Economics Bulletin

Volume 31, Issue 2

Timing of debt issues: Evidence from a panel of Tunisian and French firms

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Abstract

Recent literature argues that market timing becomes the factor that shapes financing policies. However, empirical studies on debt market timing still less numerous than those on equity market timing. This paper seeks to investigate the relevance of market timing considerations on debt issues using a panel of Tunisian and French listed firms. We have documented that net debt issuance is a decrease function of the market monetary rate. Moreover, our findings reveals that Tunisian firms succeed to raise their values by issuing debt when they expect that interest rates will increase. By contrast, french firms fail to reduce their overall cost of capital.

Citation: Khemaies Bougatef and Jameleddine Chichti, (2011) "Timing of debt issues: Evidence from a panel of Tunisian and French firms", *Economics Bulletin*, Vol. 31 no.2 pp. 1188-1197.
Submitted: Jan 10 2011. **Published:** April 17, 2011.

1. Introduction

Recently, the market timing approach has challenged previous theories by suggesting that debt issuing depends on credit market conditions. Debt market timing consists in issuing debt when the borrowing cost is occasionally low. The market timing theory emphasizes the mangers' ability to time the market in order to borrow cheaply. Several studies make evidence that market timing becomes the factor that shapes financing policies. However, debt market timing still less developed compared to equity market timing. In this paper we attempt to fill this gap by investigating the determinants of the debt issues of Tunisian and French firms. This study makes two main contributions to the literature. Our first contribution is to extend the investigation of the impact of market timing considerations on the amount of debt issues to two bank-based systems. Previous studies are almost reserved to U.S firms and other market-based systems. Our second contribution is to explore the impact of debt market timing attempts on the firm's valuing. As far as we know, this study is the first which explores the implications of market timing on debt issues using a panel of Tunisian and French firms. Overall, our results are consistent with the market timing theory. We find that Tunisian and French firms tend to issue debt when interest rates are low and they prefer equity issuance when they perceive equity market conditions as more favorable. More interestingly, we document a positive impact of this market timing behavior on stock prices of tunisian firms.

The rest of the paper is structured as follows. Section 2 reviews the literature on the debt market timing story. Section 3 provides a description of the data used in the empirical analysis and presents estimation results of the determinants of debt issues. Section 4 investigates the horizon of market timing. Section 5 testes the impact of debt market timing attempts on firm's valuing. Section 6 concludes.

2. Debt issuance: Overview of the literature

Faulkender (2005) investigates whether firms use interest rate swaps for a purpose of hedging or to time the market in order to reduce their cost of capital. He argues that managers strongly believe in their ability to time their borrowing. Managers buy swaps which amplify the exposure of their firms to the interest rate risk and not for the purpose of hedging. Similarly, Antoniou, Zhao, and Zhou (2009) find that corporate debt issuances are mainly driven by market timing considerations. Barry, Mann, Mihov, and Rodriguez (2009) investigate the relationship between interest rate fluctuations and issues of floating and fixed rate debt. They find that debt issuance depends on past and future interest rate. However, they find no evidence for the managers' ability to time the market. Graham and Harvey (2001) find that the interest rate is the most important factor considered in borrowings. Their survey provide evidence that CFOs attempt to time the interest rates by issuing debt when they feel that the market interest rates are occasionally low. Marsh (1982) examines the debt-equity choice in a sample of the U.K firms. He finds that this choice is determined by the level of the interest rate.

3. Determinants of debt issuance

To form our main Tunisian sample, we start with all listed firms appearing at any point between 2000 and 2008. We restrict the sample to exclude financial firms. The final sample covers 30 publicly traded Tunisian firms. The French sample consists in 100 non-financial French firms of the Paris stock market index SBF 120. Tunisian data were collected from Tunis Stock Exchange. French data were obtained form the database COFISEM and completed from firms' web sites.

3.1. Definition and measurement of the variables

Net debt issues d is the change in book debt reported to total assets. Book debt is defined as total liabilities. Market-to-book ratio MTB is defined as book debt plus market value of equity divided by total assets. Market capitalization is defined as shares outstanding times price. $MARKET$ reflects the performance of stock market and is defined as annual growth rate of the index *TUNINDEX* for Tunisia and *CAC40* for France. Profitability $PROF$ is earnings before interests and tax $(EBIT)$ reported to total assets. $INTEREST$ represents the money market annual average rate for Tunisia and the annual average of *EONIA* for France. The inflation rate is defined as the percentage rate of change in consumer price index.

