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1 Introduction

1.1 Background

A large part of the economic theory has focused on the behavior of mergers and acquisitions and why they occur. The underlying purpose of a merger is to reallocate resources and to gain market shares which is necessary to be able to compete with the changing market. Looking at macroeconomic factors effect on M&As it has been proven both in the long-run and short-run that, for example unemployment was affected by M&A activity (Upadhyaya and Mixon, 2003). The relationship between different method of payments and GDP has not been studied in the same extent as similar studies made by Upadhyaya and Mixon (2003). However, the relationship between M&As and economic growth has been proven efficient i.e. M&As have an impact on economic growth (Doytch and Uctum, 2012). This thesis will focus on a similar approach as Doytch and Uctum (2012) but with the difference regarding the long-run relationship of different method of payments in M&As and GDP movement.

The merger era started in the late 18th century and has been growing significantly over the 19th on to the beginning of 2000, both regarding number of deals and in the value of the transactions. The purpose of M&A activities has also changed over time. The first merger wave which started 1897 was a result of a declining economy and an increasing number of competitors and in order to adapt companies created monopolies through M&As in order to survive (Gregoriou and Renneboog, 2007). The purpose of mergers changed drastically during the second wave (1916-1929) due to the introduction of antitrust laws which prohibited companies to create monopolies (Gaughan, 2011). During the post-World War 1 period, the United States economy was still evolving included continuous investment actions in the capital market. The second merger wave was dominated by oligopolies and the mergers where more vertical than horizontal¹.

Around 1965, companies in the United States introduced conglomerates as a strategy to boost value for the company (Matsusaka, 1996). These conglomerates were generally diversified across different industries. At first, this diversification was only a feature for the large firms but later small and medium firms followed this trend of moving their field of business outside their core business in order to expand their business (Gaughan, 2011). However, in Europe takeover

¹ See section 3.2.2.

activities were more horizontal, with similar attributes as in the first wave, keep expanding in the same industry but now with more cross-border mergers (Gregoriou and Renneboog, 2007).

Table 1. Summary Merger waves from 1897-2007

	First Wave	Second Wave	Third Wave	Fourth Wave	Fifth Wave	Sixth Wave
Time period	1897-1904	1916-1929	1965-1969	1984-1989	1992-2001	2003-2007
Cause	Technological changes: The development of railroads which led to an increase in competition which in turn led to increase in M&A deals. Monopolistic view: Merge within the industry	Antitrust laws: illegal to acquire stock from other firms which in turn decreased the competition. Monopoly disappeared and oligopoly replaced	Increase in cross-border mergers in the U.K. Diversification was a tool to increase M&As in the U.S. Form conglomerates to fight the competition and boost company value	Focus on increasing competitive capital markets and improving shareholder control. Increase in hostile takeovers and leverage buy-outs. Focus on core business – less on industry diversification. New capital regulations which made it easier to capture/accessing capital.	The largest relatively increase in M&A history. The ability to issue debt and equity to access capital rise. The emerging Asian market escalated M&A activities in both Europe and the U.S.	Leverage buy-outs and complex securities where backed up with pools of debt and loan obligations with varying risk. M&A deals were financed risky loans which later on was the cause of the last financial crisis (2008).
Deal features	Increase in M&A deals	Increase in M&A deals	Increase in M&A deals	Increase in M&A deals	Increase in M&A deals	Increase in M&A deals. Not as much as in the fifth wave

Notes: References. Bain, 1944, Lewis, 1990, Matsusaka, 1996, Martynova and Renneboog, 2006 a, b, Gregoriou and Renneboog, 2007, Gaughan, 2011,

It was during the fifth wave, 1992-2001, M&As really started to expand in both value and volume. The number of M&As more than tripled compared to the numbers in the fourth wave (1984-1989). According to the Thomson database, United States had 119,000 M&A deals during this time span which could be compared with the 34,000 deals in the fourth wave. Also the value of the transactions outnumbered the fourth wave. This increase in value and volume of the M&A deals were not exclusive for the United States market as the European market had almost the same relative increase (Martynova and Renneboog, 2006 a, b).

Companies are usually attending M&A activities when there are rapid changes in the current market due to economic changes or technological changes (described in later sessions) and companies may adapt to these changes through M&As. For companies to cope and move along with this expansion, M&A activities were seen as a more efficient tool than internal organic growth (Gaughan, 2011).

1.2 Problem description

The problem this thesis investigates is if there are any changes in how M&As, and other types of deals have changed regarding the method of payment through 1997-2012. To interpret GDP and its movement over time and see if there are any increases or decreases in some methods of payment due to the occurrence of merger waves has never been investigated before. Different time periods have been fighting recessions and there have been certain events, such as merger waves, which have made the economy move in various directions. By dividing the eight year period into four it makes it possible to investigate whether the different variables integrate in the long run depending on the different economic changes that are present at that time

The problem of identifying whether there is a relation between M&A activities and macroeconomic variables have been investigated in previous research and it is strongly recommended to examine the macroeconomic environment before engaging in M&A activities (Yagil, 1996). However, using GDP as a macroeconomic variable and different method of payments as comparable variables have not been investigated to the same extent as other macroeconomic variables have had on M&A activities (Crook, 1995).

Methods of payment have had a significant role when it comes to M&A transactions due to how big or small the transaction is and the size of the acquirer and the target respectively (Facio and Masulis, 2005). Despite the role of payment method in relation to GDP, does the different type of deals have a relation to GDP and is there a difference if considered which time period the transaction is made?

1.3 Purpose

The purpose of this thesis is to investigate whether there is a long-run relationship between different method of payments, different type of deals and GDP over the time period 1997-2012. The reason to include all deals in the U.S is because this will yield a large enough sample to avoid analytical errors.

1.4 Research Question

Is there a long-run relationship between method of payments and GDP and also different types of deals and GDP over the time period 1997-2012? Is it possible to capture different relationships among the variables if dividing the time period into 8, 12, 16 year time period?

2 Previous Research

The relationship among M&As and macroeconomic variables has been identified in several studies over the last 20 years. However, the combination of GDP and M&As have only been investigated in a few cases. Crook (1995) identified a long-run relationship between number of M&A deals and GDP growth, Tobin's Q, unemployment rate, and stock price with Canadian data by executing a cointegration test. Nieh (2004) confirms the results from Crook (1995) by executing a similar study in the United States. His test examines if there exists a cointegration between mergers and five macroeconomic variables; GDP, stock price, interest rate, inflation, and unemployment rate. His findings suggests a long-run relationship among these variables.

The Johansen's cointegration test has been used in similar studies as this study but also against other studies, which illustrates that it is a commonly used test for long-run cointegration. For example, a study on the cointegrating relationship between Western European stock markets was constructed by Kasibhatla et. al. (2006) and found long-run cointegration between the Western European stock markets. They claim that there could be an excess return in the short run by diversifying the portfolio internationally, however, they also prove that there is no long-run equilibrium of diversifying the portfolio internationally.

A lot of previous research have focused on how M&A announcement have affected the stock price in both the acquiring company and the target company. Moreover, the number of deals and the type of deal have generally been compared to the stock-market movement rather than the dynamics of GDP.

The birth and behavior of a merger wave have been discussed by Jovanovic and Rousseau (2001, 2002). They provide theories concerning technological changes which are measured by the Q-theory. This theory suggests that technological and economical changes have a positive impact on the amount of growth opportunities. Moreover, they also explained that there was a connection between mergers and used capital which triggered resources reallocation between more productive and efficient industries, which in turn might have triggered merger waves. Firms with high Q-values seems to buy firms with low Q-values. However, the work done by Rhodes-Kropf and Viswanathan (2004) explains that overvalued firms tend to buy undervalued firms; that is, if the market is overvalued the synergy between the target and the bidder is high and a merger is more likely to occur.

Another study on why merger waves occur was made by Shleifer and Vishny (2003). Their study concluded that merger waves occur if the market is overvalued and the acquiring firm

purchases the other firm based on the short term benefits. This “market mispricing” tends to even out in the long run and therefore bidders can take advantage of the overvalued market in the short run by purchasing the stock of an undervalued or a less overvalued company with their own overvalued equity. Nevertheless, the target will also benefit from this overvalued market, even though it might be at the expense of the shareholders. The targeted company want to maximize their short-term benefits, and in a bull market mergers tend to increase the stock market value due to temporary market inefficiencies (Shleifer and Vishny, 2003).

