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MSc Financial Economics

THE INFLUENCE OF NET WORKING CAPITAL IN LEVERAGED BUYOUTS

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FOREWORD

Before you will read my thesis I would like to thank some people who supported me during writing my thesis and during my study. I would like to thank Sebastian Gryglewicz for guiding me from my proposal to the final report of this research and for supervising this paper.

I would like to thank my parents and my girlfriend Jacolien for their mental support. Also a special word here for Tim to thank him for the great time during my study and his advice for the statistical part of my thesis.

ABSTRACT

In this paper we test if net working capital has an influence on the takeover premium in acquisitions. We test the influence of net working capital in leveraged buyouts and compare this with the effect of net working capital on the premium of other types of acquisitions. We find that the level of net working capital in LBOs is not significantly different from the level of net working capital in other mergers and acquisitions. We find that net working capital has no direct influence on the premium paid by acquirers in both LBO as well as in other deal types in the US between 2002 and 2014. What we do find is that there is empirical evidence that the level of inventories adjusted for size and industry has a negative influence on the premium paid by acquirers in leveraged buyouts. The effect of inventories on the premium in other deal types is not significant.

JEL-classification: G34
Keywords: Mergers, net working capital, takeover premium, US, leveraged buyout.

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TERMINOLOGY

LBO	-	This is a buyout of the management of a company financed with debt.
EBIT	-	Earnings Before Interest and Taxes.
EBITDA	-	Earnings Before Interest Taxes Depreciation and Amortization.
FCF	-	Free Cash flow.
Leverage	-	The portion of debt-financing related to the total value of the company.
NWC	-	Net Working Capital.
WCR	-	Working Capital Ratio; net working capital divided by sales.
GPM	-	Gross Profit Margin. Sales turnover adjusted with costs of goods sold.
CFO	-	Cash from operations.

1 Introduction

When a company is interested in a merger or acquisition of another firm there are a few important things to check: the turnover and profit they make, the level of assets and debt and net working capital. There are a lot of strategies to make money with a merger or acquisition. One of the main strategies lies in the net working capital. When the amount of net working capital is relatively high, the acquirer will decrease the amount of net working capital to gain directly a free cash flow. On the other hand the M&A consultant should also tell the seller to make sure that the amount of net working capital is as low as possible, to gain the free cash flow before the transaction date.

In leveraged buyouts (LBOs) net working capital is also very important. After an LBO the costs of debt are relatively high and therefore there is a lot pressure on the cash flows of the company. A reduction of net working capital could lead to an extra free cash flow and therefor lower the pressure on the liquidity of the firm. When the amount of NWC is relatively high, the acquirer could easily gain free cash flow short after the transaction date. When the amount of NWC is relatively low, the target does not have this potential value. So you expect that the level of NWC will have an effect on the value of the target. We will test the effect of the level of NWC on the price of the acquisition. Off course it will be important to look at many other factors that could have an influence on the price or premium that is paid by the acquirer. We are looking at M&A deals in the US between 2002 and 2014 and we will focus on LBOs. First we will test if there is a difference in the level of NWC in leveraged buyouts and other M&A deals. In addition we will look at the difference of the effect of net working capital on the premium between LBOs and other mergers and acquisitions. The main question of this research is:

Is the takeover premium for target shareholders in LBOs of public targets in the US between 2002 and 2014 affected by net working capital?

In the next two chapters we will give a theoretical explanation of the subjects and the hypotheses. In chapter 2 we will describe the theory of the influence of net working capital on the free cash flow of a company and in chapter 3 we will give a theoretical review on the takeover premium. In chapter 4 we will explain our sample data and the methodologies we use. We will test two hypotheses to answer our main question. In chapter 5 we will discuss the results of testing our hypotheses and finally we will answer our main question in the conclusion.

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2   Net Working Capital

In this chapter we will start with the explanation of the role of net working capital in acquisitions.

2.1   What is net working capital?

Working capital is needed for the day-to-day financial operation of the firm and as such is an important indicator of the liquidity of the firm (Hall & Kruniker, 1995). Net working capital consists of accounts payable, accounts receivable and inventory.

1. $NWC = Total\ inventories + Accounts\ receivable - Accounts\ payable$

To compare the amount of NWC of different periods or between different companies it is helpful to make them relative. To make these numbers comparable between companies and comparable over time we will use a ratio of net working capital-to-sales. We will call this the WCR-ratio.

2. $WCR = \dfrac{NWC}{Sales\ turnover}$

The change on NWC has a direct influence on the Net income of a company. Net income consist of a part that is already liquid in Cash from operations and a non-cash part, which is called operating accruals. An important part of the accruals is the change in net working capital. When the change in NWC is negative, this means the cash inflow is higher. Cash from operations could even be higher than net income, because you invested less cash in working capital in a year. (Palepu, Healy, & Peek, 2013)

2.2   How does a reduction of working capital lead to a free cash flow?

Inventories, accounts receivable and accounts payable have an influence on the free cash flows. You have to buy goods which will be sold in a future period to keep your inventory on a constant level. So there is a cash outflow that doesn't lead to a cash inflow in the same period. With accounts receivable you have a higher income due to sales on the income statement, but there is no cash inflow jet. The cash flow will come in a future period. With accounts payable you have bought goods or services which lead to costs on the income statement, but the cash outflow will occur in a future period. So when the amount of inventory (on the balance sheet) or the amount of accounts receivable reduces the cash outflow is lower and when the amount of accounts payable increases the cash outflow decreases.

