatives (Hartmann & Issing, 2002). Also, the Euro provided the stability of its price as it is the main objective of the ECB to preserve the target inflation of the Euro ((ECB), 2004a). If the price is stability, then it preserves the purchase powers. It means less volatile and less internal risk exposed to its value (Hartmann & Issing, 2002). So, if one currency had a low transaction cost, the low risk attached to the currency and easy to liquidate, this currency will attract more people to use. This international role of Euro aligned with research from (Rey, 2005) and (Papaioannou & Portes, 2008).

- II. Apart from the international roles, Euro eliminated the currency risk that generally happened in the Euro area. As currency risk or exchange rate risk is the risk from the instability of the price of one currency to another currency, using common currency will eliminate those risk by definition. When the exchange risk was eliminated, the non-diversifiable risk or market risk that exposed multinational firms was reduced (Bartram & Karolyi, 2006) and as one of the ingredients in the CAPM equation, the cost of capital also declined. (Hardouvelis et al., 2007) also supported the idea of the Euro adoption led to the reduction in the cost of capital but using two ways to explain the mechanism behind this change. Each way of explanation affects the different component in CAPM. One is, like (Bartram & Karolyi, 2006), eliminating the currency risk resulted in the reduction of equity risk premium. As the multinational firms, their activities such as trading or borrowing exposed the uncertainty that arose from currency exchange rates. By eliminated those uncertainties, the equity risk premium declined. Another explanation is that applying the same set of monetary policies and operated under the same central bank, the European Central Bank (ECB), created the convergence of the interest rates and the inflation toward the German which had a lower interest rate and inflation. It resulted in reducing real risk-free rate



(Hardouvelis et al., 2007). To extend the result of those research, assuming the investment opportunities constant, the reduction in the cost of capital would induce the corporate investment rate of the firm the in Euro area, especially in the firms that previously weak currencies. This because the firm decided to invest until the marginal investment equal to the cost of the capital. Then when the cost of capital declined, the investment rate will be increased (Bris et al., 2006). By combining the single currency effect, which urged the cash flow generated by increasing trading volume with the rising in the investment rate, the firm value eventually went up (Bris et al., 2009). These benefits of the single currency tempted other players or competitors to come in, so the market competition is expected to be enlarged.

In conclusion, the elimination of currency risk benefited the firm in term of increasing firm value through the CAPM mechanism. Still, it also created more competition in the market while doing business that could make the weak firm barely survived.

- III. Euro currency facilitates financial transactions. (Rose, 2000) said that international trading transactions were improved. He gave empirical evidence that those improving was not only from the reduction in the exchange risk but also the currency itself. In other words, (Rose, 2000) separated the effect of the single currency and the reduction in exchange volatility appearing in the international trading transactions. He suggested that the increase in trading transactions came from the price transparency giving by the single currency; this means we could compare their prices right away without any adjusted in currency exchange rates. Another explanation given by Rose is a single currency created the long-term financial integration, which resulted in the upsurge in the degree of confidence of the private sectors. So, more trading or trading contract was made. A year later, (Rose & van Wincoop, 2001)

uncovered that international trade among the Eurozone countries was rising due to the vanishing of one of the trade barriers, called national currencies. The mechanism behind this disappearing was when countries used the same medium of exchange, the transaction cost attached to the standard currency exchange activities was gone; as such, it was the trade facilitation. Trading transactions considered as one of the sources of incoming cash flow (revenue from trade) on a corporate level.

## 2.2 Financial market after emerging of Euro.

Single currency influenced the financial market to change. Many research had shown the empirical evidence and provided logical behind those changes. The first market to talk about is the money market. The money market had directly activities related to money, such as simple borrowing, lending, repo, and so on. (Santillan Fraile et al., 2000) studied the common currency effect in this money market around Euro adoption. They found that the money market had a high degree of integrated due to the broken down of the market segmentation among the Euro area. This increased lending and borrowing activities, especially cross-broader lending and borrowing. Year after, ((ECB), 2001b) had done the revisit report about the money market and found the higher in the activities level, which composed of unsecured borrowing, lending, and Repo transactions since the market segment broke down. The increasing trends align with the researched done by (Hartmann & Issing, 2002).

The second market is the bond market. Single currency effect took part in this market by changing invisible forms of currencies at the beginning of 1999. All prices and trades in the bond market required to made in Euro ((ECB), 1999). Apart from rising in bond issuance spotted by ((ECB), 2004b) and (Santos & Tsatsaronis, 2003) found that the emerging of euro currency created a positive effect on the volume in the bond

market. The mechanism behind was the disappearing of national currencies brought down the barriers that created the segment between the countries. Those barriers included regulatory requirements about currency exposures and the exchange rate risk that plugin with bond yield curves. Moreover, market integration made the underwriter firms more region-wide, and it became more manageable for the underwriter to benefit from the economies of scope. So, the competition became more intent, and the underwriting fee was gone down after the advent of the Euro. Besides, the bond using for international financing also increased by approximately 20% to 30% of its previous volume (Hartmann & Issing, 2002).

The equity markets in the euro area were one of the markets that received the effect of euro adoption. ((ECB), 2001a) found that the new issuance of stock was gone up significantly. On the contrary, the euro market activities were not considerably increasing as the other markets, bond market and money market. One possible explanation is that the investors used to use the Euro market to diversify the country-specific risk. When the Euro agreed to use common currency and operation under the same governance, this created the convergence among countries in the euro area. So, the euro areas investors need to shift their investment to more international countries to maintain those scale of diversification ((ECB), 2001a). Even though the activities increased due to the national currency barrier declined. However, there was still a negative effect from the shift in activities from the euro equity market to the more international stock market. Another impact from Euro that seem to have more influence than the increasing level of activities was the effect on the equity prices (Galati & Tsatsaronis, 2003). They said the driver that made the equity prices go up reduced the country-specific-risk due to Euro adoption.

In conclusion, the single currency created a positive effect in the volume of transactions and an increase in activities level, liquidity, in both money market and bond market. The reason behind this rising in volume was market segment created from the

national currency was broken down. On the contrary, the equity market seems to have less effect in term of the transaction volume, but the apparent impact found in the equity prices due to the reduction in country-specific risk.

### 2.3 Corporate assets market and Euro currency

There is another market that affected from the advent of the Euro. Since its activities were supported by the primary goal of a common currency, to liberate the capital flow (Werner, 1970), these activities are the mergers and acquisitions (M&A) and the market that we will discuss is the corporate assets market.

To give an overview, the corporate assets market is the market where the buying and selling firms occurred. The activities in corporate assets market mainly include mergers, acquisitions, and asset sales. For this study, we shed light on the mergers and acquisitions (M&A), which generated most of the capital flow in corporate assets market (Schlingemann et al., 2002). To go further on the effect of a single currency to corporate assets market, we should know more about how its main activities, Mergers and acquisitions, happen in the first place.

Mergers and acquisitions are known as a way of the firm to relocate the resources to a better used. For example, the firm with excess cash existing in the firm would likely tend to invest since the agency problem arose when the firm had excess cash sitting in the firm (Jensen, 1986). One way to invest was investing in other firms, the firms attached to growth opportunities or potential growth. In the situation when the growth opportunities exist outside their countries, firms invest generally followed by the problem called green-field entry. So cross-border acquisition was an option for this solution.

On the other hand, when firms had a financial constraint or faced some negative effect from the economic changes, firms tend to find the white knight to help them

overcome this situation instead of sitting and waiting for the hostile takeover (Cartwright & Schoenberg, 2006). The mergers and acquisitions were one way of how the white knight come to save the firms. Even though the mergers and acquisitions benefits were obvious, the corporate asset activities were not as active as the equity market. So, one of the essential things for corporate assets market existing is liquidity. since the market liquidity means the market which had a big chunk of transactions whether buy or sell, and those transactions were taking place without any dramatically falling in the prices (Schlingemann et al., 2002). It means without the liquidity, seller or buyer had to give an extra discount or premium to attract another party to do the transactions with them, or the worst case; if there were no liquidity, there would be no transaction at all. Liquidity generally needs massive transactions to happen in the market. So, we studied more about how massive mergers and acquisitions occurred. (Harford, 2005) provided a reasonable answer to this question. He provided evidence support the neoclassical theory that the massive amount of the mergers and acquisitions or merger waves occurred, caused by the economic, regulatory, or technology shocks which provided sufficient capital liquidity.

After we give a background of how the corporate assets market occurred and what is essential in the corporate assets market, we move to the single currency effect on this market. ((ECB), 2001a) showing the mergers and acquisitions after the Euro event was enormously increasing, which is almost 39% in 1999 and 72% in 2000. However, there was no liquidity measurement or index provided in this report, as well as other studies. As the liquidity index shows the capability that the market can absorb large volume and reflect this in the prices, so the volume alone could not identify those capabilities. To be clear, the increase in volume reflected the numbers of the transaction and the transaction amount, while the liquidity concerning the activities and prices. If the market had the liquidity, assets could be traded at a price close to their intrinsic value. So, this comes down to our primary purposes of this study that is whether a single currency affect the liquidity in the corporate assets market or not.

## Chapter 3

### Hypothesis Development

As mentioned in the single currency and effect of the single currency session, Single currency induced more transactions in the money market and bond market. The research suggests that the Euro also created more activities in corporate assets market. The background reason is that a currency union served as the economic shocks to the firms, which increased the liquidity level in the corporate assets market. The increase tends come from the first objectives, reduce the exchange rate volatility and liberate the capital flow within Eurozone (Werner, 1970). With this opened opportunity, firms with motives to do mergers and acquisitions would create transactions. This assumption aligns with the previous specific industry study of (Ekkayokkaya et al., 2009). They indicated that the bidder gain was declined, implied that there were quite massive activities. Then M&As in the banking industry involved Euro party became more competitive due to the eroded of exchange risk and the reduction of the international barriers in doing the cross-border businesses that came from the promotion of financial integration in the euro area by the roles of EMU. According to the reason that previously stated, the single currency will positively affect the liquidity level in the corporate assets market.

**Hypothesis 1:** Single currency increased the liquidity in the corporate assets market.

There are two ways to explain the effect of the Euro to mergers and acquisitions logically; (1) the single currency made firms more sensitive in terms of financial situation. As the reduction of trade barriers suggested by (Rose & van Wincoop, 2001), international trades became higher, so the market where the firms doing business became more competitive. In other words, the competitors from other countries came to grab the market shares of the existing firms in those countries, supported by the evidence found by (Flam & Nordström, 2006) that the trade of the product that had not

been exported increase more than the products that were exported every year. So, the firms that became sensitive in doing business tried to find the white knight which the same business objectives to help them survive this long-term adverse effect from the single currency. This assumption aligns with (Masulis & Simsir, 2018) studied. They stated the target would initiate deal if targets that had weaknesses or financial constraints or facing adverse economic shocks, so they try to overcome this negative impact by finding a suitable partner which more strong financial condition to help them. Suppose a single currency gave a negative impact by remove the cross-border barriers and brought more competitors to the firms. In that case, the target would find the bidders to acquire or merge to overcome this difficulty. In this explanation, we expected to see more mergers and acquisitions initiated by target firms.

**Hypothesis 2.a:** Target firms more initiated mergers and acquisitions after single currency occurred.

(2) The single currency promoted market integration and reduced the cost of cross-border mergers and acquisitions. Furthermore, the firm in the euro area became stronger observing by the rising in firm value (Bris et al., 2009) since their expected cash flow increased from the increase in trade transactions (Rose, 2000); in this case, the firms not weaker by the effect of the single currency. Also, their cost of capital was reduced as their risk declined (Hardouvelis et al., 2007). Suppose existing opportunities, firms with excess cash flow would invest more to limit their potential free cash flow problem (Jensen, 1986). Given the motives of mergers and acquisitions that create the synergy; operation or financial (Bruner, 2002) that arises from relocating resource to better use, the firm would choose to engage more in mergers and acquisitions activities. This assumption aligns with specific industry studied by (Allen & Song, 2005) that mergers and acquisitions of financial services firms such as banking, investment banking, or insurance companies in the Euro area. They found that in this situation, the degree of financial integration in the euro area gone up and made the firms in this area

became stronger than those outside. So, the acquirers initiated the mergers and acquisitions transaction in the market. In this explanation, the research suggests that there would be more acquirer-initiated deal in mergers and acquisitions transactions involved parties in the Euro area.

**Hypothesis 2.b:** Acquirer firms more initiated mergers and acquisitions after single currency occurred.





## Chapter 4

### Data and Sample selection

The central research question is to answer whether the Euro currency positively affected market liquidity in the corporate assets market. The corporate assets market is not like other markets, such as the bond market or money market or stock market, which had an apparent bid-ask price to measure liquidity. This research attempts to measure liquidity level in the corporate assets market by using transaction-intensive in the market. The transaction-intensive defines by the ratio of corporate transactions, mergers and acquisitions, group by target nation, industry, and year to their total assets as a proxy of the liquidity. This method is similar to (Schlingemann et al., 2002) that studied the liquidity in the corporate assets market. Measurement of liquidity in the corporate will be presented more on 4.2 Measurement of liquidity in corporate assets market.

#### 4.1 Sample

This paper uses mergers and acquisitions to represent the activities in the corporate assets market. So, the mergers and acquisitions data, such as announcement date, primary SIC code, target or acquirer nation, are gathered from Thomson financial (SDC Platinum). Merger and acquisition deal that included in the studies are (i) Deal that primary target nation is a company in Eurozone in the year of measurement, (ii) Deal status is completed, (iii) Deal type is not categorised as Spinoffs, Recapitalisations, Self-tenders, and Repurchases, (iv) Primary target industry does not classify as Nonclassifiable, in other words, two-digit primary SIC Code defined by COMPUSTAT does not 99. These criteria align with the study of (Ekkayokkaya et al., 2009) except for the industry criteria (iv) using in this paper. The industry data related to merger and acquisition deals (total assets of each industry) are gathered from DataStream databases.

To measure the liquidity level around the Euro adoption period, this paper divides the period into three sub-periods: Pre-euro (1990 – 1995), Run-up euro (1996 – 1998), Post Euro (1999 – 2004). This paper defines the run-up period use 1996 as the starting year because this period occurred interesting events, like the referendum in many eurozone countries and signing an important treaty that led to cooperation between the Eurozone. Also, it was the period of the currency crisis. For the post euro period, this paper uses 1999 as the beginning because the implementation of the Euro began on January 1, 1999. These categories were similar to (Ekkayokkaya et al., 2009), which their research point was to measure the impact of the Euro on mergers and acquisitions in the banking industry. To answer the following question, whether the deal initiated after euro implementation was mainly target initiated or acquirer initiated, this research uses the same set of the sample as research question one, (i) Deal that target nation is the company in Eurozone in the year of measurement, (ii) Deal status is completed, (iii) Deal type is not categorised as Spinoffs, Recapitalisations, Self-tenders, and Repurchases, (iv) Primary target industry does not classify as Nonclassifiable, in other words, two-digit primary SIC Code does not 99.

The number of merger and acquisition deals that meet above criteria are 16,921 deals. Table 1 show distribution of merger and acquisition deals in the test period (1990 – 2004). Panel A show the mergers and acquisitions break down by the year of announcement and target nation. In Panel B, the group of industry, grouped by first two-digit of SIC Code have been added into the distribution.

