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# CONDITIONING FACTOR OF LATE PAYMENT OF TRADE CREDIT

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**SCIENTIFIC ARTICLE**

**TOPIC: CREDIT**

# CONDITIONING FACTOR OF LATE PAYMENT OF TRADE CREDIT

## *FATORES CONDICIONANTES DE ATRASO NOS PAGAMENTOS DE CRÉDITOS COMERCIAIS*


***ABSTRACT***

*This article presents new evidence on the practice of financial delinquency of trade credits. The low level of punctuality in payments to suppliers can negatively affect the liquidity of the lender and be transmitted to all companies in the value chain, creating uncertainties in the business environment. The aim is to identify and analyze what are the factors responsible for delay in payment to suppliers in one sample of states Minas Gerais and São Paulo companies not listed on a stock exchange. A survey with 554 companies enable to apply the model of the ordered logit regression analysis in which the dependent variable is financial delinquency level of companies that delay or not the payment of duties and independent are the demographic, financial and operational inherent demand for financing and moral hazard. The results show that companies with short-term debt, with little time for activity, the smaller and shorter cash cycle is more likely to delay their obligations to suppliers.*


***Keywords*** *│ Action hidden, information asymmetry, financial crime, moral hazard, purchase on credit*



**RESUMO**

Este artigo traz novas evidências sobre a prática de delinquência financeira de créditos comerciais. O baixo nível de pontualidade nos pagamentos a fornecedores pode afetar negativamente a liquidez do credor e ser transmitida a todas as firmas da cadeia de valor gerando incertezas no ambiente de negócios. O objetivo é identificar e analisar quais são os fatores condicionantes do atraso no pagamento aos fornecedores em uma amostra de empresas dos estados de Minas Gerais e de São Paulo e não listadas em bolsa de valores. Um *survey* com 554 firmas possibilitou aplicar o modelo da análise de regressão ordenada *logit*, na qual a variável dependente é o nível de delinquência financeira das firmas que atrasam ou não o pagamento de créditos comerciais e as independentes são os fatores demográficos, operacionais e financeiros inerentes à demanda de financiamentos e ao risco moral. Os resultados mostram que as firmas com dívidas de curto prazo, com pouco tempo em atividade, as de menor porte e com ciclo de caixa curto tem maiores probabilidades de atrasarem suas obrigações junto aos fornecedores.


**Palavras-chave** │ Ação oculta, assimetria de informações, compras a prazo, delinquência financeira, *moral hazard.*

## INTRODUCTION

The delay of payments in commercial transactions between companies is not a recent phenomenon in the real economy and it can have a negative impact not only on the performance of companies that grant the trade credit (TC), but also on the reputation of the offenders (Petersen & Rajan, 1994) and the confidence level of the business environment. This event is the realization of hidden action of asymmetric information (Akerlof, 1970) in contracts.

Howorth and Reber (2003) and Carvalho and Schiozer (2012) found that, on average, 80 % of British and Brazilian MSEs practice this type of financial delinquency. The delinquency is the lack of timely payment of the value of the TC. This event can be both financial - late payments – or by defaulting or full insolvency (Howorth & Reber, 2003). The TC contracts embed aspects of agency theory as asymmetric information and moral hazard (Akerlof, 1970; Jensen & Meckling, 1976) and transactions cost (Williansom, 1991) inherent in loan demand.

After all why do companies that receive trade credit (TC) delay payments to suppliers? However the answer to this issue it is not clear in the literature of corporate finance. From this context, and considering the lack of empirical studies and databases systematized and available on this subject in Brazil, this research seeks to fill this gap by answering the following research question:

***What are the organizational characteristics of companies not listed on the stock exchange associated with delinquent behavior of late payment to suppliers?***

The main objective of this study is to analyze whether demographic, operational and financial factors are associated, significantly or not, to the practice of late payments of commercial credits in companies not listed in the stock exchange.

The results show that companies with short-term debt, with little time for activity, the smaller and shorter cash cycle is more likely to delay their obligations to suppliers.

This study contributes to the literature of short-term corporate finance by increasing knowledge on the management of working capital, and more specifically, this type of delinquency.