We made an example in Table 1 to show that when the income statement and balance sheet of two years are exactly the same except for lower inventories of $50,- that the free cash flow will be $50,- higher. We highlighted the numbers that show that a change in net working capital leads to a change in free cash.

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Table 1: Influence of a change in NWC on the free cash flows

Income statement		2013		2014	
Sales		$	10,000	$	10,000
EBIT	15%	$	1,500	$	1,500
Tax	25%	$	375	$	375
Net income		$	1,125	$	1,125

Balance sheet		2013		2014	
Assets					
Fixed Assets		$	2,000	$	2,000
Account receivable		$	200	$	200
Inventories		$	200	$	150
Cash		$	-	$	1,175
Total assets		$	2,400	$	3,525
Liabilities					
EV		$	2,250	$	3,375
Account payable		$	150	$	150
Total liabilities		$	2,400	$	3,525
NWC		$	250	$	200

Free cash flow statement	2013		2014	
Net income	$	1,125	$	1,125
Change in NWC	$	-	$	-50
CAPEX	$	-	$	-
Free cash	$	1,125	$	1,175

2.3 Leveraged buyouts

Working capital management can be an important strategy for both the seller and the acquirer. A reduction of the NWC leads to an extra free cash flow. This opportunity of an extra free cash flow can be very important for the acquirer. For the acquirer it is possible to pay out the extra cash flow as dividend and therefore an easy way to gain a high return on his investment.

In leveraged buyouts (LBOs) there is another reason why they want an extra cash flow in the first periods after the acquisition. It can be very useful to repay debt or pay costs of debt with the extra free cash flow. In a LBO, where a takeover is financed with a lot of debt, the costs of debt put high pressure on the liquidity of the firm (Roden & Lewellen, 1995). An extra cash flow could reduce this pressure. If a high level of net working capital gives a high potential for a successful LBO you will expect that acquirers will pay a higher premium for a company than when the deal is another type than a leveraged buyout. We will test the effect of net

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working capital on the takeover premium in our second hypothesis, but first we will check if the level of net working capital has an influence on the deal type. We expect that a firm with relatively high net working capital is an interesting target for a LBO. To test this we check if net working capital is higher in LBO deals in our sample. Our first hypothesis is:

The probability that the deal type in a takeover will be "LBO" is higher when NWC is higher.

3 Takeover premium

3.1 Definition

We showed that a change in NWC leads to a change of the free cash flow ceteris paribus. The free cash flows have a direct influence on the equity value of the company. The value of a public company is measured by the price per share (Eckbo, 2009). But when there is a takeover it might that the value for the acquirer is different than the price per share, so when the acquirer pays a different price this is called the takeover premium.

$$1. \quad Takeover\ premium = \frac{(Takeover\ price\ per\ share - price\ per\ share\ before\ announcement)}{price\ per\ share\ before\ announcement}$$

3.2 Sources of the premium

There are three reasons for a takeover premium (Kraakman, 1988):
1. The company has a higher potential value for the acquirer, because he can use the assets more efficiently.
2. Mispricing: The market is undervaluing the value of the shares and the value of the company.
3. Misvaluation: The acquirer misprices the target and pays a higher price than the shares are worth. (Dong, Hirschleifer, Richardson, & Teoh, 2006)

In this research we assume that the stock market is efficient and that there is no mispricing. So the takeover premium is driven by the target's potential value for the acquirer.

3.3 Effects on the premium

Officer, Ozbaz and Sensoy analyzed acquisitions of public targets in the U.S. between 1984 and 2007 to see if there was a higher premium paid in club deals then in sole-sponsored LBOs. And what other deal-characteristics could explain this difference (Officer, Ozbaz, & Sensoy, 2010). A.J. Smith found evidence in 1990 that the operating performance of a company improves after an MBO and that this is partly a result of a tightened working capital strategy (Smith, 1990). Decreasing net working capital after an MBO(or LBO) is a well-known strategy of private equity firms. Especially after an LBO a firm has a lot of pressure on its cash flows due to costs of debt. By reducing NWC extra cash will be available for interest payments or redemption. For this reason a company with a relatively high net working capital ratio could be very attractive for a LBO. This could result in a higher takeover premium. We want to test the influence of WCR on the premium paid by the acquirer (Guo, Hotchkiss, & Song, 2011). Our second hypothesis is:

The takeover premium in LBOs is higher when net working capital is higher.

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4 Data & Methodologies

4.1 Data

There have been 7402 M&A deals of public firms in the U.S between 2002-2014 covered by the Thomson One database. As you can see in Figure 1 and Table 2 there was a peek of M&A activity in 2007 and there was low activity after 2009 especially in 2012 and 2013. The data of 2014 is until July, but also for the first half year of 2014 there is low activity. The sample consists of deals in a period of crisis (2007-2012), but also deals in better economic times (2002-2006). We have found financial data of the targets of these deals in Compustat North America. The most important data variables are the takeover premium, net working capital, revenue and net working capital of the SIC-industry. We have eliminated the deals were information about the premium was missing(4356 left). After this we have eliminated deals where the revenue in the period before the announcement was zero or negative(3828 left). Then we eliminated the deals where NWC corrected for revenue and SIC industry average was missing(1676 left). At last we eliminated three outliers of Prem1d after making a scatterplot(1673 left).

