WELFARE LOSS AND LERNER-DEMAND HYPOTHESIS: EVIDENCES FOR THE COMMERCIAL BANKS IN BRAZIL[1]

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ABSTRACT

The financial intermediary sector has big importance for developing countries. The main theories and hypotheses of industrial organization literature seek to analyze the bank market as profit-maximizing and wealth-generating. However, bank does not is a regular firm, because there is the social expectation under efficiency in its function of intermediation. At this point we raise the hypothesis that there is a positive relationship between market power and the demand behaviors, and we draw the objective of measuring the size of the deadweight-loss generated annually by the conduct of the banks in Brazil. Thus, we apply Daskin (1991) approach together with price elasticity of demand that we estimate utilizing the Berry (1994) procedure for the Time Deposit and Saving deposit segments and Berry Levinsonh and Pakes (1995) for the Loans segment. As a result, we find that the deadweight-loss produced by commercial banks in these segments oscillates between 0.29% to 0.42% of average annual Gross Domestic Product or between 7% to 13% of average total revenue of the banking sector. The paper also brings the evolution of price elasticity of demand over 2009-2016 years for whole Brazil and its five macro-regions, besides of price elasticity of this period of each county on what there is a bank branch.

RESUMO

O setor de intermediação financeira tem grande importância para os países em desenvolvimento. As principais teorias e hipóteses da literatura de Organização Industrial buscam analisar o mercado bancário a partir da ótica contábil considerando essas firmas maximizadoras de lucro e geradoras de riqueza. No entanto, os bancos não são firmas regulares, pois existe uma expectativa social que permeia a eficiências destas firmas na intermediação financeira. Neste ponto, a hipótese de que existe uma relação positiva entre o poder de mercado e o comportamento da demanda é levantada juntamente com o objetivo de auferir o tamanho do peso-morto gerado anualmente pela conduta dos bancos brasileiros. Para isso, aplica-se a abordagem de Daskin (1991) auxiliada pela elasticidade preço da demanda estimada por meio do procedimento de Berry (1994) para os segmentos de Depósito a Prazo e Poupança e Berry Levinsonh and Pakes (1995) para o segmento de Empréstimos. Dos resultados, verifica-se que a perda de peso-morto produzida pelos bancos comerciais oscila entre 0,29% a 0,42% da média anual do PIB ou entre 7% e 13% da receita média total do setor bancário. O artigo também apresenta a evolução da elasticidade preço da demanda ao longo dos anos 2009-2016 para todo o Brasil e para as cinco macrorregiões, além da distribuição da elasticidade média deste período para cada município onde existe uma agência bancária.

Área 8 – Microeconomia, Métodos Quantitativos e Finanças.

Keywords: Deadweight-Loss, Market Power, Price Elasticity, Banking Industry

Palavras Chaves: Perda de Peso Morto, Poder de Mercado, Elasticidade preço, Indústria Bancária

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1. INTRODUCTION

The current approach of the industrial organization brings as consensus that the researcher should not be treat the financial intermediation like an ordinary market. Since that banks must make decisions about risk and diversification, the relationship with managers of small firms seems to be the better way to reduce costs (Petersen & Rajan, 1994). Thus, the essence of financial intermediation is twofold: increase the banking competition through excessive risk-taking by banks; and, or, allocate the resources in large portfolios and to reduce costs through diversification. However, neither of these two extremes can generate an efficient financial system (Allen & Gale, 2004). The maximum economics welfare is one whose the aggregate investment is a result of the effective multiplication of means of payment wherein the bank will no refuse good project, and both, the banker and investor, will maximize their surpluses (Yanelle, 1989).

This is the case in most developed economies, but it is still somewhat obscure in developing countries. The crisis sequence initiated by Mexico in 1994 (followed by the East Asia in 1997, Russia and Brazil in 1998 and Argentina in 2001) showed the fragility of the financial system of these countries depend on foreign investment. The development of this crisis sequences culminated in a period of large margins for Latin American banks, which began to divide the resources available for loans destined to the private sector or destined to the public sector (Chortareas, Girardone, & Garza-García, 2010). The need to finance government expenditures may, at some relative risk, shift available resources putting some strain on highly leveraged firms or to generate working capital shortages that amplify the market frictions (see Bonfim, 2009).

These working capital shortages represent a cost to society that is referred in industrial organization and microeconomics literatures as deadweight-loss (DWL). In Latin American, Brazil is the country with the lowest rate of lending, in terms of GDP (Gross Domestic Product), to the private market (Chortareas, Girardone, & Garza-García, 2010). However, the highest net interest margins make of this country facing the same problem as the other countries in the region (some degree of distrust of foreign investment). Thus, the objective of this paper is to analyze the welfare economic due to the conduct of commercial banks presents in Brazil that act in segments of Loans (LO) and Time Deposits (TD), as well to evaluate the distribution of price elasticity of demand for county and its evolution for 2009-2016 period at these segments.

