Economics Bulletin

Volume 41, Issue 2

The impact of oil price shocks on latin american stock markets: a behavioral approach

Paulo F. Marschner
Federal University of Santa Maria

Paulo Sergio Ceretta
Federal University of Santa Maria

Abstract

We analyzed the impact of oil price shocks on the stock returns in Latin American stock markets. We found an asymmetric relationship and showed that oil price exposures are homogeneous in these markets. Our results confirm the intuitive idea that the asymmetry between the oil price and the stock returns may be related to behavioral aspects.

Citation: Paulo F. Marschner and Paulo Sergio Ceretta, (2021) "The impact of oil price shocks on latin american stock markets: a behavioral approach", *Economics Bulletin*, Vol. 41 No. 2 pp. 457-467.
Contact: Paulo F. Marschner - paulofernandomarschner@hotmail.com, Paulo Sergio Ceretta - ceretta10@gmail.com.
Submitted: July 28, 2020. **Published:** April 09, 2021.

1. Introduction

We study the impact of credit rating levels on acquisitions in Europe. Acquisitions are mainly debt financed and leverage increasing (Harford et al., 2009), which ultimately leads to credit rating downgrades (Aktas et al., 2019) [1]. Survey evidence by Graham and Harvey (2001) points out that maintaining credit rating levels is the second most important criteria when determining capital structure. The manager's priority to maintain credit rating levels can thereby disincentivize acquisitions. Meanwhile, a higher credit rating is also linked to enhanced access to acquisition financing (Karampatsas et al., 2014; Aktas et al., 2019) and may cause firms to conduct acquisitions, where the increased capital supply can even lead to potential overinvestment (Harford and Uysal, 2014). Hence, the credit rating level offers several predictions on the firm's M&A activities.

The European setting offers a unique laboratory, traditionally Europe's banking sector is well-functioning (Van Lanschoot, 2008), meanwhile the bond markets relevance have been questioned (Von Beschwetz and Howels, 2016). As a result only 7.3% of the European public firms (Blomkvist et al., 2018) have a credit rating compared to 28.1% in the U.S. (Harford and Uysal, 2014). Furthermore, the European M&A markets differ substantially due to market fragmentation, varying levels of market development and legal standards (La Porta et al., 1997; Martynova and Renneboog, 2011; Drobetz and Momtaz, 2020). With this background, we contribute to the literature by studying how credit rating levels affect acquisitions in a European setting.

Recent studies analyze the interaction between credit ratings, capital supply and M&A activity on U.S. data. Bond market access measured by having a credit rating relaxes financial constraints (Faulkender and Petersen, 2006). In line with a financial constraints explanation, Harford and Uysal (2014) find evidence that credit rated firms conduct more but have lower average returns to acquisitions relative to non-rated firms. However, as their study shows non-negative CARs, which does not suggest that credit rated firms use their additional capital supply to overinvest. Not only having a credit rating impacts capital supply but also the credit rating level. Karampatsas et al., (2014) report that firms with higher credit ratings settle transactions to a greater extent with cash. Aktas et al. (2019) find an inverse U-shaped relation between credit rating levels and acquisitions.

Our study extends the work of Aktas et al. (2019) and Karampatsas et al. (2014) to a European setting. We test two competing hypotheses: the financial constraints and the managing for rating hypotheses. First, the financial constraints hypothesis postulates that debt market frictions lead to a potential underinvestment problem (Stiglitz and Weiss, 1981). In the absence of frictions, firms conduct all NPV positive acquisitions. Meanwhile, financially constrained firms selectively invest in the highest NPV projects. This results in less acquisitions and greater announcement returns among financially constrained acquirers. Hence, rating levels should be positively related to the acquisition likelihood and the use of cash, but negatively related to the acquirer announcement returns. A related explanation to the financial constraints hypothesis, stems from that managers can deviate from their investors' objectives and use their additional capital supply to overinvest (Jensen, 1986; Harford, 1999). Overinvestment suggests a greater acquisition likelihood and below zero CARs. Second, the managing for rating hypothesis (Aktas et al., 2019), postulates that managers are concerned about downgrades and thereby more conservative in their acquisition activities, particularly at higher rating levels. Consequently, firms are reluctant to pursue cash settled acquisitions due to the potential

[1] We find a similar pattern in our sample (non-reported). Where the average acquiring firm lowers its credit rating by 0.43 notches within 2 years (t-value relative to non-acquiring firms is 2.7).

acquisition-related downgrades. Hence, the managing for rating hypothesis predicts that the credit rating level is negatively related to the acquisition likelihood and using cash as acquisition currency.