Research by Alexandridis (2011), explains which type of method of payment that generates the highest return after a transaction and also whether it is the acquirer, the target or the combination of the two firms that benefit the most of the deal. Martin (1996) had another view of why a certain method of payment was preferred by claiming the easy access to cash in the 1990s was the reason why the fraction of share deals was much smaller compared to number of cash deals.

3 Theoretical framework

3.1 GDP

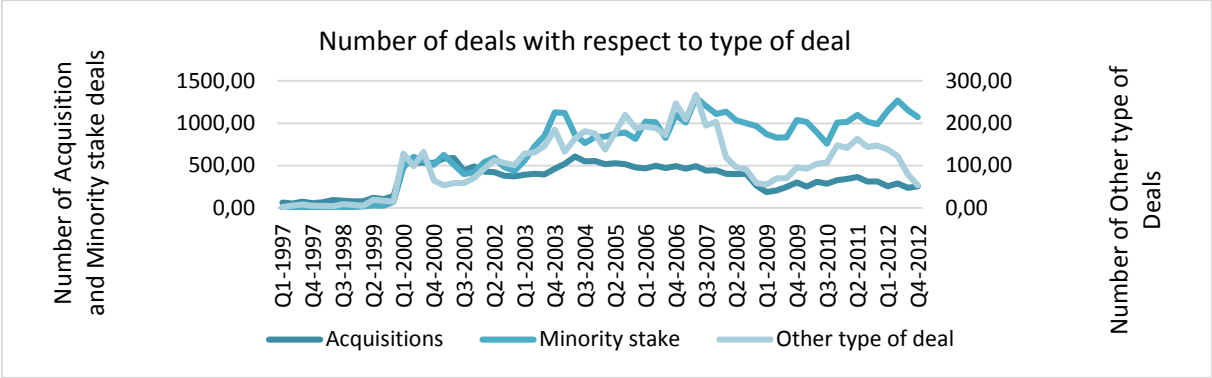
GDP (Gross Domestic Product) is a measurement of how the economy is performing in the world and for every country. It measures the total market value of all the final goods and services produced in a country over a certain time period. GDP is a continuous variable and depending on the precision of measurement the value of GDP during a specific interval can take on any value possible within that interval (Gujarati and Porter, 2009). If the economic activity goes down the GDP value will go down as well and if the economic activity increase the GDP will increase. There are different ways of using GDP as a performance measure of countries economy and these could be divided into three different approaches. The approach in this study is the expenditure approach in which M&As are included under the sub category *investments* (Hannon and Reddy, 2012). Theory suggests there would be a relationship between GDP dynamics and M&As activity if the movement in GDP was caused by M&A activity.

3.2 Type of Deal

One cause for the increase in merger and acquisition activities during the beginning of the 21st century was the increase in cross-border transactions. A more liberalized view on international trade increased the number of deals during this period (Bjortvatn, 2004). Additionally, the term globalization also rose during this time period which generated an increase in M&A activities. Moving capital across borders and the internet boom increased the awareness of other markets

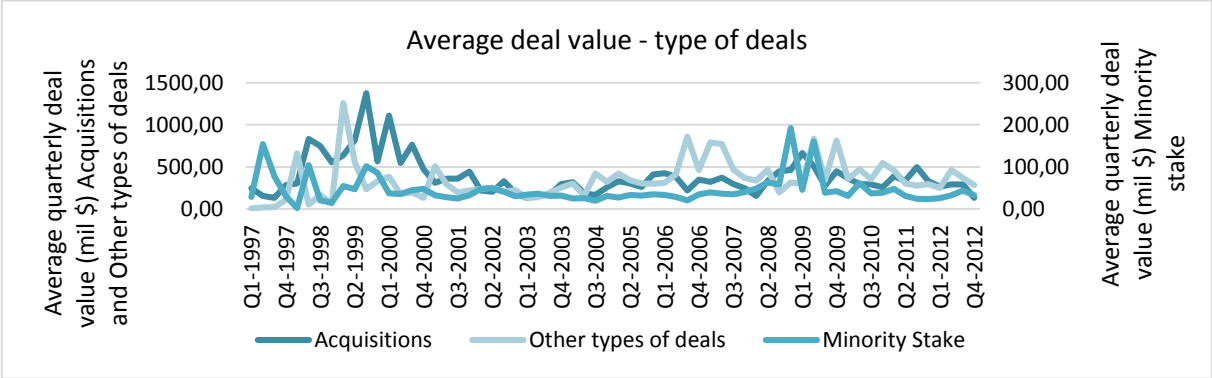
which had a deep impact on the increase in M&As (Sudarsanam, 2003). As explained in previous sections the last two merger waves occurred around 2000 and 2007 which coincide with where the peaks are in Figure 1. We can also see that the average deal value had its peaks around the time when merger waves were strongest.

Figure 1.



Note: own graph (data from Zephyr)

Figure 2.



Note: own graph (data from Zephyr)

3.2.1 Acquisition

In theory an acquisition occurs when a company takes control over another company by purchasing the other companies stock or asset and consequently gains the majority ownership of that company. The deal would not necessary concern the acquisition of the entire company, but rather the target company will often continue to operate in its line of business as a subsidiary of the acquiring company. The acquiring company may also procure only some specific assets of the target company, such as manufacturing facility, and hence the target company remains in control of the majority of its assets (DePamphilis, 2010). In theory the number of acquisition deals will increase when the market economy is in a good state (boom), and decrease when the market economy is in a bad state (recession). Additionally, minority acquisitions, less than 50

% of the target value, is more likely to occur if the market is unstable (Ouimet, 2013). This could simply be explained as when the economy is good companies are willing to spend money and make investments and vice versa if the economy is in a recession.

3.2.2 Merger

A merger occurs when two firms combine their business in the sense that one of the companies take over the other company which in turn lead to the closure of one and the survival of the other. This type of merger is called statutory merger and is just one way to explain merger activity. If a company, however, works as a subsidiary to the acquiring firm the merger is simply called subsidiary merger (Gaughan, 2011).

The difference between merger and consolidation of two companies could be explained through how the final constellation of these two companies are viewed. In a merger, company B merge with company A creating a new company with company A as its main business. In a consolidation company A and company B build an entire new company, company C. The companies in a consolidation is not competitors but rather two firms operating in two entirely unrelated industries. For example when Philip Morris acquired General Foods in 1985 (Gaughan, 2011).

Further, we could distinguish a difference in mergers on whether they are accounted as horizontal mergers or vertical mergers. The differences between these two merger types is whether there is a competition between the two merging actors, in other words, do they act in the same industry, or what kind of relative position do the merging actors have in the value chain (Porter, 1985). In a horizontal merger two companies combine their businesses and it usually occurs between companies in the same industry and the purpose is to reduce competition and to become a bigger actor in that industry. A vertical merger usually occurs when two non-competing companies, sometimes with a buyer-seller relationship, merge (Depamphilis, 2010). Similar to what was said in 3.1.1, when the economy is strong the merger activity tend to increase and if the economy is in a recession the merger activity tend to be slightly lower.

3.2.3 Economies of Scale and Economy of Scope

One of the fundamental pillars with merger and acquisitions is to gain some sort of synergy. Operating synergy focuses on economies of scale and economy of scope where the former describe the relationship between fixed cost and the increase in production volume, and the latter describe the ability to use specific set of skills and combine these skills in one company instead



of using skills from several different companies (DePamphilis, 2010). Economies of scale refers to the ability to spread the fixed cost among larger production volumes. Common costs which are accountable for in fixed cost are depreciation, amortization, taxes etc. and these do not increase even if the production volume increase.

Economy of scope explains the combination of skills from merging companies in comparison to separated operations. The objective is to make the production more efficient through a single production in one company in relation to have the production in separate companies (DePamphilis, 2010). This type of operational synergy is common in the banking industry. Mergers between banks meant that wider range of services could be reach through fewer banks. Furthermore, “smaller-bank-problems”, such as expensive computer systems, trust departments, consumer investment products units etc. could be shared, leading to a reduction of unnecessary costs (Gaughan, 2011).

