TRADE RECEIVABLES COLLECTION PERIOD AND FIRM VALUE: EVIDENCE FROM LISTED TURKISH INDUSTRIALS[*]

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ABSTRACT

This paper shows that average collection period of trade receivables (ACP) and a deterioration in the credit quality of trade receivables both have negative effect on firm value. Evidence is based on Turkish industrial firms listed on Borsa Istanbul over 2005-2017 period. The effect exists only for firms whose average collection period increased by more than thirty days within the last one to three years. Similarly, the value consequence of ACP holds for high-profit firms, but not for low-profit firms. This study utilizes system generalized method of moments in all estimations and treats trade receivable policy variables as endogenous due to omitted variable bias concerns. Overall, findings suggest a destructive effect of lengthened deferred payment terms on firm value specifically for high-profit firms and for firms with a historical upward trend in ACP.

Keywords: Trade Receivables, Credit Quality, Firm Value, Profitability

JEL Classification: G30, G32

TİCARİ ALACAK TAHSİLAT SÜRELERİNİN FİRMA DEĞERİ ÜZERİNE ETKİSİ: BORSA İSTANBUL UYGULAMASI

ÖZ

Borsa İstanbul'da 2005-2017 yıllarında işlem gören sınai firmaların verisine dayanılarak yapılan analizlerde, ortalama ticari alacak tahsilat süresinin (OTAS) firma değeri üzerinde negatif bir etki yarattığı sonucuna varılmıştır. Bu negatif etkinin son bir ila üç yıl içinde OTAS'ı otuz gün ve üzerinde artış gösterenlerde istatistiki açıdan anlamlı olduğu gözlenmiştir. Öte yandan, OTAS'ın firma değeri üzerindeki negatif etkisi yüksek kârlı firmalarda anlamlı iken, düşük kârlı firmalarda anlamlı

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çıkmamıştır. Son olarak, ticari alacak kalitesindeki kötüleşmenin de firma değerini düşürdüğü ispatlanmıştır. Sonuçların güvenilirliği, alternatif firma değeri ölçütleri kullanılarak teyit edilmiştir. Atlanan değişkenler önyargısı ihtimaline karşın ticari alacak politikası ölçütü olan değişkenler tüm analizlerde endojen değişken olarak modellenmiştir.

Anahtar kelimeler: Ticari Alacaklar, Kredi Kalitesi, Firma Değeri, Kârlılık

JEL Sınıflandırması: G30, G32

GENİŞLETİLMİŞ ÖZET

AMAÇ VE GÜDÜ

Firmaların müşterilerine vade açarak kısa vadeli finansman sağlamalarının ardındaki motivasyonlar konusunda oldukça fazla bilimsel çalışma yapılmış olmasına rağmen, bu davranışın sonuçlarıyla ilgili literatürde boşluklar bulunmaktadır. Bu çalışmanın amacı, firmaların müşterilerine kısa vadeli finansman sağlamalarının tedarikçi firmanın değeri üzerindeki etkilerini gelişmekte olan piyasa verisi kullanarak analiz etmektir. Bu çalışma hem ticari alacakların hem de ticari alacak kalitesinin (Adıguzel, 2021) firma değeri üzerindeki etkilerini analiz etmektedir. Bu çalışma ayrıca, gelişmekte olan bir ülkenin verisi kullanılarak bu alanda yapılan ilk çalışma olma özelliğini taşımaktadır. Buna ilaveten, ticari alacakların firma değeri üzerine etkisini düşük ve yüksek karlı firmalar için ayrı ayrı inceleyerek literatüre ek katkı sağlamayı amaçlamıştır.

YÖNTEM

Ticari alacakların sonuçları ile ilgili literatür öncelikli olarak firmaların bu davranışın firma karlılığı üzerine etkilerini analiz etmiştir (Deloof, 2003; Lazaridis & Tryfonidis, 2006). Daha sonraki çalışmalar, ticari alacakların hisse senedi getirisi üzerine etkisine (Hill ve diğerleri, 2012), nakit ve hazır değerler üzerine etkisine (Wu ve diğerleri, 2012) ve ciro değişimi üzerine etkisine (Yazdanfer & Ohman, 2015) odaklanmıştır. Bir grup araştırmacı ise ticari alacak ve borçların, kurumsal iflasların bulaşması konusundaki rolünü analiz etmişlerdir (Jorion & Zhang, 2009; Boissay & Gropp, 2013; Jacobson & Schedvin, 2015; Barrot, 2016). Bu çalışma, Borsa İstanbul'da 2005-2017 yıllarında işlem gören sınai firmaların verisini kapsamaktadır. Böylece ticari alacakların firma değeri üzerine etkisi ilk defa olarak gelişmekte olan bir ülke verisi kullanılarak analiz edilmiştir. Modeller, dinamik panel regresyon modellerinden Genelleştirilmiş Momentler Metodu ile analiz edilmiştir (GMM). Firma değeri bağımlı değişken, firma değerinin gecikmeli değeri, ticari alacaklar, ticari alacaklar kalite endikatörü ve firma ile ilgili kontrol değişkenler ise bağımsız değişkenler olarak tanımlanmıştır. Firma değerinin belirleyicileri üzerine yapılan çalışmaları (Hermalin & Weisbach, 1991; Harford ve diğerleri, 2008; Berger & Ofek, 1995; Denis ve diğerleri, 2002; Hansen & Wernerfelt, 1989; Haushalter ve diğerleri,

2007) gözönüne alarak, ticari alacaklar ve ticari alacak kalite endikatörleri tüm analizlerde endojen olarak kabul edilmiştir. Sistem GMM sonuçlarıyla karşılaştırma sağlamak amacıyla, birleştirilmiş sıradan en küçük kareler (OLS) ve sabit etkiler (FE) metodları ile alınan sonuçlar da raporlanmaktadır. OLS ve FE'nin sırasıyla gözlemlenmemiş heterojenlik ve değişkenlerin endojenliği konularında yetersiz kalmaları sebebiyle, analiz sonuçları system GMM çıktıları baz alınarak yorumlanmıştır.

