



Honors College Theses

4-4-2023

How are the decisions and performance of businesses within the utilities industry shaped by the issuance of debt?

Jasmine Alexander
Georgia Southern University

Follow this and additional works at: <https://digitalcommons.georgiasouthern.edu/honors-theses>



Part of the [Accounting Commons](#)

Recommended Citation

Alexander, Jasmine, "How are the decisions and performance of businesses within the utilities industry shaped by the issuance of debt?" (2023). *Honors College Theses*. 826.

<https://digitalcommons.georgiasouthern.edu/honors-theses/826>

This thesis (open access) is brought to you for free and open access by Digital Commons@Georgia Southern. It has been accepted for inclusion in Honors College Theses by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact digitalcommons@georgiasouthern.edu.

How are the decisions and performance of businesses within the utilities industry shaped by the issuance of debt?

An Honors Thesis submitted in partial fulfillment of the requirements for Honors in Accounting

By

Jasmine Alexander

Under the mentorship of *Dr. Adam Du Pon*

ABSTRACT

This study explores how companies within the utilities industry choose to finance their companies through debt vs. equity. Results from regression analysis show that debt has a significantly greater negative impact on business performance, when compared to the use of equity. This leads to a conclusion that companies tend to utilize equity financing when faced with a positive outlook for their business performance. Conversely, companies utilize debt more when faced with a negative outlook regarding business performance.

Design/methodology/approach: This study is based on data regarding the utilities industry. Regression analysis is used to examine the effect financing through debt vs. equity has within the utilities industry.

Findings: The findings showed that both equity and debt issuance harm firm performance, however, debt issuance has a stronger, more significant detrimental effect on business performance. These results explain why equity financing tends to be used during upward trends for businesses, while debt is used more during downtrends for companies.

Value: This paper provides a research framework for examining the effects of the decision to finance through debt vs. equity and how various factors, such as profitability, can influence this decision.

Thesis Mentor: *Dr. Adam Du Pon*

Honors Dean: *Dr. Steven Engel*

April 2023
Accounting
Honors College
Georgia Southern University

ACKNOWLEDGEMENTS

Thank you to Dr. Du Pon for serving as an advisor for this Honors Thesis. The expertise provided was invaluable throughout the entire research process, from brainstorming potential topics to finding literary reviews. Furthermore, the guidance shared was influential in ensuring that I had a clear and concise vision for this paper.

INTRODUCTION

According to the US Census Bureau, an average of 4.4 million businesses are started every year. Despite the number of companies being started in a year, many do not last for long. Based on a study by CB Insights, 38% of companies identify running out of cash and not being able to raise capital as the main reason their company failed. In order to expand, grow or transform in some way companies must find a way to raise funds to achieve their strategic goals. Capital is the lifeblood of businesses, and without it companies cannot run their daily operations. Thus, raising capital is typically one of the first obstacles companies face and it's imperative that they overcome it.

Capital can take a variety of forms. The methods used to gain capital can range from human labor to economic capital. Typically cash is the first thing that comes to mind when it comes to financial capital, however, assets and securities can also be considered financial capital. Having access to capital can often be the deciding factor for whether or not a company can expand and have continued growth or fail and get left behind its competitors.

There are two main types of capital that most companies employ to finance their company: debt and equity. While debt and equity financing can be beneficial for different reasons, companies may specifically choose to pursue debt financing for the following reasons (Ross 2020):

- Debt financing can be cheaper than equity financing
- Debt gives companies tax benefits

- Lenders giving out debt will not dictate how companies run their business

On the other hand, some companies may specifically choose to pursue equity financing for the following reasons (Ross 2020):

- With equity financing there is less of a burden because there is no loan to repay and investors assume the risk of investment loss
- Business owners may receive valuable guidance, resources or skills from experienced investors
- If business owners have a poor credit history, equity can be preferable than debt financing

Due to the stability and consistency of the utilities industry, the study within this research will specifically focus on the impact financing through debt vs equity has on companies within this sector.

IMPACT OF DEBT FINANCING

Debt financing involves companies raising money by selling debt instruments, such as bonds, bills or notes to investors. When it comes to financing through debt, it can have different effects in the short and long term. Most companies find it more beneficial to finance through debt when financing is needed for short-term purposes rather than long-term purposes. Research shows that this is because borrowing in the short-term is cheaper than borrowing long-term since there's demand from investors for safe and liquid assets (Krishnamurthy and Vissing-Jorgensen 1970). The cost of borrowing for investors

is determined by looking at the expected repayment for each dollar invested and the probability of default.

The cost of borrowing at certain maturities is captured by the risk premium on bonds at that maturity. In that case, the difference between long-term and short-term risk premiums measures how much cheaper borrowing short-term is compared to long-term. In most cases, borrowing short-term is consistently cheaper and less risky (Ross 2020). For example, when considering that investors may need to liquidate long-term bonds before the bonds mature and the price can fluctuate over time, it can be seen that investors would face more risk when holding long-term bonds.