3.2. Descriptive statistics

Table 1 reports the descriptive statistics for the dependant and explanatory variables. Considerable insight can be obtained by comparing the average debt issuance in the two samples. In doing so, we note that Tunisian firms issue on average more debts than French firms in spite of the higher level of the money market annual average rate for Tunisia compared to the annual average of *EONIA* for France. This evidence indicates that French firms rely more on equity market if they seek external finance. Indeed, the rate *EONIA* varies between 2.04% and 4.85% for France against the Tunisian money market rate which varies between 5% and 5.94%, i.e. the minimum of the rate of the Tunisian money market exceeds the maximum of rate *EONIA*. The higher level of the Tunisian money market rate can be explained by the higher level of inflation rate. The consumer index rate in Tunisia goes up more speedily.

The average annual growth rate of the index *CAC40* is negative. This bearish trend is a result of the exposure of the Euronext Paris to financial crisis. By contrast, Tunis Stock Exchange seems to be less affected by the recent subprime crisis since *TUNINDEX* has increased with an annual average of 10% from 2000 to 2008 while CAC40 has decreased by 7% for the same period.

Tunisian and French firms have average market-to-book ratios greater than 1. This indicates that market values of Tunisian and French companies are on average higher than their book values. In the market timing framework, a high market-to-book ratio persuades the firm to issue new shares. Nevertheless, this ratio is often considered as an indicator of growth opportunities and a high level of this ratio reflects the existence of growth options. The market-to-book ratio is higher in France than in Tunisia. Indeed, it is equal on average to 1.62 in France against 1.39 in Tunisia. This suggests that it is more judicious to employ this ratio as an indicator of overvaluation than a proxy of growth opportunities since the French firms belonging to the index SBF120 are larger than Tunisian firms. If this ratio reflects growth options, Tunisian firms would have higher average market-to-book ratios.

Table 1
Descriptive statistics

	Tunisia (30 firms)					*France (100 firms)*				
Statistics	*d*	*Interest*	*Inflation*	*MTB*	*Market*	*d*	*Interest*	*Inflation*	*MTB*	*Market*
Mean	0.04	0.0531	0.0334	1.39	0.10	0.03	0. 0294	0.0193	1.62	-0.07
Median	0.02	0.0526	0.0310	1.14	0.11	0.03	0. 0309	0.0180	1.29	0.01
Maximum	0.66	0.0594	0.0500	4.33	0.37	0.58	0. 0485	0.0280	9.09	0.21
Minimum	-0.53	0.0500	0.0200	0.28	-0.13	-0.61	0. 0204	0.0149	0.62	-0.56
Std. Dev.	0.14	0.0035	0.0098	0.72	0.15	0.12	0. 0068	0.0047	1.04	0.29
Observations	189	189	189	189	189	492	9	9	492	9

Table 2 reports the correlations matrix for explanatory variables. The coefficients of correlation of explanatory variables are generally low. Using a test of Farrar-Glauber (1967), we can accept the hypothesis of the absence of multicollinearity among our independent variables.

Table 2
Correlation matrix for explanatory variables

	Tunisia (30 firms)				*France (100 firms)*			
Variables	*Interest*	*Inflation*	*MTB*	*Market*	*Interest*	*Inflation*	*MTB*	*Market*
Interest	1				1			
Inflation	-0.1425	1			-0.5406	1		
MTB	0.0805	0.0267	1		0.1616	-0.1957	1	
Market	-0.4799	0.2712	0.0920	1	-0.0348	-0.5525	0.1567	1

3.3. Estimation results

In the first part of this paper, we run the following regression where we assume that net debt issues is a linear function of interest level, inflation rate, market-to-book ratio, and stock exchange performance.

$$d_{it} = \alpha_i + \beta_1 INETREST_t + \beta_2 INFLATION_t + \beta_3 MTB_{it} + \beta_4 MARKET_t \quad (1)$$

Table 3 reports regression results for the model connecting debt issuance to two first variables which reflect debt market conditions and two other variables which reflect equity market conditions. We provide fixed effects and Pooled OLS results. Both test of Fisher and Chi-square confirm that the estimator Pooled is the proper one.