Economy of scale and economy of scope are seen as two cost-reducing operating synergies which are the most common ones. However, some mergers instead focuses on the more advanced approach of revenue-enhancing synergy. By merging, the less developed company can, for example, take advantage of the stronger company’s assets or strong brand-name (Gaughan, 2011).

3.2.4 Reducing cost of capital

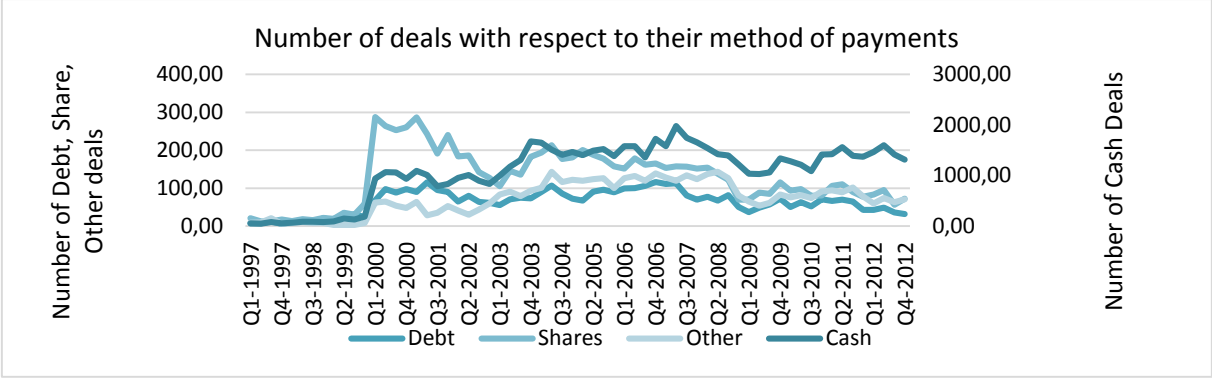
When M&As occur there sometimes develops a financial synergy which foremost have an impact on the cost of capital on the company being acquired or the newly formed company. What this financial synergy implies is if the merging companies have uncorrelated cash flows the cost of capital could be reduced. One example of this financial appearance could be if a company with excess cash flow merge with a company who lack the internal capital to fund their investment opportunities the cost of borrowing could decrease. The uncorrelated cash flow could also occur if there is one high-growth firm and one stable growth firm where the cost of capital is usually lower in a stable growth firm compared to a high-growth firm and thus a merger could reduce the cost of capital for those two firms (DePamphilis, 2010).

3.3 Method of payment

Different methods of payment are used to complete M&A transactions and the choice of method depends on the size of transaction and what type of transaction. In general, as seen in Figure 3 below, cash deals are more frequent compared to debt deals and shares deals. As displayed in

Figure 3 there are two peaks in number of deals, one around 2000 and the other one around 2007. These peaks occur around the same time as the two last merger waves which are explained earlier. Shleifer and Vishny (1992) and Harford (1999) state that merger waves occur in booms and that actors with large cash reserves are more active in M&A activities during these times.

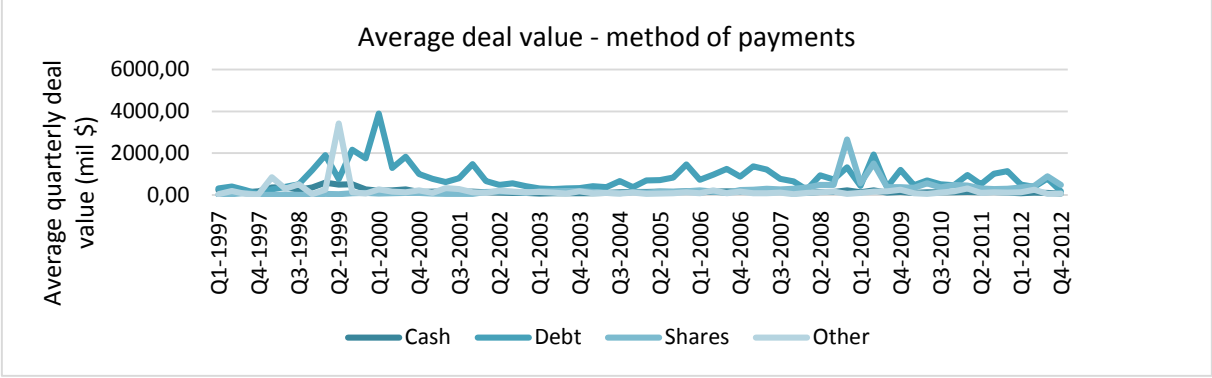
Figure 3.



Note: Own graph (data from Zephyr).

However, the average size of the deals is larger in debt deals compared to the deals using other methods of payment.

Figure 4.



Note: Own graph (data from Zephyr)

The purpose of dividing different method of payments in M&As and testing for their movement with GDP during a certain time period is important because actors tend to prefer certain methods of payment above others depending on how the market is performing. If the market is unstable M&As transactions tend to be made by using shares and otherwise due to the less riskiness by making a share transaction

3.3.1 Cash and Debt

When making a M&A transaction using cash the method of payment, the acquiring firm simply exchange cash and in turn receive shares from the acquired company. This type of transaction

is a clear-cut exchange in ownership between the two parties and there are no concerns on who serves the rights of the newly formed company. Moreover, the early performance difference becomes greater over time between cash transactions and share transaction. That is, the problem of identifying the real owner of the company is easier in a cash transaction than identifying the ownership of the company when using non-cash transactions (Rappaport and Sirower, 1990).

From the acquiring company's point of view, a cash merger would generate a substantial loss in liquidity for the company and thus these cash offers requires some sort of debt financing (Rappaport and Sirower, 1990). When acquiring a company with cash, the performance of the acquired company's stock will be stronger in the long-run compared to if the method of payment was with shares (Megginson et al, 2002).

Using debt as a method of payment is an easy way to issue money to complete the transaction. Issuing debt is comparable with taking a loan, the transaction usually becomes more expensive due to the mandatory payment of interest. On the other hand, it is more convenient to use debt finance as opposed to cash because the need for large cash-reserves is excluded. Moreover, since debt financing has similar attributes to loans a company can use that as business expenses and then deduct these expenses against business income taxes.

3.3.2 Shares

When using shares as method of payment the riskiness of the transaction is divided between the acquirer and the target. Compared to cash transactions where the acquirer takes all the risk, the risk in a share transaction is divided in proportion to the percentage of what the acquiring shareholders own in the company and with the percentage of what the target shareholders own in the company. This shared risk of the company makes it unclear on who the real owner of the company is, since in some cases the shareholders of the acquired company ended up owning a bigger part of the acquiring company than vice versa (Rappaport and Sirower, 1990).

4 Data

4.1 Data collection

Data is collected from Zephyr database which is a complementary program for the Amadeus database. The Zephyr database is the most comprehensive database regarding deal information. It includes information of most M&A deals made from 1997 till now and also financial summaries and structure on the companies involved in deals. Information on the different methods of payment and what types of deals that are made can also be found in Zephyr. Thomson and

zephyr are the two largest databases containing comprehensive deal information. Since the university only have access to the Zephyr database, which is the one I chose for my data collection regarding deal information.

Information on GDP was found in the OECD statistical database. The OECD statistical database includes information on several national aggregates which are collected from several different databases. Other databases which handle information on GDP are for instance the World Bank and TED (Total Economic Database). The World Bank and TED does not have quarterly GDP data which OECD statistical database has, and since my data from Zephyr are quarterly based the choice of OECD statistical database was more convenient.

4.2 Data selection

Sample population. The size of the sample population was limited to the M&As in the United States. Data collected from Zephyr and from the OECD statistic database contains information regarding GDP and deal information in the U.S. By limiting the sample accordingly it is possible to gather all the information needed and simultaneously avoid countries which might lack different types of data.