*Table 1: Distribution of merger and acquisition deals during 1990 to 2004*

Our sample consists of completed merger and acquisition deals that target was in the Euro area, captured from SDC platinum—noted that our analysis only focuses on the first members of Eurozone that started to convert their currency to Euro in 1999. Euro area was composed of Austria (AUT), Belgium (BEL), Finland (FIN), France (FRA), Germany (DEU), Ireland (IRL), Italy (ITA), Luxembourg (LUX), Netherlands (NLD), Portugal (PRT), Spain (ESP). Furthermore, this paper excludes deals categorized as spinoffs, recapitalisations, self-tenders, and repurchases and excludes deals that target industries classified as non-classifiable (primary two-digit SIC Code 99). Deals that had no deal value presented in SDC platinum are also excluded from our analysis. Panel A presents the distribution of merger and acquisition deals segment by year of announcement and target nation. Panel B presents the distribution of merger and acquisition deals segment by sub-period of Euro adoption (Pre-Euro, Run-up Euro, and Post Euro), target nation, and target industry group which classified as follow: A) Agriculture, Forestry, & Fishing (primary two-digit SIC code 01 – 09), B) Mining (primary two-digit SIC code 10 - 14), C) Construction (primary two-digit SIC code 15 – 19), D). Manufacturing (primary two-digit SIC code 20 – 39), E). Transportation & Public Utilities (primary two-digit SIC code 40 – 49), F). Wholesale Trade (primary two-digit SIC code 50 - 51), G). Retail Trade (primary two-digit SIC code 52-59), H). Finance, Insurance, & Real Estate (primary two-digit SIC code 60 - 69), I). Services (primary two-digit SIC code 70 - 89), and J). Public Administration (primary two-digit SIC code 90 - 98).

In Panel A, a total of 16,921 deals were captured from SDC platinum within our criteria. More than half of deals in the test period (1990 – 2004) were in the post euro period (1999 – 2004), 51.3%. Moreover, the average number of deals per year, calculated by averaging number of deals that happened in the year of announcement in each sub-period, shows that the deal that happened in the post euro period (1,420 deals per year on average) was higher than the deals that occurred in the pre-euro period and run-up euro period (810 and 1,128 deals per year on average, respectively). The percentage of the deal in each period and the average deals per year suggest that merger and acquisition deals arose more after Euro was adopted, which could be the signal that the liquidity in the corporate assets market would be increase. However, data show uneven in the percentage of deal in each country. For example, the deals in France average deals in pre-euro, run-up euro, and post euro period are 236, 289, and 316, respectively

Panel A: The distribution of merger and acquisition deals segment by year of announcement and target nation.

Year of announce	AUT	BEL	ESP	FIN	FRA	IRL	ITA	PRT	DEU	LUX	NLD	Total	%
1990	8	27	75	13	139	27	70	15	93	4	57	528	3.1%
1991	8	36	114	76	295	49	117	19	135	6	71	926	5.5%
1992	30	31	134	56	280	34	197	39	102	3	55	961	5.7%
1993	28	37	99	62	235	28	124	31	89	7	54	794	4.7%
1994	17	25	74	64	228	23	132	28	109	2	62	764	4.5%
1995	26	34	92	74	237	65	135	33	120	5	65	886	5.2%
1996	19	39	92	64	254	56	146	17	126	4	85	902	5.3%
1997	19	27	183	68	304	55	135	23	178	3	99	1,094	6.5%
1998	24	70	339	48	309	71	132	56	210	7	123	1,389	8.2%
1999	26	76	289	111	356	80	192	60	241	10	126	1,567	9.3%
2000	27	71	307	119	415	97	263	96	265	10	168	1,838	10.9%
2001	23	70	244	66	338	56	225	54	207	8	101	1,392	8.2%
2002	14	45	220	63	269	52	202	56	222	5	91	1,239	7.3%
2003	14	61	255	54	233	53	272	44	207	6	94	1,293	7.6%
2004	26	50	203	71	283	49	256	50	262	5	93	1,348	8.0%
<b>Total</b>	<b>309</b>	<b>699</b>	<b>2,720</b>	<b>1,009</b>	<b>4,175</b>	<b>795</b>	<b>2,598</b>	<b>621</b>	<b>2,566</b>	<b>85</b>	<b>1,344</b>	<b>16,921</b>	
<b>Total deals in pre euro period (%)</b>													
	37.9%	27.2%	21.6%	34.2%	33.9%	28.4%	29.8%	26.6%	25.3%	31.8%	27.1%	<b>4,859</b>	<b>28.7%</b>
<b>Average deals per year - pre euro (deals)</b>													
	20	32	98	58	236	38	129	28	108	5	61	<b>810</b>	
<b>Total deals in runup euro period</b>													
	20.1%	19.5%	22.6%	17.8%	20.8%	22.9%	15.9%	15.5%	20.0%	16.5%	22.8%	<b>3,385</b>	<b>20.0%</b>
<b>Average deals per year - run up euro (deals)</b>													
	21	45	205	60	289	61	138	32	171	5	102	<b>1,128</b>	
<b>Total deals in posteuro period</b>													
	42.1%	53.4%	55.8%	48.0%	45.4%	48.7%	54.3%	58.0%	54.7%	51.8%	50.1%	<b>8,677</b>	<b>51.3%</b>
<b>Average deals per year - post euro (deals)</b>													
	22	62	253	81	316	65	235	60	234	7	112	<b>1,420</b>	

It means that average deal per year in run-up euro increased by 22.46% from the pre-euro period, and average deal per year in post euro increased by 9% from run-up euro. Meanwhile the deals in Germany were 108, 171, and 234 in pre-euro, run-up euro, and post euro period respectively. It means that deals increased by 58.33% from pre-euro to run-up euro and increased by 36.84% from run-up euro to post euro. It suggests that single currency unequally affected merger and acquisition deals in each country.

Panel B: The distribution of merger and acquisition deals segment by sub-period, target nation, and industry group.

Sub-Period/Industry Code	AUT	BEL	ESP	FIN	FRA	IRL	ITA	PRT	DEU	LUX	NLD	Total
<b>00_PreEuro</b>	<b>117</b>	<b>190</b>	<b>588</b>	<b>345</b>	<b>1,414</b>	<b>226</b>	<b>775</b>	<b>165</b>	<b>648</b>	<b>27</b>	<b>364</b>	<b>4,859</b>
A. Agriculture, Forestry, & Fishing	1	2	12	3	17	6	5	1	1			48
B. Mining	4	2	23	6	31	18	7	4	7		9	111
C. Construction	3	3	13	11	47	4	9	4	9		6	109
D. Manufacturing	47	67	232	130	609	84	396	45	362	4	183	2,159
E. Transportation & Public Utilities	18	17	75	49	101	14	54	23	55	6	36	448
F. Wholesale Trade	2	15	29	29	100	13	18	9	50	1	41	307
G. Retail Trade	5	6	29	24	77	20	17	7	22		7	214
H. Finance, Insurance, & Real Estate	23	54	132	50	237	40	224	66	68	16	39	949
I. Services	14	24	43	43	195	27	45	6	73		43	513
J. Public Administration									1			1
<b>01_RunnpEuro</b>	<b>62</b>	<b>136</b>	<b>614</b>	<b>180</b>	<b>867</b>	<b>182</b>	<b>413</b>	<b>96</b>	<b>514</b>	<b>14</b>	<b>307</b>	<b>3,385</b>
A. Agriculture, Forestry, & Fishing				1	4		6	1				12
B. Mining	2	4	6	1	16	10	7	1	5	2	6	60
C. Construction	2	2	23	4	14	2	10	5	4		6	72
D. Manufacturing	25	43	189	66	333	57	185	23	262	1	114	1,298
E. Transportation & Public Utilities	8	11	98	36	61	20	52	19	59	4	43	411
F. Wholesale Trade	7	4	28	16	48	10	11	5	36	1	26	192
G. Retail Trade	4	8	24	6	44	15	13	3	18		12	147
H. Finance, Insurance, & Real Estate	9	45	150	30	182	31	94	23	39	4	42	649
I. Services	5	18	96	20	164	37	35	16	89	2	58	540
J. Public Administration		1			1				2			4
<b>02_PostEuro</b>	<b>130</b>	<b>373</b>	<b>1,518</b>	<b>484</b>	<b>1,894</b>	<b>387</b>	<b>1,410</b>	<b>360</b>	<b>1,404</b>	<b>44</b>	<b>673</b>	<b>8,677</b>
A. Agriculture, Forestry, & Fishing	1		9	2	16	7	2	1	2			48
B. Mining			13	9	13	5	5	11	6		10	72
C. Construction	2	10	51	4	36	2	21	22	26		15	189
D. Manufacturing	50	126	419	144	641	91	456	100	527	8	206	2,768
E. Transportation & Public Utilities	22	39	244	79	175	52	217	63	220	8	105	1,224
F. Wholesale Trade	5	6	59	22	104	27	32	9	58	1	47	370
G. Retail Trade	4	16	66	8	80	35	56	18	33		22	338
H. Finance, Insurance, & Real Estate	21	71	287	76	318	45	374	69	166	22	89	1,538
I. Services	25	105	365	140	505	121	244	67	361	5	171	2,109
J. Public Administration			5		6	2	3		5			21
<b>Grand Total</b>	<b>309</b>	<b>699</b>	<b>2,720</b>	<b>1,009</b>	<b>4,175</b>	<b>795</b>	<b>2,598</b>	<b>621</b>	<b>2,566</b>	<b>85</b>	<b>1,344</b>	<b>16,921</b>

In the industry level, the effect of the euro adoption can be different. For example, in financial sectors, money act as goods in the normal buy and sell firms. So, when the single currency was adopted, the type of goods that the financial sectors used to have reduced from eleven currencies to a single currency. It had a massive impact on the financial firm. (Ekkayokkaya et al., 2009) studied the adoption of the euro currency in the financial services industry and indicated that the financial sector was the first that got an effect from the single currency. Apart from the specific industry study, (Rose & van Wincoop, 2001) stated that single currency reduced the trade barriers, which was national currencies and united the market. Moreover, by united the market, single currency also brought more competitors (Rose, 2000). So, the industry that generally had only the competitors in their country, for example, services and public transport, suddenly had more competitors from outside countries. In Panel B, our static data

supported the idea of the difference in the level of the effect from a single currency. It shows that the merger and acquisition deals in the first two sub-period (Pre-Euro and Run-up Euro) mainly occurred in the Manufacturing industry (41.9%) and financial industry (19.4%). However, after the Euro implementation, the merger and acquisition deals were spread into other industries such as services which is increased from 12.8% to 24.3% and public transportation and public utilities (10.4% to 14.1%), which was the industry that considered as non-international trade industry.

Apart from the volume of deals that present in Table 1, this research also provides the deal distribution using amount perspective captured by value of the deals, which present in Figure 1. Figure 1 show that the deal value was increasing since 1996 and reached their peak in 1999. After 1999, the decreasing trend have been observed. However, if we averaged the deal value per in each sub period, the average deal value during post euro period (1999 - 2004) still higher than the average deal value during pre-euro or run-up euro period. To give more insight about what happen during the euro adoption period, mergers and acquisitions have been classified using the country of the acquirer. The deals would be classified as non-cross border if the acquirer nation was the same as the target nation. For the deals that their acquirer nation was in Eurozone but was not the same as target nation, we classified them as cross border within Eurozone. For deals that acquirer nation was not in Euro area, we classified them as cross border outside eurozone. Figure 1 show the increasing in the mergers and acquisitions in 1999 came from the cross-border deals outside eurozone. The exact number of merger and acquisition deals in categories that we mention is presented in Table 2.

Figure 1: The deal value of merger and acquisition classified by the nation of acquirer.

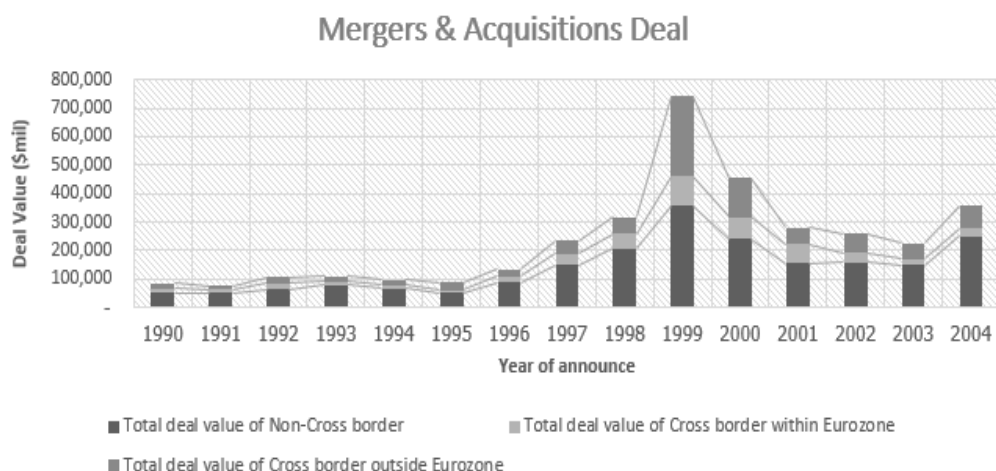


Table 2: Total value of merger and acquisition deals classified by year of announcement and the acquirer nation

Our sample consists of completed mergers and acquisition deals captured by the criteria as described in Table 1. In this table, we classify the merger and acquisition deals into three subgroups. We classify the deal as a non-cross border deal if the target nation and acquirer nation is the same. If the acquirer nation is not the same, but in the Euro area, we classify this deal as Cross border deal within eurozone. For the deals that acquirer nation was not in Euro area, we classify them as Cross border deal outside eurozone. This table presents a) Total deal value of each type of mergers and acquisitions, b) Increase (decrease) of the total deal value in each type which is calculated by total deal value in each year of announcement minus the total deal value in the prior year, and c) Percentage of the increase or decrease of the deal value in each type to the total changes in the year.

(Unit: hundred millions dollar)

Year of announce	Total deal value of Non-Cross border	Increase (Decrease)	% of increase (decrease) compare to total	Total deal value of Cross border within Eurozone	Increase (Decrease)	% of increase (decrease) compare to total	Total deal value of Cross border outside Eurozone	Increase (Decrease)	% of increase (decrease) compare to total
1990	52.29			14.44			17.78		
1991	51.91	(0.4)	4%	12.10	(2.3)	25%	11.03	(6.8)	71%
1992	64.04	12.1	41%	20.17	8.1	27%	20.44	9.4	32%
1993	79.61	15.6	376%	10.64	(9.5)	-230%	18.54	(1.9)	-46%
1994	65.95	(13.7)	125%	11.75	1.1	-10%	20.19	1.7	-15%
1995	49.66	(16.3)	185%	10.35	(1.4)	16%	29.08	8.9	-101%
1996	86.57	36.9	81%	21.61	11.3	25%	26.62	(2.5)	-5%
1997	149.07	62.5	64%	38.07	16.5	17%	45.77	19.1	20%
1998	205.77	56.7	68%	53.70	15.6	19%	57.38	11.6	14%
1999	357.32	151.6	36%	101.66	48.0	11%	283.79	226.4	53%
2000	239.98	(117.3)	41%	77.13	(24.5)	8%	136.77	(147.0)	51%
2001	153.66	(86.3)	49%	69.90	(7.2)	4%	55.63	(81.1)	46%
2002	157.72	4.1	-19%	32.94	(37.0)	173%	67.16	11.5	-54%
2003	149.38	(8.3)	25%	19.46	(13.5)	41%	56.25	(10.9)	33%
2004	248.73	99.3	76%	29.16	9.7	7%	77.47	21.2	16%

Table 2 show that the increasing in total deal value in 1999, which is the year the single currency had occurred, all categories of merger and acquisition; non-cross border, cross border within euro area, and cross border outside euro area, were increased (\$151,600 million, \$48,000 million, and \$283,790 million, respectively). The main proportion of increase (decrease) was from the cross border outside the euro area, which differed from the period before 1999 that the main proportion that drove the mergers and acquisitions to change was from the non-cross border. It suggests that single currency made the firms in eurozone more open to the firm outside eurozone. The increasing in the cross-border mergers and acquisitions can be explain using the studied result from (Bris et al., 2009) which is the value of firm in the euro area was rising. So, when the firm value was rising because of reducing in the risk factors, it increased more opportunities for investment in the corporate assets market. Moreover, the increasing in stability that provided by the existing of ECB, reduced the risk of the firms. The increasing in opportunities and reducing in risk would tempt the country outside eurozone to do more mergers and acquisitions.