In Industrial Organization theory, researchers are testing so many theories for regular firms and its market power. In this context, we have at least three main hypotheses: original efficiency analysis, by Structure-Conduct-Performance (SCP) hypothesis (see Smirlock, 1985), seeks the positive correlation for market share-profit relationship that signalizes the main source of market power. However, Shepherd (1986) proposes the Relative Market Power (RMP), that adds the concentration variable in the explanatory equation of profit together with market share, under the assumptions that market power occurs independently of any source of domination. A third hypothesis is Quiet Life (QLH – initially proposed by Hicks, 1935) that indicates that an increase in the market power brings a decrease in efficiency and so an impossibility of a bank earning higher profitability. In QLH, the efficiency is key for explicating the profitability and three points are central: allocation optics, production dimension and scale dimension (see e.g. Fiordelisi, 2004). To refute or accept Quiet Life Hypotheses talks with to refute or accept Competition-Fragility and Competition-Stability hypotheses. These last two hypotheses are specifically for bank literature and indicates that an increase in competition, decreases the bank efficiency and increase financial fragility for first and an increase in competition, promotes an increase in financial efficiency and increase stability in the financial intermediation sector for second.

We understand that all these hypotheses concern with the accounting of firms (profitability generation or shareholder wealth and its consequences for other banks). Notwithstanding, bank is not a regular firm because it participates from the financial intermediation sector and, besides efficiencies, banks also exert the development paper. Thus, we propose to test is if the increase of deadweight-loss is positively correlated with increase of market power of bank (Lerner-Demand Hypothesis). In Short, these hypotheses are based in monopoly theory, where a monopolistic firms act in the elastic region of demand and, if the

deadweight loss generates by banks in each county is true, the correlation between market power (Lerner Index) and elasticities-price of demand, in absolute terms, should be positive[2] and significative.

In the banking literature of welfare analysis, Rhoades (1972) estimated the market power profit to monopoly banking over 2,000 markets (1,635 and 194 of 2,466 counties and 281 SMSAs of United States, respectively) and founded a welfare-loss around $11.9m of dollars. However, Rhoades followed the Harberger (1954) with partial equilibrium, assuming a constant unit elasticity of demand. From this position, this author ignored the very differences of the banks and acts place in the market concentration that may generate a bias in analysis. We propose to correct this bias assuming the procedure of Daskin (1991) allied with the approach of Berry (1994) for calculating the price elasticity of demand. In the Lerner Index cost we considered the Fundação Instituto de Pesquisa Contábeis, Autuariais e Financeiras (FIPECAFI, Foundation for Actuarial and Financial Accounting in English, 2004) report.

Maudos & Guevara (2007) analyzed the relationship between market power, in loan and deposit segments, and X-efficiency for EU-15 countries in period of 1993-2002. The authors founded that welfare-loss in 2002 was 0.54% of Gross Domestic Product (GDP). In line with Rhoades, Solís & Maudos (2008) used the Harberger's triangle for Mexican banking between 1993-2005 and founded that the social cost attributable to market power in 2005 was 0.15% of Mexican GDP. The analysis of these authors assumes that banks competes via outputs. In this point, we argue that these analyses may fail in market whose banks do not compete as a Cournot market or when the analysis do not consider the outside good in decision of agents, because the financial intermediation is compounded by banks, credit unions, Grameen bank and so on. Berry (1994) procedure, in calculating the price elasticity of demand, assume the theory of indirect utility of demand, where a consumer chose to demand deposits or loans through a set of bank factors. These technical features are like a transitive basket and satisfies the hypotheses of consumer theory. Therefore, we are assuming that a determined bank adopts it strategic considering what of the other banks that are adopting in market, like a theoretical Cartel structure.

Finally, Silva and Lucinda (2017) analyzed structure of market from switching cost view and found that the relationship, between bank and costumer, produces an average cost of R$ 471,17 (four hundred seventh-one and seventeen cents of Reais) per account. We complement this analyzes with DWL calculated from ESTBAN (Data base of Central Bank of Brazil that brings banking statistic for Brazilian counties and bank branch). Thus, we contributed by mapping the distribution of the elasticities for whole Brazilian counties, where commercial banks act. We also present the evolution over time of elasticities throughout 2009-2016 period. As a result, we find that the DWL produced by financial institutions in the downstream segments oscillates around about 0.30% of Brazilian GPD annually with the average elasticity. Time Deposit segment presented the ration DWL/GDP around about 0.06%, while the DWL/GDP ratio for the loans segment was 0.24%. However, in both, TD and LO segments, the average elasticity is different of the median elasticity and therefore the DWL do not follows a normal distribution for counties. For this we present a graph, that summarize the distribution of DWL as elasticity increases. This analyzes indicates a median elasticity region of 2.0 for Time Deposit segment and a median elasticity region of 3.0 for Loans segment.

We structure this paper in more four parts: Section 2 describes the methodology used in the proposed analysis. This section is subdivided in demand analysis, deadweight-loss analysis and econometric procedures. Section 3 will be presenting the data. Section 4 discusses the results and issues. A brief conclusion follows.

2. METHODOLOGY

2.1. Stylized facts

The model begins with indirect utility of demand approach. The methodology procedure is presented by Berry (1994) and we adapt it to the banking sector where the consumers are interested in purchasing Saving Deposit (*sv*), Time Deposit (*td*) or Loans (*l*) services in *m* Brazilians counties' markets ($m = 1, ..., M$) of *j* financial institutions ($j = 0, \ldots, J$) in time *t*.

[2] This point is positive in a direct analyze, theoretically the Lerner index is equal the inverse of elasticity in absolute term. In this view the relationship should be negative.