Oftentimes investors will require higher returns on long-term bonds to compensate for the risk they face. Thus, borrowing debt in the short-term can not only be more cost-efficient but it can also provide greater security for risk-averse investors (Broner, Lorenzoni, and Schmukler 2007). Since short-term debt can provide a reduction in borrowing costs, companies may often choose to use short-term debt. Additionally, borrowers can prefer short-term debt because it matches the maturity of their liabilities, compared to their assets (Hart and Moore 1995). For example, in some instances, companies may use short-term loans to finance working capital while using long-term debt to finance fixed assets.

When companies borrow, the benefits of profitable investment projects are shared with investors. This situation incentivizes companies to make suboptimal investments. As a

result, borrowers are also incentivized to take actions that are in the interest of lenders to avoid making suboptimal investments (Ganum, Chen, Liu, Martinez, Peria 2019).

Short-term debt is also preferable to long-term debt when it comes to issues surrounding debt dilution. Debt dilution references the value of existing debt being reduced due to the issuance of new debt. Issuing new debt causes the value of existing debt to be reduced because it can increase the probability of one defaulting on their loan. Debt dilution initially arises when borrowers are unable to commit to a specific level of borrowing in the future and debt is priced by rational investors.

Rational investors can often anticipate that additional borrowing will be needed in the future so they lower the price of the debt they buy and offer a lower price for debt today. However, borrowers, on the other hand, are often unable to constrain their future borrowing, which directly creates the debt dilution problem. By using short-term debt, borrowers can minimize this issue overall. The need for short-term debt over long-term debt can also arise when borrowers are unable to commit to a certain maturity structure. In their research, Brunnermeier and Oehmke (2013) describe the “maturity rat race” that can cause borrowers to issue short-term debt in order to dilute long-term creditors. Due to this behavior, lenders are often hesitant to buy long-term debt and prefer short-term debt.

IMPACT OF EQUITY FINANCING

The financial health of a company can greatly depend on its decision to finance through debt or equity. There’s many variables that can influence the decision made. Through multiple discriminant analysis, Martin and Scott (1974) found that companies often

decided to issue debt or equity based on established policies that were related to certain financial characteristics. The decision to issue equity or debt can also depend on how flexible the financial method will be in the future. Some of the financial characteristics within Martin and Scott's study included liquidity, profitability, firm size and sales growth.

Furthermore, Hovakimian, Opler, and Titman (2001) found that the decision to finance through debt or equity can also be determined by current market conditions and a company's share price. For instance, firms that frequently have bullish share prices, would benefit from bull market conditions. As a result, they would prefer to issue equity as their source of financing. Firms may also find it beneficial to finance through equity over debt in instances where profit shortfalls occur. This is because taking on debt and then having to pay it back can be difficult to do in periods of profit declines.

Gatchev (2008) discovered that most companies consistently issued equity to fund investments in intangible assets or other innovative ventures. Hall (2002) on the other hand saw that there was a negative correlation between debt and companies' willingness to be innovative. This is most likely due to many companies not wanting to use intangible assets as collateral during credit negotiations. On the other hand investments in tangible assets are capitalized in the company's balance sheet so expenses will be recognized as sunk costs at the time spent. Furthermore, due to the uncertainty of how certain innovative projects will end up, asymmetric information problems between borrowers and lenders can develop.

This results in investors being reluctant to finance certain innovative ventures. Equity then becomes a viable alternative financing method for those companies because it can be easier to raise equity, especially for companies that have positive reputations regarding their performance.

DEBT VS EQUITY FINANCING IMPACT ON INVESTMENT DECISIONS

Equity financing involves selling ownership interest in a business in exchange for capital. In order to gain funding through equity financing, business owners must give investors a percentage of their company. Giving a percentage of the company to investors, means that companies must also share their profits and consult with their shareholders anytime a decision is being made that will affect the company. Additionally, if business owners no longer want to have an investor, the only way to remove them is to buy them out, which usually requires greater costs than the money the investor originally gave.

On the other hand, with debt financing, companies simply borrow money and pay it back with interest. One of the most common types of debt financing is a loan. When borrowing funds from a lender, companies do not have to worry about consulting with the lender for any decisions because the lender has no control over the company. Once the loan is paid back, the relationship between the financiers and the business is terminated.

OPERATING PERFORMANCE

According to Modigliani and Miller (1963) adding debt to capital structures to achieve its optimal level by minimizing the weighted average cost of capital can increase firm value overall. When determining the target ratio of debt companies are willing to take on, managers will look at other factors as well, such as tax advantages and bankruptcy costs. Debt financing often offers a tax shield for firms with high financial risk and bankruptcy exposure. As a result, the main question companies should answer before financing through debt or equity is how much debt or equity they need to maintain to take advantage of those factors or trade-offs. When looking to determine whether debt or equity financing has better results for operating performance, different studies come to different conclusions, which shows that the decision can ultimately depend on the circumstances.