BULGULAR VE TARTIŞMA

Sistem GMM sonuçlarına göre, ortalama ticari alacak süresinin (OTAS) firma değeri üzerinde negatif etkisi olduğu belirlenmiştir. Buna göre, OTAS arttıkça firma değeri düşüş göstermektedir. OTAS ve firma değeri arasındaki ilişkinin doğrusallığı ile ilgili yapılan testler, Dary ve James (2019)'i destekler niteliklidir. Martinez-Sola ve diğerleri (2013)'ün aksine, OTAS ve firma değeri arasındaki ilişkinin doğrusal olduğu tespit edilmiştir. OTAS yerine "ticari alacaklar / toplam varlıklar" (TATV) rasyosu kullanılarak yapılan regresyonlarda, TATV'nin firma değeri üzerinde etkisi olmadığı görülmektedir. Dolayısıyla firma değerindeki değişimleri açıklamakta TATV katkı sağlamamktadır. Martinez-Sola ve diğerleri (2103) ve Wu ve diğerleri (2012) çalışmalarında hem OTAS'ın hem TATV'nin benzer sonuçlar verdiğini belirtmiş olsalar da bu çalışma türk sınai firmaları açısından TATV'nin firma değeri üzerinde etkisi olmadığını ortaya koymaktadır. Buna ilaveten, ticari alacak kalitesi endikatörü kullanılarak yapılan çok değişkenli regresyonlarda, ticari alacak kalitesinin kötülemesinin firma değeri kaybına sebep olduğu tespit edilmiştir. Bir sonraki aşamada, ticari alacak kalitesi endikatörünü oluşturan üç bileşenin firma değeri üzerinde etkileri de ayrı ayrı test edilmiştir. OTAS'taki artışın son iki yıl içinde 30 günden fazla olduğunu gösteren bileşenin firma değeri üzerindeki etkisi negatif ve istatistiki açıdan anlamlı çıkmıştır. Ancak, diğer iki bileşenin firma değeri üzerinde istatistiki açıdan anlamlı etkisi olmadığı tespit edilmiştir. Firma değeri üzerinde etkisi bulunmayan bu iki bileşen, son iki yıl içindeki OTAS ve nakit dönüştürme döngüsündeki trendleri gösteren endikatörlerdir. Petersen ve Rajan (1997), Molina ve Preve (2009), Giannetti ve diğerleri (2011), Garcia-Appendini ve Montoriol-Garriga (2013)'nın çalışmalarında değinildiği üzere, düşük ve yüksek kar marjına sahip firmaların müşterilerine ticari alacakları ile ilgili vade sunma davranışlarında farklılıklar gözlenmektedir. Buradan hareketle, OTAS – firma değeri arasındaki ilişkiyi yüksek ve düşük karlı firmalar için ayrı ayrı inceledik. Bulgular, OTAS'ın firma değeri üzerindeki olumsuz etkisinin sadece yüksek karlı firmalar açısından istatistiki açıdan anlamlı olduğuna işaret etmektedir. Düşük karlı firmalar kullanılarak yapılan regresyon sonuçlarına göre, OTAS'ın firma değeri üzerinde istatistiki açıdan anlamlı bir etkisi bulunmamaktadır.

SONUÇ VE ÖNERİLER

Ticari alacakların da içinde yer aldığı dönen varlıklara yapılan yatırımın yüksek seviyelerde seyretmesi, firmaların finansal başarıları önünde bir engel teşgil etmektedir (Sagner, 2014). İşletme sermayesi döngüsü, dünya borsalarında işlem gören en büyük firmalar için dahi değer yaratma aracı olarak önem arzetmektedir (PricewaterhouseCoopers, n.d.). Satış hasılatını nakde dönüştürmenin

firmalar açısından içerdiği zorluklar gözönüne alındığında, ticari alacaklar firmalar açısından bir fırsat olarak görülebilir. Akademik literatürde, ticari alacakların firma değeri üzerindeki etkileri açısından yapılmış az sayıda çalışma bulunmaktadır. Bu nedenle, yapılacak yeni çalışmalar bu çok önemli konuya ışık tutacaktır. Bu çalışma, Borsa Istanbul'da işlem gören türk sınai firmalarından oluşan veri setini kullanarak, firmaların ticari alacak sürelerini kısaltarak değer yaratabileceklerini ortaya koymuştur ve böylece ilgili literatüre katkı sağlamaktadır. Bu çalışmada ayrıca, OTAS ve firma değeri arasındaki doğrusal ve negatif ilişkinin sadece yüksek karlı firmalar için geçerli olduğu ortaya konmuştur. Adıgüzel (2021) tarafından Amerika Birleşik Devletleri borsalarında işlem gören firmaların verisi kullanılarak test edilen ticari alacak kalitesi endikatörü ilk defa bir gelişmekte olan piyasa verisi kullanılarak bu çalışmada test edilmiştir. Sonuçlar, firmaların ticari alacak kalitesi kötüleştiği durumda bunun firma değeri üzerinde olumsuz etkisi olduğunu gösterir niteliktedir. Sonuç olarak, özellkle yüksek karlı firmalar, ortalama ticari alacak sürelerini düşürmek suretiyle firma değeri yaratma kabiliyetine sahiptirler. Ayrıca, ticari alacak kalitesinin yönetimi de firma değeri açısından önem arzetmektedir.