Table 3
Determinants of debt issues

	Tunisia		*France*	
Variables	*Pooled*	*Fixed effects*	*Pooled*	*Fixed effects*
Intercept	0.0157***	0.3184**	0.0189	0.0756
	(2.61)	(2.22)	(0.45)	(0.86)
Interest	-2.8706***	-6.3272**	-0.6168*	-0.1523
	(-3.01)	(-2.07)	(-1.90)	(-0.59)
Inflation	1.005***	2.1361**	1.4962	2.5052*
	(3.59)	(1.98)	(1.23)	(1.93)
MTB	-0.005*	0.0067	-0.0029*	-0.0044
	(-1.7)	(0.34)	(-1.72)	(-1.53)
Market	-0.1449***	-0.2722***	-0.0375*	-0.0592*
	(-8.77)	(-3.18)	(-1.79)	(-1.89)
R square	0.0817	0.2405	0.2139	0.2345
$p - Fisher$	0.0082	0.0642	0.2075	0.2079
$p - Chi - Square$		0.1260	0.0000	0.1511
Observations	189	189	492	492
Cross-section	30	30	100	100

***significant at 1% level, **significant at 5% level, *significant at 10% level,
Note: The values parentheses in are t-statistics

Overall, our empirical results strongly support the market timing theory which predicts the existence of a significant correlation between market conditions and debt issuance. Indeed, the two variables reflecting equity market conditions have the expected and significant signs. The market-to-book ratio has a negative impact on debt issues. This result suggests that

Tunisian and French firms tend to raise external equity when their market values are relatively higher than their book values. The plausible explanation of this behaviour is that these firms perceive their shares as overpriced and they attempt to draw advantages from this misevaluation by issuing more equity and use proceeds to pay down debts.

The variable *MARKET* which measures the performance of the stock market (index *TUNINDEX* for Tunisia and *CAC40* for France) dissuades debt issuance. This evidence indicates that an improvement of stock market persuades Tunisian and French firm to issue new shares against debts. Debts repaid will not be renewed if the conditions of the stock market are more "fascinating" than the credit market. This result provides strong support to the market timing theory which assumes that firms reduce their indebtedness if they perceive that equity market conditions are relatively more favorable. It suggests that Tunisian and French firms consider favourable conditions of the equity market as a “window of opportunity” and attempt to draw advantage from this occasion by issuing new shares against borrowing from banks. However, we note that the coefficient of this variable is relatively weak for France. An improvement of the *CAC40* by 100% will be followed by a decrease of debt issues of French firms by only 3.75%.

We find also that an increase in inflation rate will be followed by an increase of issued debts. But, the most interesting result is the negative and significant impact of the variable *INTEREST* on debt issuance. This evidence suggests that Tunisian and French firms attempt to prefer equity financing and postpone debt issuance when they perceive that credit market conditions are unfavourable. However, we should determine whether debt issuance depends on historical or future rates in order to know whether firms are real market timers.

4. Horizon of market timing

Recent studies that have focused on the investigation of the determinants of the debt issuance have highlighted the market timing behavior of managers. Managers tend to issue debt when current interest rates are relatively lower than historical rates (backward market timing) or when they expect an increase of future interest rates (forward market timing). Baker, Greenwood, and Wurgler (2003) emphasize the ability of managers to perfectly predict fluctuations of interest rates and implement a market timing strategy in order to reduce their borrowing costs. By contrast, Butler, Grullon, and Weston (2006) argue that market timing defended by Baker, Greenwood, and Wurgler (2003) is illusory since managers react (and do not expect) to the increase of the cost of long-term debt by issuing short-term debt. Baker, Taliaferro, and Wurgler (2006) response that the excess of bond yields cannot be explained solely by the pseudo market timing. Barry, Mann, Mihov, and Rodriguez (2009) tested the ability of managers to predict the market trend and show that they are issuing more debt when interest rates are lower than historical rates, which means a market timing turned to the past and not to the future.

In this paper, we attempt to determine the horizon of market timing by testing the relationship between the debt issues and historical and future interest rates. For this reason, we estimate the two following models:

Model 1. Backward market timing

$$d_{it} = \alpha_i + \beta_1 \Delta INTEREST_{t-1} + \beta_2 INFLATION_t + \beta_3 MTB_{it} + \beta_4 MARKET_t + \varepsilon_{it} \quad (2)$$

Where $\Delta INTEREST_{t-1}$ is the difference between money market rate at the year t and the year $t-1$

Model 2. Forward market timing

$$d_{it} = \alpha_i + \beta_1 \Delta INTEREST_{t+1} + \beta_2 INFLATION_t + \beta_3 MTB_{it} + \beta_4 MARKET_t + \varepsilon_{it} \quad (3)$$

Where $\Delta INTEREST_{t+1}$ is the difference between money market rate at the year t and the year $t+1$

Only results regarding the coefficient of this variable are reported in tables 4 and 5[1]. The two statistics of Fisher and Chi-square confirm that the constants are assumed to be homogeneous and therefore the Pooled estimator is the proper one.

