

Determinant macroeconomic factors for consumers' default in Brazil

Fatores macroeconômicos determinantes para a inadimplência do consumidor no Brasil

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Abstract: This research investigated major macroeconomic factors for consumers' default in the Brazilian economy. The methodology applied was VAR analysis with Granger causality and impulse response function approaches. Moreover, found out what economic theory stream is applicable to the Brazilian economy with respect this issue. Results pointed out unemployment rate, credit availability and expectation rate the most sensitive macroeconomic variables to consumers' default rate in Brazil. An employment rate shock of +23.14% will provoke a sharp increase of +66.66% in consumers' default rate. On the other side, credit availability shock of +15.06% will contribute to -32.40% effect in consumers' default rate. An optimistic shock of expectation rate of +14.50% will indicate -25.50% effect in consumers' default rate. Monetary policy seems to affect consumers' default rate through interest rates, however inflation seems to be an irrelevant factor to this ratio. Main results also suggest that credit, GDP and consumers' expectation rate is fully linked to consumers' default rate in the opposite direction. Interest rates and unemployment rate are also linked to consumers' default rate in the same direction.

Keywords: VAR. Consumer's default. Macroeconomic factors.

Resumo: Essa pesquisa investigou importantes fatores macroeconômicos da inadimplência do consumidor na economia brasileira. As metodologias utilizadas foram análise VAR, causalidade de Granger e função impulso resposta. Mais ainda, identificou qual corrente da teoria econômica é aplicável à economia brasileira com relação a essa área. Os resultados apontaram

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que a taxa de desemprego, disponibilidade de crédito e a taxa de expectativa são as variáveis macroeconômicas mais sensíveis à taxa de inadimplência do consumidor no Brasil. Um choque na taxa de desemprego de +23,14% provoca um aumento drástico de +66,66% na taxa de inadimplência do consumidor. Por outro lado, um choque de +15,06% na disponibilidade de crédito, contribui para uma redução de 32,40% na taxa de inadimplência do consumidor. Um choque otimista na taxa de expectativa de +14,50% indicará uma redução de 25,50% na taxa de inadimplência do consumidor. A política monetária parece afetar a taxa de inadimplência do consumidor através das taxas de juros, entretanto inflação parece ser irrelevante a esse indicador. Principais resultados também sugerem que crédito, Produto Interno Bruto (PIB) e taxa de expectativa estão inteiramente ligados à inadimplência do consumidor em direção oposta. Taxas de juros e taxa de desemprego são também interligados a esse indicador, porém na mesma direção.

Palavras-chave: Var. Inadimplência do consumidor. Fatores macroeconômicos.

JEL codes: C32. D03. D12. E21.

I Introduction

This academic research analyses major macroeconomic determinant factors for consumers' economic default and its impact into the Brazilian economy. Brazilian economy suffered from many economic and political shocks, especially in the last decade, what have affected in different ways consumers' default. Consumers' default is an outstanding issue in economic theory, however relevant economic schools disagree in major points such as: Post-Keynesians especially represented by [Minsky \(1986\)](#) state that economic default should increase in economic expanding phases when financial fragility also increases. On the other side, New Keynesians especially represented by [Stiglitz \(1987\)](#), state that economic default behaviour is cyclical, decreasing when economy is growing and increasing when economy is in recession. This work will also confirm under research findings what economic stream is applicable to Brazilian economy.

Brazilian economic policy provoked by the American Crisis, increased consumers' credit levels without increasing productivity. This behaviour induced domestic inflation which has been faced by traditional monetary policies. Due to ideological view, Brazilian government increased dramatically public expenses, boosting inflation and reducing economic growth. The most visible outcome has been consistent reductions of consumers' economic expectations, exchange rate depreciation, smaller sales, greater unemployment rate and economic

recession. Consumers' default also is the reflection of this entire environment. What are the macroeconomic determinant factors for consumers' default in Brazil?