The results provide important implications in the companies' form of managing the grant of TC. The factors responsible for late payment may be considered, for example, to review and update models of intercompany credit risk evaluation scores and also by class associations to formulate financial education and training programs for managers. They may be also used by authorities to formulate public policies aimed at removing institutional credit market frictions to improve access to funding sources and reduce the cost of capital transactions of companies not listed in the stock exchange.

## THEORETICAL AND EMPIRICAL FRAMEWORK

The theoretical perspectives of agency and transaction costs support the development of this study.

### 2.1 Transaction Costs

A firm can be understood as a nexus of contracts in which there are two types of costs, production that take place within it, and the transaction with third parties (Coase, 1937). A transaction occurs when a good or service is transferred across technologically distinct interfaces (Williamson, 1981). According to this theoretical perspective firms exist because it is more economical to carry out a transaction that internally use the free market. Thus the decision to delay the payment of TC's can be explained based on the trade-off between the transaction cost of financial institutions and suppliers.

In this case, organizations create costly bureaucratic and hierarchical structures to coordinate and control both internal activities as contracts. As a result, there is the institutionalization of management routines to coordinate efficiency in procurement transactions, inventory, while the financial lend themselves to provide liquidity and minimize business risks. For example, the control

of the cash conversion cycle becomes necessary because both articulates both terms of client-supplier-shareholders agreements, as seeks to meet the desired level of liquidity by the manager.

At this conjecture, transaction costs are based: (1) the behavioral assumptions of bounded rationality and opportunism of agents; and (2) the dimensions and / or characteristics of transactions such as frequency, asset specificity and uncertainty. The factors on the demand side of TC as frequency of purchases on the type of product purchased and the behavior of the consumer market are determinants of CT which may affect liquidity of the firm. Moreover, the decision to internalize the activities of lending on credit sales may involve costly actions because the company is faced with many uncertainties about the credit quality of the customer and, as a result, incurs in transaction cost to obtain information the credit bureau, SPC and other before hiring the operation. This is because there is hidden information (Akerloff, 1970) customers that are difficult to access, both ex-ante and ex-post for sale. In this case, the greater the uncertainty, the greater the chances of customers do not pay their debts at maturity, increasing thus the transaction cost and the cash deficit, which contributes to the firm to delay the payment of TC's. However the financial costs implicit of this type of delinquency in underdeveloped and emerging credit markets (default interest, penalties and other costs of collection), are costly and can compromise the capital return of the company demanding TC.

**Agency Theory**

As argued Berle and Means (1932) separation of the function of managing the control needed a corporate governance structure because of potential conflicts of interests arising from the principal-agent relationship (Ross, 1973). The mitigation of these conflicts generates "agency costs" to the main due to the asymmetry of information between agents (Jensen & Meckling, 1976). These costs arise because of incomplete alignment of interests between the parties to a contract. Smaller companies are confronted with various difficulties to access credit markets outside traditional banking, for reasons of both adverse selection and moral hazard (Rice & Strahan, 2010). Etiennot, Preve and Sarria-Allende (2012) show evidence that these problems are even more serious when the financial and capital markets of the country are less developed as Brazil and the company is smaller. In this case, agency costs of debt are expected higher for smaller firms.

Antov and Atanasova (2007) noted that the opacity of information in companies not listed in the Stock Exchange is the main reason for the financial market to restrict these companies access to external funds, due to the presence of high costs of asymmetric information resulting from ex-post moral risk arising from potential hidden actions (Akerlof, 1970) of the buyer and not identifiable ex-ante. Among the potential hidden actions in the business environment, is the non-payment of the debt on the contracted date to the suppliers. In such situations, the issues inherent to informational asymmetry, adverse selection and moral hazard may have a relatively large effect when companies are young (with little historical informations) and small, which may explain why they find it difficult to obtain loans in the traditional credit market (Petersen & Rajan, 1994).