1. INTRODUCTION

Non-financial firms extend trade credit (TC) to their customers by offering deferred payment terms. This practice is very common across the globe. For instance, average collection period of trade receivables varies from 21 days in Panama to 94 days in Italy. Moreover, publicly listed firms across the world invest on average 17% of their assets in trade receivables (El Ghoul & Zheng, 2016). Based on the sample used in this study, listed Turkish industrials wait for about 138 days on average before collecting their receivables from customers and invest about 25% of their assets in trade receivables. Although there is plenty of empirical evidence about the reasons that motivate non-financial firms to offer TC to their clients, the consequences of TC provision remain a relatively less-researched area. This study aims to extend the literature by analyzing the impact of TC provision on firm value within an emerging market context.

This study initially analyzes the impact of TC provision on firm value by utilizing two widely-used measures of trade receivable policy; average collection period denoted by ACP (trade receivables / daily sales) and the percentage of total assets invested in trade receivables denoted by RECTA (trade receivables /total assets). The study finds that ACP has a negative and linear impact on firm value while RECTA has no impact on the value. These results are robust to alternative measures of firm value.

This study next investigates the value effect of trade receivables credit quality (Adiguzel, 2021). It is found that as the credit quality of trade receivables worsens, firm value is reduced. Therefore, this study provides empirical evidence within an emerging market context that the deterioration of trade receivables credit quality leads to loss of firm value. Additionally, ACP-value relation is analyzed further by splitting the sample into two sub-samples. The first sub-sample is composed of firms with

more than thirty-day increase in ACP within the last year and the second one is composed of firms that did not experience such an increase in ACP. The evidence reveals that the negative linear relationship between ACP and firm value only exists among firms that tied up more cash into their working capital (WCAP) by lengthening ACP within the last one to three years. On the contrary, for firms, whose ACP did not increase by more than thirty days within the last one to three years, the negative impact of ACP on firm value is not statistically significant.

Next, this study analyzes the ACP-value relation for firms with high versus low profitability for the first time in TC literature. It is found that ACP-value relationship is statistically significant for high-profit firms and also that ACP has no value consequence for firms with low profitability. These findings are consistent across the three alternative measures of profitability. Therefore, the author concludes that efficiency improvements in trade receivable process lead to higher value for firms that are highly profitable. However, such an effort does not have any impact on value for firms that are relatively performing poorly in terms of profit generation capability.

This study extends the related literature by adding to the findings of Martinez-Sola et al. (2013) and Dary and James (2019). It provides new evidence regarding the value consequences of trade receivable policy within an emerging market setting for the first time. Moreover, this study extends the existing literature by analyzing the value consequences of TC provision for high and low profit firms separately. Furthermore, value impact of ACP is also examined in more detail for firms with an upward trend in ACP. Finally, this study provides evidence for the first time in TC literature about the impact of a deterioration in trade receivables credit quality on firm value within an emerging market context. In a nutshell, this study is a first attempt to provide empirical evidence and detailed analysis from an emerging market regarding the value impact of trade receivable policy of firms.

Based on the analysis performed in this study, this study finds evidence for the following conclusions: ACP has negative and linear impact on firm value, RECTA has no impact on firm value, the negative impact of ACP on firm value holds for high-profit firms and for firms whose ACP lengthened by more than thirty days within the last one to three years, and finally a worsening of trade receivables credit quality has negative impact on firm value. In summary, findings indicate that ACP and the credit quality of trade receivables explain part of the variation in firm value, specifically for highly profitable firms and for firms with upward ACP trend.

The structure of the paper is as follows. Section 2 provides a review of the existing TC literature. Data, variable definitions, regression model, and estimation methodology are presented in Section 3. Empirical results are delivered and discussed in Section 4. Section 5 concludes the study.

2. LITERATURE REVIEW

Theoretical studies in TC literature identified five major motives that explain why non-financial companies provide credit to their customers. These motives are financing, efficiency, investment, price discrimination, and quality assurance motives (Nadiri, 1969; Schwartz, 1974; Emery, 1984; Smith, 1987; Ferris, 1981; Lee & Stowe 1993; Frank & Maksimovic, 2003). This stream of TC literature provides plenty of supporting empirical evidence for the five major motives (Petersen & Rajan, 1997; Deloof & Jegers, 1996; Blazenko & Vandezande, 2003; Bougheas et al., 2009) are among some of the most well-known studies in this area.

Consequences of TC provision constitute the second stream of empirical research. Early studies in this area analyze the relationship between components of working capital (WCAP) and profitability of the firm (Deloof, 2003; Lazaridis & Tryfonidis, 2006). Hill et al. (2012) found a positive and statistically as well as economically significant relationship between supply of TC and annual excess stock returns. Furthermore, Wu et al. (2012) report that trade receivables and cash holdings are substitutes. Additionally, Yazdanfer and Ohman (2015) found that sales growth consequences of trade receivables are positive. Recently, a newly emerging field of research examines the propagation of corporate bankruptcies through TC chains (Jorion & Zhang, 2009; Boissay & Gropp, 2013; Jacobson & Schedvin, 2015; Barrot, 2016).