Research data was collected from Jan 2002 until Apr 2016 and methodology applied was vector auto-regressive (VAR) analysis with eight macroeconomic variables as follows: consumers' credit (CRE), gross domestic product (GDP), default rate (DR), nominal exchange rate (E), consumer price index (IPCA), interest rate (CDI), unemployment rate (UNE) and expectation rate (EXPEC).

This methodology is especially appropriate in order to take into account of bi-directional effects among these macroeconomic variables. Granger causality approach was also applied in order to identify short run effects among these variables as well as impulse response function to reveal the long run ones.

The main objectives of this research are to find out relevant macroeconomic factors for consumers' default in the Brazilian economy and its impacts to financial institutions as well as confirm what economic theory school is applicable to Brazilian economy.

The remainder of the paper is organized as follows: beyond this introduction, presents relevant academic research about consumers' default and its consequences to economic policies in II, the time series co-integration, VAR and Granger Causality methodologies are explained in III, empirical results are presented in IV, especially data collected, stationary and co-integration results are presented. In V final remarks are addressed and finally in 6 all references are listed.

II Research review

Gavazza e Tiryaki (2014) investigated applicability of Post Keynesian and New Keynesians approaches about credit default and economic cycles in Brazil. They used Granger Causality method with the following macroeconomic variables: income, credit, default rate and interest rate. The main objective is to analyze the default rate and Brazilian economic cycles between 2000 and 2012. Results indicate that economic cycles affect default rate.

Livshits (2015) collected major recent contributions about consumer default. Most relevant developments include the sources of the rise in personal bankruptcies, importance of asymmetric information, effects of developments in information technologies on consumer credit cards and cyclical behavior of consumer debt and default. The author realizes one aspect of bankruptcy and consumer debt that has received

relatively little attention until recently is their cyclical properties. The cyclicity of bankruptcy is very pronounced; in other words, go up during recessions and volatile. This picture is not very clear to consumer debt in the US. Until 1990s, consumer debt exhibited a clearly pro-cyclical behavior, or it increases in expansions and contracted during recessions. That pattern was broken in the 1990s, when debt did not decline during recessions.

[Paranhos e Ribeiro \(2014\)](#) proposed consumers' default forecasting models using macroeconomic variables applying linear multiple regression technique. Most relevant macroeconomic variables applied are as follows: credit demand volatility, GDP and credit level.

[Cordeiro, Almeida e Figueiredo \(2013\)](#) investigated consumers' default and *per capita* income in Brazil between 2001 and 2009. A multiple linear regression was performed with 95% confidence level and equation explains 89% model's variations. Main conclusion is that even though Brazilians get higher salaries due to better education level, in general do not have properly financial education and tend to accumulate debts.

[Chee et al. \(2015\)](#) studied factors of consumers' bankruptcies in the United States in the period between 1980 and 2011. The determinants included in this research are credit card debt, lending rate and divorce rate. OLS multiple regression model was employed to study the relationship between the determinants towards consumer bankruptcy rate. Results suggest that there is a significantly positive relationship between credit card debt, lending rate and divorce rate towards consumer bankruptcy rate.

[De'Armond e Zhu \(2011\)](#) employed two stages of statistical review to find implications of a propensity to consumer indebtedness. A preview of this particular research shows individuals with higher education levels exhibit a tendency toward having higher consumer debt.

[Albuquerque \(2011\)](#) studied aggregate consumers' default in Brazil. This work applied Vector of Error Correction (VEC) model to estimate long term relationship among variables. Major variables used were: unemployment rate, consumers' confidence rate and short term debt share. Results suggest that, in the long run, higher unemployment rate and higher short term debt share, higher will be consumers' default. Moreover, results also indicate that higher consumers' confidence rate and higher credit availability rate smaller will be consumers' default.

III Time series co-integration and Granger Causality approaches

The stationary condition is the main requirement for time series analysis. The valid conditions of minimum squares are only valid in the presence of stationary time series according to [Enders \(1995\)](#). The unit root test was applied to check stationary conditions of data series in this research. The following series were used in this work: consumers' credit (*CRE*), Gross Domestic Product (*GDP*), default rate (*DR*), nominal exchange rate (*E*), consumer price index (*IPCA*), interest rate (*CDI*), unemployment rate (*UNE*) and expectation rate (*EXPEC*).