In the context of MSEs, the focus of agency relationships is no longer between shareholder and administrator shall involve other actors, for example, customers who require credit for purchases over time, suppliers that offer trade credit as a tool for sales and encourage them financial institutions. As a result of information asymmetry in contracts, agency problems arise in two categories: adverse selection and moral hazard. Adverse selection occurs while ex-ante moral hazard involves ex-post to hiring. MSEs are considered high-risk agents and are therefore rationed capital suffer because of financial constraints in the institutional credit due to the opacity of market information. In this situation, the supplier makes the adverse selection of these firms to supply them with goods even though the possibility of moral hazard in the client does not pay the commercial credits. Costs of bank debt agency are higher than those of CC's because the high frequency of contact with customers generates informational advantage of suppliers over banks. Berger, Espinosa-See, Frame and Miller (2005) postulated that there is a direct relationship between information asymmetry and firms' use of short-term debt. In addition, Brockam, Martin and Unlu

(2010) emphasize that hiring short-term discipline the behavior of managers, which reduces agency conflicts and may reduce borrowing costs when good news Company are disclosed but expose firms to liquidity risk due to inefficient liquidation of debt when refinancing is not possible (Diamond, 1991). In this case the firms are likely to delay payment of CC's for lack of cash. The size, the length of the firm's activity and the frequency of use of external financing are proxies used to capture the elements of adverse selection models. In line with the guidelines of Myers and Majluf (1984), firms with higher growth opportunities are subject to higher managerial agency costs because there is private information of managers about the expansion projects that foreign investors only partially known.

In models of moral hazard smaller firms are subject to higher levels of default CC's because access to the credit market is limited. In this study the frequency of late payment to suppliers is the chosen proxy for assessing the risk of financial crime company. The ratio of forward purchases (a proxy for the demand for TC) capture both issues of transaction cost as adverse selection problem.

## DATA AND METHODS

### Data collection procedure

Considering the objective of this study and the absence of public databases available, I carried out a survey of managers and financial executives of companies about short-term financial management practices.

The units of analysis were organizations not listed on BM&FBOVESPA. The companies, of all sizes, were based in 32 Brazilian cities, 65% in São Paulo and 35% in the State of Minas Gerais.

The classification of the companies by size followed the pattern (number of employees) of the Brazilian Service of Support for Micro and Small Enterprises – SEBRAE. This design allowed the formation of a database, unique, and original of 554 non-financial companies.

The criterion for choosing the companies in the sample was convenience and the accessibility of the interviewer to the respondent. The data collection was cross-sectional, between 2008 and 2010, with three waves. The null hypothesis of difference between the averages of the samples was not rejected at a significance level of 5%. Thus, this procedure minimizes the existence of statistical bias between samples, allowing them to be aggregated for analysis.

The instrument for data collection was a structured questionnaire by Howorth and Westhead (2003), reverse translated and adapted to the Brazilian context. I conducted the pre-test of the adjusted version of the questionnaire with eight managers to check if the writing and understanding of each question was clear.

The interviewer conducted the completion of the questionnaires personally as the interviewee answered the question. The average time to complete the questionnaire was 15 minutes. Cases with missing or inconsistent data were eliminated from the database. Only profit organizations participated from the analysis.

The choice of variables associated with late payments of commercial credits selected in this study are based on theoretical aspects of transactions cost and agency. Chart 1 lists the variables, definitions and measurement metric.

Chart 1 - Variables, interpretation and measurement scale

| Variables | Mnemonic | Interpretation | Measurement scale |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Payment delay to suppliers | LATE | Paying the supplier after the due date previously agreed between buyer and seller | Ordinal: 1 = always delayed 9 = never delayed |
| Company uptime | AGE | Interval of time from the foundation up to the date of the interview | Continuous: years |
| Cash conversion cycle | CCC | Average net length, arising from the management of accounts receivable, inventories and accounts payable | Continuous: days |
| Punctuality of payments from customers | ONTIME | Average history of collecting the receivables portfolio on the due date | Continuous: average ratio of the last 12 months between amounts received from customers at maturity and the total value of the receivables portfolio |
| Credit purchases | PURCHASE | Demand for trade credit from suppliers | Continuous: average ratio for the last 12 months of credit purchases and total purchases |
| Growth | GROWTH | Importance of sales growth in the past three years | Ordinal: 1 = unimportant to 9 = very important |
| Bank external financing | FINEX | Frequency of use of five sources of bank funds in the last three years | Ordinal: 5 = never used any of the sources of funds to 25 = very frequent use. |

## Variables

**Payment delay**: the frequency of payment delay of commercial loans in companies is the dependent variable of the estimated ordinal logit model. A company delays payment of an obligation to the supplier when it does not honor the terms agreed in the contract. This financial crime can be linked to factors and organizational characteristics widely supported by the literature of moral hazard. This is a proxy for moral hazard model. The following discusses each of up explanatory variables comprising the empirical model.