Table 4 shows that the debt issuance depends negatively on historical interest rates. Tunisian and French firms tend to reduce their debt when current interest rate is higher than the rate of the previous year. However, the variable measuring the retrospective effect of market timing is not significant in the two samples.

Table 4
Backward market timing

	Tunisia (30 firms)		*France (100 firms)*	
	Pooled	*Fixed effects*	*Pooled*	*Fixed effects*
ΔTMM_{it-1}	-3.14	-3.88	-0.8824	-0.2302
	(-1.29)	(-1.44)	(-1.46)	(-0.24)
R square	0.0500	0.18	0.1607	0.2355
$p-Fisher$		0.71	0.1538	0. 1789
$p-Chi-Square$		0.55		0. 0514
Observations	188	188	492	492

Note: The values parentheses in are t-statistics

Table 5 shows a significance of future interest rate. This result suggests that Tunisian and French firms tend to issue more debt when they expect an increase of the interest rate. This result represents a strong support to the forward market timing.

Table 5
Forward market timing

	Tunisia (30 firms)		*France (100 firms)*	
	Pooled	*Fixed effects*	*Pooled*	*Fixed effects*
ΔTMM_{it+1}	0.40***	0.41***	1.9985***	1.5753*
	(3.54)	(4.7)	(3.88)	(1.63)
R square	0.0544	0.2642	0.1193	0.2903
$p-Fisher$	0.0624	0.0699	0.1103	0.0457
$p-Chi-Square$		0.1199	0.0000	0.0506
Observations	164	164	395	395

*** significant at 1% level, * significant at 10% level,
Note: The values parentheses in are t-statistics

5. Impact of market timing on firm's value

In an efficient, integrated, and perfect capital market, Modigliani and Miller (1958) show that there is no advantage to be drawn from the switching between equity and debts. There is only

[1] Other results are available upon request.

one possibility to reduce the cost of debt is to increase the risk for shareholders and therefore increase the cost of equity. However, in a segmented capital market, firms can reduce their borrowing cost without changing the cost of equity. A successful debt market timing strategy implies that the credit market and the equity market are not perfectly integrated. Titman (2002) shows that testing the success of market timing strategies is to test the efficiency of the market and intuitively deduce why the market inefficiency can be exploited only by corporate managers. Titman argues that this inefficiency can be exploited only by the managers if they are better informed than investors about future fluctuations of interest rates. However, he affirms that it is difficult to test if managers can reduce the overall cost of capital via the implementation of a market timing strategy. Song (2009) finds that there is no significant difference between the value of timers and non-timers. He concludes that market timers fail to reduce the overall cost of capital and he explains this failure by the fact that if the timing strategies are profitable and if the market can distinguish between timers and non-timers. As a consequence, the timers should have higher market values than non-timers even before market timing strategies are implemented.

5.1. The determinants of the firm's market value

The market value of a firm equals the sum of the value of market capitalization and book debts. Market capitalization equals the number of shares outstanding times price. In this paper, we assume that the evolution of stock prices can be explained by variables specific to the firm such as profitability, by macroeconomic variables such as interest rates and inflation, and a variable which reflects the stock market performance.

Profitability

According to the model of Gordon and Shapiro (1956), the current stock price equals the present value of its future dividends. Gordon and Shapiro assume that the dividend is a constant fraction of the profits carried out by the company. Therefore, an improvement in profitability leads to an increase in stock price. Tsoukalas and Sil (1999) find a strong correlation between the stock prices and dividends paid by U.K firms.

Inflation

The impact of inflation on the stock price is not obvious. If households expect higher prices, they can increase their consumption and therefore reduce their savings. This behavior will lower stock prices. By contrast, if households choose to keep the value of their heritage, they tend to save more this will have positive effects on prices.

The interest rate

The impact of changes in interest rates on stock prices is mixed. If rates rise, bonds become less expensive which encourages shareholders to arbitrate for the bonds by selling the shares they hold and therefore stock prices fall. By contrast, a significant decrease of interest rate makes shares more profitable and persuades investors to buy back equity and pushing up prices. To explore the impact of market timing on the firm's value, we connect stock price to a variable that reflects the coincidence of the debt issuance and the credit market conditions. This variable is similar in design to the variable computed by Baker and Wurgler (2002) to detect equity market timing attempts i.e. the weighted average market-to-book ratios. This variable is computed as follows:

$$INETREST_{dwa,t} = \sum_{s=0}^{t} \frac{d_{is}}{\sum_{r=0}^{t} d_{ir}} * INETREST_t \quad (4)$$

The stock market performance

A bull market is characterized by higher valorizations and a bear market is characterized by lower stock prices. In this paper, we used the indices Tunindex and CAC40 to measure the performance of respectively the Tunisian and French stock market.