In a study done by Shikumo, Oluoch and Wepukulu (2020) short-term debt positively and significantly influenced the financial growth of companies when measured by the growth in market capitalization. This shows that debt financing would be a more favorable choice when operating performance is in mind. Through equity financing, firms can raise money by selling shares of stock. Financing through equity has no impact on a firm's profitability performance, but it can lead to stockholders' existing shares being diluted since the company's net income is being divided among a larger number of shares. Myers and Majluf's (1984) pecking order theory states that the market may undervalue company's new shares when information asymmetry occurs due to the company's investment opportunities not being revealed to the market.

This shows that issuing new shares when financing through equity can harm existing shareholders as value is transferred from the old shareholders to the new shareholders. When operating performance is valued, it is clear that managers will prefer to finance through debt rather than equity. However, the dilemma that comes up is that firms that are profitable are expected to use less debt in their capital structure since they should be able to finance new projects with retained earnings. Over time, a negative relationship between debt level and firm's performance or profitability can also occur.

HYPOTHESES

H_0 : Debt has a stronger impact on the financials of a company than equity.

METHODOLOGY

The primary goal of this study is to examine the decision faced by companies to finance through debt or equity and how the decision can impact factors such as business performance. This is explored by utilizing regression analysis through Stata.

FRAMEWORK

A. Coefficients

Regression coefficients are estimates of the unknown population parameters and describe the relationship between a predictor variable and the response. In linear regression, coefficients represent the values that multiply the predictor values. The sign of each coefficient determines the direction of the relationship between a predictor and response variable. If a coefficient is positive, this indicates that as the predictor variable increases,

the response variable also increases. If a coefficient is negative, this indicates that as the predictor variable decreases, the response variable also decreases.

A study by Martin and Scott (1974) found that if a firm has a greater ability to generate cash then they will have a greater ability to pay off debt, which will also lead them to issue debt rather than equity.

B. Standard Error

The standard error of a regression is also known as the standard error of the estimate. This variable represents the average distance between the observed values and the regression line. Essentially, it tells you how wrong the regression model is on average in regards to the units of the response variable.

C. P-Values

The p-values in regression analysis help determine whether the relationships observed in the sample also exist in the larger populations.

Martin and Scott (1974) state that market conditions can greatly influence the issuance of debt or equity. When share prices are increasing in the market, companies will prefer to issue equity rather than debt.

DATA

The following analysis focuses on how the choice of debt and equity financing impacts the utilities industry. The data tables were developed through the use of various formulaic expressions in Stata:

Table 1. Sales Turnover

```
. reg salesturnover currentdebtscaldbyassets longtermdebtscaldbyassets
```

Source	SS	df	MS	Number of obs	=	7,742
Model	26.1642307	2	13.0821153	F(2, 7739)	=	107.41
Residual	942.594982	7,739	.121798034	Prob > F	=	0.0000
				R-squared	=	0.0270
				Adj R-squared	=	0.0268
Total	968.759213	7,741	.12514652	Root MSE	=	.349

salesturnover	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
currentdebtscaldbyassets	-.0010219	.0002807	-3.64	0.000	-.0015721	-.0004718
longtermdebtscaldbyassets	-.430011	.0298639	-14.40	0.000	-.4885524	-.3714696
_cons	.5458157	.0100234	54.45	0.000	.526167	.5654644

As the current debt scaled by assets increases and the long term debt scaled by assets increases, sales turnover decreases.

Table 2. Return on Assets IB

```
. reg returnonassetsib currentdebtscaldbyassets longtermdebtscaldbyassets
```

Source	SS	df	MS	Number of obs	=	7,742
Model	14499.5802	2	7249.79012	F(2, 7739)	=	1172.05
Residual	47870.0437	7,739	6.18555934	Prob > F	=	0.0000
				R-squared	=	0.2325
				Adj R-squared	=	0.2323
Total	62369.6239	7,741	8.05704999	Root MSE	=	2.4871

returnonassetsib	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
currentdebtscaldbyassets	-.0968367	.0020001	-48.42	0.000	-.1007574	-.0929159
longtermdebtscaldbyassets	-.6660594	.212822	-3.13	0.002	-1.083248	-.2488706
_cons	.2642932	.071431	3.70	0.000	.1242692	.4043172

As the current debt scaled by assets increases and the long term debt scaled by assets increases, return on assets ib decreases.

Table 3. Return on Assets OI

```
. reg returnonassetsoi currentdebtscaldbyassets longtermdebtscaldbyassets
```

Source	SS	df	MS	Number of obs	=	7,742
Model	14436.4776	2	7218.23881	F(2, 7739)	=	3051.55
Residual	18306.0806	7,739	2.3654323	Prob > F	=	0.0000
				R-squared	=	0.4409
				Adj R-squared	=	0.4408
Total	32742.5582	7,741	4.22975819	Root MSE	=	1.538

returnonassetsoi	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
currentdebtscaldbyassets	-.0964541	.0012369	-77.98	0.000	-.0988786	-.0940295
longtermdebtscaldbyassets	-.0376671	.131608	-0.29	0.775	-.2956544	.2203202
_cons	.0712652	.0441725	1.61	0.107	-.0153249	.1578554

As the current debt scaled by assets increases and the long term debt scaled by assets increases, return on assets oi decreases.

