

Business Conditions and Firms' Financing Decisions

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Abstract

In this study, I examine the impact of business conditions on U.S. firms' financing decisions. I use the newly developed Aruoba-Diebold-Scotti (i.e. ADS) Business Conditions Index to differentiate between above-average and below-average business condition periods and between improving versus worsening business condition periods. Using a comprehensive sample of 2,510 seasoned equity offerings and 12,144 debt offerings, I find that smaller firms with relatively fewer tangible assets tend to go the financial markets when the business conditions are more favorable. This may be due to the difficulties that these smaller firms experience in financial markets during the unfavorable business condition periods. When I use binary logistic regressions to examine the impact of business conditions on the choice between equity and debt, I find that when business conditions are above-average, debt financing is preferred to equity financing. Interestingly, when business conditions are improving, my results show that equity financing is preferred to debt financing.

Keywords: financing choice, capital structure, business conditions, cost of capital

1. Introduction

The previous studies have shown that the macroeconomic environment affects the equity premium (i.e. the excess return to investors from investing in equity rather than in debt instruments). Campbell and Cochrane (1999) have shown that equity premium, as well as all other risk premiums, increases in recessionary periods. Later, Siegel (2005) and Arnott and Bernstein (2002) have confirmed this assertion. When the macroeconomic environment gets worse (i.e. when the economy falls into a recession), the risk premiums (and the equity premium) go up because investors start to demand even higher returns from these riskier investments.

On the other hand, the literature on market timing has linked firms' cost of capital (and equity premium) to the timing of their equity and debt offerings. For equity markets, Baker and Wurgler (2002), Hovakimian (2005), and Alti (2006) have shown that cost of equity capital explains firms' timing behavior regarding their initial and seasoned public offerings (i.e. IPOs and SEOs). For debt markets, Taggart (1977), Marsh (1982), Graham and Harvey (2001), Bancel and Mittoo (2004), and Barry, Mann, Mihov, and Rodriguez (2008) have shown that cost of debt explains the timing of firms' debt offerings (i.e. public debt offerings, private placements, and syndicated loan agreements).

So, the previous research has shown that the macroeconomic environment has a significant impact on equity premium, and equity premium, in turn, explains the timing of firms' equity and debt offerings. Based on these evidences, any study on firms' financing choice should consider (or control for) the state of the economy. When the economy is not doing well, all risk premiums (including the equity premium) go up, therefore issuing risky securities (like stocks) become more costly to the firms. As a result, during these bad times, we would expect firms to lean towards debt financing instead of equity financing. Interestingly, none of the studies on firms' financing choice examines the impact of the macroeconomic environment on the financing decision. Elliott, Koeter-Kant, and Warr (2007) has shown that firms which are overvalued relative to previous years fund a greater proportion of their financing deficit with equity rather than debt. They argue that equity overvaluation lowers the cost of equity capital relative to the cost of debt capital; therefore firms that are overvalued in the stock market tend to take advantage of this situation by using more equity financing compared to debt financing to fund their deficit. However, as mentioned above, they have not controlled for the macroeconomic environment.

Elliott, Koeter-Kant, and Warr (2008) examine the public equity vs. public and private debt issuance decision while controlling for the static trade off and the pecking order theories. They find that, while overvalued firms are more likely to issue equity, those that are fairly valued or undervalued tend to issue debt. Again, this study has ignored the status of the economy.

Huang and Ritter (2009) examine the choice between equity and public debt. They use several different measures as a proxy for the relative cost of equity (i.e. the beginning-of-year implied equity risk premium, lagged values of the average first-day return of IPOs, average closed-end fund discount, lagged realized market returns, and past and future realizations of the Fama-French SMB and HML factors). They find that the measures that they use for the relative cost of equity explain firms' choice between equity financing and public debt financing. When the relative cost of equity (compared to the cost of debt) is low, firms tend to issue equity rather than debt. Again, as mentioned above, this is another study on firms' financing choice that has ignored the macroeconomic environment.

My objective in this current study is to complement the previous literature by testing for the impact of the macroeconomic environment on U.S. firms' financing choice. I use the Aruoba-Diebold-Scotti (i.e. ADS) Index to measure the health of the macroeconomic environment. The ADS Index is a continuous index that tracks real business conditions at high frequency. It tracks economic indicators like weekly initial jobless claims, monthly payroll employment, industrial production, personal income less transfer payments, manufacturing and trade sales, and quarterly real GDP in real time, and it is now being used by researchers to compare business conditions at different times. The daily values of the index are posted on Philadelphia Fed's website (<http://www.philadelphiafed.org/research-and-data/real-time-center/business-conditions-index>).