The researcher observes the individuals *I* (*i = 1, ... I_m*) in aggregate forms by counties and your choices are view like a market share of each bank in these counties. However, the choices *j* = 0 (zero) means the outside-good allocation of consumer money. Is a like paper Money Held by the Public calculated in a Monetary Economic approach. This raises some implications for the relevant market because the individual may live in city *m=i* and have a bank account in county *m=j* (for *i≠j*).

Thus, our relevant market is based on the microregions defined by Instituto Brasileiro de Geografia e Estatística (IBGE or Brazilian Institute of Statistics and Geography in English). For to compute the market shares with outside-good in each microregion, we considerate the total of remuneration presents in these localities (sums of wages of formal workers, pensions and government aids) as weighting of the stock variables (monthly balance of TD, SD and LO segments) disclosed by Banco Central do Brasil (BCB, Central Bank of Brazil in English).

2.2.The Demand Model

Consider the followings indirect utility:

$$u^{td}{}_{ijmt} = p^{td}_{jmt}\alpha^{td}_2 + p^{ad}_{jmt}\alpha^{ad}_3 + x_{jmt}\beta + \mathrm{Y}\vartheta + \varepsilon^{td}{}_{ijmt} \quad (1)$$

$$u^{l}{}_{ijmt} = p^{l}_{jmt}\alpha^{l}_1 + x_{jmt}\beta + \mathrm{Y}_{jmt}\vartheta + \varepsilon^{l}{}_{ijmt} \quad (2)$$

$$u^{d}{}_{ijmt} = p^{td}_{jmt}\alpha^{td}_5 + p^{sv}_{jmt}\alpha^{sv}_4 + x_{jmt}\beta + \mathrm{Y}_{jmt}\vartheta + \varepsilon^{d}{}_{ijmt} \quad (3)$$

where $\mathrm{p}^{\mathrm{td}}_{\mathrm{jmt}}$ is the price that the bank *j* to remunerate for the TD market; p^{ad}_{jmt} is the administration rate of the TD incurred on the product of bank *j* and the p^{l}_{jmt} is the loans price of bank *j* to consumers *I*; x_{jmt} represents a vectors line of observable K dimension features and; ε_{ijt} is the random mean zero disturbance. The angular coefficients α^{l} α^{td}, α^{ad} e β summarizes consumer preferences.

Like Berry (1994), we suppose that term of error ε_{ijt} is type 2 (two) i.i.d. with the "extreme value" distribution function exp (-exp (-ε)). Thus, the predict share of bank *j* for the three products (here appraised) is then given by the well-known logit formula:

$$s^{td}_{jmt} = \frac{e^{u_j}}{1+\sum_{k=1}^{J} e^{u_k}} \quad (3.1)$$

$$s^{l}_{jmt} = \frac{e^{u_j}}{1+\sum_{k=1}^{J} e^{u_k}} \quad (3.2)$$

$$s^{d}_{jmt} = \frac{e^{u_j}}{1+\sum_{k=1}^{J} e^{u_k}} \quad (3.3)$$

The linearization of the Accumulated Logistic Distribution Function (FDA) allows us to find probability of the consumer *i* choose the bank *j* through the observable characteristics of each institution. Therefore, the demand equations are as follows:

$$ln\left(s^{td}_{jt}\right) - lns^{td}_{0t} = p^{ad}_{jt}\alpha^{ad} + p^{td}_{jt}\alpha^{td} + y_{jt}\vartheta + x_{jt}\beta + \xi_j \quad (4.1)$$

$$ln\left(s^{l}_{jt}\right) - lns^{l}_{0t} = p^{l}_{jt}\alpha^{l} + y_{jt}\vartheta + x_{jt}\beta + \xi_j \quad (4.2)$$

$$ln\left(s^{d}_{jt}\right) - lns^{d}_{0t} = p^{td}_{jt}\alpha^{td} + p^{sv}_{jt}\alpha^{sv} + y_{jt}\vartheta + x_{jt}\beta + \xi_j \quad (4.3)$$

Following Berry (1994), the elasticities-price of demand, equations (3.x), are respectively the following:

$$\frac{\partial \mathrm{s}^{\mathrm{l}}_{\mathrm{jmt}}\,\mathrm{p}^{\mathrm{l}}_{\mathrm{j}}}{\partial \mathrm{p}^{\mathrm{l}}_{\mathrm{j}}\,\mathrm{s}^{\mathrm{l}}_{\mathrm{jmt}}} = \alpha_1\left(1 - \mathrm{s}^{\mathrm{l}}_{\mathrm{jt}}\right)\mathrm{p}^{\mathrm{l}}_{\mathrm{j}} \quad (5.1)$$

$$\frac{\partial \mathrm{s}^{\mathrm{td}}_{\mathrm{jmt}}\,\mathrm{p}^{\mathrm{td}}_{\mathrm{j}}}{\partial \mathrm{p}^{\mathrm{td}}_{\mathrm{j}}\,\mathrm{s}^{\mathrm{td}}_{\mathrm{jmt}}} = \alpha_2\left(1 - \mathrm{s}^{\mathrm{td}}_{\mathrm{jt}}\right)\mathrm{p}^{\mathrm{td}}_{\mathrm{j}} \quad (5.2)$$

$$\frac{\partial s_{jmt}^{td}\, p_j^{ad}}{\partial p_j^{ad}\, s_{jmt}^{td}} = \alpha_3\left(1 - s_{jt}^{td}\right)p_j^{ad} \quad (5.3)$$

$$\frac{\partial s_{jmt}^{d}\, p_j^{sv}}{\partial p_j^{sv}\, s_{jmt}^{d}} = \alpha_4\left(1 - s_{jt}^{d}\right) \quad (5.4)$$

$$\frac{\partial s_{jmt}^{d}\, p_j^{td}}{\partial p_j^{td}\, s_{jmt}^{d}} = \alpha_5\left(1 - s_{jt}^{d}\right)p_j^{td} \quad (5.5)$$