Table 4. Sales Turnover

```
. reg salesturnover currentdebtscaldbyassets longtermdebtscaldbyassets i.fyear
```

Source	SS	df	MS	Number of obs	=	7,742
Model	76.6542773	26	2.94824143	F(26, 7715)	=	25.50
Residual	892.104935	7,715	.115632526	Prob > F	=	0.0000
				R-squared	=	0.0791
				Adj R-squared	=	0.0760
Total	968.759213	7,741	.12514652	Root MSE	=	.34005

salesturnover	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
currentdebtscaldbyassets	-.0008825	.0002738	-3.22	0.001	-.0014192	-.0003458
longtermdebtscaldbyassets	-.4242311	.0291785	-14.54	0.000	-.4814288	-.3670333
fyear						
1998	-.0229016	.0263754	-0.87	0.385	-.0746045	.0288013
1999	-.0229325	.0260443	-0.88	0.379	-.0739864	.0281214
2000	.0141966	.026503	0.54	0.592	-.0377566	.0661497
2001	.0915588	.0262551	3.49	0.000	.0400918	.1430259
2002	-.0680608	.0262355	-2.59	0.009	-.1194895	-.0166321
2003	-.0500622	.0262554	-1.91	0.057	-.10153	.0014055
2004	-.0405234	.0263361	-1.54	0.124	-.0921494	.0111025
2005	-.0336964	.0263622	-1.28	0.201	-.0853735	.0179807
2006	-.0356853	.0264218	-1.35	0.177	-.0874791	.0161085
2007	-.0510353	.0266304	-1.92	0.055	-.1032381	.0011675
2008	-.0353271	.02665	-1.33	0.185	-.0875682	.0169141
2009	-.1137323	.026716	-4.26	0.000	-.1661028	-.0613617
2010	-.1195571	.0268065	-4.46	0.000	-.1721052	-.067009
2011	-.1205188	.0267622	-4.50	0.000	-.1729798	-.0680577
2012	-.1381169	.0267625	-5.16	0.000	-.1905786	-.0856551
2013	-.1257261	.0267238	-4.70	0.000	-.178112	-.0733402
2014	-.1350533	.0267668	-5.05	0.000	-.1875234	-.0825831
2015	-.1837977	.0267899	-6.86	0.000	-.2363132	-.1312822
2016	-.1983989	.0271982	-7.29	0.000	-.2517149	-.145083
2017	-.1831637	.0272466	-6.72	0.000	-.2365745	-.1297529
2018	-.176062	.0278039	-6.33	0.000	-.2305651	-.1215588
2019	-.1933091	.0279806	-6.91	0.000	-.2481587	-.1384596
2020	-.2368913	.0282605	-8.38	0.000	-.2922895	-.181493
2021	-.2145011	.0283224	-7.57	0.000	-.2700208	-.1589815
_cons	.6340022	.0206702	30.67	0.000	.5934829	.6745214

As the current debt scaled by assets increases and the long term debt scaled by assets increases, sales turnover decreases over the years.

Table 5. Return on Assets OI

```
. reg returnonassetsoi currentdebtscaledbyassets longtermdebtscaledbyassets i.fyear
```

Source	SS	df	MS	Number of obs	=	7,742
Model	14500.4402	26	557.709239	F(26, 7715)	=	235.87
Residual	18242.118	7,715	2.36450006	Prob > F	=	0.0000
				R-squared	=	0.4429
				Adj R-squared	=	0.4410
Total	32742.5582	7,741	4.22975819	Root MSE	=	1.5377

returnonassetsoi	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
currentdebtscaledbyassets	-.0964039	.0012381	-77.86	0.000	-.0988309	-.0939769
longtermdebtscaledbyassets	-.0318997	.1319448	-0.24	0.809	-.2905473	.2267479
fyear						
1998	-.0218898	.1192693	-0.18	0.854	-.25569	.2119104
1999	-.0566952	.1177721	-0.48	0.630	-.2875605	.17417
2000	-.0142615	.1198465	-0.12	0.905	-.2491932	.2206702
2001	-.0106269	.1187252	-0.09	0.929	-.2433605	.2221066
2002	-.0207438	.1186367	-0.17	0.861	-.2533039	.2118163
2003	-.0182519	.1187267	-0.15	0.878	-.2509885	.2144847
2004	-.017365	.1190917	-0.15	0.884	-.2508171	.2160872
2005	-.0198419	.1192097	-0.17	0.868	-.2535253	.2138415
2006	-.0172751	.1194789	-0.14	0.885	-.2514862	.216936
2007	-.0164343	.1204224	-0.14	0.891	-.2524949	.2196262
2008	-.018806	.1205109	-0.16	0.876	-.2550401	.217428
2009	-.0249972	.1208094	-0.21	0.836	-.2618164	.211822
2010	-.0289127	.121219	-0.24	0.811	-.2665348	.2087094
2011	-.0294683	.1210182	-0.24	0.808	-.2666968	.2077603
2012	-.0258587	.1210198	-0.21	0.831	-.2630904	.2113729
2013	.1122372	.1208448	0.93	0.353	-.1246513	.3491257
2014	.0319419	.1210392	0.26	0.792	-.2053278	.2692115
2015	.0236224	.1211437	0.19	0.845	-.2138522	.2610971
2016	.1179612	.1229902	0.96	0.338	-.123133	.3590554
2017	-.4376464	.1232089	-3.55	0.000	-.6791694	-.1961234
2018	-.0464394	.1257289	-0.37	0.712	-.2929022	.2000234
2019	-.0350486	.126528	-0.28	0.782	-.2830778	.2129806
2020	-.0373522	.1277938	-0.29	0.770	-.2878628	.2131583
2021	-.0376424	.1280737	-0.29	0.769	-.2887017	.2134168
_cons	.0942319	.0934706	1.01	0.313	-.0889959	.2774597