The Small sample consist of 1673 M&A deals of public firms in the U.S between 2002-2014 covered by the Thomson One database. In this sample are 156 deals with deal type LBO and 1517 deals are of another deal type than LBO. The percentage of LBO deals and other deals is roughly the same for the small sample and full sample. Between 2002 and 2014 the number of LBOs as a percentage of total M&A deals has been around 8%, but in the years 2002, 2008 and 2009 it was only around 4%. With the CUSIP codes from Thomson One we found quarterly data of net working capital and other financials of the target companies in Compustat.
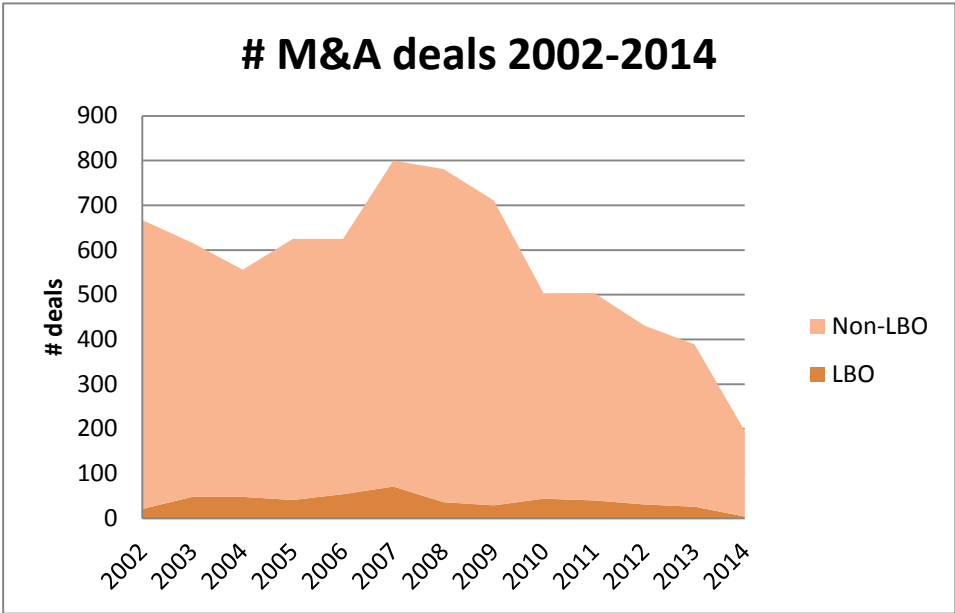

Figure 1: M&A deals 2002 - 2014

Table 2: Sample stats

	Full sample			Small-sample	
	LBO	Total		LBO	Total
No.Deals	493	7402		156	1673
%	7%	100%		9%	100%
No.Deals					
2002	21	667		7	120
2003	48	616		18	135
2004	48	556		18	112
2005	41	625		11	138
2006	54	625		13	165
2007	71	800		19	197
2008	36	781		9	168
2009	29	711		7	128
2010	44	502		12	129
2011	40	504		20	124
2012	31	431		10	124
2013	26	389		10	100
2014	4	195		2	33

4.2 Methodologies

We will test hypothesis 1 with a probit regression (Bollen, 2005). The dependent variable is deal type (XDealtype) with two levels: "LBO" and "Other". The independent variable is net working capital in the quarter before the announcement of the deal (NWC1). Net working capital is corrected for size and industry in this research. Also the parameters accounts payable, accounts receivable and inventories are corrected for size and industry. We will test hypothesis 2 with a linear regression model. The premium 1 day before announcement is the dependent variable. Net working capital corrected for size and industry is the independent variable. We added multiple control variables to check for a spurious relationship. We added the logical variable XDealtype as a dummy variable to check if there is a difference in LBO deals compared to the whole sample.

4.3 Variables

We will test hypothesis 1 with a logistic regression and hypothesis 2 with a linear regression model. In the logistic regression the deal type will be our dependent variable. In the linear regression the takeover premium will be the dependent variable and we will use multiple factors of NWC as independent variable, but also factors as control variables to avoid a spurious relation.

4.3.1 Dependent variable

We describe two dependent variables here. Deal type for the probit regression of hypothesis 1 and takeover premium for the linear regression model of hypothesis 2.

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4.3.1.1   Deal type (XDealtype)

This is a logical variable, where deal type LBO is true and other deal types are false. In our sample 156 deals are of deal type "LBO" and 1517 deals are of deal type "Other".

4.3.1.2   Takeover premium (Prem1d)

Our dependent variable will be a measurement of the takeover price in acquisitions. To make prices comparable we will use the price premium paid by the acquirer. The premium is an indicator of the difference between the price paid to shareholders and the share price before the transaction (Walter & Bugeja, 1995). We took the offer price to target stock price premium 1 day prior to announcement from ThomsonOne.

Because there were still some outliers in the takeover premium we Winsorized the data (Tukey, 1977). This means that for the premium we set the values of the highest 1% of the sample to the highest value of 99% of the sample. Before Winsorizing the highest value of premium was 816.67, after Winsorizing all values higher than 218.68 are set to 218.68. We did the same for the lowest 1% of the sample.

4.4   Independent variables

First we describe our main explanatory variables which are the most important for testing our hypotheses, thereafter we describe different control variables and our dummy variable.