The correlations presented by error of type 2 (two) listed above are due to the characteristics of the banks that are perceived by the individuals and highlighted by the BCB. Thus, we controlled this bias by three nested that resumes the features of banks. These categories are: commercial banks, public banks and multiple banks. By including these groups, the demand equation becomes:

$$ln\left(s_{jt}^{td}\right) - lns_{0t}^{td} = \delta^{td} + \sigma^{td}\bar{s}_{\frac{j}{g}}^{td} \quad (6.1)$$

$$ln(s_{jt}^{l}) - lns_{0t}^{l} = p_{jt}^{l}\alpha^{l} + x_{jt}\beta + \sigma^{l}\bar{s}_{j/g}^{l} \quad (6.2)$$

$$ln\left(s_{jt}^{d}\right) - lns_{0t}^{d} = \delta^{d} + \sigma^{d}\bar{s}_{\frac{j}{g}}^{d} \quad (6.3)$$

In addition to α and β, σ also belongs to the parameters to be estimated and the elasticities-price of demand that will be used in the analysis of banking behavior with nests, are:

$$\frac{\partial s_{jmt}^{l}\, p_j^{l}}{\partial p_j^{l}\, s_{jmt}^{l}} = (\alpha_1)\left(1 - s_{jt}^{l}\right)p_j^{l} + \frac{\sigma}{1-\sigma}(\alpha_1)(1 - s_{j/g}^{l})p_j^{l} \quad (7.1)$$

$$\frac{\partial s_{jmt}^{td}\, p_j^{td}}{\partial p_j^{td}\, s_{jmt}^{td}} = \alpha_2\left(1 - s_{jt}^{td}\right)p_j^{td} + \frac{\sigma}{1-\sigma}\alpha_2(1 - s_{j/g}^{td})p_j^{td} \quad (7.2)$$

$$\frac{\partial s_{jmt}^{td}\, p_j^{ad}}{\partial p_j^{ad}\, s_{jmt}^{td}} = \alpha_3\left(1 - s_{jt}^{td}\right)p_j^{ad} + \frac{\sigma}{1-\sigma}\alpha_3(1 - s_{j/g}^{td})p_j^{ad} \quad (7.3)$$

$$\frac{\partial s_{jmt}^{d}\, p_j^{sv}}{\partial p_j^{sv}\, s_{jmt}^{d}} = \alpha_4\left(1 - s_{jt}^{d}\right) + \frac{\sigma}{1-\sigma}\alpha_4(1 - s_{j/g}^{d}) \quad (7.4)$$

$$\frac{\partial s_{jmt}^{d}\, p_j^{td}}{\partial p_j^{td}\, s_{jmt}^{d}} = \alpha_5\left(1 - s_{jt}^{d}\right)p_j^{td} + \frac{\sigma}{1-\sigma}\alpha_5(1 - s_{j/g}^{td})p_j^{td} \quad (7.5)$$

2.3.The Deadweight-Loss

In this paper, the DWL method of Daskin (1991) will use the elasticities estimated in equations (5.x) and (7.x). In theory, it is a demand with constant elasticity (isoelastic – price elasticity means of 2009-2016 period) determined by:

$$Q = AP^{-\varepsilon} \quad (8)$$

where Q is the quantity sold in industry, A (greater than zero) is a constant and ε is the absolute value of the price elasticity of demand. P is the price of the homogeneous product. Therefore, an industry with N firms, where q_j is the quantity for the financial institution j. The profit of bank j is:

$$\pi_j = RT_j - CT_j(q_i) \quad (9)$$

The first order of equation (10) is:

$$\frac{\partial \pi}{\partial q_j} = P(Q) + \frac{\partial P(Q)}{\partial Q}\left[\frac{\partial P(q_j)}{\partial q_j} + \frac{\partial P(q_1)}{\partial q_j} + \cdots + \frac{\partial P(q_{n-1})}{\partial q_j}\right] - CM_j = 0 \quad (10)$$

Where the value inside the brackets can be aggregated:

$$P(Q) + P(Q)\frac{q_j}{Q}\left[\frac{(Q)}{P(Q)}\frac{\partial P(Q)}{\partial Q}\right]\left[1 + \sum_{j\neq k=1}^{N-1}\frac{\partial q_k}{\partial q_j}\right] - CM_j = 0 \quad (11)$$