#### **4.2 Measure of Liquidity in the corporate assets market**

(Sarr & Lybek, 2002) stated that researchers used two main methods to measure the financial measure liquidity: price-based and volume-based measurement. The example of those measures included bid-ask spreads, turnover ratios, depth, and breadth of the market. However, it depends on what market characteristics do they faced. The corporate assets market is one of the under the table deals which no obvious bid-ask data. (Schlingemann et al., 2002) are one of the researchers that measured the liquidity in the corporate assets market. They presented another way to measure liquidity, using the intensity of the market transactions as the market is liquid when assets in the market, can be sold quickly without any dramatically discount in their fundamental value to attract buyers or sellers. So, they proxied the intensity of corporate transactions segment by industry using the equation below.



$$\text{Liquidity Index} = \frac{\text{the value of the industry's corporate transactions}}{\text{the value of the industry's total assets}}$$

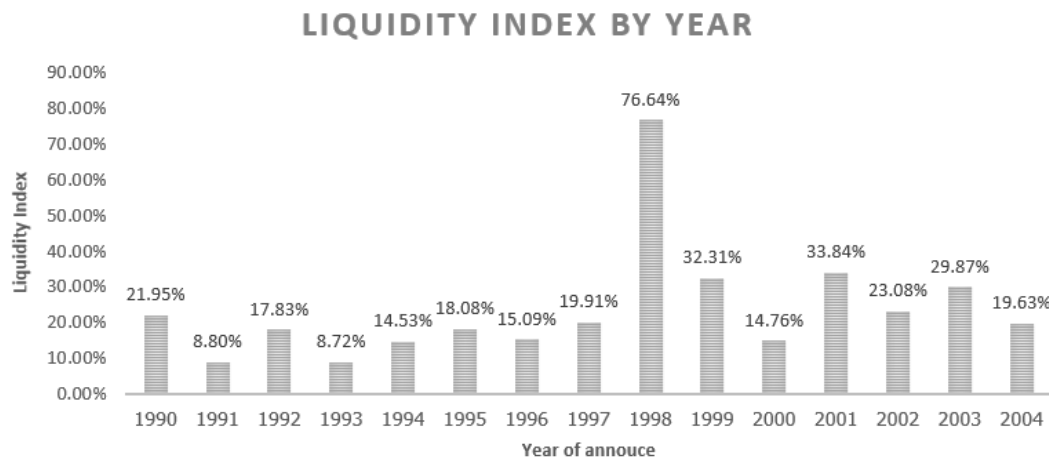
Liquidity index is the value of the industry's corporate transactions in each country and year divided by the value of the industry's total assets in the same country and year. The industry defines using two-digit of primary SIC Code of the target. The country is the target country, and the year is the year of the mergers and acquisitions announcement date. For example, the Liquidity index of metal mining (Two-digit of primary SIC Code = 10) in French in the year 1999 calculates from the summary of the deal value that target was French and mergers and acquisitions happened in 1999 divide by the summary of total asset of the French's firm that their two-digit SIC code was 10.

However, there is two inconsistency that arises in this research due to data limitations. First, the type of firms used as the denominator (public) and the type of firm used in the nominator (public and private) are different. Second, the value used in the denominator (book value) and the value used in the nominator (market value) is also different. The differences in the two aspects mentioned earlier might create some abnormal values. An industry that had total assets in the market smaller than the total deal value of merger and acquisition will result in an abnormal high liquidity index. Despite issues mentioned earlier, this study still used these total assets as the denominator, aligning with (Schlingemann et al., 2002). It because the total assets, denominator, is for scaling to make the liquidity index in each industry and country comparable and we believe that public data is typically large enough to capture the entire market for each industry.

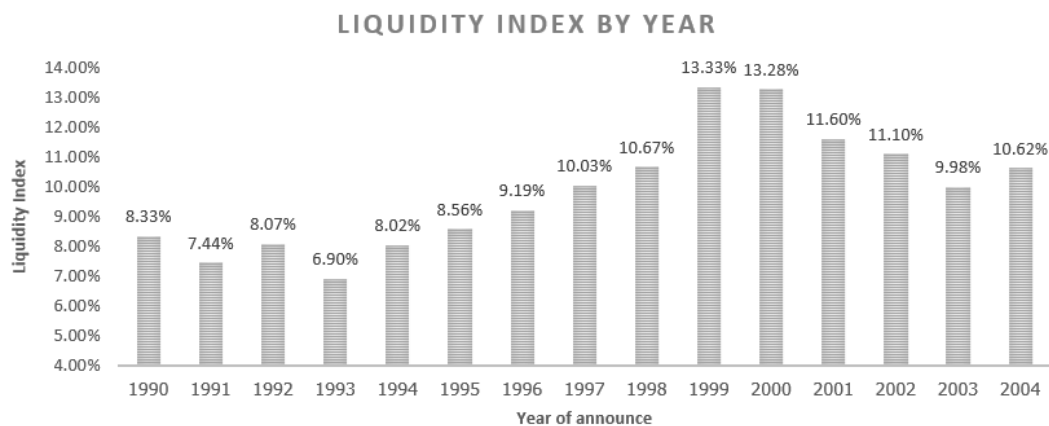
The Liquidity index calculated using method previously mentioned are presented in figures 2. As we aware of the abnormal value might create some extremely high liquidity, so we try to capture and cut off those abnormal values. The liquidity index that cut off those extremely high value is presented in figure 3. Table 3 presents the descriptive statistics of the liquidity index and other variables that might affected the

liquidity index. The rationale and the explanation of the effect from each other variables will be discuss more in detail in Chapter 5 and the value of each variable are presented in Appendix C.

*Figure 2: The average liquidity index in each year of announcement*



*Figure 3: The average liquidity index after cutting off 1% of outliers (more than 350%)*



*Table 3: Descriptive statistics of Liquidity index from the sample.*

The observations consist of 4,388 Liquidity index using 16,291 merger and acquisition deals in the calculation (Appendix B). GDP growth is the percentage change of World GDP excluded the GDP of the countries in the Eurozone. WGI indexes are the corporate governance indicator that had a value between -2.5 to 2.5; the negative sign reflects the poor governance. FD index is the indicator that show the degree of financial development.

		All Period	Pre Euro	Runup Euro	Post Euro
<b>Observations</b>	Count	4388	1560	842	1884
	%	100%	36%	19%	43%
<b>Research Variable :</b>					
Liquidity Index	Mean	9.98%	7.89%	10.00%	11.69%
	Median	0.71%	0.52%	0.75%	0.94%
<b>Control Variable :</b>					
GDP Growth	Mean	3.0323	2.3534	3.2833	3.4823
	Median	3.1637	2.1858	3.7048	3.3212
<b>WGI Index</b>					
- RegulatoryQuality	Mean	1.3345	1.3115	1.2918	1.3727
	Median	1.2858	1.2191	1.2918	1.3143
- PoliticalStabilityandAbsenceo	Mean	1.0427	1.1067	1.2888	0.9736
	Median	1.1304	1.2888	1.0788	1.0171
- VoiceandAccountability	Mean	1.3464	1.3657	1.3300	1.3328
	Median	1.3300	1.3300	1.3409	1.3200
- GovernmentEffectiveness	Mean	1.5713	1.5063	1.6700	1.6322
	Median	1.7100	1.6700	1.5554	1.7300
- RuleofLaw	Mean	1.4747	1.5008	1.4800	1.4508
	Median	1.4800	1.4800	1.4801	1.4600
- ControlofCorruption	Mean	1.4922	1.4574	1.3700	1.5276
	Median	1.3900	1.3700	1.3900	1.4000
FD Index	Mean	0.6284	0.5054	0.6288	0.7300
	Median	0.6361	0.4787	0.6283	0.7378
Bond Yield	Mean	6.6538	9.3770	5.9179	4.7278
	Median	5.5758	8.7925	5.6408	4.7775

As observed in Figure 2, there is an abnormal averaged liquidity index in 1998. Moreover, Table 3 also show a high distance between the Mean and Median of the liquidity index. The abnormal high liquidity index is captured in this research. We found that the source of the abnormal high in the liquidity index in 1998 arises from one liquidity index. Its value is equal to 18,908% due to the inconsistency that we mentioned before. 1% of outliers had been detected and cut off in our analysis. We noted that only 52 liquidity indexes from 4,338 of our sample that had liquidity index more than 350% (Appendix B present distribution of the liquidity index). The average liquidity index after cutting off the abnormal value present in Figure 3 (remaining 4,286 out of 4,338). Figure 3 also show the increasing trend similar to Figure 2. It shows that the liquidity index goes up since 1994, and sharply increasing in 1999, then gradually dropping year by year until 2004. The increasing trend of liquidity index aligns with the univariant analysis in 4.1, which indicates the increased sign of liquidity index after the Euro was implemented.

### 4.3 Deal Initiation

This paper broadly defines deals by their initiation party using the first intention expression criteria. The deal that the target or seller firm first expressed its intention to sell is classified as a target-initiated deal or seller-initiated deal. On the contrary, the deal will be classified as an acquirer-initiated deal or buyer-initiated deal when the acquirer or buyer firm first expressed its intention to buy.

To answer whether mergers and acquisitions were more initiated by target (seller) or acquirer (buyer) after the emerge of the Euro, the percentage of deal initiation is used. As deals can be either target-initiated or bidder-initiated, so this research uses only the target-initiated ratio as a representative to answer the research question. Percentage of target-initiated calculated from the number of deals initiated by target or seller divided by the total number of deals in each group of our samples that used in the liquidity measurement (samples group by country, industry, and event year).

$$\textit{Percentage of target initiated} = \frac{\textit{Number of deals that initiaed by target}}{\textit{Total number of deals in each year}}$$

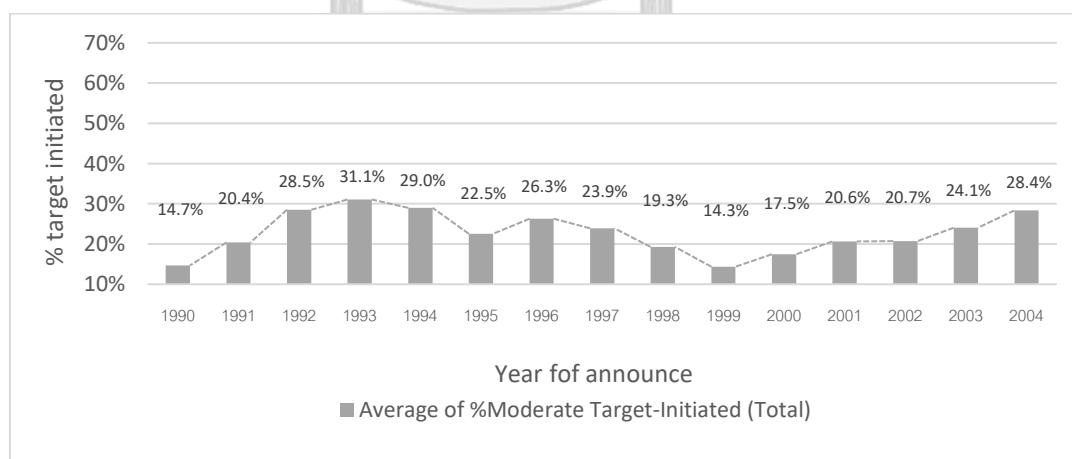
Deal-initiated is defined based on the evidence presented, which can be categorized into two types. First is deal-initiated based on strong evidence, and second is deal-initiated based on moderate evidence as available information in the SDC platinum database. We identify deals as a strong evidence if we have an obvious information about the deal initiation party, for example, search for buyer(s). Deals identify as moderate evidence if the deal initiation party most likely to be target, but the confidence level is lower than the strong evidence, for example, plan to split off, divestiture plan. The percentage of target-initiated (Moderate Evidence) included the deals that target initiated identified using moderate evidence plus strong evidence. However, the percentage of target-initiated (Strong Evidence) included only the deals that the target initiated identified using strong evidence. The moderate evidence

covered 2,712 pans (6,248 M&A deals) while the strong evidence covered 1,813 pans (3,265 M&A deals). More details about data using in this process are presented in Appendix E.

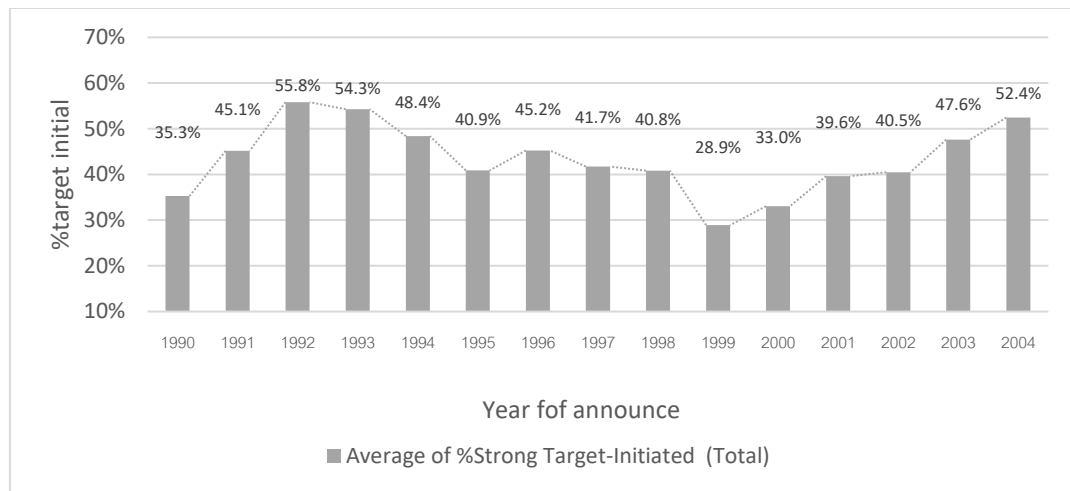
Apart from the level of evidence provided, the percentage of target-initiated is categorized into two subgroups which are a) the percentage of target-initiated (Inside) b) the percentage of target-initiated (Outside). The percentage of target-initiated (Inside) was calculated using the deals that the target initiated, and the acquirer was the firm in Euro area divided by the total deals that acquirer was the firm in Euro area. Meanwhile, the percentage of target-initiated (Outside) was calculated using the deals that the acquirer was the firm outside euro area instead of inside euro area.