If a time series has unit root³ then it is not stationary and the differentiation process⁴ is required. In order to test the null hypothesis of unit root existence the Augmented Dickey-Fuller (ADF), where H_0 represents $\delta = 0$, was applied. Besides ADF test, the Phillips-Perron test may be applied for the same objective.

Suppose Y_t and X_t time series $I(1)$, stationary in first difference, the residues of equation (2) are also, what is similar to say that those time series are not stationary in level.

$$Y_t = \alpha + \beta X_t + \varepsilon_t. \quad (1)$$

According to [Granger e Newbold \(1986\)](#) there are some cases in which equation (1), for both $I(1)$ time series, which may result in a stationary combination $I(0)$. When this happens Y_t e X_t are so called co-integrated or shows a long term balance. The co-integration equation may be represented in (2) and β is the co-integration parameter.

$$\varepsilon_t = Y_t - \alpha - \beta X_t = 0. \quad (2)$$

Following [Enders \(1995\)](#) the most suitable test to detect time series co-integration is the Johansen Test. The model proposed by [Johansen \(1988\)](#) uses trace and eigenvalue statistics in order to detect time series co-integration existence. The Johansen Test proposes the following VAR specification model:

$$\Delta Y_t = \Pi Y_{t-1} + \sum \Gamma'_i \Delta Y_{t-1} + \beta X_t + \varepsilon_t$$

X_t is the deterministic variable vector. According to [Enders \(1995\)](#), the critical point in the Johansen Test is to find the matrix Π rank. This rank r indicates the number of independent co-integration vectors. So, if

³The unit root test shows the following model $Y_t = \rho Y_{t-1} + u_t$, where u_t is the stochastic error term that follows the Classical Hypothesis: zero mean, stable variance and is not correlated.

⁴The new time series will have the following format: $\Delta y_t = y_t - y_{t-1}$.

$r = 0$, those time series are not co-integrated. In case of $r = 1$ this indicates 1 (one) co-integration vector between those time series. For those cases where $1 < r < n$, may happen multiple co-integration vectors among time series.

The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. A time series is said to Granger-cause if it can be shown, usually through a series of t -tests and F -tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y .

If a time series is a stationary process, the test is performed using the level values of two (or more) variables. If the variables are non-stationary, then the test is done using first (or higher) differences. The number of lags to be included is usually chosen using an information criterion, such as the Akaike information criterion or the Schwarz information criterion. Any particular lagged value of one of the variables is retained in the regression if: it is significant according to a t -test and it and the other lagged values of the variable jointly add explanatory power to the model according to an F -test. Then the null hypothesis of no Granger causality is not rejected if and only if no lagged values of an explanatory variable have been retained in the regression, [Enders \(1995\)](#).

III.I Economic features of VAR model approach

Briefly a VAR model is a linear equation system on which one variable is function of this lagged variable from many periods of time and is also function of others lagged variables of the system. A relevant consideration to be taken is to specify the VAR model with variables in level or in first difference.

The specification to be applied depends on mainly the time series properties. When non stationary and non co integrated variables are detected, it is suggested to use a VAR model in first difference. [Ramaswamy e Slok \(1998\)](#) presented many cases the use of unrestricted VAR in comparison to restricted VAR. The main objective of the VAR model approach is not estimate model parameters but find out variables relationships [Ibrahim \(2005\)](#).

When we are not sure about variables exogenous nature in an equation system, in other words, if any variable is exogenous in relation to the others in a set of n variables, therefore is proposed a model that each variable system be affected for all others. This way any vari-

able is affected by its current and past realizations as well as current and past realizations of the others variables. This situation is described as a structural VAR model, with n lags.