**Uptime and size**: organizational reputation is an important construct for companies to access the financial system. The literature shows that agency cost of debt are lower for larger companies and that have been longer in operation, allegedly, have accumulated more resources and real guarantees to honor their commitments and have more access to the bank credit market. In this study, the variables size and uptime are proxies that represent element of transaction cost and agency. Alphonse, Ducret and Séverin (2004) analyzed data from small U.S. businesses and found evidence that TC used by companies helped improve business reputation and show the credit quality of the firm and thereby facilitated access to new debt/bank loans. The uptime variable is new in this study. The hypothesis 1 is formulated from these arguments:

**Hypothesis 1: The uptime of the company is negatively associated with late payments**

**Cash conversion cycle (CCC)**: The variable ccc is also new in this study. The decision to include it arises from its nature as a measure of liquidity of the company (Ebben & Johnson, 2011). The theory of liquidity (Cunat, 2006) states that the availability of cash ensures the stay in the market and the growth of organizations in a healthy way. The CCC variable measures the time interval between the date of receipt of credit sales and the date of payment of suppliers, and is the

best indicator of performance that shows the operating efficiency of the firm in managing accounts payable, inventory and accounts receivable. This variable is a proxy measure of the efficiency of working capital management (Deloof, 2003). The higher the value of this variable, the higher the value of working capital required to finance the operations of the companies. In addition to this reasoning, Pike and Cheng (2001) found signs that companies that delay payments to suppliers more frequently do so because their cash cycle is long, demanding more funds to support the operation.

It is possible that companies with longer CCC have greater chances of delaying the payment of trade credit compared to those that operate with short financial cycles. Thus, the following hypothesis is formulated:

**Hypothesis 2: The duration of the CCC of the company is directly associated with the delay of liabilities to suppliers**

**Punctuality of payment on maturity:** this variable indicates the level of timely payment of the customers who received credit from companies in forward purchases. It reports to the monthly average ratio in the past 12 months between receiving on the contracted date and the total amount of accounts receivable forecast. When this ratio is low, the uncertainty of the inputs of cash flow increases and the chance of not honoring obligations to the supplier is greater. This information may be useful to investors in assessing the risk of granting new funds. The late payment to suppliers can also keep a negative connection with the low levels of punctuality of payments from clients, establishing thus a transmission channel of delays on financial commitments, causing a domino effect (Wynarczyk, 2000) in the supply chain. Thus, was established the following hypothesis:

**Hypothesis 3: The punctuality of the receivables portfolio is negatively associated to the delay of payments to suppliers**

**Credit purchases:** this variable is a *proxy* of demand for commercial loans for moral hazard and adverse selection models. Companies with little access to bank credit market fulfill, quite frequently, their capital needs (Petersen & Rajan, 1997) from partner suppliers from the business chain operations. In addition to liquidity needs and strategic use to encourage sales, the demand for TC can be directly affected by the proportion of sales on credit made to customers (Pike & Cheng, 2001), since MSMEs are companies with limited access to bank credit, they begin to rely more on financing from suppliers than banks. As professed by Preve and Sarria-Allende (2010, p. 100), the relationship with the supplier is a strategic aspect for clients, because [.... ] the knowledge that suppliers might provide financing when it is needed most has clear implications for how a firm will set its financing mix during normal times. These authors also argue that the availability of TC is more stable than bank loans, and this contributes to strengthen both the use of credit as the long-term business relationship. The volume of purchases over time can indicate the quality of the credit of the enterprise, the relationship degree with the supplier and the buyer's market power. As well as greater volume of accounts payable may be associated with an decrease in the chance of delaying their financial commitments to suppliers.