Figure 4 and Figure 5 shows the average percentage of target-initiated in each year using moderate and strong evidence, respectively. Figure 6 and 7 show the comparison of the average percentage of target-initiated (inside) and the average percentage of target-initiated (outside) in each year using moderate and strong evidence. Table 4 presents the descriptive statistics of the percentage target initiated for the moderate evidence.

*Figure 4: The average percentage of target-initiated in each year (moderate evidence)*

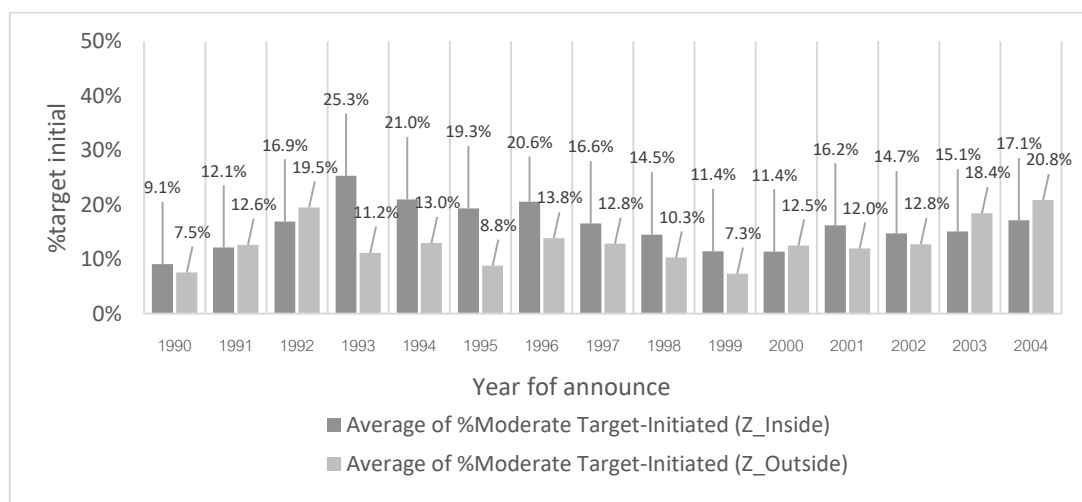


**Figure 5:** The average percentage of target-initiated in each year (Strong evidence)



Figures 4 and 5 show the uprising pattern of the percentage of target-initiated during 1990 to 1993. After 1993, the percentage of target-initiated gradually drop until 1999. However, after 1999, the percentage of target-initiated had an increasing trend until 2004. Based on only analysis of the distribution of the percentage of target-initiated, it can be interpreted that after Euro occurred, the target in the Euro area was likely to initiate more deals. From this point of view, our hypothesis 2a target firm initiated more after single currency happened is likely to be true.

**Figure 6:** The average percentage of target-initiated classified by the nation of acquirer; Inside and Outside euro area (moderate evidence)



*Figure 7: The average percentage of target-initiated classified by the nation of acquirer; Inside and Outside euro area (moderate evidence)*

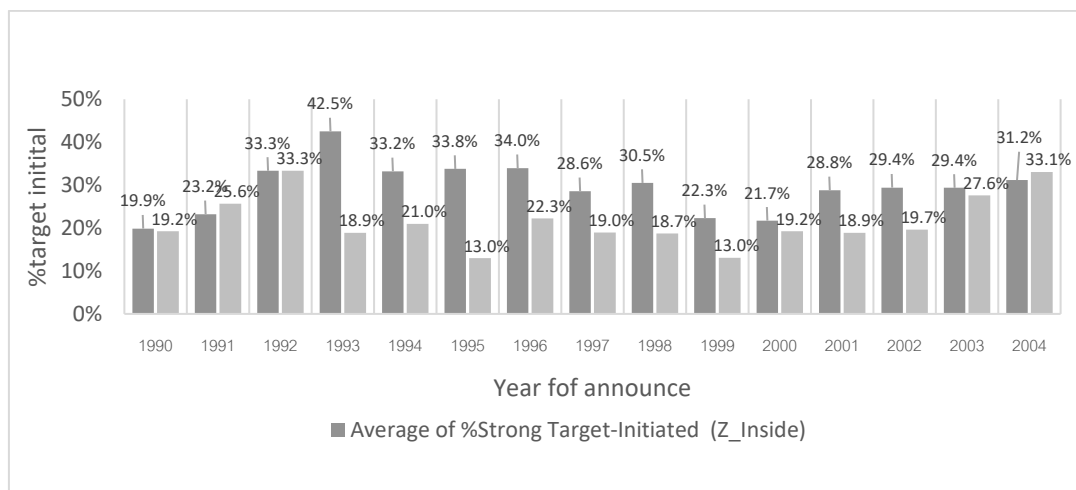


Figure 6 and 7 show that mostly both the percentage of target-initiated (Inside) and (Outside) followed the same trend of increasing and decreasing, as we mentioned in Figure 4 and 5 analysis. However, we found that the percentage of target-initiated for inside deals was higher than outside. According to the studies from (Masulis & Simsir, 2018), It can be interpreted that when a firm faced a financial constraint, they prefer to find the target inside the Euro area to help them survive.

However, the descriptive statistics of the percentage of target-initiated in Table 4 show a high distance between mean and medium, so further distribution analysis had been performed in this case. We found that percentage of target-initiated have an extreme value equal to 0% or 100%, especially in the strong evidence percentage of target-initiated due to the small numbers of merger and acquisition deals in each pan. So, to provide more supporting empirical evidence from our study, the percentage of target-initiated grouped by country and years are performed. The detail of the distribution of the percentage of target-initiated for both methods show in Appendix E.

*Table 4: Descriptive statistics of the percentage of target-initiated.*

The percentage of target-initiated from moderate evidence covered 2,712 pans (6,248 M&A deals). Economic recession (%) is the percentage change of GDP of each country in the Eurozone. HHI dummy is the dummy variable equal to 1(0) when the HHI of the target industry is greater than the average HHI (Otherwise). WGI indexes are the corporate governance indicator with a value between -2.5 to 2.5, and the negative sign reflects the poor governance. FD index is the indicator that shows the degree of financial development.

		All Period	Pre Euro	Runup Euro	Post Euro
<b>Observations</b>	Count	2712	931	544	1237
	%	100%	34%	20%	46%
<b>Research Variable :</b>					
Percentage of Target-initiated	Mean	22.82%	25.11%	23.14%	20.95%
	Median	0.00%	0.00%	0.00%	0.00%
<b>Control Variable :</b>					
Economic Rescession	Mean	1.3141	2.0053	3.2083	2.5941
	Median	1.2499	2.1067	2.3429	2.6100
WGI Index					
- RegulatoryQuality	Mean	1.3141	1.2989	1.2611	1.3488
	Median	1.2499	1.2142	1.2167	1.2915
- PoliticalStabilityandAbsenceo	Mean	1.0134	1.0923	1.0579	0.9345
	Median	1.1112	1.2866	1.1924	0.9286
- VoiceandAccountability	Mean	1.3393	1.3618	1.3314	1.3260
	Median	1.3200	1.3300	1.3200	1.3100
- GovernmentEffectiveness	Mean	1.5573	1.4925	1.5233	1.6211
	Median	1.7100	1.6200	1.6600	1.7200
- RuleofLaw	Mean	1.4601	1.4942	1.4664	1.4318
	Median	1.4800	1.4800	1.4800	1.4400
- ControlofCorruption	Mean	1.4733	1.4442	1.4522	1.5045
	Median	1.3700	1.3600	1.3900	1.3900
HHI Index	Count	1001	388	209	404
	%	100%	39%	21%	40%



## Chapter 5

### Methodology

**Hypothesis 1:** Single currency increased the liquidity in the corporate assets market.

To prove that single currency created a positive effect on the liquidity in the corporate assets market, we run the linear regression using the following formula, equation (1).

$$\begin{aligned}
 & \textbf{Liquidity Index}_{i,j,t} \text{ --- (1)} \\
 & = \beta_0 + \beta_1 \text{RunupEuro}_t + \beta_2 \text{PostEuro}_t + \sum_{k=3}^5 \beta_k \text{Control variable}_{k,i,j,t} + \varepsilon_{i,j,t}
 \end{aligned}$$

Where the liquidity index  $i,j,t$  is the liquidity indexes of industry  $i$  (which defines by the primary two-digit SIC code of target industry) in country  $j$  (which is the target's country) at year  $t$ , liquidity index is calculated from the ratio of total deal value in each country, industry, and year (as the numerator) to the total industry's assets in each country and year. The RunupEuro is the dummy variable that defines as 1 when the year of liquidity index is between 1996 – 1998; else, we define RunupEuro as 0. The PostEuro is the dummy variable that defines as 1 when the year of liquidity index is between 1999 – 2004; else, we define PostEuro as 0. The coefficient of RunupEuro ( $\beta_1$ ) expect to be positive, and PostEuro ( $\beta_2$ ) expect to be significantly positive, meaning that the liquidity index after Euro has erupted would be increased.

We proceed the analysis and attempt to control possible factors that might affect the liquidity index in each country, industry, and times. Those factors (Control variables) were listed as follow.

- I. **Economic growth:** (Ali-Yrkkö, 2002) found that the mergers and acquisitions trend significantly went up within the economic growth environment. So, the economic environment change is an exogenous factor that generally made mergers and acquisitions numbers gone up. As we compared the liquidity index between the years, so when the world economic growth, we would see the increase in the mergers and acquisitions and vice visa. Then we control the rest of the world economic growth because, with or without a single currency, the liquidity could be increased. We proxy economic growth using weighted-average GDP, excluding the country in the euro area. The logical why we use the rest of the world economic growth is that including the mergers and acquisitions transactions in Euro would cause endogeneity problems. As mergers and acquisitions transactions in the Euro ( $y$ ) can drive the economic growth in Eurozone ( $x$ ) or  $y$  can cause  $x$ .
- II. **Corporate governance:** Research papers indicated the corporate governance had a positive impact on investment in those countries (Stulz, 2005) and (Porta et al., 1998). Countries with poor corporate governance would have low investment access to their capital market as poor corporate governance means low investor protection. Without proper protections, the investors would be worth off because of the agency cost caused by the information's asymmetry. The outsider does not know the firm's real value and the risk attached to it. As such, the insiders can gain more benefit from this information. It aligns with the result found by (Bris et al., 2008) stated that the country that had better investors' protection had more numbers of cross-border transactions. According to our measurement, we assess liquidity grouped by their countries, industries, and years, so the corporate transactions in each country could result from their corporate governance. So, we attempt to control this corporate governance by using the corporate governance

index (WGI) provided by the world bank data. According to the world bank data, WGI have been divided into six aspects, which are a) Regulatory quality, b) Political Stability and Absence of Violence/Terrorism, c) Rule of law, d) Control of corruption, e). Voice and accountability, f). Government effectiveness. We noted that all six aspects of WGI will be used as control variables as it theoretically has the impact on the investor decision. The country that had a low worldwide governance index will have poor capital access or less liquidity.

- III. **Financial development:** (Jongwanich et al., 2013) studied the relationship between cross border mergers & acquisitions and financial development. They show that with the limitation of the financial instrument that encouraging mergers and acquisition transactions, the cross-border tends to be more complicated. Mergers and acquisitions could be more costly than green-fields entry without the proper instruments supported mergers and acquisitions; for example, the developed stock and equity market that can easily trade shares or even the less limitation of financing sources, such as the bond market and money market. In the country-level analysis, countries that provided good financial instrument or had better financial development would have high mergers and acquisitions transactions. So, we proxy the degree of financial development using the financial development index presented by IMF.

For more details on measurement and predicted signs, see Table 5.

*Table 5: Measurement and the predicted sign of variables for Hypothesis 1*

Variable	Measurement	Predicted Sign
RunupEuro	is the dummy variable that defines as 1 when the year of liquidity index is between 1996 – 1998, else we define RunupEuro as 0	Positive
PostEuro	is the dummy variable that defines as 1 when the year of liquidity index is between 1999 – 2004, else we define PostEuro as 0	Positive
Economic Growth	represented by the weighted average GDP of each year (excluded the GDP of the countries in the Eurozone).	Positive
Corporate Governance	is the worldwide governance indicator (WGI) of the Euro area's target countries, retrieved from the world bank data (possible value: -2.5 to 2.5)	Positive
Financial development	is the financial development index (FD) of the target countries in the Euro area, retrieved from the IMF database (International monetary fund)	Positive

We perform a regression test using linear regression. The related variables included economic growth, corporate governance, financial development, and dummy euro as an independent variable and the liquidity index as the dependent variables.

**Hypothesis 2a:** Target firms more initiated mergers and acquisitions after single currency occurred.

**Hypothesis 2b:** Acquirer firms more initiated mergers and acquisitions after the single currency occurred.

This paper divided the hypothesis into two sub-hypotheses to answer whether the euro adoption made more target-initiated deals or created more bidder-initiated deals. The two sub-hypotheses comprised of Hypothesis 2a: Target firms more initiated mergers and acquisitions after single currency occurred and Hypothesis 2.b: Acquirer firms more initiated mergers and acquisitions after single currency occurred.

As a deal can either initiated by the target (seller) or acquirer (buyer), we use only the percentage of the target-initiated deal as a representative to test. This paper performs a linear regression model as the percentage of target-initiated are the industries- year observations. On the contrary, if we measure the firm-specific observations, like the dummy target-initiated that the value can only be zero or one, it would be proper to use probit or logit model. Linear regression is performed using the below formula, Equation (2).

$$\begin{aligned} & \textit{Percentage of target initiated}_{i,j,t} \quad \text{--- (2)} \\ & = \gamma_0 + \gamma_1 \textit{RunupEuro}_t + \gamma_2 \textit{PostEuro}_t + \sum_{l=3}^5 \gamma_l \textit{Control variable}_{l,i,j,t} + \varepsilon_{i,j,t} \end{aligned}$$

Where the percentage of target initiated  $i,j,t$  is the percentage of target initiated deal in industry  $i$  (which defines by primary two-digit SIC code of target industry) in country  $j$  (which is the target's country) at year  $t$ . percentage of target initiated calculated from the number of deal initiated by target (as the numerator) divided by the total number of deals (as the denominator) in each country, industry, and year.

The RunupEuro is the dummy variable that defines as 1 when the year of liquidity index is between 1996 – 1998, else we define RunupEuro as 0. The PostEuro is the dummy variable that defines as 1 when the year of liquidity index is between 1999 – 2004, else we define PostEuro as 0. The coefficient of RunupEuro ( $\gamma_1$ ) and PostEuro ( $\gamma_2$ ) expect to be significantly positive if single currency made target initiated more deals and expect to be negative if the single currency made less target-initiated deals, or in other words, single currency made acquirer initiated more deals.

We control the possible factors that might impact deal-initiated party—most of the control variable (Control variables in the equation) used in this paper drawn from (Masulis & Simsir, 2018).