This study falls under the second stream of empirical research in literature about TC provision by focusing on the firm value consequences of TC supply. So far, only two studies have analyzed the value consequences of trade receivable policy by utilizing data from developed markets (Martinez-Sola et al., 2013; Dary & James, 2019). This study provides empirical evidence within an emerging market setting for the first time in the related literature.

The key variable of interest in most of the related research is either net working capital or net trade cycle or cash conversion cycle (Aktas et al., 2015; Lei 2019; Boisjoly et al., 2020). As companies have distinct and separate policies for each component of WCAP, the impact of each component on firm value should also be analyzed separately. Martinez-Sola et al. (2013) and Dary and James (2019) provide small sample evidence for Spain and the US, respectively. Additionally, Vural et al. (2012) is the only study that analyzes the impact of WCAP components on firm value using data from Turkey. This study extends the existing literature by analyzing the effects of not only the quantity but also the quality of trade receivables on firm value within an emerging market setting. Additionally, this study also treats trade receivables as endogenous in all estimations due to omitted variable bias concerns. Endogeneity may arise when explanatory variables and the error term are correlated. When an unobserved or omitted variable captured by the error term is confounding both independent and dependent variables, the estimate of the regression coefficient would be biased. This issue is addressed by treating trade

receivables as an endogenous variable and by utilizing System Generalized Method of Moments in estimations.

The results of studies analyzing the value consequences of trade receivable policy are mixed. Vural et al. (2012) report that ACP has no impact on Tobin's Q whereas Martinez-Sola et al. (2013) find an inverted U-shape relationship between TC provision and Tobin's Q. On the other hand, Dary and James (2019) analyze the same relationship and found that TC provision's effect on value is positive and linear. Based on large-sample US data, Adiguzel (2021) found that if companies invest more in trade receivables, their value is reduced. Adiguzel (2021) also provides robust evidence that this relationship is non-linear. These studies use data from developed markets.

3. DATA, REGRESSION MODEL AND ESTIMATION STRATEGY

3.1 Data

Data is collected from Thompson Reuters Datastream. Turkish industrial firms that are listed on Borsa Istanbul (BIST) from 2005 to 2017 form the initial sample. After firms with negative revenue, negative total assets and missing receivables data are excluded from the sample, 293 firms and 3,809 firm-year observations are included in the final sample. All continuous variables are winsorized at the 1 percent and 99 percent levels to minimize the influence of outliers.

3.2 Regression Model

The author develops three models to examine the value consequences of trade receivable policy of firms. Model 1 and Model 2 incorporate ACP and RECTA as two alternative quantitative measures of trade receivable policy whereas Model 3 incorporates TRQI that proxy the quality of trade receivables as explanatory variables. Definitions of key variables (ACP, RECTA and TRQI) are provided in Section 3.3. Model specifications are as follows:

Model 1:

$$TQ_{i,t} = \beta_{10} + \beta_{11}\, TQ_{i,t-1} + \beta_{12}\, ACP_{i,t} + X_{i,t}\, \beta_{13} + \text{Year Dummies} + \varepsilon_{i,t} \quad (1)$$

Model 2:

$$TQ_{i,t} = \beta_{20} + \beta_{21}\, TQ_{i,t-1} + \beta_{22}\, RECTA_{i,t} + X_{i,t}\, \beta_{23} + \text{Year Dummies} + \varepsilon_{i,t} \quad (2)$$

Model 3:

$$TQ_{i,t} = \beta_{30} + \beta_{31}\, TQ_{i,t-1} + \beta_{32}\, TRQI_{i,t} + X_{i,t}\, \beta_{33} + \text{Year Dummies} + \varepsilon_{i,t} \quad (3)$$

This study utilizes System Generalized Method of Moments (GMM) to estimate the models. Each model includes lagged values of TQ as one of the explanatory variables (Martinez-Sola et al., 2013; Rong & Xiao, 2017). Furthermore, $X_{i,t}$ represents the set of time-variant, firm-specific control variables in all models. Additionally, the models include dummy variables for each year to control for economic factors. The error term is denoted by $\varepsilon_{i,t}$, where firm and year are indicated by i and t, respectively. As

the coefficients of industry dummies are neither individually nor jointly significant, these dummies are excluded from the regressions.

3.3 Variables

3.3.1 Dependent Variables

Dependent variable is Tobin's Q (TQ), and its alternative is enterprise value (EV). TQ and EV are calculated as follows:

TQ = (market capitalization + total liabilities + preferred equity + minority interest) / book value of assets.

EV = (market value of equity + market value of debt - excess cash) / total assets.

3.3.2 Control Variables

In the firm value model, SIZE (natural logarithm of total assets), LVRG (total liabilities scaled by total assets), GROWTH (natural logarithm of net income before extraordinary items $(NIBE)_t$ / $NIBE_{t-1}$) and ROA (earnings before interest, taxes, depreciation and amortization divided by total assets) are included as control variables.