To study this in a European setting slightly alters the interpretation of the two main hypotheses. The financial constraints hypothesis is only indirectly related to bond market financing. Because a higher rating level also correlates with characteristics associated with greater access to bank credit. Instead, studying the curve-linear relationship between credit ratings and acquisitions shows if managers perceive bond ratings as irrelevant. Conveying if firms at the higher rating levels forego acquisition opportunities to mitigate downgrades. Such a behavior results in an inverse U-shaped relation between credit rating levels and acquisitions.

Using a sample of 2,959 European firm-years between 1.1.2000-31.12.2017, we find a positive relation between credit rating levels and acquisitions. We attribute this finding to lower financial constraints and enhanced capability of highly rated firms to access financing. As the rating level further increases firms begin to forego acquisition opportunities resulting in an inverse U-shaped relation between credit rating levels and acquisitions. The pattern is consistent with that high rated firms manage their credit rating levels by mitigating acquisition-induced downgrades. When further taking into account the method of payment, we find a stronger curve linear relation for cash payments relative to mixed and stock payment, to avoid potential downgrade risk.

We perform several tests to analyze the robustness of our results. First, we test for the severity of potential omitted variable biases using the Oster (2019) coefficient stability test. The Oster (2019) test analyzes if observable characteristics are at least as important as unobservable characteristics in determining the acquisition likelihood. Second, we explore a channel of reverse causation, that firms increase their credit rating by freeing up debt capacity to conduct acquisitions (Morelec and Zhdanov, 2008; Uysal, 2011). Our results hold up after including lagged upgrade and downgrades in our main analysis. Third, we test for potential biases due to our variable construct, where we transform credit ratings into a continuous variable. After creating indicators for credit rating categories, our curve linearity results remain intact. We further rule out an alternative explanation, that our results are due to overinvestment by high rated firms with greater access to cheap debt capital.

The study is structured as follows. Chapter 2 presents the data and method. In chapter 3 we present the results and chapter 4 concludes the study.

2. Data and Method

We retrieve our sample from the Eikon database covering 1.1.2000- 31.12.2017. The sample includes all listed firms from the EU-11 countries that adopted the euro in 1999 and non-euro countries: Denmark, Sweden, UK, Norway and Switzerland. In accordance with previous studies (e.g., Blomkvist et al., 2018; Harford and Uysal, 2014), we exclude financial firms and regulated utilities, and firm-years with sales below €1 million. After our initial filtering and further excluding firm-years with missing data, our sample consists of 28,697 firm-year observations. Out of these firm-year observations, we exclude all firms without a S&P long-term issuer credit rating, and end up with a final sample of 2,959 credit rated firm-years. As in Aktas et al. (2019) we construct our main independent variable (Rating Level), by the S&P rating, numerically assigning AAA (C) as 20 (1).

In accordance with Harford and Usyal (2014), our M&A sample includes majority bids with deal value greater than 1% of the total assets of the acquiring firm. We drop firms with missing deal values. After the initial screening, we end with 547 acquiring firm-years. We construct our main dependent variable, the acquisition likelihood (ACQ) as an indicator that equals one if the firm conducts at least one acquisition during the given year. We include ln(Sales), Cash/Assets, Market Leverage, 12-Month Return, Market-to-Book, EBITDA/Assets, Herfindahl, M&A Liquidity as control variables as in Harford and Uysal (2014). We winsorize all accounting variables at the 99th percentile. All variables are defined in Table A1.