- I. **Herfindahl-Hirschmand index (HHI):** Herfindahl-Hirschmand index is the index for measure market concentration. In each industry, the HHI calculated from the total of squaring the market share of each firm. The industry with a high HHI value means that this industry has a low competitive or high concentration. (Masulis & Simsir, 2018) gave evidence that when the target had high HHI or target is in the highly concentrated market, the number of target-initiated deals would also be high. Logical behind the high level of the target-initiated deal was when fewer firms in the industry also mean less potential bidders. So, more target-initiated were observed in this situation. We use the High HHI dummy as a proxy of market concentration as the target trend to do more initiation if the target is in the high concentration market. This paper calculates HHI using only the market share of public firms as the public firms typically large. It should capture the majority of the market share of the product or services in the industry. We give High HHI to be one if calculated HHI is more than average HHI; else, High HHI equal to zero.
- II. **Economic recession:** Next variables that could affect the deal initiated was the economic recession. Like the evidence stated by (Masulis & Simsir, 2018), the target-initiated resulted from the negative economy-wide shock. This negative shock made firms more vulnerable, dropping in sales, market shares, and so on. Instead of waiting for the firm to be financially distressed, firms will find other firms to migrate those adverse effects (Harford, 2005). Economic recession is measured by the GDP of each industry and country in the Euro area each year. The rationale behind industry-based GDP is when the industry was in a recession (industry-wide shock). It made firms in the euro area more vulnerable. It came out to find suitable business partners to help them overcome this adverse effect.

- III. **Corporate governance:** The poor corporate governance countries would have more target-initiated deals if there are existing motives in mergers and acquisitions. The explanation behind the more target-initiated deal begins with the agency problem. Agency problems arise because of the asymmetry information between buyers and sellers; sellers have more information about their firms and their intrinsic value than buyers (Jensen & Meckling, 1976). In this case, the more inform party (seller) can benefit from the ill-inform party (buyers), for example, by selling firms with the price much more than their intrinsic value. With the proper investor protection such as financial disclosure laws, the information asymmetry level can be reduced, meaning that low chance or amount that more inform party would benefit from the ill-inform party. In countries with poor corporate governance or low investor protection, outside investors rationally fear that sellers would steal their wealth and invest less in this kind of countries (Porta et al., 1998). However, with the existing demand for selling firms, the target firms can voluntarily choose to disclose information to the investors to reduce their information asymmetry gap. So, in poor corporate governance country, the target would initiate the deal. Thus, we attempt to control this corporate governance by using the corporate governance index (WGI) provided by the world bank data. The country with a low worldwide governance index will have a high probability of a target-initiated deal or a high percentage of the target-initiated.

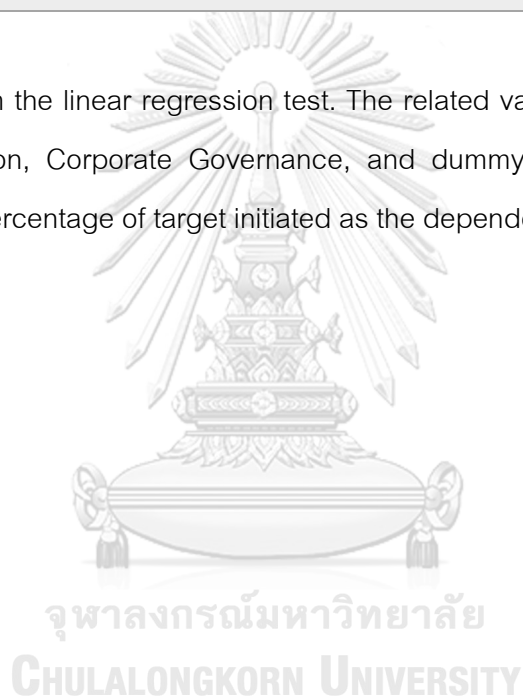
Those control variables are listed below.

**Table 6:** Measurement and the predicted sign of variables for Hypothesis 2

Control variables	Measurement	Predicted Sign
RunupEuro	is the dummy variable that defines as 1 when the year of liquidity index is between 1996 – 1998, else we define RunupEuro as 0	Positive or negative
PostEuro	is the dummy variable that defines as 1 when the year of liquidity	Positive or

Control variables	Measurement	Predicted Sign
	index is between 1999 – 2004, else we define PostEuro as 0	negative
High HHI	is the dummy variable equal to 1 when the HHI of target industry greater than average HHI, otherwise equal to 0 (HHI calculated from the total of the square of each firm's market share in the industry).	Positive
Economic Recession	represented by the GDP growth of each industry and each country in the Euro area in each year.	Negative
Corporate Governance	is the worldwide governance indicator (WGI) of the Euro area's target countries, retrieved from the world bank data (possible value: -2.5 to 2.5)	Negative

We perform the linear regression test. The related variables included High HHI, Economic recession, Corporate Governance, and dummy euro as an independent variable and the percentage of target initiated as the dependent variables.





## Chapter 6

### Empirical Result

This chapter shows the empirical result from the test to answer hypotheses. Hypothesis 1 is that Single currency increased the liquidity in the corporate assets market and Hypothesis 2 are (2a) Target firms more initiated mergers and acquisitions after single currency occurred or (2b) Acquirer firms more initiated mergers and acquisitions after the single currency occurred.

#### 6.1 H1: Single currency increased the liquidity in corporate assets market.

##### 6.1.1 Results from Pooled Ordinary least squares regression – liquidity index, Fixed effect, and control variables

To test our first hypothesis, we perform the pooled OLS regression. Five models are introduced in our study. Model (1), the liquidity index is expected to be solely affected by the euro adoption. In Model (2), the country fixed effect has been added to the Model to address the potential country effect. In Model (3), the industry fixed effect has been added to the Model to address both potential effect from country and industry. Model (4) represent all potential factors that might affect the liquidity index. Finally, in Model (5), the bond yield has been added into the Model as it potentially represents the source of financing for M&A deals. The results from each model are shown in Table 7.

**Table 7:** *Regression analysis of Single currency to the liquidity index*

Results are from running pooled OLS of equation (1). In all models, the dependent variable is the liquidity index. Euro period – Run-up Euro is the dummy variable defined as 1(0) if the liquidity index is in the Run-up Euro period, 1996 – 1998 (Otherwise). Euro period – Post Euro is the dummy variable defined as 1(0) if the liquidity index is in Post Euro period, 1999 – 2004 (Otherwise). For Model (4) and (5), GDP growth is the percentage change of World GDP excluding the GDP of countries in the Eurozone. WGI indexes is the corporate governance indicator using six perspectives which are 1)

Regulatory Quality, 2) Political Stability and Absence of Violence/ Terrorism, 3) Voice and Accountability, 4) Government Effectiveness, 5) Rule of Law, and 6) Control of Corruption. WGI index had a value between -2.5 to 2.5, and the negative sign reflects the poor governance. FD index is the indicator that shows the degree of financial development. For Model (5), Bond yield is the average outstanding 10-year government bond yield of the target countries retrieved from the IMF database. The country fixed effects represent target countries, and the industry fixed effects represent by the primary 2 Digit of SIC Code. \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	1	2	3	4	5
<b>Explanatory variables :</b>					
Euro period - Run-up Euro	0.3505 *** (0.1139)	0.3272 *** (0.1017)	0.2889 *** (0.0935)	0.2212 * (0.1292)	0.2889 ** (0.1476)
Euro period - Post Euro	0.4921 *** (0.094)	0.4570 *** (0.0833)	0.3775 *** (0.0752)	0.3534 ** (0.1722)	0.4127 ** (0.1832)
GDP Growth				0.1284 *** (0.0434)	0.1264 *** (0.0435)
WGI Index					
- RegulatoryQuality				0.1840 (0.3885)	0.2220 (0.3905)
- PoliticalStabilityandAbsenceo				0.3797 * (0.2017)	0.3854 * (0.2017)
- VoiceandAccountability				-0.3432 (0.7218)	-0.3485 (0.7219)
- GovernmentEffectiveness				-0.4335 (0.3232)	-0.5221 (0.3364)
- RuleofLaw				-0.0328 (0.6058)	-0.1020 (0.6101)
- ControlofCorruption				1.5785 *** (0.4695)	1.5104 *** (0.4749)
FD Index				-0.7166 (0.7874)	-0.1695 (0.9757)
Bond Yield					0.0356 (0.0375)
Constant	-0.6882 *** (0.0685)				
Country Fixed Effect	-	Yes	Yes	Yes	Yes
Industry Fixed Effect	-	-	Yes	Yes	Yes
F-stat	14.08	122.06	31.48	29.04	28.73
R-squared (Adjusted)	0.66%	22.97%	37.12%	37.32%	37.32%
N	4286	4286	4286	4286	4286

In this paper, we predict the positive sign of  $\beta_1$  (Run-up Euro) and  $\beta_2$  (Post Euro) in equation (1). The result from the regression in all our models, Table 7, shows the consistent sign with the prediction for both  $\beta_1$  (0.3505, 0.3272, 0.2889, 0.2212, 0.2889 in model (1), (2), (3), (4), and (5), respectively) and  $\beta_2$  (0.4921, 0.4570, 0.3775, 0.3534, 0.4127 in model (1), (2), (3), (4), and (5), respectively). Not only the matching in sign is found, but also it is significant at least 10% confidential level throughout any models. It can be interpreting that whether; we control for other factors that might affect the

liquidity index. The euro adoption periods are still drove the liquidity index to increase. After applied the country fixed effect in model (2), the Adjusted R square increase from 0.66% to 22.97% and increasing from 22.97% to 37.12% in Model (3), which mean that the single currency not equally affected liquidity index in the different country and industry as predict.

**Table 8: Factors that affect the liquidity index.**

The sample consists of 4,338 liquidity indexes during the test period (1990-2004). The Pre-Euro, Run-up Euro, and Post Euro are the periods during 1990 – 1995, 1996 – 1998, 1999 – 2004, respectively. GDP growth is the percentage change of World GDP excluded the GDP of a country in the Eurozone. WGI indexes is the corporate governance indicator using six perspectives which are 1) Regulatory Quality, 2) Political Stability and Absence of Violence/ Terrorism, 3) Voice and Accountability, 4) Government Effectiveness, 5) Rule of Law, and 6) Control of Corruption. WGI index had a value between -2.5 to 2.5, and the negative sign reflects the poor governance. FD index is the indicator that shows the degree of financial development. All the periods mention before run using country and industry fixed effects which represent target countries. \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	All Period	Pre Euro	Runup Euro	Post Euro
<b>Explanatory variables :</b>				
GDP Growth	0.1472 *** (0.0422)	0.2985 *** (0.1008)	-0.1918 (0.4073)	0.1749 *** (0.0609)
WGI Index				
- RegulatoryQuality	0.2568 (0.3781)	0.0000	-0.1366 (1.5754)	-0.4382 (0.5176)
- PoliticalStabilityandAbsenceo	0.3201 (0.1967)	-1.7152 *** (0.2169)	-4.4966 (1.9433)	0.0764 (0.3694)
- VoiceandAccountability	-0.7137 (0.703)	0.0000	8.2771 (7.6154)	-0.8398 (0.9296)
- GovernmentEffectiveness	-0.4326 (0.3341)	0.0000	-1.6304 (2.6056)	-0.0512 (0.6173)
- RuleofLaw	0.3623 (0.5754)	0.0000	-1.1027 (2.6997)	0.6911 (1.117)
- ControlofCorruption	1.3603 *** (0.4682)	-0.6686 ** (0.3361)	0.0698 (2.15)	0.8122 (0.8235)
FD Index	0.5601 (0.867)	-6.8232 ** (2.891)	3.0364 (2.7538)	-2.1061 (2.2906)
Bond Yield	0.0021 (0.0328)	0.0014 (0.0711)	0.0500 (0.183)	0.0961 (0.1677)
Country Fixed Effect	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes
F-stat	29.29	12.13	7.18	15.67
R-squared (Adjusted)	37.27%	35.17%	38.46%	40.68%
N	4286	1560	842	1884

While our studied variables are significant and align with the prediction, the predicted sign of FD Index and some categories of WGI index are not matched with our prediction. Table 8 show the result from the regression liquidity index with control variables. FD Index in Table 8 show a positive sign align with our prediction but different from the FD Index sign (negative) in Table 7. It suggests that the FD index potentially have a high correlation with the year. Appendix C, Table C-VI, shows that the FDI index mostly increases as the year goes by. It indicates that the depth, accessibility, and efficiency of the financial market and institution are continuously developing each year. So, we reform the regression test without the financial development (Index). The interpretation of results is not significantly different from the result in Model (4). The detail of comparison is present in Appendix D.

To conclude, the liquidity index was increased since before the Euro was adopted, indicated by the significant positive sign of the  $\beta_1$  (Run-up period). However, the euro adoption gave a stronger positive effect on the liquidity index observed by the significant positive sign of  $\beta_2$  (0.4127) that have a higher value than  $\beta_1$  (0.2889).

#### 6.1.2 Results from Pooled Ordinary least squares regression – liquidity index from the merger and acquisition within Eurozone and outside the eurozone.

Refer to the distribution of merger and acquisition deals presented in Chapter 4, Figure 1 shows that a single currency might have a different degree of effect on each type of merger. We perform further analysis by categorized the liquidity index into two groups which are a) Liquidity index from the merger and acquisition deals within the eurozone and b) Liquidity index from the merger and acquisition deals outside eurozone. The Liquidity index from the merger and acquisition deals within the eurozone captured by using the deals that the acquirer nation is one of the eleven countries in euro area, otherwise we classify it as merger and acquisition deals outside eurozone. We then perform the regression to analyse their relationship with the single currency. Four models were built; Model (1) and (2) represent the Liquidity index from the merger

and acquisition deals within the eurozone. The difference between Model (1) and Model (2) is that in Model (1), the liquidity index is expected to be solely affected by the euro adoption. In Model (2) all control variables and fixed effects had been added. In Model (3) and (4), the liquidity index is the liquidity index from the merger and acquisition deals outside eurozone. The difference between Model (3) and Model (4) is similar to the difference between Model (1) and Model (2). The result is shown in Table 9.

*Table 9: Regression analysis of Single currency to the liquidity index comparing the mergers and acquisitions within Eurozone and outside the eurozone.*

Results are from running pooled OLS of equation (1). The dependent variables, control variables, and the fixed effect used in this table are similar to the variables mentioned in Table 7. Model (1) and (2) represent the liquidity index from the merger and acquisition deals within the eurozone, and Model (3) and (4) represent the liquidity index from the merger and acquisition deals outside the eurozone. \*\*\*, \*\*, \* represent significant 1%, 5% and 10%, respectively

	1	2	3	4
<b>Explanatory variables :</b>				
Euro period - Run-up Euro	0.1794 (0.1296)	0.2176 (0.168)	0.2786 * (0.162)	0.2279 (0.1997)
Euro period - Post Euro	0.3421 *** (0.1053)	0.3243 (0.2078)	0.4575 *** (0.1345)	0.4266 * (0.2501)
GDP Growth		0.1245 *** (0.0482)		0.0836 (0.0595)
WGI Index				
- RegulatoryQuality		0.3814 (0.4315)		-0.2157 (0.5399)
- PoliticalStabilityandAbsenceo		0.4556 ** (0.2185)		-0.2222 (0.2746)
- VoiceandAccountability		-0.7972 (0.7851)		0.2193 (0.9839)
- GovernmentEffectiveness		-0.6144 * (0.3649)		-0.4358 (0.4604)
- RuleofLaw		-0.6126 (0.6615)		1.2785 (0.8426)
- ControlofCorruption		1.8924 *** (0.5364)		1.6091 ** (0.6533)
FD Index		0.4144 (1.0997)		-0.7335 (1.3031)
Bond Yield		0.1009 ** (0.0422)		0.0026 (0.0525)
Constant	-0.9077 *** (0.0793)		-1.7447 *** (0.0969)	
Country Fixed Effect	-	Yes	-	Yes
Industry Fixed Effect	-	Yes	-	Yes
F-stat	5.28	24.07	5.82	22.19
R-squared (Adjusted)	0.30%	37.54%	0.47%	43.14%
N	3494	3494	2441	2441

After separate the effect of the single currency to the liquidity index of merger and acquisition deals that occurred inside from outside eurozone shown in Table 9, we found that the liquidity index for the mergers and acquisitions inside eurozone did not significantly affect by the single currency. However, it appears to drive by the global GDP, corporate governance, and bond yield of the target country. The possible logical explanation behind the effect of single currency towards the liquidity index for the acquirers that stayed outside Euro, it because in the eye of country outside euro area after the single currency was adopted, Euro area became stronger as a pan. It aligns with (Rose & van Wincoop, 2001) and (Allen & Song, 2005) which stated that single currency created the long-term financial integration, which resulted in the upsurge in the degree of confidence of the private sectors. So, the acquirers outside eurozone saw these opportunities and expected it to overcome the cost of cross border mergers. So, they invested more in the Euro area. Meanwhile, the single currency adoption did not give a significant effect to the country in Euro zone. As one of cost in cross border mergers, the currency risk in the Euro zone was typically low since before the single currency happened (Werner, 1970). So, when the single currency adopted, the increasing in benefit from the disappearing of the currency risk was low. The choices of investing in mergers and acquisitions then not mainly depend on the disappearing of legacy currencies but depend on the other factors, such as corporate governance, global economic growth. However, bond yield that considered as one of a cost of financing, typically give a negative impact to the mergers and acquisitions. Surprisingly, the result present in Table 9 show the slightly positive effective (0.1009) to the mergers and acquisition. The possible explanation for this result is that the benefit of the mergers and acquisition had overcome the cost of financing, which represent by the bond yield in this case.