3.3.3 Key Independent Variables of Interest

Main variables of interest are those that relate to the trade receivable policy of firms. In the related literature, trade receivable policy is measured by scaling trade receivables on the balance sheet either by sales (Deloof, 2003; Ferrando & Mulier, 2013; Gao & Wang, 2017; Box et al., 2018) or by total assets (Martinez-Sola et al., 2014; Yazdanfer & Ohman, 2015; Dary & James, 2019). In this study, the author analyzes the value consequences of both ACP and RECTA as the key variables of interest. ACP is calculated by dividing trade receivables (including notes receivables) by daily sales to indicate the average number of days trade receivables are recorded on company accounts before they get collected in cash.

This study also utilizes an indicator variable, developed by Adiguzel (2021). This indicator, which is a proxy for the credit quality of trade receivables, is denoted by TRQI and has three components. They are time trend of average collection period (ACP_trend), bucket migration in ACP (ACP_bucket) and time trend of cash conversion cycle (CCC_trend). The first two indicators are primary indicators of worsened credit quality whereas the third one is a situation that may strengthen the possibility of a deterioration in TC credit quality when it accompanies the two primary indicators. The definitions of these three components are:

ACP_trend: This indicator takes the value 1 if there is an upward trend in ACP for the last two consecutive years and 0 otherwise.

ACP_bucket: This indicator takes the value 1 if the increase in ACP within the last two years is more than thirty days and 0 otherwise.

CCC_trend: This indicator takes the value 1 if there is an upward trend in CCC[1] for the last two consecutive years and 0 otherwise.

Based on the above, TRQI is defined as the product of these three components:

TRQI = ACP_trend * ACP_bucket * CCC_trend

Therefore, TRQI takes the value 1 if all the three components are 1, and 0 otherwise.

3.4 Estimation Strategy

For comparison, this study reports pooled ordinary least squares (OLS), fixed effects (FE) and system GMM estimation results. Results are interpreted based on the system GMM output, because OLS parameter estimates may be biased due to unobserved heterogeneity. Additionally, FE model addresses the issue of unobserved heterogeneity, however it assumes that all explanatory variables are strictly exogenous. As trade receivable policy-related variables (ACP, RECTA and TRQI) are considered not to be strictly exogenous, they are treated as endogenous in system GMM estimations. Endogeneity of ACP, RECTA and TRQI arises from a possible correlation between these variables and unobserved factors affecting firm value. Corporate governance, diversification, organizational structure and product market dynamics are examples of unobserved factors that affect value (Hermalin & Weisbach, 1991; Harford et al., 2008; Berger & Ofek, 1995; Denis et al., 2002; Hansen & Wernerfelt, 1989; Haushalter et al., 2007). Thus, this study avoids omitted variables bias by estimating the models through system GMM and also by treating ACP, RECTA and TRQI as endogenous. Accordingly, ACP, RECTA and TRQI are instrumented by their respective lags 2 and 3 in all system GMM estimations (Blundell & Bond, 1998; Brown & Petersen, 2011).

System GMM estimation is executed by xtabond2 module in Stata (Roodman, 2009). Model specification is assessed by employing Arellano-Bond tests for serial correlation in the error term (denoted by ar(2)) and Hansen tests for the validity of instruments (Hansen 1982). Standard errors are robust to heteroscedasticity in all estimations.

4. EMPIRICAL RESULTS

4.1 Descriptive Statistics and Correlation Matrix

The descriptive statistics for the variables are given in Table 1. Mean ACP is about 138 days. However, when observations with ACP over 365 days (170 observations out of 3187 observations in total) are excluded, ACP mean comes down to 101 days. Moreover, ACP has gone from about 90 days in 2005 to about 110 days in 2017, which corresponds to an increase of 22% in twelve years. RECTA average is 24%.

[1] CCC is calculated by adding the average age of inventory (ending inventory/cost of revenue*365) and ACP and then by subtracting average payment period (accounts payable / daily purchases) from this sum (Gitman and Zutter 2012, pp. 603).

Table 1. Descriptive Statistics

Variable	N	Min	Median	Max	Mean	Std. Dev.
TQ	3009	0.5017	1.1762	7.6650	1.4489	0.9114
EV	2879	0.1165	0.8360	6.9686	1.0725	0.8592
ACP	3187	5.3920	90.951	2902.6	137.75	203.91
RECTA	3228	0.0029	0.2138	0.7787	0.2427	0.1648
TRQI	2429	0.0000	0.0000	1.0000	0.0770	0.2666
SIZE	3232	8.6985	12.327	17.048	12.387	1.6729
LVRG	3233	0.0109	0.4848	2.1911	0.4969	0.2709
GROWTH	2242	-3.5309	0.1414	3.4861	0.1238	1.0303
ROA	3060	-0.2735	0.0859	0.5065	0.0916	0.1054

Table 2 provides the correlation matrix for the independent variables. The correlations indicate that multicollinearity among the independent variables is not a concern. Additionally, Variance Inflation Factor (VIF) is also reported in the last column of Table 2. The VIF values of all explanatory variables are below 5, which is widely accepted as the critical VIF value (Studenmund, 2006). Therefore, this also confirms lack of multicollinearity among the variables.