The remainder of the paper is organized as follows: Section 2 states the hypotheses that are being tested. Sections 3 and 4 describe the data and the methodology, respectively. The empirical results are presented in Section 5. Section 6 concludes.

2. Hypotheses

In this study, first I differentiate between "above-average" and "below-average" business condition periods (as defined by the Federal Reserve Bank of Philadelphia), and then between improving (i.e. the ADS Index has gone up compared to the previous quarter) and worsening (i.e. the ADS Index has gone down compared to the previous quarter) business condition periods. After doing these two classifications, I examine the impact of "above-average" business conditions as well as "improving" business conditions on firms' financing decisions.

Since funds are limited in the capital markets in periods of deteriorating business conditions, I expect smaller, less established firms (that tend to have fewer tangible assets) to go to the capital markets when business conditions are relatively more favorable. Hence, my hypotheses of interest in the first part of the study are as follows:

Hypothesis 1a: Relatively smaller firms (with fewer tangible assets) go to the capital markets during above-average business condition periods compared to the firms that finance during below-average business condition periods.

Hypothesis 1b: Relatively smaller firms (with fewer tangible assets) go to the capital markets during improving business condition periods compared to the firms that finance during worsening business condition periods.

Then, I examine the impact of business conditions on the choice between equity and debt. As we know, the Pecking-order Theory states that, due to its high cost, equity financing is used only as a last resort. Since more capital will be available (and at better terms) to these firms during "above-average" business condition periods, I expect firms to follow the pecking-order and prefer debt financing over equity financing during these periods. Hence, my hypothesis of interest is:

Hypothesis 2a: Firms prefer debt financing over equity financing in periods of above-average business conditions.

My expectation regarding the relation between the improving/worsening business conditions and the debt-equity choice is different.

Since improving business conditions generally present new investment opportunities with large capital requirements to the firms, and since equity offerings are, on average, much larger than debt offerings (in my sample, while the median proceeds scaled by assets for SEOs is 0.35, the corresponding numbers are 0.02, 0.05, and 0.16 for public debt offerings, private placements, and syndicated loans, respectively), I expect my sample firms to prefer equity financing over debt financing when business conditions are improving. Therefore, my hypothesis of interest here is:

Hypothesis 2b: Firms prefer equity financing over debt financing in periods of improving business conditions.

3. Data

First, I have downloaded all data on seasoned equity offerings, public debt offerings, private placements, and syndicated bank loan agreements from the Securities Data Company (SDC) New Issues Database for the 1984-2004 period, and then matched them with the corresponding accounting data from Compustat. I strongly believe that studies that focus on managerial decisions like this one should use quarterly data rather than annual data, so in this study, I use quarterly accounting data from Compustat. After excluding the financial firms, small firms (i.e. firms with book values of assets below \$10 million in 2004 dollars), the subsidiary firms, the unit offers, and the outliers (i.e. market-to-book ratio greater than 10, leverage ratio greater than 1, earnings before interest, taxes, and depreciation scaled by assets greater than 1), I have 2,510 SEOs, and 12,144 total debt transactions in my final sample. Out of these debt transactions, 3,077 are public debt offerings, 2,164 are private placements or 144a issues, and 6,903 are syndicated bank loan agreements. I have used the Federal Reserve Bank of Philadelphia's website to access the data series on the Aruoba-Diebold-Scotti Business Conditions Index.

The characteristics of the equity and debt issuers in my final sample are shown in Table 1. The last column shows the results of the Wilcoxon two-sample test that compares the two groups' characteristics. As we can see from the table, the equity (i.e. SEO) issuers are smaller firms (p-value<0.0001) with fewer tangible assets (p-value<0.0001) compared to the debt issuers. They also are less levered compared to the borrowers (p-value<0.0001). On the other hand, they are more profitable than the borrowers (p-value=0.0072) and their market-to-book (i.e. M/B) ratios are significantly higher compared to the borrowers (p-value<0.0001).

4. Methodology

First, I compare the characteristics of firms that went to the market during favorable (i.e. above-average) business condition periods, and firms that went to the market during unfavorable (i.e. below-average) business condition periods. The Federal Reserve Bank of Philadelphia calculates the index each day and classifies each day as either above-average or below-average. In this paper, I use their classification. I do two separate analyses: one for the SEO firms and one for the debt issuers. To make the comparisons, I use the Wilcoxon two-sample test.