However, the feedback effects are performed as deterministic components, what hold the structural model solution. Besides that, this system cannot be conceited in a reduced format for its equations [Enders \(1995\)](#). This format can be obtained by algebraic manipulations, obtaining a VAR in a standard format or unrestricted VAR that has the following format:

$$\vec{x}_t = A_0 + \sum_{i=1}^m (A_i \vec{x}_{t-i}) + \vec{\zeta}_t \quad (3)$$

The unrestricted VAR, specified in equation (3) is also associated to the structural VAR model with the following format:

$$B \vec{x}_t = B_0 + \sum_{i=1}^m (B_i \times \vec{x}_{t-i}) + \vec{\varepsilon}_t$$

In the unrestricted VAR (performed by stationary variables), the stochastic tendency are removed by differentiation resulting in stationary time series. However, the best way to deal with non-stationary variables is to find linear combinations of integrated variables that are stationary, this way are called co integrated variables [Enders \(1995\)](#).

IV Data, stationary condition and co-integration

V Final remarks

The monthly data was collected in IPEADATA⁵ from January/2002 to April/2016. The stationary condition was tested in all-time series in order to make possible for the application of co-integration test, Johansen Test. The co-integration methodology is only applicable using time series not stationary in level. The ADF and Phillips-Perron (PP)⁶ tests were applied and all results are showed in Table 1.

This academic work will accept stationary time series if both stationary tests reveal this condition. At least one test indicates non-stationary condition such as: *DR* and *IPCA*. Therefore, according to

⁵Available in: <<http://www.ipeadata.gov.br>>.

⁶The Phillips-Perron test is desirable when structural breakdown is likely. This academic work deals with data across the American Crisis and volatility was very frequent among major macroeconomic variables.

Table 1: Stationary test for macroeconomic time series.

Time Series	Specif.	ADF	ADF crit. values	PP	PP crit. values	Signif.
<i>CRE</i>	Level**	-0.204	-25.796	-0.158	-25.785	1%
<i>GDP</i>	Level*	-0.710	-40.171	-36.587	-40.126	1%
<i>DR</i>	Level*	-20.093	-40.171	-86.759	-40.126	1%
<i>E</i>	Level**	+0.217	-25.786	+0.322	-25.785	1%
<i>IPCA</i>	Level**	-11.109	-25.792	-27.088	-25.785	1%
<i>CDI</i>	Level**	-16.078	-25.795	-10.079	-25.785	1%
<i>UNE</i>	Level**	-0.342	-25.794	-0.426	-25.785	1%
<i>EXPEC</i>	Level**	-0.135	-25.785	-0.144	-25.785	1%

Source: Own research. Legend: *drift and linear tendency. **none.

Table 2: Johansen co-integration test–number of co-integrating relations by model.

Data Trend	None	None	Linear	Linear	Quadratic
Test Type	No intercept No trend	Intercept No trend	Intercept No trend	Intercept Trend	Intercept Trend
Trace	4	6	4	4	4
Max–Eigenvalue	3	4	2	2	2

Own research.

ADF and Phillips-Perron tests, all time series are non-stationary in level what make suitable the co integration analysis.

The Johansen test is the most suitable econometric test to detect time series co integration. Therefore, we proceed to extend the work developed by [Johansen e Juselius \(1990\)](#) into a multivariate co-integrating framework with auto-regression maximum likelihood approach. Using the combination of all eight macroeconomic variables this test was performed. All results are shown in Table 2.

According to Johansen Test, the combination of all time series is stationary. Considering no intercept and no trend in the time series set, due to majority of those indicate, as previously stated, the Trace test found four co-integrating relation vectors and on the other hand, the Max–Eigenvalue test indicated three co-integrating relation vectors. These results demonstrate that the combination of all macroeconomic variables, in this research, have a stable long term relationship.

Stationary tests shown indicated that all macroeconomic variables are non-stationary in level. However, differentiating all variables, the stationary condition was found. Both stationary tests were performed;

ADF and Phillips-Perron, and results indicate that all-time series are $I(1)$.