We conduct four set of tests. The first set replicates Aktas et al., (2019) and aims to explain the acquisition likelihood with the credit rating level. We estimate the following model:

$$(1)\ ACQ_{i,t} = \beta' Rating\ Level_{i,t-1} + \boldsymbol{\gamma' X_{i,t-1}} + \varepsilon_{i,t},$$

where X is a matrix of control variables. In our main specifications we further include the squared rating level (Rating Level^2) to test for curve linearity. The second set of tests, include only completed transactions, to study the rating levels effect on the CAR and the propensity to pay with 100% cash as in Karampatsas et al. (2014). In these tests, the sample size reduces to 467 observations due to the availability of payment method and return data. We further conduct two robustness tests. First, to analyze if past rating level changes cause firms to conduct acquisitions. Second, we split the rating level variable into indicators building on rating categories.

Table 1: Descriptive statistics

This table reports descriptive statistics. ACQ is an indicator variable taking the value of one if the firm conducts an acquisition during year *t*. Rating level is the firm's credit rating classified as AAA (20) to C (1). Market leverage is (Total debt)/(Total Assets – Book equity + Market Capitalization). M/B is (Total Assets – Book equity + Market Capitalization)/Total Assets. Size is the natural logarithm of sales in 2018 euros. Cash/Assets is cash holdings scaled by total assets. 12-Month Return is the firm's lagged stock return. Herfindahl is based on sales in the 3-digit industry. M&A Liquidity is (Industry deal value/Industry total assets) measured on 3-digit industry level. All independent variables are measured at *t-1*.

Variable	Mean	St dev
ACQ	0.230	0.421
Rating Level	11.234	2.962
Market Leverage	0.213	0.133
Cash/A	0.097	0.073
Size	11.411	1.383
M/B	1.639	0.841
ROA	0.130	0.065
12 month return	0.001	0.004
Herfindahl	0.012	0.033
M&A Liquidity	0.040	0.065
N	2,959	

Our sample is shown in Table 1. What is striking is the high acquisition likelihood among European rated firms (23%) compared to 18% in Aktas et al. (2019). In general, our descriptive statistics suggest that the credit rated European firm is different from U.S. firms. This is likely due to the higher boundaries for European firms to self-select into having a credit rating.

3. Results

We test two competing hypotheses offering different predictions on the relation between credit rating levels and acquisitions: the financial constraints and the managing for rating hypothesis. We report our main findings in Table 2. In columns (1) and (2), we study the cross-sectional relation between rating levels and acquisitions.[2] In non-reported marginal effects we observe that increasing the rating by one notch from the average rating leads to an increase in the acquisition likelihood by 1.87pp (8.1% from the mean value), suggesting that a higher credit rating relaxes financial constraints. In column (2), we include the squared rating level in the model and report a curve linear effect. The squared term is statistically different from zero ($p<0.05$). By including year fixed effects we capture differences in the macro environment and also changes in rating standards (Alp, 2013). In columns (3) and (4) we control for cross-industry heterogeneity by including industry fixed effects. Our results remain intact, a positive relation between the credit rating level and acquisitions and a negative relation between the squared credit rating level and acquisitions. When studying the within-firm relation in column (5), we instead find no relation between credit rating levels and acquisitions.[3] One possible explanation is that due to the low time-series variation in rating levels, the firm fixed-effects almost fully absorbs the rating level variation and makes it difficult to draw any inference (see, e.g. Bae and Goyal, 2009). An alternative is to use random firm-level effects that take into account both cross-sectional and time-series variation. By including random effects in column (6), the relation becomes positive and gradually decreases over the rating levels as in Aktas et al. (2019). In order to take into account country heterogeneity stemming from market fragmentation, we have in unreported tests added country fixed effects to Models (1) and (2) of Table 2. Our findings remain intact after the inclusion of country fixed effects. In general, our findings are in line with a financial constraints explanation. However, in specifications (2), (4) and (6) we further report that managers refrain from acquisitions at the highest rating levels.