**Hypothesis 4: The proportion of purchases on credit is negatively associated to the payment delay to suppliers**

**Growth:** Growth was measured according to the perceived importance, by the leader of this event, of the pace of historical expansion of the firm. This variable is a proxy for adverse selection models. According to the foundations of the theory of agency, the agency cost managerial are expected higher for firm with high growth opportunities (Titman & Wessel, 1988) because of high levels of private information asymmetry between insiders of firms no listed and outsiders investors (Jensen & Meckling, 1976). In this context, the greater the desire for company growth, the greater the pressure for funds to finance working capital due to increased operating activity to win markets, greater transactions cost. However the sample firms can not access the credit market for foreign capital and thus increase the chances of the company to delay payment to suppliers. The hypothesis derived from this argument is that:

**Hypothesis 5: The desire to grow is associated positively to delay payments to suppliers**

**External financing:** the proxy chosen to capture the use of debt for financial leverage was the frequency of use of the main lines of banking resources available in the domestic financial market. This variable shows itself relevant because the empirical literature of trade credit documents the hypothesis of complementarity between these two sources. Thus, domestic evidence shows that traded companies with more access to external funding sources also extend more trade credit to their customers (Schiozer & Brando, 2011; Palombini & Nakamura, 2012).

According with Myers (1977), the use of short-term debt minimizes agency costs of debt such as underinvestiment and asset substituition (Jensen & Meckling, 1976) by making renegotiation more frequent and fit as a mechanism to discipline managers that reduces agency conflicts between managers and shareholders. As a consequence, transaction costs can reduce, allowing contracting of institutional credit for the firm to obtain liquidity and meet its obligations to suppliers. So one might expect an inverse association between access to loans and late payments.

In this study, the institutional lines of credit most commonly available in the financial market were: overdraft, guaranteed accounts, check and bill cashing, working capital loans and financing by Banco Nacional de Desenvolvimento Econômico e Sustentável - BNDES. An ordinal scale, in which the value of 25 corresponded to frequent use of the five sources of funding while the value of 5 corresponded to non-use. Each resource line had the same weight in calculating the average value added of frequency of use of external sources of funding. Therefore, was idealized the following assumption:

**Hypothesis 6: Firms that make more use of lines of credit are negatively associated with payment delays**

**Method**

The empirical model was estimated by applying multivariate ologit regression models to find the factors that are associated significant payment delay to suppliers. Choice models are developed from economic theories of random utility, where as classification models (classifying severity levels of financial delinquency, for example) are developed by minimizing classification errors with respect to the x's and classification levels y. This phenomenon is particularly true in a trade credit supply where finance delinquency is more common. It is usually estimated using maximum likelihood. The use of the OLM is justified in the multiple-category case (late payment severity different levels in this study), which is considered ordinal in nature.

In statistics, ordered (or ordinal) logit method (hereafter OLM) is a generalization of the popular logit analysis to the case of more than two discrete outcomes of an ordinal or polytomous dependent variable. The OLM is one of many models subsumed under the rubric of generalized linear models for ordinal data. The model is based on the assumption that there is a latent continuous outcome variable or index and that the observed ordinal outcome arises from discretizing the underlying continuum into j-ordered groups. The thresholds in SPSS estimate these cutoff values. In this study, the underlying relationship (latent) can be characterized is

$$y^*_i = \alpha_i + \mathbf{x}_{ki}.\beta_k + \varepsilon_i \text{ where,}$$

$\alpha$ is the intercept;

$y^*$ is the exact but unobserved continuous dependent variable (management's attitude about late payment level in firms);

**x** is the vector of independent variables or character operational, demographics of firms or attributes of individuals that the decision maker choice, and

$\beta$ is the vector of regression coefficients which wish to estimate and

$\varepsilon$ is error term, that suposed follow logistic distribuition.

Then the OLM technique will use the observations or choice on y (ordinal categories of response), which are a form of censored continuous data on $y^*$, to fit the parameter vector $\beta$. In this case, the model for the latent variable ($y^*$ ), along with category thresholds, can determine the cumulative probability distribution of y: $Pr(Y_i \leq J) = Pr(y_i^* \leq \mu_j)$. If the errors follow the similar logistic distribution, then the ordered logit or proportional-odds model is:

$$\text{Logit}[Pr(Y_i \leq J)] = \log_e\left[\frac{Pr(Yi \leq J)}{Pr(Yi > J)}\right] = \alpha_j - \alpha - x_{i1}\beta_1 - \ldots\ldots\ldots - x_{ik}\beta_k$$

for j = 1,2, ….., m - 1.