Time period. When selecting the time period the aim was to capture an as long as possible time period and since the Zephyr database contains M&A deals from 01/01/1997 onwards the limitations were set to 01/01/1997 to 31/12/2012. To analyze the difference in the time period I will divide the period into four sub-period, first: 1997-2000, second: 2001-2004, third: 2005-2008, and fourth: 2009-2012.

Methods of payment. The different methods of payment have to be collected for each time period separately. The reason to include some methods of payments in one group, other², was because of the low number of deals which were made with these methods in a specific time period.

Type of deals. In order to gather a large enough sample of deals, the decision of bundling some of the types of deals was made³. The use of acquisition as one single type and minority stake as another was adequate due to the large number of deal in these two types, while the other had to be bundled together due to the lack of finalized deals.

² See Appendix 1.

³ See Appendix 1

General selection. First, when searching for the number of deals in each of the above limitations the decision was to include all deals which were completed and confirmed. On the other hand, rumored, announced and assumed-complete deals were not taken into account. Second, the decision not to consider whether the party making that deal was the acquirer, the one being acquired, or the vendor was made. Third, only deals with known values were used in this sample.

Implication. Since GDP is a continuous variable and M&A deals is a discrete variables this could generate implications when computing different tests. But since GDP is in such a large number the decision to count it as a discrete variable was made to be able to continue with the tests.

5 Method

5.1 Unit Root

To identify if different time series are cointegrated it is necessary to identify whether a time series is stationary or non-stationary. This identification can be done with several different methods. One method is the Dickey and Fuller Unit root test (Dickey and Fuller, 1981). When computing a unit root test the aim is to investigate whether there is a stationary $I(0)$ process between each series tested. If a time series is stationary the mean, variance and autocovariance is time-constant. This is, the time series will return to its mean with the variance being constant, regardless on which time it is measured (Gujarati and Porter, 2009). If these criteria are fulfilled there is a stationary relation between series the technique of linear regressions can be applied to identify statistical estimates and conclusions (Granger and Newbold, 1974). If these criteria are not fulfilled the time series are seen as non-stationary. If there are two or more non-stationary series then it is possible to identify the existence of a cointegration relationship between them (Hendry and Juselius, 2001).

Dickey and Fuller (1981) developed three models to identify unit roots, which all have the starting point from the autocorrelation formula.

$$y_t = \rho y_{t-1} + \varepsilon_t$$

Where, y_t is the variable of interest, t is the time period, ρ is a coefficient and ε_t is the white noise or error term. The ρ coefficient can take values between -1 to 1 and in case $\rho = 1$ there is a non-stationary process $I(1)$ in the equation which means a unit root do exist.

To achieve a Dickey and Fuller model (DF model), the first step is to manipulate the autocorrelation formula by subtracting y_{t-1} on both sides of the equation

$$\begin{aligned} y_t - y_{t-1} &= \rho y_{t-1} - y_{t-1} + \varepsilon_t \\ &= (\rho - 1)y_{t-1} + \varepsilon_t \end{aligned}$$

Which could be rewritten as:

$$\nabla y_t = \delta y_{t-1} + \varepsilon_t$$

Where ∇y_t is the first difference operator of the variable of interest, and where $\delta = \rho - 1$ and if $\delta = 0$ the equation has a unit root and the first difference operator ∇ is used to identify if the estimates slope coefficient is zero or not. If the slope coefficient is zero y_t is non-stationary.

For y_t to be stationary the slope coefficient has to be negative. This is due to the relationship $\delta = \rho - 1$, where ρ must be less than one for stationarity and thus the δ has to be negative. The above equation is used when the time series is flat, which means that there is no trend or intercept variables included in the formula. The hypothesis in the DF model are:

H_0 : when $\delta = 0$ there is a unit root

H_1 : when $\delta < 0$ there is no unit root and y_t has a zero mean

However, the t value of the null hypothesis does not follow the normal t distribution which is most commonly used to accept or reject null hypothesis. In this case we use the *Dickey-Fuller test*, originally known as the *tau-statistic* to find the critical values and further to identify whether to accept or reject the null hypothesis (Dickey and Fuller, 1979). To the second model Dickey and Fuller simply add a drift variable, also known as intercept α and the third DF model includes the drift variable but also a trend variable β . Moreover, it is important to be aware that for each DF model there are a specific critical values, in other words, there exist three different DF tests. Critical values in this study are gathered from MacKinnon's Critical Values of Cointegration table (Engle and Granger, 1991)

5.2 The Augmented Dickey-Fuller (ADF) test

The ADF test is a developed version of the DF test and is used for larger and more advanced time series. What the ADF test includes, which the DF test does not, is the lagged values. This test is also preferable to use if the error term between the different time series is correlated, when in the DF test the error term between the time series is uncorrelated (Gujarati and Porter, 2009).

$$\nabla y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

The purpose of this model is to find an unbiased value of $\delta = 0$, and the way of doing so is to collect adequate number of lagged difference terms so that the error term is serially uncorrelated. To find the correct lag length different information criterion could be used. Gujarati and Porter (2009) use Akaike Information Criterion (AIC) and Schwartz Information criterion (SC) as two reliable measure for an accurate lag length and by using, for example EViews, the lag length will automatically be selected for you. The ADF test follows the same critical value table as the DF test and again it is important to use different critical values depending on which of the three models we use.

5.3 Cointegration test

The difference between a cointegration test and the ADF unit root test is that the latter one is performed on a univariate time series while cointegration test is a regression which tests the relationship between several different time series which all holds a unit root (Dickey et. al. 1991). When constructing a regression of two or more time series which all are non-stationary it is necessary to use a cointegration test rather than a normal regression model to avoid the risk of a spurious regression (Gujarati and Porter, 2009). There are different methods which can be used to identify cointegration and the method used in this study is the Johansen's cointegration test. The Johansen's cointegration test is the one among several different tests solving for this issue and this this test has been most commonly used hence it is chosen.

5.3.1 The Johansen test

The Johansen's cointegration test could be divided into two methods which could be used to identify cointegration among variables. The first method is developed to see if two variables are cointegrated or not. This test is called a Bivariate Johansen's Cointegration test and is only used between two variables and their cointegration. This test is usually used as a complement to the multivariate cointegration test.

The Johansen test could also be a multivariate cointegration test in which we test the cointegration between several different variables. The purpose of the Johansen multivariate test is to find which, if any, variables that is expressed as linear combination among the other variables, also known as normalize the cointegrating relationship, and to see if there exist one or more cointegration relationship between the set of variables (Cromwell et. al., 1994).

Johansen's multivariate maximum likelihood cointegration test could be estimated as follows:

$$\Delta x_t = \mu + \sum_{i=1}^{\rho} \Gamma_t \Delta x_{t-i} + \alpha \beta' x_{t-i} + \varepsilon_t$$

Where x_t ($n \times 1$) is the vector of all the non-stationary time series in the study. Here I will conduct two tests in which one consists of GDP and the methods of payment while the other will consist of GDP and different type of deals, Γ is the matrix coefficient ($n \times n$), α ($n \times r$) is the error correction coefficient matrix which measures the speed in which the variables adjust

to their equilibrium, and β ($n \times r$) is the matrix of r cointegration vectors, which measures the long-run cointegration relationship (Johansen, 1988).

As mention there are several criterion in determining lag length. Both the Akaike information criterion (AIC) and Schwarz information criterion (SC) have been seen as two frequently used criterion in a lot of literature, however none of them is preferred over the other. This study have chosen the latter one determining the lag length. SC is seen as more consistent compared to AIC but usually both come up with similar results (Brooks, 2008).

In the Johansen's cointegration test we define two different test statistics: the Trace test and the Max Eigenvalue test. These two test statistics could be used in parallel with each other to confirm the other's results. The Trace test tries to identify the number of cointegration vectors exist under the null hypothesis ($H_0: r = 0, H_1: r \geq 0$) and the Max Eigenvalue test tries to identify if the number of cointegration vectors is equal to r ($H_0: n = r, H_1: n = r+1$). In both these equations the r represents the number of cointegration vectors and λ_i estimates the i th ordered eigenvalue from $\alpha\beta'$ matrices (Brooks, 2008)

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^g \ln(1 - \lambda_i)$$

$$\lambda_{max}(r, r+1) = -T \ln(1 - \lambda_{r+1})$$

6 Empirical Results

In this section the results for the Unit Root, the Bivariate Johansen's Cointegration test and the Johansen's Multivariate cointegration test will be presented. Further analysis will be presented in section 7.