Then, I create a new dummy variable called "Improving" which is equal to one if the ADS Business Conditions Index had gone up compared to the last quarter, and equal to zero if the index had gone down compared to the last quarter. Here, I am looking at the trend in the index. Improving conditions may have a positive psychological effect on both the issuers and the investors, while worsening conditions may have a negative impact on all participants. Then, I compare the characteristics of firms that went to the market during "Improving" business condition periods, and firms that went to the market during "Worsening" business condition periods. Again, I use the Wilcoxon two-sample test to make the comparisons.

After the nonparametric tests, I run binary logistic regressions to see the impact of business conditions at the time of the transaction on the financing choice of my sample firms. Here, I try to see the impact of business conditions on firms' choice between equity and debt. In the rare case of more than one type of financing activity for a firm in a given quarter, I drop that firm's observations from my sample. In other words, I assume no financing activity for that firm in that quarter.

In both binary logistic regressions, I compare the probability of an equity issue versus a debt issue (that includes the public debt offerings as well as the private placements and the syndicated loans). But, in the first regression, I control for firm characteristics like size, M/B, leverage, profitability, and tangibility, and test for the impact of "Above-average" business conditions on the choice between equity and debt.

In the second regression, I control for the same variables and test for the impact of “Improving” business conditions on the choice between equity and debt. So, in model 1, my main explanatory variable is the “Above-average” dummy variable, and in model 2, it is the “Improving” dummy variable.

The empirical model for the first binary logistic regression is:

$$\begin{aligned} Issue_Type = c_0 + c_1 Above_Average + c_2 (M/B)_{t-1} + c_3 Profitability_{t-1} + c_4 Size_{t-1} \\ + c_5 Tangibility_{t-1} + c_6 Leverage_{t-1} + \varepsilon_t \end{aligned} \quad (1)$$

Here, I try to see if the level of business conditions (above-average or below-average) at the time of the transaction have an impact on firms’ debt-equity choice after controlling for firm characteristics like size, M/B, pre-issue leverage, profitability, and tangibility.

The empirical model for the second binary logistic regression is:

$$\begin{aligned} Issue_Type = c_0 + c_1 Improving + c_2 (M/B)_{t-1} + c_3 Profitability_{t-1} + c_4 Size_{t-1} \\ + c_5 Tangibility_{t-1} + c_6 Leverage_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

Here, I try to see if the trend in the business conditions (improving or worsening) at the time of the transaction have an impact on firms’ financing choice after controlling for firm characteristics like size, M/B, pre-issue leverage, profitability, and tangibility.

5. Empirical Results

Table 2 compares the characteristics of firms that went to the equity or debt markets when business conditions are “above-average” to the characteristics of firms that financed when business conditions are “below-average”. Likewise, Table 3 compares the firms that went to the equity or debt markets when business conditions are “improving” to the firms that financed when business conditions are “worsening”.

Table 2-Panel A shows that equity issuers that financed when business conditions are “above-average” have fewer tangible assets (p-value=0.0859) compared to the firms that went to the market when conditions are “below-average”. They don’t have as much debt as the other firms (p-value=0.0739), and they are more profitable than the other firms (p-value<0.0001). They also have higher M/B ratios compared to the other firms (p-value=0.0227).

Panel B shows that borrowers that financed when business conditions are “above-average” are smaller firms (p-value<0.0001) with fewer tangible assets (p-value=0.0174) compared to the other firms. They don’t have as much debt as the other firms (p-value<0.0001), and they are more profitable than the other firms (p-value=0.0014). They also have higher M/B ratios compared to the other firms (p-value<0.0001).

The results in Table 2 are consistent with my expectations. Generally, smaller firms with fewer tangible assets tend to wait until the conditions are more favorable. These firms are younger and more profitable firms with higher valuations (i.e. M/B ratios), and they don’t have as much leverage as the other, more established firms.

Table 3-Panel A shows that equity issuers that financed when business conditions are “improving”, are smaller (p-value=0.0001) and more profitable firms (p-value=0.0003) compared to the firms that went to the market when conditions are “worsening”.

Panel B shows that borrowers that financed when business conditions are “improving” are smaller (p-value=0.0101) and more profitable firms (p-value=0.0002) compared to the firms that borrowed when conditions are “worsening”. They are also less levered (p-value=0.0024) compared to the other firms.

As we know, the Pecking-Order Theory states that firms’ financing choice depends on the relative cost of each method of financing. Firms prefer to use internal funds first since it is the cheapest form of financing. When internal funds are inadequate, they prefer debt financing. Equity financing is used only as a last resort.