Table 2: Credit rating levels and acquisitions

This table report Logit, OLS and Probit estimates using Acquisition likelihood (ACQ) as dependent variable. All variables defined as in Table A1. Singleton observations are dropped, this causes a lower number of observations in the firm fixed effects models. Clustered (Firm) robust t-values are reported in parentheses. ***, **,* denotes 1%, 5%, 10% significance, respectively.

	(1)	(2)	(3)	(4)	(3)	(4)
	ACQ	ACQ	ACQ	ACQ	ACQ	ACQ
Rating Level	0.1131***	0.3769***	0.0955***	0.3463***	0.0331	0.2134***
	(3.912)	(3.031)	(2.962)	(2.595)	(1.391)	(3.048)
Rating Level ^2		-0.0114**		-0.0111*	-0.0008	-0.0065**
		(-2.151)		(-1.835)	(-0.705)	(-2.156)
Market Leverage	-1.8558***	-1.7553***	-2.6841***	-2.5756***	-0.6353***	-1.3665***
	(-2.911)	(-2.725)	(-3.783)	(-3.570)	(-4.942)	(-3.830)

[2] Pastor et al. (2017) show that using year fixed effects is similar to estimating a Fama and Macbeth cross-sectional regression with different weighting scheme, and that firm fixed effects mimics N time-series regressions.

[3] We estimate the firm fixed effects models using a linear probability model (OLS) instead of Logit regressions due to the inclusion of a large number fixed effects, Logit and Probit are not consistent estimators in that case. Angrist and Pischke, (2008) show that using a linear probability model instead of Logit and Probit yields similar estimates.

Cash/Assets	-0.0544	0.0341	1.2347	1.3669*	0.5329***	0.4705
	(-0.071)	(0.045)	(1.604)	(1.757)	(3.030)	(0.999)
Size	-0.0614	-0.0580	-0.0062	-0.0070	-0.0316	-0.0431
	(-1.053)	(-1.019)	(-0.094)	(-0.106)	(-0.894)	(-1.205)
M/B	-0.1190	-0.1050	-0.0655	-0.0559	0.0126	-0.0269
	(-1.190)	(-1.060)	(-0.608)	(-0.519)	(0.595)	(-0.481)
ROA	0.5012	0.6402	0.5660	0.6496	0.4111	0.5529
	(0.472)	(0.598)	(0.506)	(0.582)	(1.582)	(0.861)
12-month Return	-6.8108	-6.4019	-7.6658	-6.9016	-1.1810	-4.1729
	(-0.489)	(-0.439)	(-0.514)	(-0.446)	(-0.603)	(-0.409)
Herfindahl	0.3198	0.5664	-0.6146	-0.4121	0.2648	0.2658
	(0.114)	(0.218)	(-0.271)	(-0.187)	(0.339)	(0.253)
M&A Liquidity	2.9531***	2.9950***	3.0690***	3.0714***	0.5929***	1.7428***
	(3.539)	(3.509)	(2.805)	(2.784)	(3.103)	(4.325)
Constant	-0.3474	-1.8307**	-0.9190	-2.0527*	0.3118	-0.9828*
	(-0.504)	(-1.968)	(-0.902)	(-1.822)	(0.778)	(-1.766)
Observations	2,959	2,959	2,959	2,959	2,930	2,959
R-squared	0.062	0.064	0.085	0.086	0.212	-
Year Effects	YES	YES	YES	YES	YES	YES
Industry Effects	NO	NO	YES	YES	NO	NO
Firm Effects	NO	NO	NO	NO	YES	YES
Model	LOGIT	LOGIT	LOGIT	LOGIT	OLS FE	PROBIT RE

In Table 3 columns (1) and (2), we study the effect of credit rating levels on the 21-day cumulative abnormal return (CAR). We find no direct relation between the rating level and acquirer announcement returns. However, when we include the squared rating level in specification two, which indicates that mid rated firms have a higher CAR. Our results do not provide any conclusive evidence of overinvestment, since there is no direct linear relation between credit rating level and acquisitions. The overinvestment hypothesis postulates that higher rated firms should have lower announcement returns compared to low rated firms. To further test the financial constraints and managing for rating hypotheses we study the choice of payment method conditional on that an acquisition takes place. We argue that both the financial constraints hypothesis and managing for rating hypothesis are more sensitive to using cash as currency in the transaction. Cash payments are usually financed by debt issuance, bank loans or internal funds and thereby net-leverage increasing (Martynova and Renneboog, 2009). In columns (3) and (4), we test the relation between credit rating levels and the payment method. In line with our expectations, we find a positive but decreasing relation between rating levels and 100% cash payment relative to mixed and stock payment.