4.4.1   Net working capital (NWC1)

We use a comparable ratio of Net Working Capital as our main independent variable. We focus on the operating part of working capital defined as: sum of accounts receivable and inventories net of accounts payable. To make net working capital comparable over time, between companies and between industries we relate it to sales. The working capital ratio of a company significantly differs for each industry (Hawawini, Viallet, & Vora, 1985). So we correct net working capital for size and industry. We took the balance sheet items of the quarter before announcement (t=-1). By dividing the items of net working capital to sales turnover we correct for the size of a company, assuming that turnover is an indicator of the size of a company. Net working capital corrected for size is called WCR. We look at 4-digit SIC industry codes. We computed the average WCR for all SIC industry codes in each quarter between 2002 and 2014. The WCR of a company in the quarter before announcement minus the SIC average WCR in the corresponding period gives NWC1. This is the dependent variable we will use to test our regressions.

$$NWC1 = \left(\frac{Accounts\ Receivable}{Sales\ Turnover} + \frac{Inventories}{Sales\ Turnover} - \frac{Accounts\ Payable}{Sales\ Turnover}\right) - SIC\ average\ WCR$$

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There are some outliers of NWC1 in our data so we Winsorized the lowest 1% and the highest 1% of net working capital in our sample. See below in Figure 2 a scatterplot of the dependent variable and net working capital.
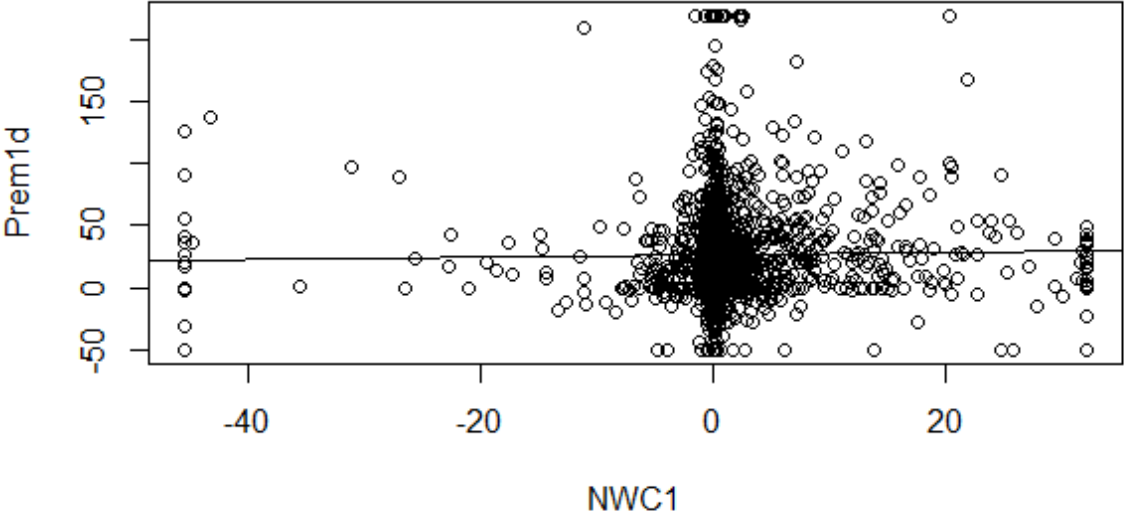

Figure 2: Scatterplot of Prem1d and NWC1

4.4.1.1   Accounts Receivable, Inventories and Accounts Payable

We test our regressions both for net working capital(NWC1) as for each individual component of net working capital. We use the quarter before the announcement date for these components as well. We use Receivables1, Inventory1 and Payables1 as names for these variables. These variables are corrected for size and industry in the same way as NWC1.

4.5   Control variables

4.5.1   Deal size (Dealvalue)

We expect that deal size will have an influence on the premium. In particular due to earlier research we expect that deal size will have a negative effect on the premium paid by the acquirer. This means that larger deals will have a lower premium (Alexandridis, Fuller, Terhaar, & Travlos, 2013). Deal size will be measured as the total value of the transaction.

4.5.2   Acquirer public status (Publicstatus)

We added this variable to check for the public status of the acquirer. There are 6 categories: Public, Private, Joint Venture (J.V.), Government, Investor and Subsidiary. We expect that

the premium paid by public acquirers is higher than the premium paid by private acquirers based on earlier research (Eckbo, 2009) and (Bargeron, Schlingemann, Stulz, & Zutter, 2008).

4.5.3 Gross Profit margin (GPM1 and GPM2)

We expect an inverse relationship between GPM and the WCR-ratio and the dependent variable. When Gross Profit margin is high, the cost of goods sold are low. COGS and accounts payable have a strong relationship, so high GPM will lead to low accounts payable and therefore high WCR. We expect that a high gross profit margin will lead to a higher price.

4.5.4 Debt (Debt1 and Debt2)

We added the amount of debt of a company to the control variables. We expect that debt has a negative influence on the premium (Uysal, 2011). We take both the quarter before announcement (t=-1) and the another quarter before that period (t=-2). Debt1 is at t=-1 and Debt2 is at t=-2.

4.5.5 Costs of debt (Costdebt1)

The costs of debt could have a big influence on the financial liquidity of a company. If the costs of debt have too big pressure on the liquidity this may affect the level of net working capital. Leverage and the costs of debt show a relationship with the level of protection to hostile takeovers (Garvey & Hanka, 1999). This implies that targets with lower debt level and lower cost of debt have higher costs of a hostile takeover (Klock, Mansi, & Maxwell, 2005). We add the control variable costs of debt to check if it affects the premium of a takeover.