As the current debt scaled by assets increases and the long term debt scaled by assets increases, return on assets oi decreases over the years.

Table 6. Return on Assets IB

. reg returnonassetsib currentdebtscaledbyassets longtermdebtscaledbyassets i.fyear

Source	SS	df	MS	Number of obs	=	7,742
Model	14539.2767	26	559.202948	F(26, 7715)	=	90.20
Residual	47830.3473	7,715	6.19965616	Prob > F	=	0.0000
				R-squared	=	0.2331
				Adj R-squared	=	0.2305
Total	62369.6239	7,741	8.05704999	Root MSE	=	2.4899

returnonassetsib	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
currentdebtscaledbyassets	-.097065	.0020048	-48.42	0.000	-.100995	-.0931351
longtermdebtscaledbyassets	-.6516984	.2136517	-3.05	0.002	-1.070514	-.232883
fyear						
1998	-.0168458	.1931269	-0.09	0.930	-.395427	.3617353
1999	-.0485163	.1907026	-0.25	0.799	-.4223451	.3253125
2000	-.015571	.1940616	-0.08	0.936	-.3959844	.3648424
2001	-.007708	.1922458	-0.04	0.968	-.384562	.369146
2002	-.0170046	.1921026	-0.09	0.929	-.3935778	.3595686
2003	-.0131517	.1922483	-0.07	0.945	-.3900106	.3637073
2004	-.0128542	.1928394	-0.07	0.947	-.3908718	.3651634
2005	-.0203567	.1930304	-0.11	0.916	-.3987488	.3580353
2006	-.0163817	.1934663	-0.08	0.933	-.3956282	.3628649
2007	-.0119686	.1949941	-0.06	0.951	-.3942099	.3702727
2008	-.0130179	.1951373	-0.07	0.947	-.3955401	.3695042
2009	-.0109641	.1956207	-0.06	0.955	-.3944338	.3725055
2010	-.0210072	.1962839	-0.11	0.915	-.405777	.3637626
2011	-.0222149	.1959588	-0.11	0.910	-.4063475	.3619176
2012	-.0229803	.1959614	-0.12	0.907	-.4071179	.3611573
2013	.1184112	.195678	0.61	0.545	-.2651708	.5019931
2014	.0784121	.1959928	0.40	0.689	-.305787	.4626112
2015	.0774289	.1961621	0.39	0.693	-.3071021	.4619599
2016	.2861201	.199152	1.44	0.151	-.1042719	.6765121
2017	.1563146	.1995062	0.78	0.433	-.2347717	.5474008
2018	-.0323923	.2035866	-0.16	0.874	-.4314773	.3666927
2019	-.0022981	.2048806	-0.01	0.991	-.4039196	.3993235
2020	-.0069201	.2069302	-0.03	0.973	-.4125595	.3987194
2021	-.0079536	.2073835	-0.04	0.969	-.4144815	.3985743
_cons	.2453775	.1513524	1.62	0.105	-.0513143	.5420693

As the current debt scaled by assets increases and the long term debt scaled by assets increases, return on assets ib decreases over the years.

Table 7. Return on Assets OI

. lincom totaldebtscaldbyassets - equityscaldbyassets

(1) totaldebtscaldbyassets - equityscaldbyassets = 0

returnonas~i	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
(1)	-.2275483	.0040147	-56.68	0.000	-.2354181	-.2196785