Table 3: CAR and method of payment

This table reports OLS and LOGIT estimates of the rating level effects on CAR and 100% cash payment. CAR is calculated using the market-adjusted model, i.e. the excess return over the MSCI Europe, -10/+10 day relative to the bid announcement. Cash100% is an indicator taking the value of one if the firm uses 100% cash as payment. Relative size is (deal value/acquirer total assets). Public Target takes the value of one if the target is publicly traded. Cross-Border takes the value of one if the acquirer and target originates from different countries.

Horizontal takes the value of one if the acquirer and target have the same 3-digit industry code. Clustered (Firm) robust t-values are reported in parentheses. ***, **,* denotes 1%, 5%, 10% significance, respectively.

	(1)	(2)	(3)	(4)
	CAR -10/+10	CAR -10/+10	Cash 100%	Cash 100%
Rating Level	-0.0010	0.0180	0.1444***	0.6148***
	(-0.400)	(1.643)	(3.000)	(2.984)
Rating Level ^2		-0.0008*		-0.0193**
		(-1.883)		(-2.373)
Size	0.0074	0.0081	0.0304	0.0492
	(1.207)	(1.332)	(0.251)	(0.397)
Relative Size	-0.0590*	-0.0571*	-0.9786*	-0.9394*
	(-1.716)	(-1.660)	(-1.916)	(-1.808)
Public Target	-0.0143	-0.0140	1.8075***	1.8157***
	(-1.151)	(-1.133)	(6.969)	(6.927)
Cross-Border Acquisition	-0.0089	-0.0093	-0.1685	-0.1718
	(-0.816)	(-0.851)	(-0.681)	(-0.682)
Horizontal	0.0001	0.0007	0.3248	0.3392
	(0.004)	(0.055)	(1.417)	(1.468)
Cash 100%	0.0156	0.0137	-4.0245***	-6.8347***
	(1.224)	(1.077)	(-3.234)	(-3.862)
Constant	-0.0517	-0.1689*		
	(-0.790)	(-1.695)		
Observations	467	467	467	467
R-squared	0.083	0.088	0.170	0.176
Model	OLS	OLS	LOGIT	LOGIT
Year FE	YES	YES	YES	YES

We address potential endogeneity problems as follow. First, we conduct the Oster (2019) coefficient stability test on our main specifications [Columns (3) and (4) of Table 3]. The Oster methodology creates an omitted variable bias adjusted beta (lower bound for the coefficient estimates). A lower bound of beta that does not change sign indicates that the observables are at least equally important as the unobservable characteristics (δ=1) in determining the acquisition likelihood. In the Oster test we use the proposed R^2_{max} of 1.3*R^2 as model inputs, where R^2 is the R-squared from the estimated models. After applying the Oster (2019) methodology for testing the coefficient stability both the Rating Level coefficient in Column (3) and Column (4) remain positive, suggesting that the omitted variable bias is not severe. Second, we explore potential reverse causality. Both Morelec and Zhdanov (2008) and Uysal (2011) provide insight into how future acquisitions may cause changes in credit rating levels. They argue that firms free up debt capacity in order to have a greater possibility of winning a potential bidding contest. The potential de-leveraging is also likely to map into higher credit rating levels. Lower leverage ratios are correlated with higher rating levels (see, e.g, Karampatsas et al., 2014). To rule out this reverse causality channel, we include indicator variables for prior upgrades (downgrades) capturing changes in the credit rating level one and

two years prior to the potential acquisition year. Our findings in Table 4 do not suggest that prior changes in credit rating levels drive our results.