The relationship of financial institution *j* which any financial institution *k*, shows the constant elasticity β_j. So, we can get equation for $\frac{\partial q_k}{\partial q_i}$ and replace it in equation (11) for obtain:

$$\beta_j = \frac{\partial q_k}{\partial q_j}\frac{q_j}{q_k} \;\therefore\; \frac{\partial q_k}{\partial q_i} = \beta_j\frac{q_k}{q_j} \quad (12)$$

$$P(Q) + P(Q)\frac{q_j}{Q}\left[\frac{(Q)}{P(Q)}\frac{\partial P(Q)}{\partial Q}\right]\left[1 + \sum_{j\neq k=1}^{N-1}\beta_i\frac{q_k}{q_j}\right] - CM_j = 0 \quad (13)$$

After a sequence of algebraic manipulations, we arrive at the equation (14) that can be rewriting in equation (15):

$$P(Q)\left\{1 - \frac{s_j}{|\epsilon|}\left[1 + \frac{\beta_j}{s_j}(1 - s_j)\right]\right\} - CM_j = 0 \quad (14)$$

$$P(Q)\left\{\frac{s_j + \beta_j(1 - s_j)}{|\epsilon|}\right\} - CM_j = 0 \quad (15)$$

In equation (14), the s_j is the share presented by equations (3.x) and $|\epsilon|$ is elasticity-price of demand. Remember that default Lerner Index is L= [P(Q)-C]/P(Q). Thus, the equation (15) can be rewriting in:

$$L_j = \left\{\frac{s_j(1 - \beta_j) + \beta_j}{|\epsilon|}\right\} \quad (16)$$

Equation (16) will be all the greater the greater the share of financial institution *j*. Intuitively, the DWL is the area whose producer surplus do not cover consumer surplus losses, when the firm increases your price. That is, the DWL is represented by the difference between the reduction in consumer surplus and the increase in producer surplus, when the producer ceases to be competitive and becomes a monopolist (HARBERGER, 1954). To calculate this area, we can use the integral presented by equation (18).

$$DWL = \int_{P_{Bertrand}}^{Cartel}\{Q(P) - CM[Q(P)]\}dp \quad (17)$$

The equation (17) have, between price estimated by theoretical Bertrand and price estimated by theoretical Cartel, in its first element, the consumer surplus (EC) and in the second element the producer surplus (EP). Assuming a Cobb Douglas demand, $Au^{-\varepsilon}$, and solving for it integral, we arrive at equation (18.2).

$$EC = \int_{P_{Bertrand}}^{Cartel} A\,u^{-\varepsilon}du, \varepsilon \neq 1 \quad (18)$$

$$EC = \frac{Au^{(1-\varepsilon)}}{(1-\varepsilon)}\Big|_{Bertrand}^{Cartel} \quad (18.1)$$

$$EC = \frac{Rt(Q)_{Cartel}}{(1-\varepsilon)}\left[1 - \left(\frac{P(Q)_{Bertrand}}{P(Q)_{Cartel}}\right)^{(1-\varepsilon)}\right] \quad (18.2)$$

The firm surplus is:

$$EP = \sum_{K=1}^{N}\pi_K = \sum_{K=1}^{N}\big(P(Q) - C_j\big)q_i = \sum_{K=1}^{N}\frac{(P(Q) - C_j)}{P(Q)}\frac{q_j}{Q}[P(Q)Q] \quad (19)$$

Make the Lerner index and considering that C = CM_j = $P(Q)_{Bertrand}$ we have the equation (20.1) and (20.2):

$$L_i = \frac{P(Q)_{Cartel} - P(Q)_{Bertrand}}{P(Q)_{Cartel}} = 1 - \frac{P(Q)_{Bertrand}}{P(Q)_{Cartel}} \quad (20.1)$$

$$1 - L_i = \frac{P(Q)_{Bertrand}}{P(Q)_{Cartel}} \quad (20.2)$$

The consumer surplus is obtained by replace the equation (20.1) in equation (18.2):

$$EC = \frac{RT(Q)_{Cartel}}{(1-\varepsilon)}[1 - (1 - L_i)^{(1-\varepsilon)}] \quad (21)$$

The firm surplus is obtained by replace the equation (20.2) in equation (19):

$$EP = \frac{RT(Q)_{Cartel}}{(1-\varepsilon)} \sum_{i=1}^{N} \pi_i S_i \quad (22)$$

The DWL is the subtraction between equations (21) and (22). Make this and we obtain:

$$DWL = EC - EP$$

$$DWL = \left\{\frac{RT(Q)_{Cartel}}{(1-\varepsilon)}\left[1 - (1 - L_i)^{(1-\varepsilon)}\right]\right\} - \{RT(Q)_{Cartel} \sum_{i=1}^{N} L_i S_i\} \quad (23)$$

The total revenue is calculated for the entire industry (through the Cartel price) and the profit, π_i, is the margin observed. The equation (23) is in generalized form, since it will only be used in segments that are considered cartelized or in those whose observed price is above the estimated price for theoretical Bertrand.

For to test the hypothesis of positive relationship between market power and price-elasticity of demand in absolute term we will estimate the following equation:

$$L_{m,t} = \varepsilon_{m,t} + \mu_{m,t} \quad (24)$$

where L is Lerner index in county *m* in period *t*, $\varepsilon_{m,t}$ is the price-elasticity of demand of county *m* in time *t* and $\mu_{m,t}$ is term of error.