. reg returnonassetsoi totaldebtscaldbyassets equityscaldbyassets i.fyear

Source	SS	df	MS	Number of obs	=	7,741
Model	16889.0024	26	649.577017	F(26, 7714)	=	316.07
Residual	15853.5551	7,714	2.0551666	Prob > F	=	0.0000
				R-squared	=	0.5158
				Adj R-squared	=	0.5142
Total	32742.5576	7,740	4.2303046	Root MSE	=	1.4336

returnonassetsoi	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
totaldebtscaldbyassets	-2.229131	.0625636	-35.63	0.000	-2.351773	-2.106489
equityscaldbyassets	-2.001583	.0587073	-34.09	0.000	-2.116665	-1.8865
fyear						
1998	-.0251559	.1111943	-0.23	0.821	-.243127	.1928151
1999	-.1374223	.1098229	-1.25	0.211	-.352705	.0778604
2000	-.0830679	.1117358	-0.74	0.457	-.3021003	.1359646
2001	-.0195175	.1106873	-0.18	0.860	-.2364946	.1974597
2002	-.0188643	.110604	-0.17	0.865	-.2356782	.1979496
2003	-.0855726	.1107044	-0.77	0.440	-.3025833	.1314382
2004	-.0715047	.1110345	-0.64	0.520	-.2891625	.1461531
2005	-.0928836	.1111285	-0.84	0.403	-.3107257	.1249584
2006	-.0657872	.1113757	-0.59	0.555	-.2841137	.1525393
2007	-.0476909	.1122627	-0.42	0.671	-.2677562	.1723744
2008	-.061259	.1123579	-0.55	0.586	-.281511	.1589929
2009	-.0524695	.1126328	-0.47	0.641	-.2732603	.1683214
2010	-.0657816	.1130141	-0.58	0.561	-.2873199	.1557568
2011	-.1166487	.1128475	-1.03	0.301	-.3378606	.1045631
2012	-.0875093	.1128349	-0.78	0.438	-.3086963	.1336777
2013	.0542464	.112665	0.48	0.630	-.1666076	.2751004
2014	-.1301514	.1129225	-1.15	0.249	-.3515102	.0912073
2015	-.0938054	.1129711	-0.83	0.406	-.3152594	.1276485
2016	.0411729	.1146659	0.36	0.720	-.1836034	.2659492
2017	-.4334308	.1149659	-3.77	0.000	-.6587952	-.2080664
2018	-.1056268	.1172237	-0.90	0.368	-.3354171	.1241635
2019	-.0553465	.1179539	-0.47	0.639	-.2865681	.1758752
2020	-.0373065	.1191202	-0.31	0.754	-.2708145	.1962015
2021	-.0443361	.1193897	-0.37	0.710	-.2783723	.1897
_cons	1.539675	.088577	17.38	0.000	1.36604	1.71331

As the total debt scaled by assets increases and the equity scaled by assets increases, return on assets oi decreases over the years.

Table 8. Return on Assets IB

. lincom totaldebtscaldbyassets - equityscaldbyassets

(1) totaldebtscaldbyassets - equityscaldbyassets = 0

returnonas~b	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
(1)	-.2223686	.0068148	-32.63	0.000	-.2357273	-.2090098

. reg returnonassetsib totaldebtscaldbyassets equityscaldbyassets i.fyear

Source	SS	df	MS	Number of obs	=	7,741
Model	16688.9349	26	641.882112	F(26, 7714)	=	108.39
Residual	45680.6889	7,714	5.92179011	Prob > F	=	0.0000
				R-squared	=	0.2676
				Adj R-squared	=	0.2651
Total	62369.6238	7,740	8.05809094	Root MSE	=	2.4335

returnonassetsib	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
totaldebtscaldbyassets	-2.139426	.1062	-20.15	0.000	-2.347607	-1.931246
equityscaldbyassets	-1.917058	.0996542	-19.24	0.000	-2.112407	-1.721709
fyear						
1998	-.0197859	.1887494	-0.10	0.917	-.389786	.3502142
1999	-.1284863	.1864214	-0.69	0.491	-.493923	.2369503
2000	-.0724815	.1896685	-0.38	0.702	-.4442833	.2993203
2001	-.0163074	.1878888	-0.09	0.931	-.3846204	.3520056
2002	-.0134926	.1877474	-0.07	0.943	-.3815284	.3545432
2003	-.0747813	.1879179	-0.40	0.691	-.4431513	.2935887
2004	-.0592334	.1884781	-0.31	0.753	-.4287018	.3102349
2005	-.0773413	.1886377	-0.41	0.682	-.4471224	.2924398
2006	-.0515662	.1890572	-0.27	0.785	-.4221697	.3190373
2007	-.0343163	.1905629	-0.18	0.857	-.4078713	.3392388
2008	-.0515877	.1907245	-0.27	0.787	-.4254595	.3222842
2009	-.0384174	.1911912	-0.20	0.841	-.413204	.3363692
2010	-.0522553	.1918385	-0.27	0.785	-.4283108	.3238001
2011	-.0999603	.1915557	-0.52	0.602	-.4754615	.2755409
2012	-.0763824	.1915342	-0.40	0.690	-.4518415	.2990766
2013	.070608	.1912458	0.37	0.712	-.3042858	.4455018
2014	-.0660326	.191683	-0.34	0.730	-.4417833	.309718
2015	-.023799	.1917654	-0.12	0.901	-.3997112	.3521132
2016	.2230099	.1946423	1.15	0.252	-.1585419	.6045617
2017	.1692325	.1951516	0.87	0.386	-.2133175	.5517826
2018	-.0834162	.1989841	-0.42	0.675	-.4734791	.3066467
2019	-.0291533	.2002236	-0.15	0.884	-.4216459	.3633393
2020	-.0182127	.2022034	-0.09	0.928	-.4145862	.3781609
2021	-.0232547	.2026608	-0.11	0.909	-.4205249	.3740154
_cons	1.435913	.1503571	9.55	0.000	1.141172	1.730654

As the total debt scaled by assets increases and the equity scaled by assets increases, return on assets ib decreases over the years.