4.5.6 (Lagged) Operating cash flow (CFO1 and CFO2)

An increase in working capital, means there is a cash outflow. So the cash flow and working capital ratios are related. We will look at the effect of operating cash flow on thepremium. We took the cash from operations of the two periods before announcement (CFO1 and CFO2).

4.5.7 Average premium per year (AvgPrem1dY)

We computed the average takeover premium of all M&A deals in each year from 2002 – 2014 and added the average of the year when the deal took place as a control variable. In the graph below you see that the average premium of the full sample fluctuates during the period of our sample. In Table3 we show the average and medium of the premium in each year for the full sample and the small sample. In the small sample the difference between the average and the median is smaller, because we deleted three big outliers.
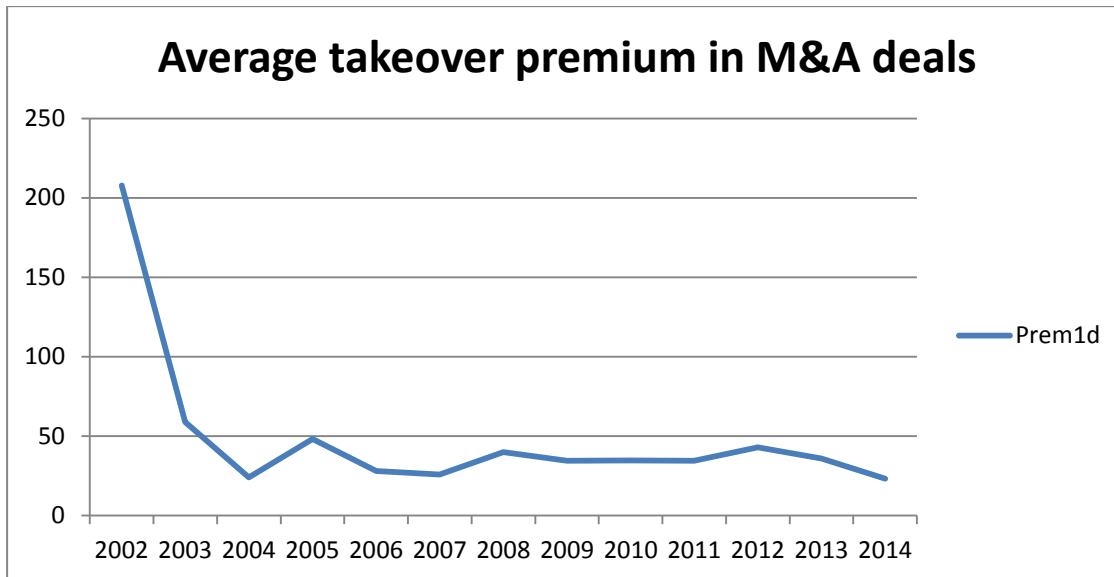
Figure 3: Average takeover premium in M&A deals

4.5.8   Average premium per industry (AvgPrem1dSIC)

We computed the average premium per industry, ranked with 4-digit SIC codes. We add this as a control variable to see if the average premium of all deals within in the industry has influence on the premium of a deal.

4.6   Dummy variable

4.6.1   Deal type (XDealtype)

The dependent variable of hypothesis 1 XDealtype is the dummy variable in hypothesis 2. In this variable we set LBO as "TRUE" and other deal types as "FALSE". We add XDealtype as an individual variable to check if the takeover premium is significantly different for LBOs. And we add the dummy to all other variables. We take the product of the dummy and another variable, so the outcome of this variable is only the effect of the variable on premium in LBO deals.

Table 3: Takeover premium stats

| | Full sample | | | Small-sample | |
	LBO	Total		LBO	Total
No.Deals	493	7402		156	1673
%	7%	100%		9%	100%
Average Prem1d					
Median Prem1d					
2002	28.85	207.82		29.59	36.29
	26.79	*19.05*		*32.08*	*20.01*
2003	28.58	58.82		29.88	34.09
	25.35	*24.05*		*28.35*	*22.22*
2004	34.63	24.07		24.75	20.78
	13.10	*17.06*		*10.76*	*14.37*
2005	25.74	48.30		30.04	24.83
	26.25	*18.56*		*26.58*	*16.25*
2006	25.19	28.10		19.35	26.14
	18.23	*19.51*		*17.96*	*20.53*
2007	18.21	25.92		16.13	26.41
	17.65	*18.14*		*13.95*	*15.56*
2008	27.94	39.89		3.97	24.15
	24.58	*20.83*		*7.88*	*16.64*
2009	69.43	34.42		65.78	30.42
	22.15	*18.26*		*26.90*	*20.00*
2010	33.43	34.65		34.05	33.02
	38.07	*29.34*		*38.07*	*29.86*
2011	37.67	34.57		34.29	29.49
	26.26	*27.22*		*22.93*	*25.70*
2012	43.34	42.94		41.55	31.91
	32.61	*30.89*		*31.55*	*27.60*
2013	32.45	35.96		41.36	24.36
	23.71	*21.71*		*25.69*	*20.72*
2014	13.97	23.28		22.42	13.07
	10.04	*20.54*		*22.42*	*11.50*