6.1 Unit root

An ADF test was conducted to identify the unit root for the different variables in my sample. For all my variable there where a non-stationary process, reached after first difference, which means that it did exist a unit root in all of them. When computing the first difference all time series were significant at 1 % level which means that all these could be included in a Johansen's cointegration test. I have chosen not to include the Unit Root test results in the body of this text but the results are included in the appendix.

6.2 Johansen Cointegration test

6.2.1 Bivariate Cointegration Test

The result from the Bivariate Johansen's cointegration test for methods of payment is displayed in Table 2 below. An estimation on cointegration was not possible for a four year time period due to multicollinearity and hence that time period has been excluded from further tests. We can see that for the different time periods there have only been a few combinations of variables where a tendency of cointegration could be displayed. If we analyze the entire time period, 16 years, there are no combination of variables where cointegration has occurred. We cannot reject the null hypothesis that there is an underlying relationship between variables during that time period.

Table 2. Method of Payment - Bivariate Johansen's Cointegration Test Results

Series Tested	1997-2012	1997-2004	1997-2008
	P	P	P
GDP/Cash	0.8415	0.0115**	0.3854
GDP/Debt	0.8656	0.0179**	0.6168
GDP/Shares	0.9032	0.0070***	0.6825
GDP/Other method of payments	0.9164	0.1986	0.0821*

Notes: Null Hypothesis (H₀): Series are not cointegrated. A rejection of the null hypothesis indicates that there is an underlying relationship between the variables selected. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

Nevertheless, for the 8 year time period there are several combinations of time series in which a cointegration has occurred. The combination of GDP and cash shows a relationship under the 5 % significance level. Moreover, the bivariate equation also proves the existence of a relationship between the variables GDP and debt under the 8 year time period at the 5 % significance level and finally a relationship is displayed in the combination between GDP and shares at the 1 % significance level.

For the 12 year time period we could only display one relationship and that was between GDP and other methods of payment at the 10 % significance level. What we see in Table 2 is that over the three different time periods there are no combinations that have a steady relationship.

In Table 3 the results from the bivariate Johansen's cointegration test for different type of deals is displayed (GDP also included). As in Table 2 there are only a few combinations of time series in which we can see a cointegration relationship.



Table 3. Type of deals - Bivariate Johansen's Cointegration Test Results

Series Tested	1997-2012	1997-2004	1997-2008
	P	P	P
GDP/Acquisitions	0.8858	0.0188**	0.5849
GDP/Minority Stake	0.6563	0.0035***	0.2439
GDP/Other type of deals	0.1169	0.0527*	0.0031***

Notes: Null Hypothesis (Ho): Series are not cointegrated. A rejection of the null hypothesis indicates that there is an underlying relationship between the variables selected. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

For the 16 year time period there was no cointegration relationship which was similar to same time period for methods of payment.

For the 8 year time period the GDP/other type of deals combinations show a cointegration relationship at a significance level of 10 %. The combination of GDP and acquisitions shows a slightly stronger cointegration relationship with a significance level of 5 %. However, when combining the two time series GDP and minority stake the cointegration relationship is significant at 1 % level.

For the last time period, 12 years, the only combination of time series in which a cointegration relationship exist is the one including GDP and other type of deals. The cointegration relationship is significant at 1 % level.

In Table 3 there is one combinations which has a significant cointegration relationship at two different time periods, the GDP and other type of deals combinations are significant at the 8 and 12 year time period.

6.2.2 Johansen's Multivariate Maximum Likelihood Cointegration Test -Method of Payment

In addition to the bivariate Johansen's cointegration test, two Johansen's Multivariate cointegration test were carried out, the Trace test and the Max-Eigenvalue test. The results of the multivariate cointegration tests are divided in the same way as the results in the bivariate cointegration test, 8, 12, and 16 year time periods.

The Trace test in Table 4 shows that there is a cointegration between methods of payment and GDP at an 8 year time period. Table 4 includes three equations which states that there is a cointegration relationship between these time series. However, the significance level differ be-

tween the equations. There is the 1 % significance that we reject the nonexistence of a cointegration relationship, there is the 5 % significance that we reject that it is at most 1 cointegration relationship, and there is the 10 % significance that we reject that it is at most 4 cointegration relationship between the time series in this Johansen’s multivariate cointegration test.

Table 4. 8-Year Johansen Cointegration Results - Method of Payment – Trace Test and Max-Eigenvalue Test

Hypothesized Number of Cointegrating Equations	Trace Statistic	Max-Eigenvalue statistic
None	88.19895***	36.96138**
At Most 1	51.23757**	24.73567
At Most 2	26.50190	13.83325
At Most 3	12.66865	9.552464
At Most 4	3.116184*	3.116184*

Note: This sample includes data from Q1 1997-Q4 2004 with a total of 30 observations of each series after adjustments. Series included is the total GDP in the United States (GDP_USA), the number of deals where the transaction was made with cash (CASH_KNOWN_DEALS), debt (DEBT_KNOWN_DEALS), shares (SHARES_KNOWN_DEALS), and other methods of payment (OTHER_KNOWN_DEALS). Trend assumption: Linear Deterministic Trend. Lag order determined by SC: Lag 1. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

The Max Eigenvalue test is included to confirm the results from the Trace test. The Max Eigenvalue test confirms the rejection of a nonexistence of a cointegration relationship at the 1 % significance level. It also confirms the rejection that it is at most 4 cointegration equations at the 10 % significance level. However, the Max Eigenvalue test does not cope with the Trace test regarding the rejection of the fact that at most 1 equation is cointegrated.

When increasing the time period to 12 years the Trace test displays a rejection of the no existing cointegration equation at the 10 % significance level (see Table 5). However, when implementing the Max Eigenvalue test for confirmation there is again a disagreement between these two tests. The Max Eigenvalue test illustrate that there are no cointegration vectors in this cointegration equation for this time period. This makes it difficult to confirm whether this time period have a cointegration vector or not.

Table 5. 12-Year Johansen Cointegration Results - Method of Payment– Trace Test and Max-Eigenvalue Test

Hypothesized Number of Cointegrating Equations	Trace Statistic	Max-Eigenvalue Statistic
None	69.78805*	30.69710
At Most 1	39.09095	20.08721
At Most 2	19.00373	12.22497
At Most 3	6.778759	5.473461
At Most 4	1.305307	1.305307

Note: This sample includes data from Q1 1997-Q4 2008 with a total of 46 observations of each series after adjustments. Series included is the total GDP in the United States (GDP_USA), the number of deals where the transaction was made with cash (CASH_KNOWN_DEALS), debt (DEBT_KNOWN_DEALS), shares (SHARES_KNOWN_DEALS), and other methods of payment (OTHER_KNOWN_DEALS). Trend assumption: Linear Deterministic Trend. Lag order determined by SC: Lag 1. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

For the last and entire time period, 16 years, the Trace test does not include any cointegration equations for any significance level, see Table 6. However, the Max Eigenvalue test (Table 6) states that we can reject the null hypothesis of a no existing cointegration equation. Again, this makes it difficult to confirm whether there is a cointegration relationship between the different methods of payments and GDP at the 16 year time period.

Table 6. 16-Year Johansen Cointegration Results - Method of Payment– Trace Test and Max-Eigenvalue Test

Hypothesized Number of Cointegrating Equations	Trace Statistic	Max-Eigenvalue Statistic
None	61.78569	31.42382*
At Most 1	30.36187	19.12680
At Most 2	11.23507	6.883600
At Most 3	4.351471	4.055874
At Most 4	0.295597	0.295597

Note: This sample includes data from Q1 1997-Q4 2012 with a total of 62 observations of each series after adjustments. Series included is the total GDP in the United States (GDP_USA), the number of deals where the transaction was made with cash (CASH_KNOWN_DEALS), debt (DEBT_KNOWN_DEALS), shares (SHARES_KNOWN_DEALS), and other methods of payment (OTHER_KNOWN_DEALS). Trend assumption: Linear Deterministic Trend (restricted). Lag order determined by SC: Lag 1. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

In general for methods of payment we can see that there are several cointegration relationships in the 8 year time period but there exist a disagreement between the Trace test and the Max Eigenvalue test regarding the existence of cointegration relationships in the 12 year time period and the 16 year time period.