Table 9. Sales Turnover

. lincom totaldebtscaledbyassets - equityscaledbyassets

(1) totaldebtscaledbyassets - equityscaledbyassets = 0

salesturnover	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
(1)	-.0100507	.0009588	-10.48	0.000	-.0119302	-.0081712

. reg salesturnover totaldebtscaledbyassets equityscaledbyassets i.fyear

Source	SS	df	MS	Number of obs	=	7,741
Model	64.5059843	26	2.48099939	F(26, 7714)	=	21.16
Residual	904.251605	7,714	.117222142	Prob > F	=	0.0000
				R-squared	=	0.0666
				Adj R-squared	=	0.0634
Total	968.757589	7,740	.125162479	Root MSE	=	.34238

salesturnover	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
totaldebtscaledbyassets	-.1531968	.0149418	-10.25	0.000	-.1824868	-.1239069
equityscaledbyassets	-.1431461	.0140208	-10.21	0.000	-.1706308	-.1156615
fyear						
1998	-.0230046	.0265561	-0.87	0.386	-.0750617	.0290526
1999	-.0305471	.0262285	-1.16	0.244	-.0819622	.020868
2000	.0155175	.0266854	0.58	0.561	-.0367932	.0678281
2001	-.0908645	.026435	3.44	0.001	.0390447	.1426842
2002	-.0667379	.0264151	-2.53	0.012	-.1185186	-.0149571
2003	-.0528994	.0264391	-2.00	0.045	-.1047271	-.0010716
2004	-.0405947	.0265179	-1.53	0.126	-.092577	.0113876
2005	-.0299134	.0265404	-1.13	0.260	-.0819397	.0221129
2006	-.031324	.0265994	-1.18	0.239	-.0834661	.020818
2007	-.0480018	.0268112	-1.79	0.073	-.1005591	.0045555
2008	-.0369118	.026834	-1.38	0.169	-.0895136	.0156901
2009	-.1164892	.0268996	-4.33	0.000	-.1692198	-.0637587
2010	-.1193724	.0269907	-4.42	0.000	-.1722815	-.0664634
2011	-.1227592	.0269509	-4.55	0.000	-.1755903	-.0699281
2012	-.1386071	.0269479	-5.14	0.000	-.1914322	-.0857819
2013	-.1245018	.0269073	-4.63	0.000	-.1772474	-.0717561
2014	-.1391455	.0269688	-5.16	0.000	-.1920117	-.0862793
2015	-.1843919	.0269804	-6.83	0.000	-.2372809	-.131503
2016	-.1966469	.0273852	-7.18	0.000	-.2503293	-.1429645
2017	-.1781075	.0274568	-6.49	0.000	-.2319303	-.1242846
2018	-.1763624	.027996	-6.30	0.000	-.2312423	-.1214825
2019	-.1999085	.0281704	-7.10	0.000	-.2551302	-.1446868
2020	-.2447586	.028449	-8.60	0.000	-.3005263	-.1889908
2021	-.221152	.0285133	-7.76	0.000	-.2770459	-.1652582
_cons	.6027772	.0211545	28.49	0.000	.5613087	.6442457

As the total debt scaled by assets increases and the equity scaled by assets increases, sales turnover decreases over the years.

ANALYSIS AND DISCUSSION

The analysis above shows that when comparing debt and equity, debt has a stronger impact on multiple dependent variables, such as sales and return on assets.

Throughout the first six analysis charts, current and long-term debt consistently increased as the dependent variables decreased. Debt reduction represents the reduction in obligations through cash payments or conversion of convertible securities to the company's common stock together with the payments for costs necessary to originally make the loan, such as issuance costs.

When looking at the last three charts, the comparison between debt and equity shows that debt has a strong negative effect on the dependent performance variables. While equity has a smaller negative effect on the variables related to business performance. This demonstrates that having more debt is worse for companies' performance in comparison to having more equity.

Debt requires regular repayments, which can hurt the cash flow of a company and hinder its ability to grow. While debt is riskier for a company because of its obligation to pay its debt, equity is riskier for investors because of various factors, such as a company failing.

CONCLUSION

Although prior research has shown that in times of low growth, companies seek to issue equity, the calculations, and analysis done above illustrate that companies tend to lean more toward issuing debt over equity. However, this inclination towards debt over equity comes at the expense of a decline in profitability, relative to cash flow/net worth.