After the stationary condition is reached the Granger causality test may be applied. The Granger causality investigation is relevant for this research because the results may explain the cause-effect among all macroeconomic variables in two way direction with consumers' default rate. In order to apply this test is crucial to find out how important the variable past is relevant to explain the present. For this purpose the optimal lag length criterion in VAR analysis should be observed by step-down procedure of [Campbell e Perron \(1991\)](#). Using the Schwarz criterion the optimum lag number is 1.

Granger causality test revealed that all time series, except expectation rate, directly affect consumers' default rate. Nominal exchange rate and inflation are also correlated due to the pass-through process in the Brazilian economy. It is acceptable that nominal exchange rate affect domestic inflation and this variable should affect consumers' default rate. In other words, higher exchange rate depreciation, higher inflation and also higher consumers' default rate.

Interest rate seems to be linked to credit. When interest rates are climbing, credit availability should decline also affecting consumers' default rate. Higher interest rates will affect economic activity with smaller sales and due to default risk, financial institutions tend to hold consumers' credit limits, what will indicate higher consumers' default rate.

Unemployment and economic growth are fully interlinked and affect consumers' default rate. It is expected that unemployment should induce higher consumers' default rate. With respect to economic growth and its reflection on consumers' default rate, as mentioned before, there are two economic theory streams. Impulse response functions outcomes will clarify this behaviour. What is undoubtedly is the economic growth participation on consumers' default rate.

On the other direction, consumers' default rate affect directly all major macroeconomic variables, except interest rate and the expectation rate. Higher default rate will provoke lower credit availability offered by financial institutions. It is also expected that higher default rate will induce lower inflation rate due to smaller sales and less economic investments.

Abrupt rise of default rate is a classic symptom of economic instability. Therefore, it is acceptable that higher default rate will indicate higher unemployment rate due to less economic activity. In the same logic, higher default rate will induce less economic growth and prob-

Table 3: Granger causality test.

	→	E	CDI	CRE	UNE	EXPEC	DR	IPCA	GDP
E	↓	-	-	-	-	-	-	-	-
CDI		No/Yes	-	Yes/Yes	Yes/Yes	Yes/No	Yes/Yes	Yes/Yes	-
CRE		No/Yes	Yes/Yes	-	Yes/Yes	No/No	Yes/Yes	Yes/Yes	-
UNE		No/Yes	Yes/Yes	Yes/No	-	Yes/No	Yes/Yes	-	-
EXPEC		Yes/No	No/No	Yes/No	Yes/No	-	Yes/No	No/No	-
DR		Yes/Yes	No/Yes	Yes/Yes	Yes/Yes	No/No	Yes/Yes	Yes/Yes	-
IPCA		Yes/Yes	Yes/No	No/No	Yes/No	No/No	Yes/Yes	No/Yes	-
GDP		Yes/Yes	Yes/Yes	Yes/Yes	Yes/No	No/No	Yes/Yes	No/Yes	-

Source: Own research.

ably nominal exchange rate depreciation.

All cross relations among macroeconomic variables are showed in Table 3 but are not the purpose of this research.

The Granger causality results are useful to identify variable ordering in VAR analysis. Changes in variable ordering may result drastic changes in impulse response function results. VAR variable ordering is made in decreasing order of exogenous effects among variables. The higher correlations between residuals should come first in variable ordering.

The desirable ordering is from less affected to the most affected variable in VAR construction. Across the research period, macroeconomic variables are $I(1)$ and jointly co-integrated as previously demonstrated. This specification suggests VEC analysis instead of VAR analysis. Considering all these prerequisites a $VEC(1)$ was built with the following variable ordering: *CRE-CDI-GDP-DR-EXPEC-E-UNE-IPCA*.

An increase in credit level availability, as well as, in GDP will induce a decrease in default rate. On the other hand, an increase in interest rates and unemployment rate will provoke an increase in default rate as expected. All results indicate that when there is economic growth and subsequent increase in credit availability economic default should decline. On the opposite direction, increase in interest rates should hold economic growth and make unemployment rate moving up, what will undoubtedly increase economic default.