## RESULTS

### Sample

The sample comprised 554 companies of varying sizes, being 51.6% micro companies, 37% small, 5.2% average and 6.1% large companies, showing that the size distribution of companies has positive asymmetry, consistent with the geographic population of the companies. When you separate the data relating to the practice of delaying payments or not, you find that 53.4% of the companies delayed payment to vendors quite frequently. The null hypothesis of binomial distribution ratio was supported (p <.001). Table 1, below, shows the relative distribution and the cumulative responses of the leaders on the routine of financial delinquency.

Table 1 **- Frequency of payment delay to suppliers by label**

| Score | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| % | 3,6 | 4,0 | 6,3 | 3,6 | 5,2 | 4,3 | 10,5 | 15,9 | 46,6 |
| % Accumulated | 3,6 | 7,6 | 13,9 | 17,5 | 22,7 | 27,0 | 37,5 | 53,4 | 100,0 |

Note: the scale had labels with scores ranging from 1 for frequent delays to 9 for never delaying payments to suppliers. The companies with score 9 were reclassified as group 0 (non-defaulting) and the others as belonging to group 1 (offenders).

As can be seen, there are different degrees of severity (label 1: very high and label 8: very low) for this event. One way to better understand this variation and its association with the characteristics of the companies is to reduce the scale of responses. In this study, eight labels were combined and nested, in ascending order, in pairs, and I reclassified in four groups according to the severity levels of delaying obligations to suppliers. Table 2, below, sets the groups and their frequency responses.

Table2 **- Frequency of payment delay by group**

| **Labels** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| **Groups** | G1 | | G2 | | G3 | | G4 | |
| **%** | 14,2 | | 18,7 | | 17,9 | | 49,3 | |

Note: G1 consists of companies with a high degree of severity, G2 and G3 firms with an intermediate degree and G4 firms showing a low degree.

The panel shown in Table 3, below, describes the characteristics of independents variables of the ordered logit model according to the severity levels of the delay or non-payment.

### Descriptive statistics

Table 3 -**Descriptive analysis**

| | N | Minimum | Maximum | Average | Standard deviation | Symmetry |
|---|---|---|---|---|---|---|
| Group 0: Non-defaulting | | | | | | |
| AGE | 258 | 1 | 117 | 16,12 | 12,96 | 2,75 |
| PURCHASE | 258 | 0 | 100 | 48,06 | 37,69 | ,03 |
| CCC | 258 | 5 | 180 | 31,57 | 20,61 | 3,11 |
| ONTIME | 258 | 5 | 95 | 41,94 | 25,67 | ,53 |
| Group 1: high severity | | | | | | |
| AGE | 42 | 1 | 54 | 14,43 | 11,48 | 1,51 |
| PURCHASE | 42 | 0 | 100 | 54,52 | 35,17 | -,22 |
| CCC | 42 | 6 | 60 | 27,26 | 10,62 | ,60 |
| ONTIME | 42 | 5 | 95 | 43,71 | 26,31 | ,60 |
| Group 2: low average | | | | | | |
| AGE | 55 | 2 | 69 | 12,55 | 13,24 | 2,17 |
| PURCHASE | 55 | 1 | 98 | 55,98 | 32,94 | -,46 |
| CCC | 55 | 4 | 90 | 29,76 | 13,17 | 1,87 |
| ONTIME | 55 | 5 | 95 | 43,25 | 25,72 | ,52 |
| Group 3: high average | | | | | | |
| AGE | 53 | 2 | 36 | 12,19 | 8,55 | 1,31 |
| PURCHASE | 53 | 0 | 100 | 51,30 | 35,39 | -,22 |
| CCC | 53 | 5 | 75 | 31,47 | 16,25 | ,75 |
| ONTIME | 53 | 10 | 95 | 47,11 | 23,41 | ,29 |
| Group 4: very low | | | | | | |
| AGE | 146 | 2 | 73 | 16,39 | 13,39 | 1,83 |
| PURCHASE | 146 | 0 | 100 | 51,00 | 36,02 | -,05 |
| CCC | 146 | 7 | 132 | 34,66 | 20,10 | 2,27 |
| ONTIME | 146 | 2 | 95 | 41,80 | 24,63 | ,39 |

The frequency distributions of the explanatory variables have asymmetry to the right, except for forward purchases. In this situation, most companies are micro and small sized, relatively mature, with 75% of them taking up to 36 days to recover the capital invested in current assets and 60% of customers who pay their credit purchases timely. With regard to financing by commercial loans, 75% of the sample companies buy up to 90% of stock on credit.