As demonstrated through the charts listed above, as debt increased the various dependent variables impacting business performance decreased. For example, Table 1 shows that as more debt was added, the worse sales were. Table 2 shows that as more current debt was added, return on assets decreased. Additionally, as more long-term debt was added, return on assets decreased.

Despite debt having a greater negative impact on the performance of businesses, the last three tables comparing the effects of debt and equity show that equity also produces negative results. Though the negative effect produced by equity is smaller, this dilemma demonstrates that there isn't an optimal debt structure. The analysis shows that companies may experience a greater negative impact on their business performance when using more debt compared to equity, however, both equity and debt still produced negative effects.

As a result, companies will, ultimately, need to select their debt structure based on what works best for them as neither debt nor equity produces completely positive returns all of the time.

Works Cited

- Commerce Institute. (2023, January 18). *How many new businesses are started each year? (2022 data)*. Commerce Institute. Retrieved from <https://www.commerceinstitute.com/new-businesses-started-every-year/#:~:text=Data%20from%20the%20US%20Census,new%20businesses%20is%20trending%20up.>
- Levy, A. (2014, September 25). *Why start-ups fail*. CNBC. Retrieved from <https://www.cnbc.com/2014/09/25/why-start-ups-fail-cash-runs-out-and-raising-too-much-money.html>
- Krishnamurthy, A., & Vissing-Jorgensen, A. (1970, January 1). *The impact of Treasury supply on financial sector lending and stability*. Journal of Financial Economics. Retrieved from https://econpapers.repec.org/article/eejfinec/v_3a118_3ay_3a2015_3ai_3a3_3ap_3a571-600.htm
- Broner, F. A., Lorenzoni, G., & Schmukler, S. L. (2007, May). *Why do emerging economies borrow short term?* NBER WORKING PAPER SERIES. Retrieved from https://www.nber.org/system/files/working_papers/w13076/w13076.pdf
- Hart, O., & Moore, J. (1995, January 1). *Debt and seniority: An analysis of the role of hard claims in constraining management*. American Economic Review. Retrieved from

https://econpapers.repec.org/article/aeaaecrev/v_3a85_3ay_3a1995_3ai_3a3_3ap_3a567-85.htm

Ganum, P., Chen, S., Liu, L. Q., Martinez, L., & Peria, M. S. M. (2019, February 5). *Debt maturity and the use of short-term debt: Evidence form sovereigns and firms*.

IMF. Retrieved from

<https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2019/02/04/Debt-Maturity-and-the-Use-of-Short-Term-Debt-Evidence-form-Sovereigns-and-Firms-46240>

Brunnermeier, M. K. (2013). *The maturity rat race*. Princeton University. Retrieved from

<https://markus.scholar.princeton.edu/publications/maturity-rat-race>

Martin, J. D., & Scott, D. F. (1974). *A discriminant analysis of the corporate debt-equity decision*. Journal Storage. <https://www.jstor.org/stable/3664932>

Gatchev , V. A., Spindt , P. A., & Tarhan, V. (2008, November 17). *How do firms finance their investments?: The relative importance of equity issuance and debt*

contracting costs. Journal of Corporate Finance. Retrieved from

<https://www.sciencedirect.com/science/article/abs/pii/S0929119908001004>

Hall, B. H. (2002, March 1). *The Financing of Research and Development*. Oxford

Review of Economic Policy. Retrieved from

<https://academic.oup.com/oxrep/article-abstract/18/1/35/353760>

Modigliani, F., & Miller, M. H. (1963). *Corporate Income Taxes and the Cost of Capital:*

A Correction. Scientific Research: An Academic Publisher. Retrieved from

[https://www.scirp.org/\(S\(i43dyn45teexjx455qlt3d2q\)\)/reference/ReferencesPapers.aspx?ReferenceID=1363843](https://www.scirp.org/(S(i43dyn45teexjx455qlt3d2q))/reference/ReferencesPapers.aspx?ReferenceID=1363843)

Shikumo, D. H., Oluoch, O., & Wepukhulu, J. M. (2020). *Effect of Short-Term Debt on Financial Growth of Non-Financial Firms Listed at Nairobi Securities Exchange*. Research Journal of Finance and Accounting. Retrieved from <https://arxiv.org/ftp/arxiv/papers/2011/2011.03339.pdf>

Leary, M. T., & Michael, M. R. (2009, November 10). *The pecking order, debt capacity, and information asymmetry*. Journal of Financial Economics. Retrieved from <https://www.sciencedirect.com/science/article/abs/pii/S03044405X0900230X#:~:text=The%20pecking%20order%20hypothesis%20posited,preference%20ranking%20over%20financing%20sources>.

Myers, S. C., & Majluf, N. S. (1984, June). *Corporate financing and investment decisions when firms have information that investors do not have*. Journal of Financial Economics. <https://www.sciencedirect.com/science/article/abs/pii/03044405X84900230>

Ross, Stephen A., et al. *Essentials of Corporate Finance*. McGraw-Hill Education, 2020.