2.4. Econometric Procedures, Instruments and Controls

Like Berry (1994), the demand equations 4.x and 6.x, will be estimated by Instrumental Variables (IV). If, the error correlation terms of equations 4.2 (6.2) and 4.3 (6.3) (TD and LO respectively) are strong enough, the procedure for the estimation will be via Generalized Method of Moments (GMM). However, if the correlation between two equations is not strong, then, in addition to the estimation by 2SLS, the Berry, Levinsohn and Pakes (BLP, 1995) procedure will be used.

We also will perform the endogeneity tests, overidentification (Hansen J statistics) tests, unit-root (ADF – Augmented Dickey Fuller) testing and weak-instrument (Kleibergen-Paap F statistic) tests. Finally, we will perform the robust correction of the variance per cluster (microregions).

The identification of demand is reached by variation in branch bank market shares controlled by variation in bank features. Thus, we decompose the optimal instruments into five groups:

- BLP_1: number of bank branches (all banks), number of specific branches and quantity of electronic service stations (ESS) – for all banks;
- BLP_2: interaction between the total cost of a bank branch and total number of ESS and the interaction between the added value of a specific bank branch and the total number of branches in a certain county;
- INT_1: interaction between debt index and total number of branches in a county, interaction between debt index and the quantity of specific bank branches, interaction between debt index and total number of ESSs;
- INT_2: ESS density, rival branch density, density of ESS rivals and branch density;

- Shifter: liquidity index.

We controlled the remuneration of deposits in determining bank in accordance with the Taylor's rule, where the inflation gap is the distance between observed annual inflation and the center of its target, 4,5%, and we considered the municipality output gap as the distance of observed output in period t and the largest output observed between 2009-2016 period.

As in BLP procedure, restricting utility parameter to the segment features space and to a polynomial system is enough to identify the demand. This is important because the bank demand is a function of the features of all products and this invalidates our confidence in the "exclusion" constraint tests.

The Lerner-Demand test hypothesis for time deposit and loans will be performed by panel with fixed effects. The panel season will be performed by time, because the relationship of banks in inter-finance market in these segments is a source of correlation for this estimate. Thus, we will analyze each Lerner index and price elasticities by time for whole banks presents in each county in determined time.

Finally, if the GMM system will be necessary, the estimates are made with on-weight matrix for each micro-region and year and therefore, the restriction that the covariance between microregions is equal to zero is forced.

3. DATA

The data comes from several sources. The wage of formal workers comes from the Relação Anual de Informações Sociais (RAIS, Annual Report of Social Information in English) and Cadastro Geral de Empregados e Desempregado (CAGED, General Register of Employees and Unemployed in English). The stock variables of analyzed segments come from the Estatística Bancária Mensal do Banco Central do Brasil (ESTBAN, Monthly Banking Statistics of the Central Bank of Brazil). The manutention fee and management fee come from report 4010 disclosed by Central Bank of Brazil. The interest rates, and CDI rates comes from the specifics monthly bank reports of Central Bank of Brazil. The Government aid comes from Portal de Transparência do Governo (Federal Government Transparency Website in English) and the social pension comes from Portal da Previdência Social (Social Security Website). Table 1 shows the number of banks and municipalities analyzed in each segment over the period:

Table 1. Number of banks and counties

Period	Saving Deposit	Time Deposit	Loans	Counties
2009 – 2010	81	81	35	3449
2011 – 2012	79	79	39	3580
2013 – 2014	71	71	25	3669
2015 – 2016	69	69	24	3580
2009 – 2016	91	91	55	3449

Source: Search Result
Note: according to ESTBAN.

For we find the annual average of stock variables, the monthly ESTBAN data were seasonally adjusted by the seasonal dummies technique and the monetary values were updated for the period of December 2009, from this de annual average was calculated. The interest rates (p_j^l) charged by banks in the LO is the average annual interest rate of each bank. This rate is at the national level.

The statistics descriptive of the variables used in the model estimates are provided by Table 2.

Table 2. Descriptive statistics of the main variables used

Market Share	Obs.	Means	D.P.	Min.	Max.
Save Deposit	68,805	0.0161	0.0354	3.83e-14	0.9944
Time Deposit	68,805	0.0211	0.0435	4.90e-13	0.9810
ETD	68,895	0.0341	0.3718	1.79e-11	0.9890
Prices	Obs.	Means	D.P.	Min.	Max.
CDI-SAVE	68,805	0.0182	0.0098	0.0035	0.0335
Management Fees	68,620	0.9943	0.0574	0.7144	1.6852

Service Fee	68,805	0.1456	0.2277	4.27e-08	32.5489
Interest Rate	68,164	0.6298	0.2252	0.1198	7.1706
ln(S) – ln(S_0)	Obs.	Means	D.P.	Min.	Max.
Save Deposit	68,805	-5.5653	2.1869	-30.8930	5.1839
Time Deposit	68,805	-5.4322	2.3958	-28.3446	3.9442
ETD	67,895	-46089	2.1256	-247443	4.5028

Source: Search Result
Obs.: The dots are decimal separators.

The CDI-REAL data (p_j^{td}) is the net effective annual interest rate, after deducting 15% of Income Tax[3] on the CDI's profitability. In savings there is no incidence of income tax. The management fee (p_j^{ad}) represents the banks income to manages the "households" resources. It is a result of the division between the accounts 71700009 and 41500002 of the balance sheet provided by report 4010 of Central Bank of Brazil. The account services fees (p^{sv}) represent the average traded in the five working days before month end. The responsibility for information lies with financial institutions. The values of p^{sv} are the transformation of the available values for the logarithmic scale.