In conclusion, the single currency created liquidity in the corporate asset market. Empirical evidence shows that single currency impacted the mergers and acquisitions since the planning phase (1996). However, this impact was smaller than the period after

the single currency was first adopted in 1999. After further investigation of the liquidity index separate by the acquisition party, liquidity index within Euro and outside Euro. We found that the single currency had a significant impact on those cross-border deals outside the eurozone. However, the increase in liquidity index within the eurozone was mainly driven by other factors such as corporate governance, global economic growth.

**6.2 H2: Target firms more initiated mergers and acquisitions after single currency occurred.**

**6.2.1 Results from Pooled Ordinary least squares regression – segment by industry, country, and year**

To test our second hypothesis and our third hypothesis, we perform the pooled OLS regression. Twelve models are introduced in our study. The sample used in Model (1), (2), (3), (7), (8), and (9) are the percentage of target-initiated that composed of more than three mergers and acquisitions in exempt to cut off those extreme values. The sample used in Model (4), (5), (6), (10), (11), and (12) are the percentage of target-initiated that composed of at least one merger and acquisition deal. Model (1), (4), (7) and (10), we perform on the basis that country and industry do not affect the percentage of target-initiated. Model (2), (5), (8) and (11), the country fix effects has been added, and Model (3), (6), (9), and (12), the industry and country fix effects, have been add. The results for moderate evidence are shown in Table 10, Model (1) to Model (6) and the results for strong evidence are shown in Table 11, Model (7) to Model (12).

**Table 10: Effect of euro adoption on the percentage of target-initiated segment by industry, country, and year (Moderate Evidence).**

The sample consists of merger and acquisition deals during 1990 – 2004. The percentage of target-initiated was calculated using the number of target-initiated deals divided by total deals that can identify the initiated party segmented by country, industry, and year. Our studies variable, Euro period – Run-up Euro is the dummy variable defined as 1(0) if the liquidity index is in the Run-up Euro

period, 1996 – 1998 (Otherwise). Euro period – Post Euro is the dummy variable defined as 1(0) if the liquidity index is in Post Euro period, 1999 – 2004 (Otherwise). Economic recession is the percentage of GDP growth of target country. WGI indexes is the corporate governance indicator using six perspectives similar to WGI index in Table 7. HHI Dummy is the dummy variable defined as 1(0) if the HHI of the industry is more than the average HHI in the year (Otherwise). In Model (2) and (5), we control for only the country fixed effect, and In Model (3) and (6), we control for both the country and industry fixed effect. We then run pooled OLS regression (after adjusted for robust) to test how the Euro adoption affect the percentage target-initiated (moderate evidence). \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Moderate Evidence</b>	<b>%Target - initiated (Moderate evidence)</b>	<b>%Target - initiated (Moderate evidence)</b>	<b>%Target - initiated (Moderate evidence)</b>	<b>%Target - initiated (Moderate evidence)</b>	<b>%Target - initiated (Moderate evidence)</b>	<b>%Target - initiated (Moderate evidence)</b>
Euro period - Run-up Euro	0.0244 (0.0449)	0.0205 (0.0302)	0.0151 (0.0297)	0.0010 (0.0228)	-0.0004 (0.0234)	-0.0094 (0.0201)
Euro period - Post Euro	0.0047 (0.0345)	-0.0105 (0.0331)	-0.0129 (0.033)	-0.0436 ** (0.0192)	-0.0512 ** (0.0207)	-0.0519 *** (0.0201)
Economic recession (%)	-0.0181 ** (0.0087)	-0.0270 *** (0.008)	-0.0314 *** (0.0079)	-0.0114 *** (0.0042)	-0.0122 ** (0.0047)	-0.0128 *** (0.0044)
WGI Index						
- RegulatoryQuality	0.0530 (0.0693)	0.0043 (0.1212)	-0.0186 (0.1176)	0.1817 *** (0.0542)	0.1715 ** (0.0676)	0.1461 * (0.0788)
- PoliticalStabilityandAbsenc	0.0207 (0.0291)	0.0147 (0.0565)	0.0093 (0.0554)	-0.0112 (0.0167)	-0.0401 (0.0298)	-0.0226 (0.0397)
- VoiceandAccountability	0.2642 * (0.1517)	0.5189 ** (0.2025)	0.5154 *** (0.1982)	0.0575 (0.1037)	0.3362 *** (0.1171)	0.3404 ** (0.1346)
- GovernmentEffectiveness	0.0223 (0.0411)	0.1124 (0.0814)	0.1034 (0.0796)	-0.0119 (0.0364)	0.0676 (0.0536)	0.0635 (0.0615)
- RuleofLaw	-0.1751 (0.1187)	-0.0954 (0.1635)	-0.0327 (0.1623)	-0.0828 (0.069)	-0.1170 (0.0973)	-0.1234 (0.11)
- ControlofCorruption	0.0176 (0.0738)	0.3066 ** (0.1421)	0.4026 *** (0.139)	-0.0485 (0.0455)	0.0115 (0.0954)	0.0004 (0.0882)
HHI Dummy	0.0114 (0.0345)	0.0232 (0.0261)	0.0255 (0.0318)	0.0079 (0.0164)	0.0126 (0.0178)	0.0180 (0.0171)
Country Fixed	-	Yes	Yes	-	Yes	Yes
Industry Fixed	-	-	Yes	-	-	Yes
F-stat	1.85	2.62	2.52	4.06	5.28	2.58
R-squared (Adjusted)	4.04%	6.27%	17.23%	1.39%	2.63%	4.77%
N	461*	461*	461*	2712	2712	2712

\* Dropped those percentage of target-initiated that calculate from less than 4 M&A deals.

*Table 11: Effect of euro adoption on the percentage of target-initiated segment by industry, country, and year (Strong Evidence).*

The sample consists of merger and acquisition deals during 1990 – 2004. All variables using in this table are similar to the variables using in Table 10. In Model (8) and (11), we control for only the country fixed effect, and In Model (9) and (12), we control for both the country and industry fixed



effect. We then run pooled OLS regression (after adjusted for robust) to test how the Euro adoption affects the percentage target-initiated (strong evidence). \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	(7)	(8)	(9)	(10)	(11)	(12)
	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)
Euro period - Run-up Euro	0.1000 * (0.0547)	0.0889 (0.0565)	0.1056 * (0.0619)	-0.0233 (0.031)	-0.0304 (0.0311)	-0.0467 (0.0307)
Euro period - Post Euro	0.0590 (0.0672)	0.0460 (0.0755)	-0.0088 (0.0894)	-0.1080 *** (0.028)	-0.1181 *** (0.0315)	-0.1259 *** (0.0309)
Economic recession (%)	-0.0252 (0.0157)	-0.0201 (0.0182)	-0.0209 (0.0195)	-0.0159 *** (0.0059)	-0.0189 ** (0.0075)	-0.0214 *** (0.0075)
WGI Index						
- RegulatoryQuality	0.2310 (0.1826)	0.0735 (0.286)	-0.0391 (0.2511)	0.3772 *** (0.0657)	0.2801 ** (0.1162)	0.2127 * (0.1122)
- PoliticalStabilityandAbsenc	-0.0222 (0.0768)	0.0995 (0.1396)	0.1156 (0.1354)	-0.0961 *** (0.0309)	-0.0794 ** (0.0583)	-0.0606 (0.056)
- VoiceandAccountability	0.6379 * (0.3256)	1.3170 *** (0.479)	1.2506 *** (0.4214)	0.0839 (0.1298)	0.4873 (0.2009)	0.4983 *** (0.1941)
- GovernmentEffectiveness	0.1270 (0.1265)	0.2287 (0.1675)	0.3527 ** (0.1686)	-0.0289 (0.0622)	0.1358 ** (0.0874)	0.1639 ** (0.0836)
- RuleofLaw	-0.7908 *** (0.2525)	-0.5748 * (0.3159)	-0.5682 * (0.3349)	-0.3265 *** (0.0993)	-0.3929 (0.1586)	-0.4163 *** (0.1575)
- ControlofCorruption	0.0182 (0.1773)	0.6209 * (0.3254)	0.7517 ** (0.3002)	-0.0019 (0.0682)	0.0983 ** (0.1393)	0.0739 (0.1349)
HHI Dummy	-0.0270 (0.0516)	-0.0123 (0.0554)	-0.0333 (0.0858)	0.0195 (0.0227)	0.0334 (0.0229)	0.0409 (0.0265)
Country Fixed	-	Yes	Yes	-	Yes	Yes
Industry Fixed	-	-	Yes	-	-	Yes
F-stat	15.76	15.57	0	8.46	6.7	0
R-squared (Adjusted)	21.46%	31.15%	54.84%	3.96%	6.17%	16.16%
N	179*	179*	179*	1813	1813	1813

In this paper, if the hypothesis 2a is true, we predict positive signs of  $\gamma_1$  (Run-up Euro) and  $\gamma_2$  (Post Euro) in equation (2). On the contrary, if the hypothesis 2b is true, we predict negative signs of  $\gamma_1$  (Run-up Euro) and  $\gamma_2$  (Post Euro) in equation (2). The results for all our models that use the percentage of target-initiated that consist of at least one merger and acquisition deals show the consistent signs align with the prediction in Hypothesis 2b for  $\gamma_2$  (-0.0436, -0.0512, -0.0519, -0.1080, -0.1181, and, -0.1259 in model (4), (5), (6), (10), (11), and (12), respectively). This consistent of sign  $\gamma_2$  is significant at least 5% confidential level throughout these models for both moderate and strong evidence. It can be interpreting that the acquirer initiated more merger and acquisition deals after the Euro was implemented. The increase in acquirer initiated can explain that the single currency induces more trading transactions and makes the firm value gone up. So, the countries in the Euro zone became stronger. Seeing the opportunity, the

acquirer firms will come into the corporate assets market to invest. For Model (1), (2), (3), (7), (8), and (9), the single currency has no significant effect on the percentage of target-initiated in the post Euro period. We noted that these percentage of target-initiated are consist of at least three merger and acquisition deals. The cut-off criteria, cut off the deals that have less than 4 deals in percentage of target-initiated calculation, force us to exclude the sample from one specific country, Luxembourg, and excluded industries in Agriculture, Forestry, & Fishing and Public Administration. So, the results from these models are not good representative of the sample.

### 6.2.2 Results from Pooled Ordinary least squares regression – segment by year and country

To provide a further figure of the deal-initiated and the euro effect, we recalculated the percentage of the target-initiated deal segment by year and country instead of segmented by industry, country, year. Then we run the pooled OLS to test the euro effect on it. The result is shown in Table 12. The HHI index is dropped from the control variable as it is industry-specific data and cannot be used on a country basis. The Model represents in this assumption are build based on the same structure as the Model in 6.2.1.



**Table 12:** *Effect of euro adoption on the percentage of target-initiated segment by country and year – Moderate Evidence*

The sample consists of merger and acquisition deals during 1990 – 2004. The percentage of target-initiated was calculated using the number of target-initiated deals divided by total deals that can identify the initiated party segmented by country and yearly basis.

#### **Percentage of target initiated<sub>j,t</sub>**

$$= \gamma_0 + \gamma_1 \text{RunupEuro}_t + \gamma_2 \text{PostEuro}_t + \sum_{l=3}^5 \gamma_l \text{Control variable}_{l,j,t} + \varepsilon_{j,t}$$

Our studies variable, dummy euro periods, are defined based on year; (a) Run-up Euro period (1996 – 1998), (b) Post Euro period (1999 – 2004). The control variables used in this model is similar to the control variables in Table 10 except for HHI index, which dropped from this analysis. We run pooled OLS regression (after adjusted for robust) to test how the Euro adoption affects the percentage target initiated for the moderate evidence. \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)
Country Pan	%Target - initiated (Moderate evidence)	%Target - initiated (Moderate evidence)	%Target - initiated (Moderate evidence)	%Target - initiated (Moderate evidence)
Euro period - Run-up Euro	0.0365 (0.0272)	0.0320 (0.0249)	0.0222 (0.0344)	0.0304 (0.0356)
Euro period - Post Euro	-0.0318 (0.0214)	-0.0291 (0.0242)	-0.0408 (0.0283)	-0.0339 (0.0337)
Economic recession (%)	-0.0127 *** (0.0044)	-0.0128 ** (0.0052)	-0.0085 * (0.005)	-0.0114 * (0.0065)
WGI Index				
- RegulatoryQuality	0.2147 *** (0.0634)	0.2217 *** (0.0849)	0.1554 ** (0.068)	0.1622 (0.1049)
- PoliticalStabilityandAbsenc	0.0230 (0.0234)	0.0985 ** (0.0479)	0.0185 (0.0239)	0.0630 (0.0527)
- VoiceandAccountability	0.0426 (0.11)	0.4526 *** (0.1503)	0.0054 (0.1196)	0.3513 ** (0.1519)
- GovernmentEffectiveness	-0.0360 (0.051)	0.0113 (0.0747)	-0.0372 (0.055)	0.0255 (0.0893)
- RuleofLaw	-0.0377 (0.0909)	-0.3519 ** (0.1484)	-0.1130 (0.0977)	-0.2585 (0.1844)
- ControlofCorruption	-0.0856 (0.0608)	-0.0330 (0.1078)	-0.0102 (0.0647)	0.0587 (0.1185)
Country Fixed	-	Yes	-	Yes
F-stat	3.07	4.62	2	2.44
R-squared (Adjusted)	15.00%	35.39%	6.89%	16.11%
N	152*	152*	164	164

\* Dropped those percentage of target-initiated that calculate from less than 4 M&A deals.