Table 4: Previous rating changes and acquisitions

This table report Logit, estimates using Acquisition likelihood (ACQ) as dependent variable. All variables defined as in Table A1. Clustered (Firm) robust t-values are reported in parentheses. ***, **,* denotes 1%, 5%, 10% significance, respectively.

	(1)	(2)	(3)	(4)
	ACQ	ACQ	ACQ	ACQ
Rating Level	0.0888***	0.0902***	0.3464***	0.3472***
	(2.680)	(2.718)	(2.578)	(2.590)
Rating Level ^2			-0.0114*	-0.0114*
			(-1.872)	(-1.878)
Upgrade (between t-2 and t-1)	0.0531		0.0729	
	(0.418)		(0.577)	
Downgrade (between t-2 and t-1)	-0.1458		-0.1474	
	(-1.064)		(-1.072)	
Upgrade (between t-3 and t-1)		-0.0118		0.0032
		(-0.095)		(0.026)
Downgrade (between t-3 and t-1)		-0.2285*		-0.2358*
		(-1.652)		(-1.705)
Market Leverage	-2.6951***	-2.6887***	-2.5867***	-2.5818***
	(-3.808)	(-3.753)	(-3.593)	(-3.542)
Cash/Assets	1.2433	1.2578	1.3828*	1.3984*
	(1.615)	(1.629)	(1.777)	(1.792)
Size	0.0046	0.0060	0.0045	0.0061
	(0.069)	(0.090)	(0.067)	(0.091)
M/B	-0.0639	-0.0627	-0.0537	-0.0528
	(-0.592)	(-0.586)	(-0.496)	(-0.494)
ROA	0.5347	0.5084	0.6188	0.5928
	(0.479)	(0.457)	(0.556)	(0.534)
12-month Return	-6.6762	-6.1962	-5.7624	-5.2014
	(-0.449)	(-0.420)	(-0.373)	(-0.340)
Herfindahl	-0.6965	-0.8050	-0.4841	-0.5904
	(-0.309)	(-0.357)	(-0.221)	(-0.271)
M&A Liquidity	3.1290***	3.0972***	3.1330***	3.1016***
	(2.871)	(2.842)	(2.854)	(2.819)
Constant	-0.9765	-0.9597	-2.1502*	-2.1302*
	(-0.961)	(-0.945)	(-1.910)	(-1.897)
Observations	2,959	2,959	2,959	2,959
R-Squared	0.085	0.086	0.087	0.088
Year Effects	YES	YES	YES	YES
Industry Effects	NO	NO	YES	YES
Firm Effects	NO	NO	NO	NO
Model	LOGIT	LOGIT	LOGIT	LOGIT

We also address concerns about multicollinearity, since the control variables correlates with the credit rating level. We perform a VIF test to ensure our results are not driven by bias stemming from collinearity of explanatory variables. In un-tabulated results, we find that the VIF in our main specification is above the recommended threshold of 10. Therefore, we exclude Size and obtain an acceptable VIF of 4.34 and re-estimate our results using this specification. The positive coefficient of Rating Level and negative coefficient of Rating Level^2 remain statistically different from zero.

The Rating Level variable is an ordinal variable transformed into a continuous variable. Since, increments in credit rating levels are not symmetric in terms of credit risk and cost of debt capital (Jorion and Zhang, 2007; May, 2010), we create indicators for rating categories and re-estimate our main results in Table 5. In the first two columns we test the effect of having an investment grade rating on acquisitions. Our findings suggest that firms with an investment grade rating are more likely to conduct acquisitions relative firms with a speculative grade rating. In columns (3) and (4), we test for curve linearity, that firms at higher and lower rating levels refrain from conducting acquisitions. To test for this, we let AAA, B and C rated firms act as intercept and include indicators for AA, A, BBB and BB rated firms. Our results indicate that firms with a rating level in the middle of the spectrum have a greater acquisition likelihood.

Table 5: Rating categories

This table report Logit, estimates using Acquisition likelihood (ACQ) as dependent variable. Investment Grade is an indicator variable taking the value of one if the firm has a BBB- or above credit rating. AA, A, BBB and BB are credit rating category indicators. The control variables are identical to the ones in Table 2. Clustered (Firm) robust t-values are reported in parentheses. ***, **,* denotes 1%, 5%, 10% significance, respectively.