The model that we use to study the impact of market timing on the firm's value may be formulated as follows:

$$Ln(price_{it}) = \alpha_i + \beta_1 INTEREST_{dwa,t} + \beta_2 INFLATION_t + \beta_3 PROF_{it} + \beta_4 MARKET_t + \varepsilon_{it} \quad (5)$$

Where *Ln (price)* is the natural logarithm of stock price.

5.2. Regression results

The Chi-square statistics and Hausman confirm the significance of individual effects and that these effects are assumed to be fixed.

Table 6

Impact of debt market timing on firm's valuing

	Tunisia (30 firms)			*France (100 firms)*		
Variables	*Pooled*	*Fixed effects*	*Random effects*	*Pooled*	*Fixed effects*	*Random effects*
Intercept	2.78***	2.72***	2.59***	4.0874***	3.8476***	3.3849***
	(14.74)	(14.99)	(9.16)	(30.56)	(27.21)	(26.58)
$INTEREST_{dwa}$	0.31***	0.19***	0.21***	-0.1108***	-0.0494	-0.0534
	(6.61)	(3.33)	(4.69)	(-3.02)	(-0.6176)	(-0.63)
PROF	6.17***	2.75***	3.08***	2.1374***	3.3707***	3.068***
	(4.29)	(3.12)	(3.18)	(6.76)	(3.43)	(3.54)
MARKET	0.17	0.33	0.32	0.1688	0.2423**	0.2453***
	(0.46)	(0.89)	(0.81)	(1.17)	(2.42)	(2.59)
INFLATION	-16.55***	-9.14*	-10.36**	-29.5197***	-24.92**	-25.80***
	(-3.32)	(-1.82)	(-2.07)	(-5.06)	(-4.18)	(-4.28)
R Square	0.1687	0.7664	0.0448	0.2993	0.7731	0.2103
Adjusted R Square	0.1501	0.7149	0.0234	0.2936	0.7138	0.2039
$p-Fisher$	0.0000	0.0000	0.0831	0.0000	0.0000	0.0000
$p-Chi-Square$		0.0000			0.0000	
$p-Haussman$			0.0477			0.0173
Observations	184	184	184	498	498	498

***significant at 1% level, **significant at 5% level, *significant at 10% level,

Note: The values parentheses in are t-statistics

The variable introduced to detect debt market timing attempts has a significantly positive impact on stock prices of Tunisian firms. This result indicates that these firms can increase their market values by increasing their debt when interest rates are relatively low. This result suggests that the capital market is not perfectly integrated.

In the French context, the interest rate weighted by the debt issuance has no significant impact on stock prices. This result is consistent with the theorem of irrelevance of financial structure

on the firm's valuing established by Modigliani and Miller (1958). In an efficient market, perfect and integrated, a gain on the cost of equity is offset by a loss on the cost of debt and vice versa. Our result suggests that even if French managers attempt to implement a market-timing strategy, they fail to reduce the overall cost of capital. This evidence contradicts the prediction of the market timing theory. Indeed, Baker, Greenwood and Wurgler (2003) argue that managers are able to reduce the overall cost of capital.

The profitability has a positive impact on stock prices. Highly profitable firms have higher stock prices. If the firm releases new positive results, investors will be more optimistic about its prospects and the expected future cash flows and therefore they will be willing to pay dearly to buy its securities.

6. Conclusion

In this paper we investigated the debt market timing behavior in a sample of non-financial publicly traded Tunisian and French firms. The data is treated using many techniques of panel data. First, we examined whether market timing implications affect debt issues. Overall, our findings are consistent with the market timing theory according to which managers are able to time their borrowing by switching between debt and equity according to market conditions. We find that high market-to-book ratios are associated with low debt issues. This evidence suggests that Tunisian and French firms tend to issue equity when their market values are high and employ proceeds to pay down their debts. Managers believe that market values are irrationally high. Therefore, they try to take advantage from this opportunity by issuing overpriced equity shares. Indeed, the narrowness of Tunis Stock Exchange may increase the degree of informational asymmetry and consequently the likelihood of misevaluation that is at the basis of timing considerations. French firms may exploit the over-optimism of investors about the firm's prospects. We documented also that firms are more likely to issue new debts after an enhancement of the credit market conditions and to avoid unfavorable equity market conditions.

More interestingly, we find that debt issues depend negatively on interest rates. Moreover, Tunisian firms issue more debts when the current interest rates are relatively lower than future rates. Contrary to French firms, Tunisian firms succeed in raising their market values by this forward debt market timing strategy.

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