5 Results

5.1 Hypothesis 1

We conduct a probit regression with dependent variable XDealtype to test if net working capital has an influence in the probability of a LBO deal compared to other deal types. We set up four models. One with net working capital as the only independent variable, one with the three components of net working capital as the independent variables, one with net working capital and 11 control variables and one with the three components of net working capital and also 11 control variables. The formulas for these regressions are:

1. XDealtype=(Intercept)+b1*NWC1
2. XDealtype=(Intercept)+b1*Receivables1+b2*Payables1+b3*Inventory1
3. XDealtype=(Intercept)+b1*NWC1b2*Dealvalueb3*Publicstatus+b4*GPM1+b5*GPM2 +b6*Debt1+b7*Debt2+b8*CostDebt1+b9*CFO1+b10*CFO2+b11*AvgPrem1dY+b12* AvgPrem1dSIC
4. XDealtype=(Intercept)+b1*Receivables1+b2*Payables1+b3*Inventory1+b4*Dealvalue +b5*Publicstatus+b6*GPM1+b7*GPM2+b8*Debt1+b9*Debt2+b10*CostDebt1+b11*C FO1+b12*CFO2+b13*AvgPrem1dY+b14*AvgPrem1dSIC

In the results of our first model in Table 4 we see that NWC1 has a significant influence on XDealtype. This means that when WCR in the period before the announcement is higher than the average WCR of the industry in the same period the probability that a M&A deal is a leveraged buyout will be lower. This result is significant at a confidence level of 90%. When we split up NWC1 in Payables1, Receivables1 and Inventory1 in our second model, we see in the results that these variables have no significant effect on the dependent variable. This means that if only one of the components of NWC1 is high, the probability of an LBO is not significantly lower.

In the third and fourth model we add control variables to check if there are other variables affecting the dependent. When we look at the results of those models we see that R^2 is higher than the first two models. This means that the variables of model 3 and 4 have more explaining value of the dependent variable than the variables of model 1 and 2. In model 3 and 4 the control variables PublicStatusPriv. And AvgPrem1dY have significant influence on the probability of a leveraged buyout. When the acquirer is a private company the chance that a M&A deal is a leveraged buyout is higher. When the average takeover premium of all M&A deals in a year is higher, the probability of a leveraged buyout is a little lower. Both variables are significant at a confidence level of 90%. In model 3 we see that these control variables have significant influence on the dependent variable 'XDealtype', but the influence

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of NWC1 is not significant anymore. This means that the effect of net working capital on the dependent variable disappears by adding control variables to the model. So with the four models of a probit regression we have tested hypothesis1: The probability that the deal type in a takeover will be "LBO" is higher when NWC is higher. We can say with our results from Table 4 that the probability of a LBO is not significantly higher when net working capital is higher. The public status of the acquirer and the average takeover premium in a year do have an influence on the probability. In the next part we will look at the results of hypothesis 2, where we test if net working capital has an effect on the takeover premium in LBO deals. And we will look at the difference between this effect on LBO deals and other deal types.

Table 4: Results probit regression model 1-4

	Xdealtype	Xdealtype	Xdealtype	Xdealtype
(Intercept)	0.0978 ***	0.0964 ***	0.0571	0.0533
	(<2e-16)	(<2e-16)	(0.6548)	(0.677)
NWC1	-0.0022 *		-0.0013	
	(0.0626)		(0.2549)	
Receivables1		-0.0007		0.0006
		(0.729)		(0.7817)
Payables1		0.0015		0.0012
		(0.194)		(0.3034)
Inventory1		-0.0013		0.0011
		(0.798)		(0.8353)
Dealvalue			0.0000	0.0000
			(0.5299)	(0.4797)
PublicstatusInv.			0.0350	0.0381
			(0.809)	(0.7933)
PublicstatusJ.V.			-0.0530	-0.0431
			(0.7352)	(0.7836)
PublicstatusPriv.			0.2418 *	0.2474 *
			(0.0594)	(0.0544)
PublicstatusPublic			-0.0197	-0.0144
			(0.8777)	(0.9107)
PublicstatusSub.			0.0997	0.1046
			(0.4386)	(0.4179)
GPM1			0.0001	0.0002
			(0.253)	(0.198)
GPM2			0.0001	0.0001
			(0.6927)	(0.6306)
Debt1			0.0000	0.0000
			(0.1949)	(0.136)
Debt2			0.0000	0.0000
			(0.2059)	(0.1514)
CostDebt1			0.0000	0.0000
			(0.7945)	(0.7901)
CFO1			0.0000	0.0000
			(0.2744)	(0.2707)
CFO2			0.0000	0.0000
			(0.6079)	(0.5985)
AvgPrem1dY			-0.0003 *	-0.0003 *
			(0.0924)	(0.0967)
AvgPrem1dSIC			0.0000	0.0000
			(0.7264)	(0.7148)
Observations	1671	1669	1608	1606
R²	0.0021	0.0011	0.1328	0.1333

∗∗∗Significant at the 0.01 level.
∗∗Significant at the 0.05 level.
∗Significant at the 0.10 level.