When business conditions are “above-average”, firms either use their internal funds (which would be plenty since the economy is doing fine) or go to the debt markets (which have enough potential investors during these good times). Therefore, firms tend to avoid issuing equity during these good times and prefer debt financing over equity financing as long as they can finance in the debt markets.

My sample also indicates that equity offerings are generally much larger transactions compared to debt transactions. While the median proceeds scaled by assets for SEOs is 0.35, the corresponding numbers are 0.02, 0.05, and 0.16 for public debt offerings, private placements, and syndicated loans, respectively. When business conditions are “above-average”, firms would do better financially, and as a result, they would not need large funds through equity offerings. They would be satisfied with relatively less risky and smaller sized debt transactions.

Columns (3) and (4) show the results of the second regression where the impact of “improving” business conditions on the financing choice is examined (equation (2)). Here, again, the dependent variable “Issue_Type” is equal to one if it is an equity issue, and equal to zero if it is a debt transaction. As we can see from columns (3) and (4), the coefficient for the “Improving” variable is 0.12 and it is significant (p -value=0.02). This result indicates that firms tend to choose equity over debt when business conditions are “improving”. I believe that everything depends on where the firms are in the business cycle. If the conditions have just started improving but still unfavorable (i.e. below-average), it would be a different story. But if the conditions are improving and at the same time favorable (i.e. above-average), it would be a different story. Also, the results here may be driven by one of the three debt markets, rather than all three debt markets. In fact, in Table 9, I show that the results here are driven by one of the three debt markets.

6. Conclusion

In this study, I examine the impact of business conditions on U.S. firms’ debt financing versus equity financing decisions. I use the newly developed Aruoba-Diebold-Scotti (i.e. ADS) Business Conditions Index to differentiate between above-average and below-average business condition periods and between improving versus worsening business condition periods.

When I differentiate between above-average and below-average business condition periods using the daily values of the ADS Index published by the Federal Reserve Bank of Philadelphia, I find that smaller firms with relatively fewer tangible assets tend to wait until the business conditions are more favorable. This may be due to the difficulties that these smaller firms experience in financial markets during the unfavorable business condition periods. The results also indicate that these small firms are relatively profitable firms with high valuations. They also do not have as much debt as the other firms in the sample.

When I differentiate between improving (i.e. the ADS Index has gone up compared to the previous quarter) versus worsening (i.e. the ADS Index has gone down compared to the previous quarter) business condition periods, I find that smaller and more profitable firms tend to finance in improving business condition periods.

After that, I run binary logistic regressions to examine the impact of business conditions on the choice between equity and debt. I find that when business conditions are above-average, debt financing is preferred to equity financing. Interestingly, when business conditions are improving, I find that equity financing is preferred to debt financing.

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Table 1. Summary Statistics for Equity and Debt Offerings

Variable	Equity			Debt			Wilcoxon
	Median	Mean	St.D.	Median	Mean	St.D.	p-value
M/B	1.61	2.37	2.10	0.75	1.06	1.05	<0.0001
Profitability	0.26	0.29	0.21	0.24	0.27	0.17	0.0072
Size	3.55	3.60	1.96	5.70	5.65	1.95	<0.0001
Tangibility	0.28	0.36	0.27	0.38	0.42	0.25	<0.0001
Leverage	0.27	0.28	0.22	0.33	0.34	0.17	<0.0001
Observations	2,510			12,144			

Notes: “Equity” includes seasoned equity offerings and “Debt” includes public debt offerings, private placements/144a issues, and syndicated bank loan agreements. Size is the natural logarithm of sales (Item 2). Tangibility is measured as net property, plant, and equipment (Item 42)/total assets (Item 44). Profitability is EBITDA (Item 21)/total assets (Item 44). The market-to-book ratio is the (total assets – book value of equity + market value of equity)/total assets. Leverage is long-term debt (Item 51) + short-term debt (Item 45)/total assets. All variables are measured at the end of the previous quarter (t-1).

Table 2. Financing Activities in Above-Average versus Below-Average Business Condition Periods

Panel A – Equity Offerings							
Variable	Above-Average Conditions			Below-Average Conditions			Wilcoxon
	Median	Mean	St.D.	Median	Mean	St.D.	p-value
M/B	1.66	2.44	2.13	1.55	2.27	2.05	0.0227
Profitability	0.27	0.31	0.21	0.24	0.27	0.20	<0.0001
Size	3.50	3.54	1.90	3.61	3.68	2.05	0.1374
Tangibility	0.28	0.35	0.26	0.28	0.37	0.28	0.0859
Leverage	0.26	0.27	0.22	0.29	0.28	0.21	0.0739
Observations	1476			1034			
Panel B –Debt Offerings							
Variable	Above-Average Conditions			Below-Average Conditions			Wilcoxon
	Median	Mean	St.D.	Median	Mean	St.D.	p-value
M/B	0.80	1.12	1.06	0.65	0.97	1.03	<0.0001
Profitability	0.25	0.28	0.17	0.24	0.26	0.17	0.0014
Size	5.53	5.51	1.99	5.92	5.86	1.87	<0.0001
Tangibility	0.37	0.42	0.25	0.39	0.43	0.25	0.0174
Leverage	0.33	0.34	0.18	0.34	0.35	0.17	<0.0001
Observations	7528			4616			