An increase in the consumers' expectation rate indicates a reduction in the default rate, as well as, an increase in nominal exchange rate depreciation. consumers' expectation rate is fully linked to economic growth behavior. Nominal exchange rate depreciation affects foreign accounts increasing exportations and decreasing importations, what will indicate major economic growth. The effect in the default rate by an increase in inflation seems to be very small in comparison to its shock. Probably the most sensitive macroeconomic variable to the default rate, according to results obtained, should be the unemployment rate due to its direct impact in consumers' income.

The New Keynesians Theory about economic default is also confirmed for the Brazilian economy. According to impulse response function results when GDP increases 21.45% the default rate should decrease 28.2%. This theory states that economic default behaviour is cyclical; decreasing when economy is growing and increasing when economy is in recession, what seems to be the Brazilian case.

Table 4: Residual correlation matrix.

	<i>E</i>	<i>CDI</i>	<i>CRE</i>	<i>UNE</i>	<i>EXPEC</i>	<i>DR</i>	<i>IPCA</i>	<i>GDP</i>
<i>E</i>	1	0.092	0.019	-0.210	-0.051	-0.118	0.056	-0.035
<i>CDI</i>	0.092	1	0.625	-0.218	-0.167	-0.056	0.055	0.441
<i>CRE</i>	0.019	0.625	1	-0.208	-0.160	-0.065	0.014	0.546
<i>UNE</i>	-0.210	-0.218	-0.208	1	-0.203	0.085	-0.249	-0.031
<i>EXPEC</i>	-0.051	-0.167	-0.160	-0.203	1	0.108	0.038	-0.206
<i>DR</i>	-0.118	-0.056	-0.065	0.085	0.108	1	0.005	0.013
<i>IPCA</i>	0.056	0.055	0.014	-0.249	0.038	0.005	1	-0.059
<i>GDP</i>	-0.035	0.441	0.546	-0.031	-0.206	0.013	-0.059	1

Source: Own research.

Table 5: Impulse–response function simulations.

Shock Variable	Effect		
	Variable	% Shock	% Effect
<i>CRE</i>	DR	15.06	–32.4 (4)
<i>GDP</i>	DR	21.45	–28.2 (6)
<i>CDI</i>	DR	31.88	+39.7 (2)
<i>E</i>	DR	25.70	–25.5 (2)
<i>UNE</i>	DR	23.14	+66.6 (6)
<i>EXPEC</i>	DR	14.50	–25.5 (2)
<i>IPCA</i>	DR	71.21	–7.9 (3)

Source: Own research. Note: Number in parenthesis indicates month of occurrence.

VI Final remarks

This research investigated major macroeconomic factors for consumers' default in the Brazilian economy. The methodology applied was VAR analysis with Granger causality and impulse response function approaches. Moreover, found out what economic theory stream is applicable to the Brazilian economy with respect this issue. As stated above, the New Keynesians Theory about economic default is closely applicable to the Brazilian economy.

Results pointed out unemployment rate, credit availability and expectation rate the most sensitive macroeconomic variables to consumers' default rate in Brazil. An employment rate shock of +23,14% will provoke a sharp increase of +66,66% in consumers' default rate. On the other side, credit availability shock of +15,06% will contribute to –32,40% effects in consumers' default rate. An optimistic shock of expectation rate of +14,50% will indicate –25,50% effects in consumers' default rate. A relevant point is that all major effects were felt up to six months from shock. Unemployment rate effect seems to be the longest from shock but the strongest.

Research findings confirmed [Gavazza e Tiryaki \(2014\)](#) results about effects of economic cycles in consumers' default rate in Brazil; also confirmed [Albuquerque \(2011\)](#) results about unemployment rate, credit availability and expectation rate in consumers' default rate in Brazil with similar conclusions. [Paranhos e Ribeiro \(2014\)](#) results were also confirmed into this academic research with respect credit and GDP relevance in consumers' default rate behavior.

Monetary policy seems to affect consumers' default rate through interest rates, however inflation seems to be an irrelevant factor to this ratio. Main results also suggest that credit, GDP and consumers'

expectation rate is fully linked to consumers' default rate in the opposite direction. Interest rates and unemployment rate are also linked to consumers' default rate in the same direction. Finally this research made relevant contributions to financial institutions to deal with consumers' default rate across economic cycle's fluctuations in Brazil.