Table 2. Correlation Matrix

Variable	ACP	RECTA	SIZE	LVRG	GROWTH	ROA	VIF
ACP	1						1.02
RECTA	0.2321*	1					1.09
SIZE	-0.0725*	-0.1162*	1				1.11
LVRG	-0.0140	0.1626*	0.0378	1			1.24
GROWTH	-0.0001	0.0083	0.0140	-0.0098	1		1.03
ROA	-0.1061*	0.0819*	0.1751*	-0.3275*	0.0908*	1	1.34

Note: * p<0.1

4.2 Multivariate Regression Results

4.2.1 Impact of ACP on Firm Value

Table 3 presents the results of multivariate regression on the direct impact of ACP on firm value. As per the estimation results (columns 1, 2 and 3), ACP coefficients are negative and are statistically significant at 1% level in OLS and FE estimations and at 5% level in system GMM estimation. This implies that as companies offer longer payment terms to their customers, firm value is reduced. Therefore, when ACP lengthens (shortens) firm value is reduced (increased). These findings are in line with the modern view of WCAP management that perceives excessive levels of current assets as an impediment to financial performance (Sagner, 2014).

Table 3. ACP and Firm Value

Variables	Dependent Variable: Tobin's Q			Dependent Variable: EV		
	OLS	FE	System GMM	OLS	FE	System GMM
	(1)	(2)	(3)	(4)	(5)	(6)
ACP	-0.000232***	-0.000285***	-0.000189**	-0.000159**	-0.000175**	-0.000277**
SIZE	-0.10762***	-0.26960***	-0.04367***	-0.09932***	-0.27700***	-0.04397***
LVRG	0.49432***	0.21469*	0.20343***	0.15507*	-0.09632	0.02786
GROWTH	-0.01809	0.01213	0.01821*	-0.02102	0.01340	0.01984**
ROA	3.20607***	0.96792***	1.16927***	2.83325***	0.86318***	1.09788***
Lagged TQ/EV	No	No	Yes	No	No	Yes
Firm FE	No	Yes	Yes	No	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No of Obs.	1897	1897	1830	1816	1816	1747
Adjusted R^2	0.1625	0.1411		0.1546	0.1447	
ar(2)			0.5335			0.9660
Hansen p-value			0.0870			0.0759

Note: The estimates are robust to heteroscedastic standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively.

Control variables are statistically significant, and their signs are in line with similar studies in the literature. As per system GMM results, size has negative impact on firm value while leverage, growth and profitability affect firm value positively. Furthermore, ar(2) and Hansen p-values in system GMM estimations justify the absence of autocorrelation and the validity of instruments, respectively.

The robustness of the model is assessed by utilizing EV as an alternative measure of firm value (Columns 4, 5 and 6 in Table 3). The results are consistent with that where dependent variable is TQ. Therefore, the results of the model are robust to the use of TQ and EV as two alternative measures of firm value.

4.2.2 Impact of RECTA on Firm Value

Table 4 presents the results of multivariate regressions on the value consequences of RECTA. As per system GMM results (columns 3 and 6), where RECTA is instrumented by its second and third lags due to endogeneity concerns, RECTA coefficients are positive and are not statistically significant. These findings imply that RECTA does not explain any part of the variations in firm value. Although Martinez-Sola et al. (2103) and Wu et al. (2012) report that they get similar results when ACP and RECTA are used as alternative measures of trade receivables policy, findings of this study reveal that it does not hold for Turkish industrials. The findings of this study imply that the decision to invest a certain portion of a firm's assets into trade receivables (measured by RECTA) and the decision regarding the deferred payment terms to be offered to customers (measured by ACP) are two separate decisions.

Table 4. RECTA and Firm Value

Variables	Dependent Variable: Tobin's Q			Dependent Variable: EV		
	OLS	FE	System GMM	OLS	FE	System GMM
	(1)	(2)	(3)	(4)	(5)	(6)
RECTA	-0.34181***	-0.46943**	0.16289	-0.48739***	-0.15751	0.13899
SIZE	-0.11093***	-0.30484***	-0.04164***	-0.10394***	-0.29701***	-0.08893***
LVRG	0.56198***	0.21556*	0.15151	0.24104***	-0.11640	0.08131
GROWTH	-0.01774	0.01207	0.01908*	-0.02053	0.01355	-0.01111
ROA	3.32070***	1.03189***	1.11675***	2.95673***	0.87365***	2.27117***
Lagged TQ/EV	No	No	Yes	No	No	Yes
Firm FE	No	Yes	Yes	No	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No of Obs.	1907	1907	1837	1822	1822	1818
Adjusted R^2	0.1621	0.1426		0.1586	0.1476	
ar(2)			0.3245			0.1173
Hansen p-value			0.1765			0.0471

Note: The estimates are robust to heteroscedastic standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively.

The author has also tested the non-linearity of the relationship between ACP and value by re-estimating Model 1 with the polynomial term of ACP embedded into the model specification. The results of the existing two small-sample studies (Martinez-Sola et al., 2013; Dary & James, 2019) are mixed. Martinez Sola et al., (2013) found a non-linear relationship between TC supply and value whereas Dary and James (2019) report a linear relationship between the two. As per unreported estimations[2], the coefficient of the polynomial term for ACP is not statistically significant (p-value: 0.223). Therefore, ACP-value relationship is linear.