	(1)	(2)	(3)	(4)
	ACQ	ACQ	ACQ	ACQ
Investment Grade	0.5398***	0.4615***		
	(2.993)	(2.603)		
AA			1.8569***	1.5165***
			(5.006)	(3.805)
A			1.7610***	1.5760***
			(5.442)	(4.749)
BBB			1.4936***	1.3051***
			(5.173)	(4.670)
BB			1.1801***	1.0528***
			(3.921)	(3.493)
Observations	2,959	2,959	2,959	2,959
R-squared	0.0597	0.0837	0.0663	0.0886
Controls	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES
Industry Effects	NO	YES	NO	YES
Firm Effects	NO	NO	NO	NO
Model	LOGIT	LOGIT	LOGIT	LOGIT

In unreported tests, we have further examined the effect of credit rating levels on other types of investments (CAPEX and Asset Growth). Our results do not suggest a similar pattern for other investments as for acquisitions. One possible explanation to this pattern is that firms with a credit rating are usually mature firms (Blomkvist et al., 2020), and mature firms are more likely to grow through acquisitions instead of building new capacity.

4. Conclusions

We study the impact of credit rating levels on acquisitions in Europe. Europe offers a unique setting different from the U.S., due to market fragmentation and the lesser role of bond market financing. Our findings on the two hypotheses: the financial constraints and the managing for rating hypothesis lend support to both. In particular, the acquisition likelihood is positively related to the rating level. However, at higher rating levels firms refrain from conducting acquisitions which create a curve linear relation between credit rating levels and acquisitions. This relation is further strengthened when cash serves as payment currency in the transaction. Our results suggest that that high rated firms take actions to maintain their higher rating levels. Due to the minor role of bond markets as debt financing source, our findings are less pronounced compared to U.S. studies (see, e,g., Karampatsas et al., 2014; Aktas et al. 2019). Nonetheless, our results highlight that managers are averse to downgrades and higher ratings are linked to enhanced access to acquisition financing.

References

Aktas, N., N. Karampatsas, D. Petmezas and H. Servaes (2019) "Credit ratings and acquisitions" SSRN working paper.

Alp, A. (2013) "Structural shifts in credit rating standards" *Journal of Finance* **68**, 2435-2470.

Angrist, J. and J. Pischke (2008) "Mostly harmless econometrics: an empiricists companion" Princeton, NJ: Princeton University Press.

Bae, K-H. and V. Goyal (2009) "Creditor rights, enforcement, and bank loans" *Journal of Finance* **64**, 823–860.

Blomkvist, M., T. Friman and T. Korkeamäki (2018) "Bond market access and acquisitions: empirical evidence from the European market" *European Journal of Finance* **24**, 478-498.

Blomkvist, M., A. Löflund and H., Vyas (2020) "Credit ratings and firm life-cycle" *Finance Research Letters*, forthcoming.

Drobetz, W. and P. Mometz (2020), "Corporate governance convergence in the European M&A market" *Finance Research Letters* **32**, 101091.

Faulkender, M. and M. Petersen (2006) "Does the source of capital affect capital structure?" *Review of Financial Studies* **19**, 45–79.

Graham J. and C. Harvey (2001) "The theory and practice of corporate finance: evidence from the field" *Journal of Financial Economics* **60**, 187 - 243.

Harford J. (1999) "Corporate cash reserves and acquisitions" *Journal of Finance* **54**, 1969-1997.

Harford, J., S. Klasa and N. Walcott (2009) "Do firms have leverage targets? Evidence from acquisitions" *Journal of Financial Economics* **93**, 1-14.

Harford, J. and V. Uysal (2014) "Bond market access and investment" *Journal of Financial* Economics **24**, 147-163.

Jensen, M. (1986) "Agency costs of free cash flow, corporate finance, and takeovers" *American Economic Review* **76**, 323-329.