References

ALBUQUERQUE, L. C. *Determinantes macroeconômicos para inadimplência agregada do consumidor*. 34 f. Dissertação (Mestrado Profissional em Economia) — INSPER. Insper Instituto de Ensino e Pesquisa, São Paulo, 2011.

CAMPBELL, J. Y.; PERRON, P. Pitfalls and opportunities: what macroeconomists should know about unit roots? In: BLANCHARD, O. J.; FISCHER, S. (Ed.). *NBER macroeconomics annual*. Cambridge: MIT Press, 1991. v. 6.

CHEE, C. W. et al. Bachelor of Business Administration (Hons) Banking and Finance, *Factors of consumer bankruptcy: a case study in the United States*. Sungai Long: [s.n.], 2015. 70 f.

CORDEIRO, R. A.; ALMEIDA, L. M.; FIGUEIREDO, J. C. B. Classe média brasileira: mais dinheiro e menos dívidas, sonho ou realidade? In: IV ENCONTRO DE ADMINISTRAÇÃO POLÍTICA PARA O DESENVOLVIMENTO DO BRASIL. *Anais...* Vitória da Conquista, 2013. Disponível em: <<http://www.uesb.br/eventos/encontroadministracaopolitica/artigos/EAP011.pdf>>. Acesso em: 20 nov. 2017.

DE'ARMOND, D.; ZHU, D. Determinants of consumer debt: an examination of individual credit management variables. *Journal of Finance and Accountancy*, Ponte Vedra Beach, v. 7, p. 1–17, set. 2011.

ENDERS, W. *Applied econometrics time series*. New York: John Wiley, 1995.

GAVAZZA, I. O.; TIRYAKI, G. F. Inadimplência do crédito e os ciclos econômicos no Brasil entre 2000 e 2012. In: X ENCONTRO DE ECONOMIA BAIANA. *Anais...* Salvador, 2014. Disponível em: <http://www.eeb.sei.ba.gov.br/pdf/2014/fd/inadimplencia_do_credito.pdf>. Acesso em: 10 mar. 2017.

GRANGER, C. W. J.; NEWBOLD, P. *Forecasting economic time series*. 2. ed. Amsterdam: Elsevier, 1986.

IBRAHIM, M. H. Sectoral effects of monetary policy: evidence from Malaysia. *Asian Economic Journal*, Nishinomiya, v. 19, n. 1, p. 83–102, 2005.

JOHANSEN, S. Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, Amsterdam, v. 12, n. 2–3, p. 231–254, jun. 1988.

JOHANSEN, S.; JUSELIUS, K. The full information maximum likelihood procedure for inference on cointegrating with application to demand for money. *Oxford Bulletin of Economics and Statistics*, Oxford, v. 52, n. 2, p. 169–210, 1990.

LIVSHITS, I. Recent developments in consumer credit and default literature. *Journal of Economic Surveys*, London, v. 29, n. 4, ago. 2015.

MINSKY, H. P. Stabilizing an unstable economy. In: BANK CREDIT ANALYST CONFERENCE. *Anais...* New York, 1986.

PARANHOS, L. S.; RIBEIRO, J. L. D. *Interferência do ambiente macroeconômico na inadimplência de pessoas físicas no Brasil*. 26 f. Monografia (Trabalho de conclusão de graduação) — UFMG. Universidade Federal de Minas Gerais, Belo Horizonte, 2014.

RAMASWAMY, R.; SLOK, T. *The real effects of monetary policy in the European Union: what are the differences?* Washington, 1998. v. 45, n. 2, 374–396 p.

STIGLITZ, J. E. The causes and consequences of the dependence of quality on price. *Journal of Economic Literature*, Nashville, v. 25, n. 1, p. 1–48, mar. 1987. Disponível em: <<http://www.jstor.org/stable/2726189>>. Acesso em: 20 set. 2016.