4. RESULTS

4.1.Demand Analysis

The first results that we will analyze is for Time Deposit segments. The errors between savings deposit and time deposit were considered highly correlated (approximately 90%). Thus, the estimated GMM system assumed the form of the system presented in equation (25). The nests desegregate up to six equations (three for SD and three for TD) totaling seven equations for model 2 and eleven for model 3.

$$\begin{cases} s_{jmt}^{SD} - \alpha_0 - \alpha_1 p^{sv} - \alpha_2 p^{td} = \varepsilon_{jmt}^{SD} + \mathrm{Y}\vartheta + BLP_1\tau + INT\_1\varphi \\ s_{jmt}^{TD} - \alpha_6 - \alpha_4 p^{ad} - \alpha_5 p^{td} = \varepsilon_{jmt}^{TD} + \mathrm{Y}\vartheta + BLP_{1\tau} + INT\_1\varphi \\ p^{sv} - \alpha_7 = \varepsilon_{jmt}^{psv} + \mathrm{Y}\vartheta + BLP_1\tau + BLP_2\varphi + INT_1\omega \\ Nests^{sv\ or\ td} - \alpha_8 = \varepsilon_{jmt}^{Nest^{sv\ or\ td}} + \mathrm{Y}\vartheta + BLP_1\tau + BLP_2\varphi + INT_1\omega + INT_2\rho \\ p^{ad} - \alpha_9 = \varepsilon_{jmt}^{pad} + \mathrm{Y}\vartheta + BLP_1\tau + BLP_2\varphi + INT_1\omega + INT_2\rho \\ p^{td} = \alpha_{10} - \beta_4 \mathrm{gap}_{\mathrm{remun}_{mt}} - \beta_5 \mathrm{gap}_{\mathrm{inflation}_t} = \varepsilon_{jmt}^{ptd} + \mathrm{Y}\vartheta R \end{cases} \quad (25)$$

In Table 3 the first and second columns are respectively the Logit and Nested Logit models (for multiple banks only). The third column presents the Nested Logit with three paths: public banks, private multiple banks and private commercial banks. In addition to the variables presented, controls and instruments are also part of the regression (econometric procedure sections).

By results, the demand was identified and is statistically significant. The higher the management fee the lower the demand for time deposits. Note that given the existence of these management fees, when the difference between the yields of the CDI and the savings increases, the market share of the time deposits segment fall. This is because many of the large banks have paid 70 or even 60% of CDI's profitability to their applicators and there is still the incidence of Income Tax. Thus, the safe deposit is preferable to the time deposit.

Table 3. Demand parameters in the Time Deposit segment (means 2009 to 2016)

	Logit (1)	Nested Logit (2)	3 Nesters Logit (3)
TD: CDI-REAL	0.715***	0.716***	0.301***
	(0.049)	(0.033)	(0.031)
Management Fees (MF)	-6.343***	-6.361***	-2.356***
	(0.199)	(0.053)	(0.049)
SD: CDI-REAL	0.273***	0.107*	0.415***
	(0.068)	(0.058)	(0.054)

[3] The 15% rate represents the lowest rate of regressive taxation (over 720 days) on financial investments in Brazil.

Maintenances Fee (MT)	-0.185***	-0.209***	-8.841***
	(0.064)	(0.061)	(0.149)
TD:	-	0.469***	-
Nest – MB	-	(0.011)	-
Nest – PB	-	-	-0.039***
	-	-	(0.017)
Nest – PC	-	-	1.076***
	-	-	(0.006)
Nest – MPB	-	-	1.266***
	-	-	(0.022)
Constant	-5.101***	-60.166***	-20.258***
	(0.310)	(0.477)	(0.438)
TD Observation	57,017	57,017	57,017
SD Observation	67,338	67,338	67,338
MF Observation	67,340	67,340	57,017
CDI Observation	67,526	67,526	67,526
MT Observation	67,526	67,526	67,526
Momts.	62	93	151
Cltrs.	4,252	4,252	4,252
Parms	11	15	17
H-J test	2,699	2,721	3,036

Source: Search Result * p<0.1; ** p<0.05; *** p<0.01.

Notes: Standard errors in parentheses. All equations were controlled by trend and dummy for even years. The instruments used are presented in equation (69). MF is Management fees, CDI is CDI-REAL, and MT is Maintenance Fee in SD product. The null hypothesis of Breush-Pagan test of independence with chi (15) was rejected for all SUR models. Nests equations correlations are among 22% and 25% for models (2) and (3).

The analysis of the coefficients of the management fees of the segment on the screen is only a prior one, since the consumers' sensitivity to the price also depends on the market share of each firm and the price charged by the financial institutions (since this is not in a logarithmic scale). The price elasticities of demand for the Time Deposit segment are presented in Table 4.

Table 4. Price elasticity of demand for the Time Deposits Segment in the period from 2009 to 2016 (SUR procedure)

Percentile / Model	10%	25%	50%	75%	90%	Mean	P Valor
Logit	5.63	5.64	5.65	5.66	5.67	5.64**	0.02
Nested Logit	4.79	4.82	4.84	4.84	4.85	4.82***	0.00
3 Nesters Logit	2.28	2.33	2.34	2.35	2.36	2.32**	0.01

Source: Search Result * p<0.1; ** p<0.05; *** p<0.01.