Notes: All financing activities in each market are allocated into two subgroups: (1) all activities that are completed in periods of above-average business conditions, and (2) all activities that are completed in periods of below-average business conditions. In order to compare the two groups’ characteristics, the Mann-Whitney-Wilcoxon test is performed. The last column shows the p-values.

Table 3. Financing Activities in Improving versus Worsening Business Condition Periods

Panel A – Equity Offerings							
Variable	Improving Conditions			Worsening Conditions			Wilcoxon
	Median	Mean	St.D.	Median	Mean	St.D.	p-value
M/B	1.62	2.37	2.05	1.59	2.37	2.15	0.3001
Profitability	0.28	0.31	0.21	0.24	0.28	0.20	0.0003
Size	3.41	3.46	1.84	3.70	3.75	2.06	0.0001
Tangibility	0.28	0.35	0.26	0.28	0.36	0.28	0.5423
Leverage	0.27	0.27	0.22	0.27	0.28	0.22	0.2661
Observations	1252			1258			
Panel B –Debt Offerings							
Variable	Improving Conditions			Worsening Conditions			Wilcoxon
	Median	Mean	St.D.	Median	Mean	St.D.	p-value
M/B	0.76	1.06	1.01	0.74	1.07	1.08	0.1579
Profitability	0.25	0.28	0.18	0.24	0.27	0.17	0.0002
Size	5.67	5.58	2.01	5.73	5.70	1.90	0.0101
Tangibility	0.38	0.43	0.25	0.37	0.42	0.25	0.4929
Leverage	0.33	0.33	0.17	0.34	0.34	0.18	0.0024
Observations	5453			6691			

Notes: All financing activities in each market are allocated into two subgroups: (1) all activities that are completed in periods of improving business conditions, and (2) all activities that are completed in periods of worsening business conditions. In order to compare the two groups' characteristics, the Mann-Whitney-Wilcoxon test is performed. The last column shows the p-values.

Table 4. Binary Logistic Regressions Predicting Source of Financing - Equity vs. Debt

Column number	above-average vs. below-average business conditions		Column number	improving vs. worsening business conditions	
	(1)	(2)		(3)	(4)
Independent variable	Coefficient	p-value	Independent variable	Coefficient	p-value
Intercept	-0.31	(0.01)	Intercept	-0.61	(0.00)
Above-Average	-0.36	(0.00)	Improving	0.12	(0.02)
M/B	0.41	(0.00)	M/B	0.41	(0.00)
Profitability	0.73	(0.00)	Profitability	0.68	(0.00)
Size	-0.44	(0.00)	Size	-0.43	(0.00)
Tangibility	0.26	(0.01)	Tangibility	0.26	(0.01)
Leverage	0.22	(0.11)	Leverage	0.23	(0.10)
LR Chi-Square	2729.95	(0.00)	LR Chi-Square	2687.12	(0.00)
N	14654		N	14654	

Notes: Columns (1) and (2) in the table reports the coefficients of regressions of the form

$$\text{Issue_Type} = c_0 + c_1(\text{Above-Average}) + c_2(\text{M/B})_{t-1} + c_3(\text{Profitability})_{t-1} + c_4(\text{Size})_{t-1} + c_5(\text{Tangibility})_{t-1} + c_6(\text{Leverage})_{t-1} + \varepsilon_t$$

The binary logistic regressions compare the probability of equity financing to the probability of debt financing. The dependent variable is equal to one if it is an equity issue and equal to zero if it is a debt offering. "Above-Average" is an indicator variable, equal to one if the ADS Business Conditions Index is above its historical average, zero otherwise. All other variables are as defined in the previous tables. All variables are measured at the end of the previous quarter (t-1). Coefficients are reported with p-values in parentheses. In columns (3) and (4), the explanatory variable "Above-Average" is replaced by the variable "Improving". "Improving" is an indicator variable, equal to one if the ADS Business Conditions Index is improving (i.e. going up), zero otherwise.