4.2.3 Impact of TRQI on Firm Value

Results of the analysis about the impact of TRQI on firm value are presented in Table 5. As per system GMM estimation results, TRQI coefficient is negative and statistically significant at 10% level. TRQI coefficient is -0.51510 (p-value: 0.054) when the dependent variable is TQ, and it is -0.42231 (p-value: 0.085) when the dependent variable is EV. Therefore, it implies that a deterioration in the credit quality of trade receivables has negative impact on firm value. As a second step, this study tests the direct impact of TRQI components separately and finds that ACP_bucket is statistically significant at 1% level and has negative impact on firm value. The coefficients of ACP_bucket are -0.39756 (p-value: 0.006) and -0.47369 (p-value: 0.002) when the dependent variables are TQ and EV, respectively. The other two components of TRQI (ACP_trend and CCC_trend) are not statistically significant when tested individually.

[2] The results are available upon request.

Table 5. TRQI and Firm Value

Variables	Dependent Variable: Tobin's Q		Dependent Variable: EV	
	Baseline (1)	TRQI Impact (2)	Baseline (3)	TRQI Impact (4)
TRQI		-0.51510*		-0.42231*
SIZE	-0.04392***	-0.04511***	-0.04276***	-0.04682***
LVRG	0.195119***	0.25913***	0.03641	0.08706
GROWTH	0.01734	0.02869**	0.02075*	0.02923***
ROA	1.15418***	1.14103***	1.09436***	1.08398***
Lagged TQ/EV	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
No of Obs.	1866	1519	1777	1449
ar(2)	0.5746	0.3465	0.8682	0.7529
Hansen p-value	0.1500	0.0677	0.1708	0.1178

Note: The estimates are robust to heteroscedastic standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively.

This finding motivated us to analyze the relationship between ACP and firm value (Model 1) further by splitting the sample into two sub-samples, one of which is composed of firms whose ACP_bucket equals 1. The other sub-sample is composed of firms whose ACP_bucket equals 0. In this analysis, three versions of ACP_bucket are used to ensure robustness. Definitions of these three versions are as follows:

Version 1: This indicator takes the value 1 if the increase in ACP within the last year (from t-1 to t) is more than thirty days and 0 otherwise.

Version 2: This indicator takes the value 1 if the increase in ACP within the last two years (from t-2 to t) is more than thirty days and 0 otherwise.

Version 3: This indicator takes the value 1 if the increase in ACP within the last three years (from t-3 to t) is more than thirty days and 0 otherwise.

As per the results presented in Table 6, the negative impact of ACP on firm value is statistically significant at 1% level for firms that have experienced an increase in ACP by more than thirty days within the last two to three years (columns 4 and 6). Therefore, the negative linear relationship between ACP and firm value only exists among firms that tied up more cash into its WCAP such that their ACP went up by more than thirty days within the last one to three years. Moreover, for companies, whose ACP did not increase by more than thirty days within the last one to three years, the negative impact of ACP on firm value is not statistically significant (columns 3, 5 and 7). As companies lengthen their ACP, they are more likely to acquire customers that are financially constrained, because such customers have the tendency and motivation to prefer extended TC terms to cash discounts (Atanasova, 2012). Furthermore, customer defaults are more frequent, and loss given default is higher for suppliers that issue more TC through longer trade terms (Jacobson & Schedvin, 2015). This situation may also lead to increased likelihood of corporate failure on the supplier front (Jorion & Zhang, 2009). These, combined

with strong evidence regarding the potential riskiness of strategies involving liberal TC provision policies (Barrot, 2016), may explain why ACP becomes an important determinant of corporate value for companies whose ACP has increased by more than thirty days within the last one to three years.

Therefore, this study empirically shows that a worsening of trade receivables credit quality has negative impact on firm value, which is in line with the author's expectations. Additional empirical evidence about ACP-value relationship is also provided. This evidence implies that the negative impact of ACP on firm value is statistically significant for firms whose ACP increased by more than thirty days within the last one to three years.

4.3 Impact of ACP on Firm Value for High and Low Profit Sub-Samples

In this section, additional analysis regarding the relationship between ACP and value is performed. This analysis is motivated by several studies in the literature pointing at the difference in TC provision behavior of high versus low profit firms.

As per empirical evidence provided by Petersen and Rajan (1997), loss-making firms tend to extend more credit. This finding was re-confirmed by Molina and Preve (2009), who found that when firms start facing profitability problems, they tend to increase the supply of TC to their clients in an effort to buy market share. Similarly, findings of Giannetti et al. (2011) and Garcia-Appendini and Montoriol-Garriga (2013) suggest that firms with lower profit margins behave differently in the sense that they extend more TC to their clients. Garcia-Appendini and Montoriol-Garriga (2013) interpret such behavior as an attempt to achieve profit margin improvements by attracting new clients. These findings suggest that firms with high and low profitability tend to behave differently regarding their investments in trade receivables. Therefore, this study extends the related literature by exploring the value consequences of ACP for high and low profit firms separately.

High-profit and low-profit sub-groups are determined separately for each year. High-profit (low-profit) firms are those that are above (below) the median in a given year. ROA is used as profitability measure. For robustness purposes, this study uses three alternative measures of ROA, which are ROA1 (EBITDA[3]/Total Assets), ROA2 (Net Income / Total Assets) and ROA3 (Operating Income / Total Assets). After the data is split into high-profit and low-profit sub-samples, Model 1 is tested for the two sub-groups separately.