Jorion, P. and G. Zhang (2007) "Information effects of bond rating changes: The role of the rating prior to the announcement" *Journal of Fixed Income* **16**, 45 - 59.

Karampatsas, N., D. Petmezas and N. Travlos (2014) "Credit ratings and the choice of payment method in mergers and acquisitions" *Journal of Corporate Finance* **25**, 474-493.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1997) "Legal determinants of external finance" *Journal of Finance* **52**, 1131-1150.

Martynova, M. and L. Renneboog (2009) "What determines the financing decision in corporate takeovers: Cost of capital, agency problems, or the means of payment?" *Journal of Corporate Finance* **15**, 290-315.

Martynova, M. and L. Renneboog (2011) "The performance of the European market for corporate control: Evidence from the fifth takeover wave" *European Financial Management* **17**, 208-259.

May, A. (2010) "The impact of bond rating changes on corporate bond prices: New evidence from the over-the-counter market" *Journal of Banking and Finance* **34**, 2822 - 2836.

Morellec, E. and A. Zhdanov (2008) "Financing and Takeovers" *Journal of Financial Economics* **87**, 556-581.

Oster, E. (2019). "Unobservable selection and coefficient stability: Theory and evidence" *Journal of Business & Economic Statistics*, 37(2), 187-204.

Pastor, L., R. Stambaugh, and L. Taylor (2017) "Do funds make more when they trade more?" *Journal of Finance* **72**, 1483-1528.

Stiglitz, J. and A. Weiss (1981) "Credit rationing in markets with imperfect competition" *American Economic* Review **71**, 393 - 410.

Uysal, V. (2011) "Deviation from the target capital structure and acquisition choices" *Journal of Financial Economics*, **102**, 602-620.

Van Landschoot A. (2008) "Determinants of yield spread dynamics: euro versus dollar corporate bonds" *Journal of Banking and Finance* **32**, 2597-2605.

Von Beschwitz, B. and C. Howells (2016) "Are euro-area corporate bond markets irrelevant? The effect of bond market access on investment" Federal Reserve - discussion paper 1176.

Table A1: Variable definitions

Variable	Definition
ACQ	ACQ is an indicator variable taking the value of one if the firm conducts an acquisition during year *t*
Rating Level	Rating level is the firm's credit rating classified as AAA (20) to C (1)
Rating Level^2	The Credit Rating Level squared
Market Leverage	Market leverage is (Total debt)/(Total Assets – Book equity + Market Capitalization)
M/B	M/B is (Total Assets – Book equity + Market Capitalization)/Total Asset
Size	Size is the natural logarithm of sales in 2018 euros
Cash/Assets	Cash/Assets is cash holdings scaled by total assets
12-month Return	12-Month Return is the firm's lagged stock return
Herfindahl	Herfindahl is based on sales in the 3-digit industry
M&A Liquidity	M&A Liquidity is (Industry deal value/Industry total assets) measured on 3-digit industry level
CAR -10/+10	CAR is calculated using the market-adjusted model, i.e. the excess return over the MSCI Europe, -10/+10 day relative to the bid announcement
Cash 100%	Cash100% is an indicator taking the value of one if the firm uses 100% cash as payment
Relative Size	Relative size is (deal value/acquirer total assets)
Public Target	Public Target is an indicator taking the value of one if the target is publicly traded
Cross-Border Acquisition	Cross-Border is an indicator taking the value of one if the acquirer and target originates from different countries
Horizontal	Horizontal takes the value of one if the acquirer and target have the same 3-digit industry code
Upgrade	An indicator taking the value of one if the firm has been upgraded during the last or the last two years
Downgrade	An indicator taking the value of one if the firm has been downgraded during the last or the last two years
Investment Grade	An indicator taking the value of one if the firm has a BBB- or above credit rating level
AA	An indicator taking the value of one if the firm has a AA-, AA or AA+ rating
A	An indicator taking the value of one if the firm has a A-, A or A+ rating
BBB	An indicator taking the value of one if the firm has a BBB-, BBB or BBB+ rating
BB	An indicator taking the value of one if the firm has a BB-, BB or BB+ rating