**Table 13:** Effect of euro adoption on the percentage of target-initiated segment by country and year – Strong Evidence

All variables used in this table are similar to variables used in Table 12, except for the target-initiated percentage that calculates based on the strong evidence. \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	(5)	(6)	(7)	(8)
	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)	%Target - initiated (Strong evidence)
Euro period - Run-up Euro	-0.0068 (0.0396)	0.0025 (0.0388)	0.0343 (0.0464)	0.0460 (0.0456)
Euro period - Post Euro	-0.0753 ** (0.0351)	-0.0704 * (0.0373)	-0.0785 * (0.0417)	-0.0695 (0.0468)
Economic recession (%)	-0.0196 *** (0.0065)	-0.0220 ** (0.0089)	-0.0180 ** (0.0073)	-0.0236 ** (0.0101)
WGI Index				
- RegulatoryQuality	0.3760 *** (0.0978)	0.3817 *** (0.1437)	0.3963 *** (0.1096)	0.4224 *** (0.1628)
- PoliticalStabilityandAbsenceo	-0.0537 (0.0409)	0.0957 (0.0666)	-0.0645 (0.0405)	0.0972 *** (0.0825)
- VoiceandAccountability	0.0763 (0.1651)	0.5784 ** (0.2336)	0.0173 (0.1914)	0.5473 (0.2716)
- GovernmentEffectiveness	-0.1175 (0.0725)	-0.0130 (0.1183)	-0.1460 * (0.0827)	0.0321 ** (0.1431)
- RuleofLaw	-0.1931 (0.1412)	-0.6977 *** (0.2086)	-0.3837 ** (0.1557)	-0.7121 (0.2848)
- ControlofCorruption	-0.0135 (0.0907)	0.0771 (0.1525)	0.0864 (0.1064)	0.2212 ** (0.2041)
Country Fixed	-	Yes	-	Yes
F-stat	4.07	5.09	4.32	6.7
R-squared (Adjusted)	16.89%	36.68%	14.45%	6.17%
N	138*	138*	158	158

\* Dropped those percentage of target-initiated that calculate from less than 4 M&A deals.

Similar to Table 10 and 11, Table 12 and Table 13 show the negative relationship between the percentage of target-initiated and the adoption of single currency (Post euro period); it can be interpreted that euro adoption had a negative effect on target-initiated or had a positive effect on the percentage acquirer-initiated. It means that we see more acquired-initiated deals after euro implementation. Furthermore, the effect from the single currency for both percentages of initiated with the strong evidence and moderate evidence are consistently negative. The rationale explanation for this negative effect can be explain using the prior specific industry studied by (Allen & Song, 2005). Mergers and acquisitions of financial services firms such as banking, investment banking, or insurance companies in the Euro area, found to be increase which was result from the degree of financial integration in the euro area. The degree of integration went up and made the firms in this area stronger than those outside. Also as previously

mentioned in Chapter 4, (Bris et al., 2009) stated that the value of firm in the euro area was rising. So, when the firm value was rising because of reducing in the risk factors, it increased more opportunities for investment in the corporate assets market. In other words, it increased the number of the potential good firms that could be the target to merge or to acquire. So, with the increasing in opportunities, the acquirers would initiate more mergers and acquisitions transactions.

### 6.2.3 Results from Pooled Ordinary least squares regression – segment by year and country comparing the percentage of target-initiated from the merger and acquisition within Eurozone and outside the eurozone.

To gain more understanding about the single currency effect on the deal-initiated. We categorize the merger and acquisition deal into two groups. If the merger and acquisition deals that the acquirer was in Euro area, we categorize it as the merger and acquisition deal within eurozone. Otherwise, we categorize it as the merger and acquisition deal outside the eurozone. We then recalculate the percentage of target-initiated using the same approach as mentioned in Table 12. Four models are presented in this analysis. Model (1) and (2) are the percentage of target-initiated justify based on moderate evidence. Model (3) and (4) are the percentage of target-initiated justify based on strong evidence. Model (1) and (3), the percentage of target-initiated represent the percentage within the eurozone. Meanwhile, the percentage in Model (2) and (4) are the percentage of target-initiated outside the eurozone. The results from the regression are present in Table 14.

*Table 14: Effect of euro adoption on the percentage of target-initiated segment by country and year – comparing the percentage of target-initiated from the merger and acquisition within Eurozone and outside the eurozone.*

All variables used in this table are similar to variables used in Table 12 for moderate evidence present in Model (1) and (2), and similar to Table 13 for strong evidence present in Model (3) and (4).

\*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)
Country Pan	%Target - initiated (Moderate) - Inside Euro	%Target - initiated (Moderate) - Outside Euro	%Target - initiated (Strong) - Inside Euro	%Target - initiated (Strong) - Outside Euro
Euro period - Run-up Euro	0.0605 * (0.0355)	-0.0427 (0.0584)	0.0378 (0.0529)	-0.0245 (0.0782)
Euro period - Post Euro	-0.0666 ** (0.0331)	-0.0057 (0.055)	-0.0840 * (0.0503)	-0.0383 (0.0698)
Economic recession (%)	-0.0163 ** (0.0065)	-0.0046 (0.0093)	-0.0254 ** (0.0113)	-0.0078 (0.0128)
WGI Index				
- RegulatoryQuality	0.2596 *** (0.0978)	0.2063 (0.2209)	0.4695 *** (0.1639)	0.3955 (0.3034)
- PoliticalStabilityandAbsenc	0.0804 (0.0591)	0.0173 (0.1046)	0.1001 (0.095)	-0.0212 (0.1367)
- VoiceandAccountability	0.1555 (0.1879)	0.5076 * (0.2773)	0.0480 (0.3377)	0.8424 ** (0.3506)
- GovernmentEffectiveness	-0.0021 (0.0964)	0.0821 (0.1647)	-0.0315 (0.1621)	-0.0037 (0.1918)
- RuleofLaw	-0.2844 (0.1948)	-0.4917 (0.3172)	-0.3787 (0.2912)	-0.5117 (0.3565)
- ControlofCorruption	0.0854 (0.1311)	-0.0091 (0.1913)	0.2826 (0.2359)	0.2222 (0.2475)
Country Fixed	Yes	Yes	Yes	Yes
F-stat	2.96	1.29	4.85	2.44
R-squared (Adjusted)	23.97%	10.81%	25.94%	16.11%
N	162	157	164	164

Table 14 show the negative signs of  $\gamma_1$  (Run-up Euro) and  $\gamma_2$  (Post Euro) in all models. However, only the percentage of target-initiated within Euro show a significant at least 5%. Meanwhile, the post euro dummy variable has no significant effect on the percentage of target-initiated outside Euro. It can be interpreted that a single currency made the firm in Eurozone acquired more firms within the euro area. The potential explanation could be that some firms in the eurozone became stronger after a single currency was adopted, aligns with the specific industry studies from (Allen & Song, 2005). Without the national currency, it made the firm that became stronger saw the

increasing in opportunities. Also, the firm inside Euro area potentially yield less cost than the firm outside euro zone because the asymmetry in information about the situation happened in the euro area. So, with the cheaper cost and the increasing in opportunities, the strong firms in Euro area came out to gap those opportunities by doing more mergers or acquisitions.

In conclusion, for both strong and moderate evidence, the single currency significantly impacts the initiated party. Acquirers initiated more deals compared to the period before adopting the single currency (1999), especially for the deals that the acquirers were in the Euro area. However, there is no empirical evidence on how a single currency affects the initiation party for the acquirer countries that stay outside the eurozone.



## Chapter 7

### Conclusion

The prior research from (Hartmann & Issing, 2002), (Galati & Tsatsaronis, 2003), (Santillan Fraile et al., 2000), ((ECB), 2001b), ((ECB), 2004b), and (Santos & Tsatsaronis, 2003) shown the increase in activity level of money market, bond market, stock market, and corporate asset market after the single currency was adopted in Euro area. Our research analyses the effect of the single currency on the liquidity index, which is widely used in making financial decisions. The liquidity index in the corporate assets market is calculated by measuring the intensity of corporate transactions segment by each industry. This calculation approach is aligned with the method using by (Schlingemann et al., 2002). We found that the liquidity index after the Euro implementation in the year 1999 was significantly increased. However, the increase in liquidity index began since 1996 (Run-up period) when the Euro countries were officially agreed to use the Euro as their single currency. The increase in liquidity index did not stop there. It continuously grows even higher than the run-up period after 1999 when the Euro, a single currency, was adopted. After further analysis of the type of mergers and acquisitions, we found that single currency had a significant effect mainly on the cross-border deals those acquirers were the countries outside the eurozone. Moreover, the study also found that the level of liquidity was different among target countries and industries.

The following question is performed to answer whether the deal was initiated more from targets (sellers) or more from acquirers (buyers) after Euro emerging. The result indicates that after Euro emerged, it had a negative impact on the target-initiated deals. In other words, the result shows that the merger and acquisition deals are initiated more by acquirers or buyers after Euro was implemented. By observing the deal-initiated party categorized by type of acquirer, acquirers within the eurozone and acquirers outside the eurozone, we found that the acquirers initiated more deals to merge or acquire were the firms within Eurozone. Together with the empirical evidence



which studied on Euro effect on financial integration provided by (Allen & Song, 2005), The single currency made the degree of financial integration in the euro area went up. This effect made the firms in the Euro area became stronger while some of the firms in the eurozone became weaker as more competitors come into the market. So, the stronger firm initiated more mergers and acquisitions transactions in the market. However, this research focuses only on the merger and acquisition that targets were in the Euro area. It leaves space for future research to get empirical evidence on how the single currency effect merger and acquisition outside euro area.



## Appendix

### *Appendix A: Merger and Acquisition deals in the test period (1990 - 2004)*

**Table A1:** Distribution of merger and acquisition deals during 1990 to 2004

Our sample consists of completed merger and acquisition deals that target was in the Euro area, captured from SDC platinum—noted that our analysis only focuses on the first members of Eurozone that started to convert their currency to Euro in 1999. Euro area was composed of Austria (AUT), Belgium (BEL), Finland (FIN), France (FRA), Germany (DEU), Ireland (IRL), Italy (ITA), Luxembourg (LUX), Netherlands (NLD), Portugal (PRT), Spain (ESP). Furthermore, this paper excludes deals categorized as spinoffs, recapitalisations, self-tenders, and repurchases and excludes deals that target industries classified as non-classifiable (primary two-digit SIC Code 99). Deals that had no deal value presented in SDC platinum are also excluded from our analysis. Panel A presents the distribution of merger and acquisition deals segment by year of announcement and target nation. Panel B presents the distribution of merger and acquisition deals segment by sub-period of Euro adoption (Pre-Euro, Run-up Euro, and Post Euro), target nation, and target industry group which classified as follow: A) Agriculture, Forestry, & Fishing (primary two-digit SIC code 01 – 09), B) Mining (primary two-digit SIC code 10 - 14), C) Construction (primary two-digit SIC code 15 – 19), D). Manufacturing (primary two-digit SIC code 20 – 39), E). Transportation & Public Utilities (primary two-digit SIC code 40 – 49), F). Wholesale Trade (primary two-digit SIC code 50 - 51), G). Retail Trade (primary two-digit SIC code 52-59), H). Finance, Insurance, & Real Estate (primary two-digit SIC code 60 - 69), I). Services (primary two-digit SIC code 70 - 89), and J). Public Administration (primary two-digit SIC code 90 - 98).

Row Labels	AUT	BEL	ESP	FIN	FRA	IRL	ITA	PRT	DEU	LUX	NLD	Total	%
01 - 09	2	2	21	6	37	13	13	3	3		8	108	0.6%
10 - 14	6	6	42	16	60	33	19	16	18	2	25	243	1.4%
15 - 19	7	15	87	19	97	8	40	31	39		27	370	2.2%
20 - 39	122	236	840	340	1,583	232	1,037	168	1,151	13	503	6,225	36.8%
40 - 49	48	67	417	164	337	86	323	105	334	18	184	2,083	12.3%
50 - 51	14	25	116	67	252	50	61	23	144	3	114	869	5.1%
52- 59	13	30	119	38	201	70	86	28	73		41	699	4.1%
60 - 69	53	170	569	156	737	116	692	158	273	42	170	3,136	18.5%
70 - 89	44	147	504	203	864	185	324	89	523	7	272	3,162	18.7%
90 - 98		1	5		7	2	3		8			26	0.2%
<b>Total</b>	<b>309</b>	<b>699</b>	<b>2,720</b>	<b>1,009</b>	<b>4,175</b>	<b>795</b>	<b>2,598</b>	<b>621</b>	<b>2,566</b>	<b>85</b>	<b>1,344</b>	<b>16,921</b>	

This table show the distribution of the deal by their target country and by their group of industry represented by primary two-digits of SIC Code.

*Appendix B : Descriptive statistics of Liquidity index*

This research grouped deals into the industry-country-year pan. Total 4,739 pans (16,921 merger and acquisition deals) were created from this grouping. Nevertheless, due to the data availability of the total asset, 401 pans (542 M&A deals) have been cut off. The remaining 4,388 pans (16,379 M&A deals) and their descriptive statistics show in Figure B.I. This figure shows the average liquidity index of 24.5% (Including all our sample liquidity indexes). However, after the cut-off of those outliers (350%), the average liquidity index is equal to 9.98%. We noted that we could not find the pattern of 52 pans that we identified as outliers and had been cut off.