6.2.3 Johansen’s Multivariate Maximum Likelihood Cointegration Test –Type of Deals

In this section, similar to the previous section, two Johansen’s Multivariate cointegration test were carried out, the Trace test and the Max-Eigenvalue test. The results of the multivariate cointegration tests are divided in the same way as the results in the bivariate cointegration test, 8, 12, and 16 year time periods. In this section, compared to the previous includes time series from different type of deals and GDP.

In Table 7 we see the results from the Trace test in the 8 year time period. The test indicates that there is a cointegration relationship at the 5 % significance level. It also indicates that we can reject the null hypothesis at the 10 % significance level that there are at most 1 cointegration equation in the test.

Table 7. 8-Year Johansen Cointegration Results – Type of Deals – Trace Test and Max-Eigenvalue Test

Hypothesized Number of Cointegrating Equations	Trace Statistic	Max-Eigenvalue Statistic
None	52.62018**	22.92343
At Most 1	29.69676*	16.94826
At Most 2	12.74850	11.94668
At Most 3	0.801826	0.801826

Note: This sample includes data from Q1 1997-Q4 2004 with a total of 30 observations of each series after adjustments. Series included is the total GDP in the United States (GDP_USA), the number of deals which were acquisition deals (ACQ_KNOWN_DEALS), Minority Stake deals (MINORITY_KNOWN_DEALS), and other type of deals (OTHER_TYPE_KNOWN). Trend assumption: Linear Deterministic Trend. Lag order determined by SC: Lag 1. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

Additionally, the Max Eigenvalue test indicates that there is no cointegration relationship among these time series during the 8 year time period. This again makes it difficult to confirm whether it exist a cointegration relationship or not.

Table 8 below displays the Trace test for the 12 year time period for different type of deals and GDP. This test rejects the nonexistence of a cointegration relationship at the 5 % significance level. Moreover, Table 8 displays that we should reject the hypothesis of at most 3 cointegration relationships exist at the 10 % significance level. Comparing the Trace test with the Max Eigenvalue test we can see that the test rejects the nonexistence of a cointegration relationship at the same significance level as the Trace test, namely 5 %. Also the 10 % significant level of at most 3 cointegration relationships exist was confirmed by the Eigenvalue test.

Table 8. 12-Year Johansen Cointegration Results – Type of Deals – Trace Test and Max-Eigenvalue Test

Hypothesized Number of Cointegrating Equations	Trace Statistic	Max-Eigenvalue Statistic
None	53.92649**	29.30810**
At Most 1	24.61839	14.03150
At Most 2	10.58689	7.002868
At Most 3	3.584027*	3.584027*

Note: This sample includes data from Q1 1997-Q4 2008 with a total of 46 observations of each series after adjustments. Series included is the total GDP in the United States (GDP_USA), the number of deals which where acquisition deals (ACQ_KNOWN_DEALS), Minority Stake deals (MINORITY_KNOWN_DEALS), and other type of deals (OTHER_TYPE_KNOWN). Trend assumption: Linear Deterministic Trend. Lag order determined by SC: Lag 1. **Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

The last Johansen’s multivariate cointegration test was conducted for the entire time period, 16 years for the different type of deals and GDP. The Trace test displayed in Table 9 indicates that there is a cointegration relationship at the 1 % significance level. The Eigenvalue test confirms the fact that there is a cointegration relationship between these time series at the 1 % significance level.

Table 9. 16-Year Johansen Cointegration Results – Type of Deals – Trace Test and Max-Eigenvalue Test

Hypothesized Number of Cointegrating Equations	Trace Statistic	Max-Eigenvalue Statistic
None	72.96518***	41.74895***
At Most 1	31.21623	16.51793
At Most 2	14.69830	8.617483
At Most 3	6.080815	6.080815

Note: This sample includes data from Q1 1997-Q4 2012 with a total of 62 observations of each series after adjustments. Series included is the total GDP in the United States (GDP_USA), the number of deals which where acquisition deals (ACQ_KNOWN_DEALS), Minority Stake deals (MINORITY_KNOWN_DEALS), and other type of deals (OTHER_TYPE_KNOWN). Trend assumption: Linear Deterministic Trend (restricted). Lag order determined by SC: Lag 1. ***Significance at the 1 % level. **Significance at the 5 % level. *Significance at the 10 % level.

7 Empirical Discussion

The result from the bivariate test indicates that there is cointegration among several combination of variables. Table 2 indicates no cointegration relationship for method of payment for the 16 year period. This could be due to the various economic changes occurring during that time. Both the dot-com bubble in 2000 and the event of 9/11 in 2001 together with the great recession of 2007 made the economy instable and these two shocks in combination could be the reason why there is no long-run relations between these combinations. Although, the bivariate cointegration test did not show any relationship for the 16 year time period, it reported several relationships in the 8-year time period. The combination of GDP and cash and the combination of GDP and debt shows that there is a relationship at the 5 % significant level. However, a combination of GDP and shares shows an even stronger relationship, at the 1 % significant level. This could be due to that investing in a M&A activity with shares is less risky compared to cash and debt and thus the shocks do not affect the movement of shares and GDP as much as other methods of payment. For the 12-year time period the remaining part of method of payment indicates a cointegration relationship at a significance level of 10 %. This relationship could be difficult to interpret due to the small sample of different payment methods included in the variable “others”.

Table 3 displays, for the shortest time-period, 8 years, we could see that GDP have a cointegration relationship with all different type of deals. However, the significance level of the three different variables are different. Why the combination of GDP and minority stake has a stronger relationship could be due to that minority stake deals are less responsive to market instability and hence we could see a long-run relationship between these variables. For the 12-year period there is only one combination indicating a cointegration relationship and it is GDP and Other types of deals, at a significance level of 1 %. It could be difficult to interpret why these variables are significant as there are several different types of deals included in the “Other” variables and the number of deals included are in such small amounts.

The multivariate cointegration test conducted for methods of payment at the 8 year time period shows that there exist a cointegration relationship among this set of variables. The trace test rejects the hypothesis of no cointegration at a significance level of 5 %, which means that there is a linear combination among this set of variables. If we compare these results with the bivariate test and the combination of variables which are significant, GDP/Cash, GDP/Debt, and GDP/Shares, we can again confirm the existence of a cointegration relationship in the long-run

for these set of variables. However, the Max-Eigenvalue test also has to be taken into consideration. The Max-Eigenvalue test reports cointegration between the set of variables. Hence, during this time period we could assume that there is a long-run cointegration relationship between the variables. For the 12-year time period Table 5 reports a rejection of no cointegration at a significance level of 10 % on the Trace test but on the Max-eigenvalue test the results shows no significance for cointegration. The Trace test and the bivariate test again seems to cooperate and prove the existence of a cointegration relationship. The multivariate test for the 16-year time period only rejects the no cointegration relationship in the Max-Eigenvalue test at a significance level of 10 %. For this time period both the Trace test and the bivariate test accept the null hypothesis of no cointegration. For the tests concerning methods of payment it seems that the bivariate cointegration test and the multivariate test taking the Trace test statistics into account comes up with similar results while the Max-Eigenvalue test results implies the opposite.

The multivariate test for different types of deals for the 8-year time period also displays the existence of a cointegration relationship. The Trace test rejects the null hypothesis of no cointegration at a significance level of 5 %. This again align with the results from the bivariate test for the time period of 8 years. Similar to the multivariate test for methods of payment the Max-Eigenvalue test displays conflicting results i.e. there is no cointegration among this set of variables. For the 12 year time period, the Trace test rejects the null hypothesis of no cointegration at a significance level of 5 %. Compared to all previous results, in this case the Max-Eigenvalue test confirms the existence of a cointegration relationship among this set of variables, at a significance level of 5 %. The two test also rejects the hypothesis that there is at most three variables that are cointegrated. Comparing these results with the bivariate results we can see that there is just one cointegration, which further confirms this test. For the last time period we see that both the Trace test and the Max-Eigenvalue test rejects the null hypothesis of no cointegration, both at a significance level of 1 %. Hence, for this set of variables it is shown that the two multivariate test and the bivariate test align over all time periods, with one exception, namely the Max-Eigenvalue test for the 8 year time period.