As per the system GMM estimation results presented in Table 7, ACP has a negative and statistically significant direct impact on firm value for high-profit sub-group (columns 1,2 and 3). Therefore, the regression results for high-profit firms are very similar to the results for the whole sample (Table 3, Column 3). The coefficient of ACP for high-profit sub-sample is nearly 1.5 times the coefficient of ACP for the whole sample (columns 4, 5 and 6). Therefore, compared to the whole sample, the negative

[3] Earnings before interest, taxes, depreciation and amortization

impact of ACP on firm value is more severe for firms with relatively higher profitability. For firms with relatively lower profitability, ACP-firm value relationship is still negative but is not statistically significant. Therefore, the negative linear relationship between ACP and firm value only exists among firms with high profitability. This is valuable new evidence. The findings imply that if low-profit and/or loss-making firms lengthen their ACP to achieve certain goals such as profit margin improvements, higher market share and new customer acquisition, this change in trade receivable policy will have no direct impact on firm value.

Additionally, control variables are also statistically significant, and their signs are in line with those reported for the whole sample. These results are robust across the alternative definitions of profitability, which is proxied by ROA1, ROA2 and ROA3. Additionally, Hansen p-values justify the validity of instruments.

This study provides empirical evidence for the first time that the impact of ACP on firm value holds for companies with high profitability. This implies that TC provision strategies that involve lengthening of deferred payment terms lead to loss of firm value for high profit firms. On the contrary, similar strategy has no direct effect on firm value for firms with relatively low profitability.

Table 6. ACP and Firm Value Relationship for Three Versions of ACP_Bucket Sub-samples

Variables	Whole Sample (1)	Version 1 More than thirty day increase in ACP in *one year*		Version 2 More than thirty day increase in ACP in *two years*		Version 3 More than thirty day increase in ACP in *three years*	
		ACP_bucket=1 (2)	ACP_bucket =0 (3)	ACP_bucket =1 (4)	ACP Bucket =0 (5)	ACP_bucket =1 (6)	ACP_bucket =0 (7)
ACP	-0.000189**	-0.00023*	-0.00020	-0.00025***	-0.00015	-0.00028***	0.00006
		(0.078)	*(0.188)*	*(0.009)*	*(0.159)*	*(0.002)*	*(0.658)*
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged TQ	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of Obs.	1830	257	1573	474	1356	666	1164
ar(2)	0.5335	0.7390	0.4745	0.4057	0.4459	0.4084	0.6787
Hansen p-value	0.0870	0.1728	0.1086	0.2226	0.2638	0.5064	0.2075

Note: p-values of ACP coefficients are presented in parentheses. The estimates are robust to heteroscedastic standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively. Estimations are performed through system GMM. ACP is instrumented by its second and third lags. Dependent variable is TQ.

Table 7. ACP and Firm Value Relationship for High-profit and Low-profit Firms

Variables	Dependent Variable: Tobin's Q					
	High ROA1 (1)	High ROA2 (2)	High ROA3 (3)	Low ROA1 (4)	Low ROA2 (5)	Low ROA3 (6)
ACP	-0.00030**	-0.00032**	-0.00043***	-0.00007	-0.00005	-0.00004
SIZE	-0.02362**	-0.02924**	-0.02477*	-0.06841***	-0.05418***	-0.06011***
LVRG	0.18649**	0.36225***	0.22069*	0.30411***	0.16175	0.23679***
GROWTH	-0.002513	-0032854	-0.02050	0.01245	0.02091	0.01793
ROA	1.65096***	2.09824***	1.95560***	0.25584	0.21806	0.10919
Lagged TQ	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No of Obs.	1050	1090	1053	780	740	777
ar(2)	0.5242	0.7478	0.5707	0.7419	0.5003	0.5235
Hansen p-value	0.1772	0.1220	0.0581	0.2159	0.2201	0.2185

Note: The estimates are robust to heteroscedastic standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively.

5. CONCLUSION

Excessive levels of current assets, including trade receivables, are perceived as an impediment to financial performance (Sagner, 2014). WCAP is considered to be the next value driver even for the largest global listed companies (PricewaterhouseCoopers, n.d.). Given the current business environment where converting revenue into cash is a challenge for companies, receivables are viewed as a major source of opportunity in the coming years. Yet, the academic literature regarding the value consequences of trade receivable policy remains under-researched. Thus, this study aims to fill a gap in the TC literature by providing empirical evidence from an emerging market on the direct impact of trade receivable policy on firm value. Using a sample of listed Turkish industrials, this study shows that non-financial firms can create value by shortening their receivables collection period. Additionally, it is reported that the percentage of trade receivables in total assets does not help explain the variation in firm value. These results are robust to the use of alternative proxies for firm value. This study also addresses the omitted variables bias issue by treating trade receivable policy-related variables as endogenous.

This study also analyzes the value consequences of ACP for firms with high profitability versus low profitability and shows that the negative and linear relationship between ACP and firm value exists only for high profit firms. Additionally, ACP-value relationship is analyzed in more detail for companies that experienced an increase of more than thirty days in ACP over the last one to three years by splitting the sample into two sub-groups accordingly. Results indicate that lengthening of ACP pushes firm value down in firms whose ACP has increased by more than thirty days within the last one to three years.

In an additional analysis, the author documents that if trade receivables credit quality is impaired, firm value is reduced. Therefore, this study provides empirical evidence from an emerging market about the value consequences of a worsening in credit quality of trade receivables for the first time. Overall, results of this study highlight the importance of efficiency improvements in trade receivables process as a driver of firm value.

Research in this area may be extended further by analyzing the firm value consequences of a deterioration in the credit quality of trade receivables in other emerging market economies.

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