Two ordinal variables - growth and external financing - complete the analysis. The modal value equal to 9, which corresponds to the very important label in the growth scale, shows that the

desire to grow prevails among the leaders. There is evidence in the literature showing that the use of trade credit positively affects access to banking resources. However and opposite this notation, observed the predominant low use of institutional credit lines of among companies in the sample (mode = 5, corresponds to the non-use of bank credit lines). This information can partly explain the practice of financial delinquency in the purchasing companies. Of the organizations that contract financing operations, 75% of them used short and medium term credit lines.

**Ordered Logit Regression**

The model specified aims to estimate the probability of companies taking one of the groups according to a set of independent variables. The explanatory variables used to predict the probabilities of the enterprise to belong at one specific group as shown hereafter

$$y_i^* = \beta_0 + \beta_1 AGE_i + \beta_2 CCC_i + \beta_3 FINEX_i + \beta_4 PURCHASE_i + \beta_5 GROWTH_i + \beta_6 ONTIME_i + e$$

where

$y_i^*$ = unobserved late payment level

$y_i$ = declared value by manager

$y_i = 0$ if $y^* \leq 0$, indicating the firm no late payment suppliers

$y_i = 1$ if $0 \leq y^* < \mu_1$, indicating the delinquency financial risk is low

$y_i = 2$ if $\mu_1 \leq y^* < \mu_2$, indicating the delinquency financial risk is low – medium

$y_i = 3$ if $\mu_2 \leq y^* < \mu_3$, indicating the delinquency financial risk is high - medium

$y_i = 4$ if $\mu_3 \geq y^*$, indicating the delinquency financial risk is high

$\mu_1$, $\mu_2$ and $\mu_3$ are jointly estimated threshold values which determine the delinquency finance level of firm.

Brant's test of parallel lines was not rejected (p-value <1%). The validity of the model is verified by statistical tests on the main measures of the logistic evaluation. In estimations by means of logistic models, Hosmer and Lemanshovsky (1989) recommended that the ratio between sample size and the amount of measured variables in a study be greater than 10. In the present investigation, this parameter was ≈ 79. The model chi-square ($\chi^2$) to test the overall relationship between the dependent and independent variables, was significant at the level of p-value <.001, thus validating the proposed model ($\chi^2$ = 68,00; d.f. 32). Further, the relationship robustness tests between group members and utility of the logistic model, to assess the accuracy of classification, were significant, thus supporting the validity of the model. The Nagelkerke statistic for the pseudo-$R^2$ was of 32%.

Table 4, below, presents the results of the ordered logit regression according to the severity of the financial delinquency.

Table 4 – **Ordinal logistic model**

| Explanatory variables | Coefficient | T ratio |
|---|---|---|
| AGE | -0,028 | 2,88** |

| | | |
|---|---|---|
| CCC | 0,001 | 0,27 |
| PONT | 0,010 | 3,73** |
| COMPRAZ | 0,002 | 0,23 |
| CRESC | -0,131 | 2,87* |
| FINEX | 0,063 | 8,04*** |
| Constant | -3,19 (8,32)** | |
| $\chi^2$ | 68,85*** (g.l = 32) | |

Note: This table shows the results of ordinal logistic regression. The method used for calculation of the regression coefficients was the maximum likelihood. Values in parentheses represent the Wald statistic.

The symbols *, **, and *** indicate statistical significance at 10, 5% and 1%, respectively.

The hypothesis H1 tests the negative association between company uptime (AGE) and delay in payments according agency theory. The evidence suggests, at a significance level of 5%, that companies with less uptime late more payment than the non-defaulting ones, supporting thus the prediction. The negative sign indicates that, as the firm remains in operation, the likelihood that the company will become a financial offender reduces. This result corroborates the results from Camargos, Araújo and Camargos (2012) of companies that contracted credit with a public financial institution in Minas Gerais. In these circumstances, the theory of organizational reputation seems relevant for companies in this sample.