8 Conclusion

The purpose of this study was to identify if there is a long-run relationships between different methods of payment and GDP. By executing both a bivariate cointegration test and a multivariate cointegration test the identification of a long-run relationship among different set of variables could be done. The bivariate cointegration test for methods of payment found that there are several combinations of variables that are cointegrated in the long-run. The combination of GDP and shares show the strongest cointegration relationship for the time period of 8 years, at a significance level of 1 %, but also the GDP combinations including cash and debt displayed a relationship for the 8 year time period. The empirical findings also concluded several relationships among different type of deals for the 8 year time period using the bivariate cointegration test. Findings from the other two time periods for both methods of payment and different type of deals were either insignificant or significant for variables which were unable to interpret, therefore further studies have to be implemented to identify why these are cointegrated. The empirical findings for the multivariate cointegration test for the 8 year time period for methods of payment show cointegration relationship among the set of variables. Since, these findings are similar to the findings in the bivariate test we can confirm the existence of a long-run relationship among these variables in this time period. Similar empirical findings were identified for the 8 year time period for the type of deal's set of variables, however only for the Trace test. The multivariate cointegration test for different types of deals for the 12 and 16 year time period both identified a relationship among the set of variables; with both the Trace test and the Max Eigenvalue test confirming it. Since both these test are significant the conclusion of a long-run relationship could be justified.

However, this study did not identify which variables in the multivariate cointegration test that had the most impact on the long-run relationship. Since most of the tests only rejected the null hypothesis of no cointegration it did not identify how many variables which were cointegrated and which variables that affected the other variables the most. By looking at the bivariate cointegration test some estimations on which variables affecting the other ones could be made but not by how much. The sample size could also be extended for more accurate estimations for the variables including other methods of payments and other type of deals. Measurement on how fast the variables reach long-run relationship could also be identified. As mentioned, this study could be done by adapting other, similar methods and a deeper interpretation of each variable could be done to stronger confirm the relationship between GDP and methods of payment.

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Appendix

Appendix 1. Descriptive statistics Merger and Acquisitions

	All	1997-2000	2001-2004	2005-2008	2009-2012
METHOD OF PAYMENT					
<i>ALL</i>					
Number of deals	99,163	1,959	18,140	42,987	36,077
Number of deals with known values	86,327	1,684	15,694	37,633	31,316
Aggregate deal value (mil USD)	18,264,327	974,942	4,896,098	7,110,810	5,282,477
Mean	211.6	579.0	312.0	189.0	168.7
<i>CASH</i>					
<i>n</i>	78,651	5,874	21,094	27,562	24,121
<i>n</i> ^a	69,363	5,135	18,627	24,591	21,010
Ag. deal value ^b	9,713,793	1,233,080	2,069,771	3,858,911	2,552,331
Mean ^c	140.0	240.1	111.1	156.9	121.5
<i>DEBT</i>					
<i>n</i>	4,601	589	1,458	1,533	1,021
<i>n</i> ^a	4,095	536	1,289	1,415	855
Ag. deal value ^b	3,555,777	853,459	738,442	1,330,162	633,714
Mean ^c	868.3	1,592.3	572.9	940.0	741.2
<i>SHARES</i>					
<i>n</i>	10,614	1,743	3,782	3,257	1,832
<i>n</i> ^a	8,161	1,340	2,935	2,487	1,399
Ag. deal value ^b	4,329,340	1,493,164	1,077,410	1,137,868	620,898
Mean ^c	530.5	1,114.3	367.1	457.5	443.8
<i>OTHERS^d</i>					
<i>n</i>	5,297	380	1,397	2,144	1,376
<i>n</i> ^a	4,708	327	1,183	1,980	1,218
Ag. deal value ^b	594,390	73,485	142,914	202,604	175,387
Mean ^c	126.3	224.7	120.8	102.3	144.0
TYPE OF DEALS					
<i>ALL</i>					
<i>n</i>	86,268	1,523	15,146	36,937	32,662
<i>n</i> ^a	74,761	1,287	13,067	32,200	28,207
Ag. deal value ^b	12,574,400	663,755	3,178,519	4,802,607	3,928,519
Mean ^c	168.2	515.7	243.2	149.1	139.3
<i>ACQUISITIONS</i>					
<i>n</i>	27,034	3,774	9,185	8,622	5,453
<i>n</i> ^a	22,495	3,126	7,601	7,278	4,490
Ag. deal value ^b	8,068,009	2,153,620	1,970,883	2,391,452	1,552,054
Mean ^c	358.7	689.0	259.3	328.6	345.7
<i>MINORITY STAKE</i>					
<i>n</i>	51,518	2,658	12,135	18,200	18,525
<i>n</i> ^a	45,348	2,334	10,861	16,138	16,015
Ag. deal value ^b	1,891,121	101,372	342,424	762,057	685,268
Mean ^c	41.7	43.4	31.5	47.2	42.8
<i>OTHER^e</i>					
<i>n</i>	7,716	600	2,223	3,026	1,867
<i>n</i> ^a	6,918	526	1,897	2,764	1,731
Ag. deal value ^b	2,615,270	133,524	474,680	1,298,035	709,031
Mean ^c	378.0	253.8	250.2	469.6	409.6

Notes: ^a deals with known values. ^b million USD. ^c Rounded to one decimal. ^dIncluding: Deferred payment, Earn-out, Loan notes, and other. ^eIncluding: IPO, Planned IPO, Institution buy-out, Management buy-in, Management buy-out, Mergers, Demerger, Share buyback.

Appendix

Appendix 2. Results Unit Root Testing 8 year data – Augmented Dickey Fuller Test

		Adj. T-test	P	1 %	5 %	10 %
GDP_USA	Intercept	1.090845	0.9965	-3.661661	-2.960411	-2.619160
	Trend & int.	-1.883762	0.6370	-4.309824	-3.574244	-3.221728
	None	13.26880	1.0000	-2.641672	-1.952066	-1.610400
GDP_USA (-1)	Intercept	-10.16136	0.0000	-3.679322	-2.967767	-2.622989
ACQ_KNOWN_DEALS	Intercept	-1.246617	0.6412	-3.661661	-2.960411	-2.619160
	Trend & int.	-1.773875	0.6929	-4.284580	-3.562882	-3.215267
	None	0.260885	0.7553	-2.641672	-1.952066	-1.610400
ACQ_KNO. (-1)	Intercept	-5.389784	0.0001	-3.670170	-2.963972	-2.621007
MINORITY_KNOWN_DEALS	Intercept	-0.731110	0.8233	-3.679322	-2.967767	-2.622989
	Trend & int.	-3.879757	0.0257	-4.296729	-3.568379	-3.218382
	None	0.572957	0.8342	-2.647120	-1.952910	-1.610011
MINO_KNO (-1)	Intercept	-4.855406	0.0005	-3.679322	-2.967767	-2.622989
OTHER_TYPE_KNOWN	Intercept	-1.108215	0.6998	-3.661661	-2.960411	-2.619160
	Trend & int.	-3.605823	0.0457	-4.284580	-3.562882	-3.215267
	None	0.110149	0.7103	-2.641672	-1.952066	-1.610400
OTHER_TY (-1)	Intercept	-7.580158	0.0000	-3.670170	-2.963972	-2.621007
CASH_KNOWN_DEALS	Intercept	-0.816966	0.8002	-3.661661	-2.960411	-2.619160
	Trend & int.	-2.973977	0.1556	-4.296729	-3.568379	-3.218382
	None	0.654929	0.8523	-2.641672	-1.952066	-1.610400
CASH_KNO (-1)	Intercept	-4.475758	0.0013	-3.670170	-2.963972	-2.621007
DEBT_KNOWN_DEALS	Intercept	-1.596903	0.4722	-3.661661	-2.960411	-2.619160
	Trend & int.	-1.595624	0.7716	-4.284580	-3.562882	-3.215267
	None	-0.180771	0.6129	-2.641672	-1.952066	-1.610400
DEBT_KNO (-1)	Intercept	-5.747445	0.0000	-3.670170	-2.963972	-2.621007
SHARE_KNOWN_DEALS	Intercept	-1.614805	0.4633	-3.661661	-2.960411	-2.619160
	Trend & int.	-1.703303	0.7256	-4.284580	-3.562882	-3.215267