5.2 Hypothesis 2

In this part we will look at the results of our second hypothesis. In model 5 and 6 (Table 5) we test with a linear regression model the effect of net working capital on the takeover premium 1 day before announcement. In model 7 and 8 we add control variables and a dummy variable for deal type. So in model 7 and 8 we can see if there is a difference between the influence on the dependent variable between LBOs and other M&A deals. This are the formulas of our regression models of hypothesis 2:

1. Prem1d=(Intercept)+b1*NWC1
2. Prem1d=(Intercept)+b1*Receivables1+b2*Payables1+b3*Inventory1
3. Prem1d=(Intercept)+b1*NWC1+b2*Dealvalue+b3*PublicstatusInv.+b4*PublicstatusJ.V.+b5*Publicstatus Priv.+b6*PublicstatusPublic+b7*PublicstatusSub.+b8*GPM1+b9*GPM2+b10*Debt1+b11*Debt2+b12*Co stDebt1+b13*CFO1+b14*CFO2+b15*AvgPrem1dY+b16*AvgPrem1dSIC+b17*XDealtypeTRUE+b18*N WC1*XDealtypeTRUE+b19*Dealvalue*XDealtypeTRUE+b20*GPM1*XDealtypeTRUE+b21*GPM2*XDea ltypeTRUE+b22*Debt1*XDealtypeTRUE+b23*Debt2*XDealtypeTRUE+b24*CostDebt1*XDealtypeTRUE +b25*CFO1*XDealtypeTRUE+b26*CFO2*XDealtypeTRUE+b27*AvgPrem1dY*XDealtypeTRUE+b28*Av gPrem1dSIC*XDealtypeTRUE
4. Prem1d=(Intercept)+b1*Receivables1+b2*Payables1+b3*Inventory1+b4*PublicstatusInv.+b5*Publicstatu sJ.V.+b6*PublicstatusPriv.+b7*PublicstatusPublic+b8*PublicstatusSub.+b9*GPM1+b10*GPM2+b11*Deb t1+b12*Debt2+b13*CostDebt1+b14*CFO1+b15*CFO2+b16*AvgPrem1dY+b17*AvgPrem1dSIC+b18*XD ealtypeTRUE+b19*Receivables1*XDealtypeTRUE+b20*Payables1*XDealtypeTRUE+b21*Inventory1*X DealtypeTRUE+b22*Dealvalue*XDealtypeTRUE+b23*GPM1*XDealtypeTRUE+b24*GPM2*XDealtypeT RUE+b25*Debt1*XDealtypeTRUE+b26*Debt2*XDealtypeTRUE+b27*CostDebt1*XDealtypeTRUE+b28* CFO1*XDealtypeTRUE+b29*CFO2*XDealtypeTRUE+b30*AvgPrem1dY*XDealtypeTRUE+b31*AvgPre m1dSIC*XDealtypeTRUE

Table 5: Results linear regression model 5 and 6

| | Prem1d | | Prem1d | |
	Estimate	(p-value)	Estimate	(p-value)
(Intercept)	26.5505	(<2e-16) ***	26.4582	(<2e-16) ***
NWC1	0.1007	(0.528)		
Receivables1			0.1918	(0.487)
Payables1			-0.1057	(0.497)
Inventory1			-0.3899	(0.571)
Observations	1671		1669	
R^2	0.0002		0.0008	
***Significant at the 0.01 level.				
**Significant at the 0.05 level.				
*Significant at the 0.10 level.				

When we look at the results of model 5 and 6 in Table 5 we see that R^2 is very small. This means that the variation of our response variable is for a very little part explained by our independent variables (Moore, McCabe, Duckworth, & Alwan, 2009). Our explaining

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variables also do not have a significant effect on the dependent variable of the takeover premium one day before announcement.

In model 7 and 8 in Table 6 we see that R^2 is much higher, so adding the control variables and the dummy variable makes that our independent variables explain a bigger part of the variation of Prem1d. In model 7 we see that net working capital has no significant influence on the takeover premium, the dummy variable for LBO deals makes no difference. The dummy coefficient itself has no significant influence as well, which means that the premium paid by acquirers in LBOs does not significantly differ from the premium paid by acquirers in other types deals. There are three control variables with a significant influence on the premium. None of the variables with the dummy coefficient is significant. So we see that Debt1 and Debt2 have significant influence on the premium with a confidence level of 99%. Debt 2 has a positive influence of 0.0069 and Debt1 a negative influence of 0.0069. So if the debt level is equal at t=-1 and t=-2 the effect on the premium is 0, but if the level of debt is lower at t=-1 the effect on the premium is positive. If the level of debt is higher at t=-1 than at t=-2 the effect on the premium will be negative. We see also a significant effect of the control variable of average premium in the year of the deal. This effect is positive and significant at a confidence level of 99%. This means that the fact that the premium in a deal is high is partially explained by the fact that the average premium of all deals in the year of the deal was higher.

Model 8 is identical to model 7 except that we split up net working capital into the three individual components of NWC1. We see again that Debt1, Deb2 and AvgPrem1dY have a significant effect on premium with a confidence level of 99%. But we see now that the variable of inventories with the dummy coefficient for LBOs (Inventory1:XDealtypeTRUE) has a significant effect on premium. The estimate is -8.5820, which means that when inventory at t=-1 is higher the takeover premium is lower in leverage buyouts. The premium is significantly lower in LBOs where inventory is high at a confidence level of 99%. So with the four models of a linear regression model we have tested hypothesis 2: The takeover premium in LBOs is higher when net working capital is higher. We can not accept this hypothesis, because net working capital does not have a significant influence on the takeover premium in M&A deals and LBOs. Net working capital has even a (not significant) negative influence on the premium in LBOs. But in model 4 we also checked the individual parts of net working capital and we see there that the takeover premium in LBOs is lower when inventory adjusted for size and industry is high.