Figure B.I: Descriptive statistics of the liquidity index

	<b>Liquidity index</b>	
Max	18907.9%	
Min	0.0%	
Average	24.5%	
<b>Range</b>	<b>Freq</b>	<b>%</b>
0% - 25%	3,882	89.5%
25% - 50%	176	4.1%
50% - 100%	128	3.0%
100% - 150%	52	1.2%
150% - 200%	16	0.4%
200% - 250%	21	0.5%
250% - 300%	7	0.2%
300% - 350%	4	0.1%
More than 350%	52	1.2%
<b>Total</b>	<b>4,338</b>	

## Appendix C: Control variables in hypothesis I and II

Table C-I: Economic growth

Year/Country	Austria	Belgium	Finland	France	Germany	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	World	World except EURO
1990	4.35	3.14	0.67	2.92	5.26	8.47	1.99	5.32	4.18	3.95	3.78	2.91	2.69
1991	3.44	1.83	-5.89	1.05	5.11	1.93	1.54	8.64	2.44	4.37	2.55	1.42	1.05
1992	2.09	1.53	-3.29	1.60	1.92	3.34	0.83	1.82	1.71	1.09	0.93	1.76	1.87
1993	0.53	-0.96	-0.66	-0.63	-0.98	2.69	-0.85	4.20	1.26	-2.04	-1.03	1.53	2.19
1994	2.40	3.23	3.96	2.36	2.39	5.76	2.15	3.82	2.96	0.96	2.38	3.00	3.16
1995	2.67	2.38	4.22	2.11	1.54	9.63	2.89	1.43	3.12	4.28	2.76	3.04	3.22
1996	2.35	1.32	3.67	1.41	0.81	7.41	1.27	1.39	3.50	3.50	2.66	3.38	3.89
1997	2.09	3.79	6.33	2.34	1.79	10.90	1.83	5.71	4.33	4.40	3.70	3.47	3.70
1998	3.58	1.96	5.46	3.59	2.01	8.69	1.81	6.04	4.66	4.81	4.39	2.56	2.44
1999	3.56	3.54	4.38	3.42	1.89	10.50	1.63	8.48	5.03	3.91	4.49	3.25	3.32
2000	3.38	3.72	5.77	3.92	2.91	9.45	3.79	8.24	4.20	3.82	5.25	4.39	4.53
2001	1.27	1.10	2.61	1.98	1.68	5.28	1.95	2.53	2.33	1.94	3.93	1.96	1.91
2002	1.65	1.71	1.71	1.14	-0.20	5.92	0.25	3.82	0.22	0.77	2.73	2.18	2.56
2003	0.94	1.04	2.00	0.82	-0.70	3.02	0.14	1.63	0.16	-0.93	2.98	2.97	3.64
2004	2.74	3.57	3.99	2.83	1.18	6.72	1.42	3.61	1.98	1.79	3.12	4.41	5.00
2005	2.24	2.32	2.78	1.66	0.73	5.70	0.82	3.17	2.05	0.78	3.65	3.92	4.50
2006	3.45	2.55	4.03	2.45	3.82	5.07	1.79	5.18	3.46	1.63	4.10	4.38	4.70
2007	3.73	3.68	5.30	2.42	2.98	5.32	1.49	8.35	3.77	2.51	3.60	4.32	4.68
2008	1.46	0.45	0.78	0.25	0.96	-4.48	-0.96	-1.28	2.17	0.32	0.89	1.85	2.20
2009	-3.76	-2.02	-8.07	-2.87	-5.69	-5.08	-5.28	-4.36	-3.67	-3.12	-3.76	-1.67	-1.02
2010	1.84	2.86	3.19	1.95	4.18	1.81	1.71	4.86	1.34	1.74	0.16	4.30	4.75
2011	2.92	1.69	2.55	2.19	3.93	0.34	0.71	2.54	1.55	-1.70	-0.81	3.14	3.41
2012	0.68	0.74	-1.40	0.31	0.42	0.23	-2.98	-0.35	-1.03	-4.06	-2.96	2.52	3.25
2013	0.03	0.46	-0.90	0.58	0.44	1.35	-1.84	3.65	-0.13	-0.92	-1.44	2.67	3.27
2014	0.66	1.58	-0.36	0.96	2.21	8.56	0.00	4.30	1.42	0.79	1.38	2.86	3.16
2015	1.01	2.04	0.54	1.11	1.49	25.16	0.78	4.31	1.96	1.79	3.84	2.87	3.04
2016	1.99	1.27	2.81	1.10	2.23	3.68	1.29	4.57	2.19	2.02	3.03	2.61	2.74
2017	2.40	1.61	3.27	2.29	2.60	8.15	1.67	1.80	2.91	3.51	2.97	3.30	3.44
2018	2.58	1.81	1.52	1.79	1.27	8.17	0.94	3.11	2.36	2.85	2.43	2.98	3.20
2019	1.42	1.74	1.15	1.51	0.56	5.55	0.34	2.30	1.68	2.24	1.95	2.34	2.56

Table C-II: WGI Index (1/3)

Country/Territory	1996	1997	1998	1999	2000	2001	2002	2003	2004
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
<b>1. Regulatory Quality</b>									
Austria	1.66	1.66	1.40	1.40	1.53	1.53	1.59	1.57	1.52
Belgium	1.21	1.21	1.05	1.05	1.20	1.20	1.30	1.31	1.36
Germany	1.48	1.48	1.29	1.29	1.51	1.51	1.56	1.53	1.48
Spain	1.18	1.18	1.25	1.25	1.29	1.29	1.37	1.34	1.32
Finland	1.55	1.55	1.83	1.83	1.85	1.85	1.87	1.86	1.79
France	1.05	1.05	0.87	0.87	0.96	0.96	1.02	1.25	1.23
Ireland	1.51	1.51	1.70	1.70	1.85	1.85	1.77	1.62	1.58
Italy	0.86	0.86	0.75	0.75	0.83	0.83	0.94	1.08	1.09
Luxembourg	1.76	1.76	1.55	1.55	1.92	1.92	1.92	1.82	1.79
Netherlands	1.84	1.84	1.93	1.93	2.10	2.10	1.87	1.75	1.78
Portugal	1.22	1.22	1.14	1.14	0.96	0.96	1.29	1.26	1.20
<b>2. Political Stability and Absence of Violence/Terrorism</b>									
Austria	1.41	1.41	1.11	1.11	0.82	0.82	1.36	0.96	1.09
Belgium	1.29	1.29	1.02	1.02	1.13	1.13	1.26	0.86	0.71
Germany	1.29	1.29	1.24	1.24	1.41	1.41	1.10	0.58	0.64
Spain	0.18	0.18	0.13	0.13	0.46	0.46	0.44	-0.04	-0.09
Finland	1.41	1.41	1.47	1.47	1.72	1.72	1.76	1.69	1.62
France	0.89	0.89	0.70	0.70	0.79	0.79	0.93	0.18	0.35
Ireland	1.34	1.34	1.51	1.51	1.59	1.59	1.51	1.35	1.17
Italy	1.11	1.11	1.19	1.19	0.92	0.92	0.84	0.43	0.27
Luxembourg	1.38	1.38	1.38	1.38	1.61	1.61	1.64	1.44	1.32
Netherlands	1.53	1.53	1.59	1.59	1.76	1.76	1.31	1.16	1.02
Portugal	1.29	1.29	1.37	1.37	1.40	1.40	1.44	1.29	0.97

Table C-II: WGI Index (2/3)

Country/Territory	1996	1997	1998	1999	2000	2001	2002	2003	2004
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
<b>3. Voice and Accountability</b>									
Austria	1.45	1.45	1.35	1.35	1.32	1.32	1.31	1.34	1.48
Belgium	1.43	1.43	1.34	1.34	1.37	1.37	1.38	1.48	1.44
Germany	1.33	1.33	1.29	1.29	1.31	1.31	1.41	1.41	1.50
Spain	1.32	1.32	1.30	1.30	1.28	1.28	1.27	1.27	1.32
Finland	1.52	1.52	1.47	1.47	1.59	1.59	1.55	1.57	1.78
France	1.31	1.31	1.17	1.17	1.18	1.18	1.15	1.12	1.46
Ireland	1.38	1.38	1.36	1.36	1.41	1.41	1.27	1.28	1.48
Italy	1.13	1.13	1.06	1.06	1.04	1.04	1.04	0.99	1.18
Luxembourg	1.55	1.55	1.52	1.52	1.51	1.51	1.41	1.53	1.67
Netherlands	1.56	1.56	1.56	1.56	1.54	1.54	1.47	1.53	1.70
Portugal	1.50	1.50	1.43	1.43	1.36	1.36	1.30	1.41	1.46
<b>4. Government Effectiveness</b>									
Austria	1.73	1.73	1.87	1.87	1.93	1.93	1.94	2.00	1.87
Belgium	1.71	1.71	1.84	1.84	1.73	1.73	1.98	1.93	1.88
Germany	1.72	1.72	1.88	1.88	1.89	1.89	1.72	1.42	1.49
Spain	1.62	1.62	1.66	1.66	1.76	1.76	1.85	1.88	1.35
Finland	1.72	1.72	2.02	2.02	2.12	2.12	2.16	2.26	2.17
France	1.25	1.25	1.51	1.51	1.71	1.71	1.60	1.71	1.78
Ireland	1.67	1.67	1.80	1.80	1.67	1.67	1.63	1.56	1.54
Italy	0.84	0.84	0.87	0.87	0.77	0.77	0.80	0.80	0.65
Luxembourg	1.96	1.96	2.04	2.04	1.97	1.97	2.04	1.92	1.90
Netherlands	1.94	1.94	2.08	2.08	2.07	2.07	2.00	2.02	2.09
Portugal	1.27	1.27	1.16	1.16	1.02	1.02	1.21	1.17	1.06

Table C-III: WGI Index (3/3)

Country/Territory	1996	1997	1998	1999	2000	2001	2002	2003	2004
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
<b>5. Rule of Law</b>									
Austria	1.81	1.81	1.85	1.85	1.84	1.84	1.89	1.89	1.84
Belgium	1.37	1.37	1.25	1.25	1.34	1.34	1.37	1.37	1.33
Germany	1.61	1.61	1.66	1.66	1.64	1.64	1.67	1.67	1.64
Spain	1.44	1.44	1.34	1.34	1.43	1.43	1.26	1.28	1.14
Finland	1.91	1.91	2.00	2.00	1.98	1.98	1.94	2.00	1.96
France	1.48	1.48	1.40	1.40	1.46	1.46	1.24	1.37	1.44
Ireland	1.50	1.50	1.63	1.63	1.57	1.57	1.63	1.52	1.53
Italy	1.06	1.06	0.83	0.83	0.86	0.86	0.76	0.72	0.60
Luxembourg	1.71	1.71	1.81	1.81	1.85	1.85	1.90	1.87	1.87
Netherlands	1.70	1.70	1.79	1.79	1.77	1.77	1.74	1.75	1.76
Portugal	1.29	1.29	1.28	1.28	1.23	1.23	1.34	1.31	1.25
<b>6. Control of Corruption</b>									
Austria	1.73	1.73	1.85	1.85	1.81	1.81	1.97	2.02	2.05
Belgium	1.36	1.36	1.36	1.36	1.50	1.50	1.50	1.42	1.38
Germany	1.91	1.91	2.05	2.05	1.86	1.86	1.94	1.93	1.86
Spain	1.13	1.13	1.40	1.40	1.37	1.37	1.36	1.39	1.36
Finland	2.21	2.21	2.26	2.26	2.44	2.44	2.43	2.44	2.44
France	1.25	1.25	1.39	1.39	1.37	1.37	1.23	1.35	1.33
Ireland	1.71	1.71	1.59	1.59	1.43	1.43	1.41	1.46	1.29
Italy	0.41	0.41	0.52	0.52	0.73	0.73	0.55	0.51	0.38
Luxembourg	1.95	1.95	1.94	1.94	2.05	2.05	2.06	1.69	1.84
Netherlands	2.08	2.08	2.15	2.15	2.21	2.21	2.12	2.05	2.00
Portugal	1.37	1.37	1.29	1.29	1.19	1.19	1.26	1.16	1.14

Table C-IV: FD Index

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	0.44	0.37	0.35	0.42	0.46	0.47	0.47	0.52	0.63	0.59	0.62	0.59	0.59	0.63	0.67
Belgium	0.47	0.46	0.47	0.50	0.51	0.51	0.51	0.56	0.59	0.61	0.61	0.62	0.60	0.60	0.63
Finland	0.37	0.36	0.36	0.40	0.42	0.44	0.39	0.52	0.53	0.54	0.64	0.64	0.62	0.64	0.65
France	0.41	0.42	0.41	0.48	0.51	0.52	0.53	0.58	0.63	0.62	0.72	0.73	0.72	0.72	0.75
Germany	0.64	0.6233	0.61	0.64	0.65	0.64	0.53	0.71	0.77	0.78	0.78	0.76	0.73	0.75	0.76
Ireland-Rep	0.61	0.62	0.59	0.67	0.66	0.65	0.67	0.68	0.78	0.79	0.71	0.76	0.68	0.72	0.73
Italy	0.41	0.41	0.39	0.41	0.45	0.48	0.49	0.56	0.63	0.72	0.77	0.75	0.74	0.75	0.74
Luxembourg	0.67	0.65	0.63	0.70	0.71	0.69	0.72	0.73	0.74	0.75	0.75	0.74	0.73	0.72	0.74
Netherlands	0.58	0.58	0.58	0.60	0.62	0.64	0.71	0.79	0.82	0.80	0.84	0.80	0.80	0.83	0.84
Portugal	0.45	0.45	0.44	0.47	0.57	0.50	0.52	0.63	0.70	0.65	0.71	0.65	0.65	0.65	0.68
Spain	0.42	0.46	0.46	0.50	0.55	0.52	0.55	0.65	0.77	0.82	0.86	0.84	0.82	0.85	0.86

*Appendix D: Comparing the result of dropped FD Index and not dropped FD Index*

Table D-I: Regression analysis of Single currency to the liquidity index comparing Model (3) and Model (4).

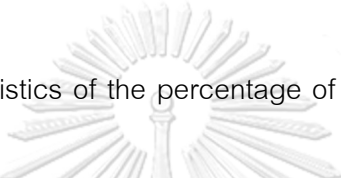
Results from running pooled OLS of equation (1). In all models, variables are the same as the variables present in Table 7. All the models are cluster by industry using the primary two-digit of SIC Code to make sure that this Model robust in every industry. \*\*\*, \*\*, \* represent significant 1%, 5% and 10% respectively.

	3	4
<b>Explanatory variables :</b>		
Euro period - Run-up Euro	0.2550 **	0.2339 *
Euro period - Post Euro	0.4278 **	0.3902 ***
GDP Growth	0.0929 **	0.0907 *
WGI Index		
- RegulatoryQuality	0.0110	0.0030
- PoliticalStabilityandAbsenceo	0.3851 *	0.3817 *
- VoiceandAccountability	-0.3311	-0.3314
- GovernmentEffectiveness	-0.5713	-0.5897
- RuleofLaw	-0.2841	-0.2106
- ControlofCorruption	1.2472 **	1.1881 **
FD Index	-0.2260	- Dropped -
Constant	-4.1469 ***	-4.2358 ***
Country Fixed Effect	Yes	Yes
F-stat	68.21	106.81
R-squared (Adjusted)	22.73%	22.65%
N	4338	4338

*Appendix E : Descriptive statistics of Target-initiated*

This research grouped deals into the industry-country-year pan. Total 4,338 pans (16,379 merger and acquisition deals) were created from this grouping. We use the best effort to identify the initiated party. Two-level of confidentiality based on the evidence are identified. A) the moderate evidence covered 2,712 pans (6,248 M&A deals). B) the strong evidence covered 1,813 pans (3,265 M&A deals). Their descriptive statistics show in Figure E.I.

Figure E.I: Descriptive statistics of the percentage of target-initiated (Industry-Country-Year)



Industry-country-year-pan	%Target-Initiated Moderate Evidence		%Target-Initiated Strong Evidence	
	Freq	%	Freq	%
Max		100.0%		100.0%
Min		0.0%		0.0%
Average		22.8%		43.1%
<b>Range</b>	<b>Freq</b>	<b>%</b>	<b>Freq</b>	<b>%</b>
0%	1,730	63.8%	844	46.6%
More than 0% - 25%	159	5.9%	57	3.1%
25% - 50%	373	13.8%	228	12.6%
50% - 75%	65	2.4%	53	2.9%
75% - 100%	385	14.2%	631	34.8%
<b>Total</b>	<b>2,712</b>		<b>1,813</b>	

The distribution of the percentage of target-initiated shows the extreme value as 0% or 100%, especially in the percentage of target-initiated that had strong evidence. We consider building the percentage of target-initiated using fewer criteria. Only country and year are remained in the grouping criteria to see if we can close these extreme value gaps. Their descriptive statistics show in Figure E.II

Figure E.II: Descriptive statistics of the percentage of target-initiated (Country-Year)

country-year-pan	%Target-Initiated Moderate Evidence		%Target-Initiated Strong Evidence	
	Freq	%	Freq	%
Max	100.0%		100.0%	
Min	0.0%		0.0%	
Average	22.3%		43.5%	
Range	Freq	%	Freq	%
0%	16	9.8%	11	7.0%
More than 0% - 25%	88	53.7%	21	13.3%
25% - 50%	56	34.1%	72	45.6%
50% - 75%	3	1.8%	45	28.5%
75% - 100%	1	0.6%	9	5.7%
<b>Total</b>	<b>164</b>		<b>158</b>	





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