Surprisingly and contrary to the hypothesis postulated in H3, the evidence (p-value <.05) suggests that delinquent companies have a higher proportion of customers who pay their credit purchases on time that the non-defaulting companies. This result is the opposite of what Howorth and Reber (2003) found for UK companies.

The evidence of the variable PURCHASE (proxy for demand of trade credit) and CCC are also curious, for not having significant discriminating power in this model. The direction of the coefficient is positive but not significant. Thus, hypothesis H2 and H4 was not supported.

Firms that desire to grow more are smaller delinquent than that of non-defaulting (p - value <.10 and.05, respectively). This result is contrary to the hypothesis postulated by H5, which is based on the theory of agency and transaction cost.

Hypothesis H6, which negatively associates the use of external to financial delinquency, was not supported in this study. The direction of the coefficients is opposite to what was presumed. The results show that companies that delay payments to suppliers use more short-term external funds than the non-defaulting. The positive coefficient of this variable (p-value <.01) shows that an increase in the use of bank financing sources increases the risk of the firm becoming delinquent. Camargos, Camargos and Araújo (2012) believe that this can happen because companies have to compromise a higher percentage of revenues for the payment of the funding installments, and the company has a greater need to generate cash, and not all can do it. As a consequence, they delay the payment of commercial debts. This mechanism confirms the theory of demand for extra funding and thus extends the credit received from trading partners unilaterally.

A plausible explanation for this finding may be in the companies'difficulty in accessing capital in larger volumes or long-term to finance its operations and also in the high cost of capital transactions in Brazil. It is also possible that bank financing be used by MSEs only eventually, or in a last case scenario to cover the mismatch of cash over short periods (Carvalho, 2012). In this context, the signaling theory of using TC acts adversely against trading supplier partners, i.e. the

bank loans are intended for other priorities or the rollover of short-term debt. Thus, the results support the fundamentals of credit rationing developed for developed markets. It is feasible to think that other management variables, not considered in this study, may have influenced these controversial findings.

Finally, the estimated coefficients of the three threshold variables are all statistically significant (p-value < 1%) indicating that the use of the four category ordered probit model is warranted.

Table 5: Probability and marginal probability of getting specific level severity

| | p(y) | ∂p(y)/∂NON-LATE |
|---|---|---|
| y = 1 | 34.09% | 14.45% |
| y = 2 | 46.04% | 5.67% |
| y = 3 | 12.95% | -8.26% |
| y = 4 | 6.92% | -11.86% |

These probabilities show that firms with higher level of financial delinquency increase their probability of to be group 1 (14.45%) or 2 (5.67%) and decrease their probability of to be group 3 (-8.26%) or 4 (-11.86%). As is evident from Table 5, a great majority of enterprise that late payment to be in group 2 (46.04%) or 1 (34.09%).

## Conclusion

The aim of this study is to identify the organizational factors associated with late payments of trade credits in companies not listed on the stock exchange. The financial delinquency negatively impacts the companies'cash management. This happens to a greater extent in those with financial difficulties and also helps to generate uncertainty in the business environment of a country. Under these conditions, opportunistic attitudes can affect the image and compromise both the reputation of the delinquent company and transaction and trade credit costs. As a result, companies may lose competitiveness and have their performance threatened.

The evidence shows that smaller companies with little uptime, i.e., those with little reputation with investors and suppliers are associated with a greater likelihood of delayed payments of trade credits.

Regarding the sources of financing, the results indicate the presence of a paradox of the theory of informational advantage of the supplier on the institutional investor. I.e., information superiority of the seller imposes a critical issue of adverse selection on them, because there is the liquidity risk of the contracted credit. In these circumstances, the use of trade credit as an additional source of funds becomes increasingly important for delinquent companies, given their dependence on capital for the continuity of the business in the market.

The contributions of this study are that it generates new knowledge on this type of moral hazard in companies not listed on stock exchanges in emerging markets and exposes the factors responsible for late payment of trade credit.

Future research could study the behavior of the delay in payment of trade credit according to the economic sector of activity and the size of companies. Another line of research would be to quantify the transaction costs of this event in developing markets and find out the factors that determine the choice of supplier who will not receive at maturity.

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