Table 6: Results linear regression model 7 and 8

	Prem1d (model 7)			Prem1d (model 8)		
	Estimate	(p-value)		Estimate	(p-value)	
(Intercept)	4.2800	(0.8106)		4.8080	(0.7879)	
NWC1	0.2234	(0.1867)				
Receivables1				0.2545	(0.3865)	
Payables1				-0.1432	(0.3825)	
Inventory1				0.1552	(0.8325)	
Dealvalue	0.0002	(0.5648)		0.0002	(0.5581)	
PublicstatusInv.	21.1700	(0.2962)		21.1200	(0.2977)	
PublicstatusJ.V.	15.0300	(0.4931)		14.6700	(0.5033)	
PublicstatusPriv.	18.3500	(0.3067)		18.0700	(0.3143)	
PublicstatusPublic	16.0200	(0.3703)		15.8800	(0.3749)	
PublicstatusSub.	24.6200	(0.1717)		24.3600	(0.1766)	
GPM1	0.0053	(0.7633)		0.0047	(0.7905)	
GPM2	0.0077	(0.6977)		0.0086	(0.6685)	
Debt1	-0.0069	(0.0027)	***	-0.0068	(0.0033)	***
Debt2	0.0069	(0.0044)	***	0.0068	(0.0052)	***
CostDebt1	-0.0004	(0.8704)		-0.0004	(0.8608)	
CFO1	-0.0008	(0.4261)		-0.0009	(0.4110)	
CFO2	0.0005	(0.6270)		0.0005	(0.6202)	
AvgPrem1dY	0.0954	(0.0002)	***	0.0944	(0.0002)	***
AvgPrem1dSIC	0.0002	(0.9629)		0.0002	(0.9681)	
XDealtypeTRUE	10.4000	(0.2120)		11.6900	(0.1613)	
NWC1*XDealtypeTRUE	-0.2385	(0.7487)				
Receivables1*XDealtypeTRUE				0.1814	(0.9099)	
Payables1*XDealtypeTRUE				0.0282	(0.9694)	
Inventory1*XDealtypeTRUE				-8.5820	(0.0030)	***
Dealvalue*XDealtypeTRUE	0.0001	(0.9806)		-0.0003	(0.8977)	
GPM1*XDealtypeTRUE	-20.2600	(0.2128)		-17.5800	(0.2800)	
GPM2*XDealtypeTRUE	14.2300	(0.4991)		2.8080	(0.8965)	
Debt1*XDealtypeTRUE	-0.0220	(0.1184)		-0.0190	(0.1776)	
Debt2*XDealtypeTRUE	0.0046	(0.6946)		0.0053	(0.6498)	
CostDebt1*XDealtypeTRUE	0.3069	(0.1139)		0.2670	(0.1695)	
CFO1*XDealtypeTRUE	-0.0749	(0.1845)		-0.0641	(0.2567)	
CFO2*XDealtypeTRUE	0.0231	(0.6326)		0.0146	(0.7630)	
AvgPrem1dY*XDealtypeTRUE	-0.1215	(0.2747)		-0.1316	(0.2360)	
AvgPrem1dSIC*XDealtypeTRUE	0.0224	(0.1148)		0.0120	(0.4132)	
Observations	1596			1592		
R²	0.0357			0.0412		

∗∗∗Significant at the 0.01 level.
∗∗Significant at the 0.05 level.
∗Significant at the 0.10 level.

Conclusion

We obtained data from a sample of M&A deals of public firms in the US from 2002 to 2014. Net working capital analysis is very important in M&A deals. We showed how a reduction of NWC leads to an extra free cash flow. In LBOs the costs of debt put high pressure on the cash flows of a company. So we test our main question: Is the takeover premium for target shareholders in LBOs of public targets in the US between 2002 and 2014 affected by net working capital? We will answer this question based on the answer of two sub questions.

First we have tested if the level of net working capital is different in LBOs compared to other M&A deals. With answering this question we can conduct a better conclusion to the second sub question. The conclusion is that net working capital and the individual components of net working capital in LBOs do not significantly differ from those in other M&A deals. The public status of the acquirer and the average premium of all M&A deals in the year of the deal have a more significant influence on the type of the deal. We can conclude that net working capital does not differ for different deal types, so with the results of the second sub question we can give an answer to our main question.

In the second question we test the influence of net working capital and its individual components on the premium in LBOs and other deal types. The conclusion is that in leveraged buyouts inventory has a negative influence on the takeover premium. The control variables of debt and average premium in the year of the deal have also an effect on the premium of all M&A deals. So the conclusion is that when a company has higher inventories related to sales compared to other companies in their industry the acquirer will pay a lower premium in leveraged buyouts. A reason for this could be that the surplus of inventory has no value for the acquirer.

In our hypotheses we expected that high net working capital would lead to high takeover premiums, especially in LBOs, but in the results from our sample we see the opposite. High inventory has a negative influence on the premium. The explanation for this lies probably in the fact that the level of net working capital is already valued in the share price of the company. Besides we see that the differences in the net working capital are quite small. It might be that public firms are most of the time quite efficient and therefore net working capital is most of the time close to the industry average. When you look at small private companies you will see that they are less efficient and will have higher levels of net working capital. For further research it would be interesting to conduct a similar research on public and private companies to see if there are differences in net working capital and the type of a deal between public and private targets.

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