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	None	-0.460129	0.5076	-2.641672	-1.952066	-1.610400
SHARE_KN (-1)	Intercept	-5.671092	0.0001	-3.670170	-2.963972	-2.621007
OTHER_MOP_	Intercept	-0.674879	0.8387	-3.661661	-2.960411	-2.619160
KNOWN_DEALS	Trend & int.	-2.659102	0.2590	-4.284580	-3.562882	-3.215267
	None	0.441547	0.8035	-2.641672	-1.952066	-1.610400
OTHER_MOP (-1)	Intercept	-6.227919	0.0000	-3.670170	-2.963972	-2.621007

Appendix 3. Results Unit Root Testing 12 year data – Augmented Dickey Fuller Test

		Adj. T-test	P	1 %	5 %	10 %
GDP_USA	Intercept	-1.509533	0.5198	-3.584743	-2.928142	-2.602225
	Trend & int.	-1.964247	0.6041	-4.180911	-3.515523	-3.188259
	None	-0.268196	0.5839	-2.617364	-1.948313	-1.612229
GDP_USA (-1)	Intercept	-8.539673	0.0000	-3.581152	-2.926622	-2.601424
ACQ_KNOWN_	Intercept	-1.880744	0.3383	-3.577723	-2.925169	-2.600658
DEALS	Trend & int.	-1.114851	0.9156	-4.165756	-3.508508	-3.184230
	None	-0.422813	0.5254	-2.615093	-1.947975	-1.612408
ACQ_KNO. (-1)	Intercept	-6.405512	0.0000	-3.581152	-2.926622	-2.601424
MINORITY_	Intercept	-1.403298	0.5728	-3.577723	-2.925169	-2.600658
KNOWN_DEALS	Trend & int.	-2.642528	0.2643	-4.165756	-3.508508	-3.184230
	None	0.136683	0.7209	-2.615093	-1.947975	-1.612408
MINO_KNO (-1)	Intercept	-6.656765	0.0000	-3.581152	-2.926622	-2.601424
OTHER_TYPE_	Intercept	-1.864928	0.3456	-3.577723	-2.925169	-2.600658
KNOWN	Trend & int.	-1.629030	0.7662	-4.165756	-3.508508	-3.184230
	None	-0.535022	0.4797	-2.616203	-1.948140	-1.612320
OTHER_TY (-1)	Intercept	-9.252087	0.0000	-3.581152	-2.926622	-2.601424
CASH_KNOWN_	Intercept	-1.644816	0.4522	-3.577723	-2.925169	-2.600658
DEALS	Trend & int.	-1.603906	0.7764	-4.165756	-3.508508	-3.184230
	None	-0.018507	0.6715	-2.615093	-1.947975	-1.612408
CASH_KNO (-1)	Intercept	-6.973309	0.0000	-3.581152	-2.926622	-2.601424

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DEBT_KNOWN_ DEALS	Intercept	-2.044147	0.2677	-3.577723	-2.925169	-2.600658
	Trend & int.	-1.512203	0.8113	-4.165756	-3.508508	-3.184230
	None	-0.520787	0.4858	-2.615093	-1.947975	-1.612408
DEBT_KNO (-1)	Intercept	-7.043252	0.0000	-3.581152	-2.926622	-2.601424
SHARE_KNOWN_ DEALS	Intercept	-1.993760	0.2885	-3.577723	-2.925169	-2.600658
	Trend & int.	-1.601261	0.7775	-4.165756	-3.508508	-3.184230
	None	-0.809088	0.3602	-2.615093	-1.947975	-1.612408
SHARE_KN (-1)	Intercept	-6.834455	0.0000	-3.581152	-2.926622	-2.601424
OTHER_MOP_ KNOWN_DEALS	Intercept	-1.565600	0.4920	-3.577723	-2.925169	-2.600658
	Trend & int.	-2.304216	0.4235	-4.165756	-3.508508	-3.184230
	None	-0.378722	0.5425	-2.615093	-1.947975	-1.612408
OTHER_MOP (-1)	Intercept	-7.136143	0.0000	-3.581152	-2.926622	-2.601424

Appendix 4. Results Unit Root Testing 16 year data – Augmented Dickey Fuller Test

		Adj. T-test	P	1 %	5 %	10 %
GDP_USA	Intercept	-0.590119	0.8648	-3.540198	-2.909206	-2.592215
	Trend & int.	-2.433316	0.3594	-4.115684	-3.485218	-3.170793
	None	3.083870	0.9994	-2.602794	-1.946161	-1.613398
GDP_USA (-1)	Intercept	-4.399059	0.0007	-3.540198	-2.909206	-2.592215
ACQ_KNOWN_ DEALS	Intercept	-2.074003	0.2557	-3.538362	-2.908420	-2.591799
	Trend & int.	-1.813987	0.6862	-4.110440	-3.482763	-3.169372
	None	-0.516826	0.4888	-2.602185	-1.946072	-1.613448
ACQ_KNO. (-1)	Intercept	-7.802764	0.0000	-3.540198	-2.909206	-2.592215
MINORITY_ KNOWN_DEALS	Intercept	-1.724440	0.4142	-3.538362	-2.908420	-2.591799
	Trend & int.	-2.457625	0.3475	-4.110440	-3.482763	-3.169372
	None	0.101284	0.7112	-2.602185	-1.946072	-1.613448
MINO_KNO (-1)	Intercept	-7.753334	0.0000	-3.540198	-2.909206	-2.592215
	Intercept	-2.161762	0.2221	-3.538362	-2.908420	-2.591799

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OTHER_TYPE_ KNOWN	Trend & int.	-1.818323	0.6841	-4.110440	-3.482763	-3.169372
	None	-0.942136	0.3049	-2.602185	-1.946072	-1.613448
OTHER_TY (-1)	Intercept	-10.20979	0.0000	-3.540198	-2.909206	-2.592215
CASH_KNOWN_ DEALS	Intercept	-1.992681	0.2893	-3.538362	-2.908420	-2.591799
	Trend & int.	-1.846584	0.6700	-4.110440	-3.482763	-3.169372
	None	-0.050173	0.6623	-2.602185	-1.946072	-1.613448
CASH_KNO (-1)	Intercept	-8.154838	0.0000	-3.540198	-2.909206	-2.592215
DEBT_KNOWN_ DEALS	Intercept	-2.250512	0.1911	-3.538362	-2.908420	-2.591799
	Trend & int.	-1.909213	0.6380	-4.110440	-3.482763	-3.169372
	None	-0.742888	0.3907	-2.602185	-1.946072	-1.613448
DEBT_KNO (-1)	Intercept	-8.732863	0.0000	-3.540198	-2.909206	-2.592215
SHARE_KNOWN_ DEALS	Intercept	-2.203450	0.2072	-3.538362	-2.908420	-2.591799
	Trend & int.	-2.174653	0.4949	-4.110440	-3.482763	-3.169372
	None	-0.924693	0.3121	-2.602185	-1.946072	-1.613448
SHARE_KN (-1)	Intercept	-8.249071	0.0000	-3.540198	-2.909206	-2.592215
OTHER_MOP_ KNOWN_DEALS	Intercept	-1.918428	0.3220	-3.538362	-2.908420	-2.591799
	Trend & int.	-1.721391	0.7301	-4.110440	-3.482763	-3.169372
	None	-0.550516	0.4747	-2.602185	-1.946072	-1.613448
OTHER_MOP (-1)	Intercept	-8.495191	0.0000	-3.540198	-2.909206	-2.592215