Note: a null hypothesis is that the mean is equal to the median;

After analyzing the Mahalanobis distance, 1% of the elasticity of Bradescard bank was considered outlier, and therefore, although this bank is available in annex, the elasticities of the above Table did not consider it in the analysis. Elasticities are in absolute values.

From results, of Table 4, we have an elastic behavior of demand against management. The price elasticity of demand, in absolute value, distribution is asymmetric on the left, where the means values for two first models are concentrated between 25th and 50th percentiles. For 3 Nested Logit model the mean value is concentrated between 10th and 25th percentiles.

The demand analysis for LO is presented in Table 5. The LO segment was performed by BLP. At first glance all validity tests of the instruments were rejected, however, such rejection occurred due to the number of observations.

Table 5. Parameters of demand for the segment of Discounted Loans and Securities for the whole of Brazil in the period from 2009 to 2016

Variables	Logit (1)	Nested Logit (2)	3 Nesters Logit (3)
Interest rate	-7.081***	-7.054***	-5.10***
	(-13.43)	(-12.63)	(-4.41)
Trend	0.302***	0.369***	0.715***
	(11.35)	(11.23)	(3.64)
Dummy	-0.0403***	-0.119***	-0.58***
(ano par = 1)	(-5.05)	(-4.12)	(-3.28)
Nest – Public Banks	-	-0.284***	-0.340**
	-	(-2.70)	(-2.03)
Nest – Private Com. Banks	-	-	0.314***
	-	-	(6.27)
Nest – Private Mult. Banks	-	-	-0.266
	-	-	(-1.39)
Constant	-1.550***	-2.399***	-3.96***
	(-7.39)	(-5.62)	(-6.72)
Observations	67,895	67,895	67,895
Weak test - F	179.1	20.75	6.703
Over teste	94.65	81.19	159.5
Over/N	0.001	0.001	0.002
N. of Banks	55	55	55
RMSE	2.145	2.434	2.99
D. freedom	3	4	6

Source: Search Result * p<0,1; ** p<0,05; *** p<0,01.
Note: t statistical in the parentheses in the models from (1) to (3).

The split of the value of this test (of all models) by the number of observations (OVER / N) shows that the correlations between second stage residuals and the instruments used are less than 1%. The random component of GLP was not statistically significant, indicating that local managers do not have much order to decide on interest rates. Interest rates presented negative coefficients, indicating that the higher the interest rates, the lower the demand for bank loans and, consequently, the lower the market share of banks (demand identification).

The distribution of the absolute elasticities for the LO Segment (Table 6) is asymmetric to the right for all three estimated models.

Table 6. Price elasticity of demand for the Loans segment for the whole of Brazil from 2009 to 2016 (time average)

Percentiles / Model	10%	25%	50%	75%	90%	Mean	P-Valor
Logit	2.099	2.309	3.310	5.108	10.967	5.036**	0.020
Nested Logit	2.091	2.275	3.297	5.062	10.926	5.005**	0.020
3 Nested Logit	1.513	1.646	2.395	3.536	7.905	3.621**	0.021

Source: Search Result * p<0.1; ** p<0.05; *** p<0.01.
Note: a null hypothesis is that the mean is equal to the median;
Elasticities are in absolute values.

Considering the first model of the five largest banks, Bradesco's demand is the most elastic and belongs to the range of 75% to 90%. The price elasticity of the demand of banks Itaú-Unibanco, Santander, Caixa Econômica Federal and Banco do Brazil are between the 50% and 75% percentiles.

4.2.Deadweight-loss Analysis

In this part, we will use the elasticities-price of demand in equation (24) to obtain the DWL measure for TD and LO segments. We also present the hypothesis for both segments of the relationship between market power and price elasticity of demand. The DWL comparison will be made with GDP and the sums of profit of five largest downstream banks. While most of European banks are stuck in single digits, in

Brazil the return on equity (a measure of profitability) are of two-digit percentage (The Economist, 2018). In our analysis, the average firm surplus of five largest banks, in three segments, was nearly $31.61 Billion.

In Table 7, we presented the results of Loans and Time Deposits deadweight-loss. The presentation of segments was analyzed in each line of the first column. In the second column, we presented the number of banks analyzed. The deadweight-loss is presented in millions of dollars in the third column. The Brazilian GDP means between 2009-2016 is presented in the fourth column. In fifth column is the DLW as percentage of GDP.

Table 7. The deadweight-loss average in segments of Time Deposit and Loans in period 2009-2016.

Models	Segment	Banks	DWL (Million)	PIB (Billion)	DWL/PIB (%)	DWL/TR (%)
Logit	Time Deposits	91	$ 1,485.10	$ 2,858.00	0.05	3.26
	Loans	55	$ 6,840.39		0.24	4.41
	All	91	$ 8,325.49		0.29	7.67
Nested Logit	Time Deposits	91	$ 1,616.49	$ 2,858.00	0.06	3.52
	Loans	55	$ 6,862.50		0.24	4.43
	All	91	$ 8,478.49		0.30	7.95
Three Nesters Logit	Time Deposits	91	$ 3,171.29	$ 2,858.00	0.11	6.90
	Loans	55	$ 8,902.87		0.31	5.74
	All	91	$ 12,906.15		0.42	12.64

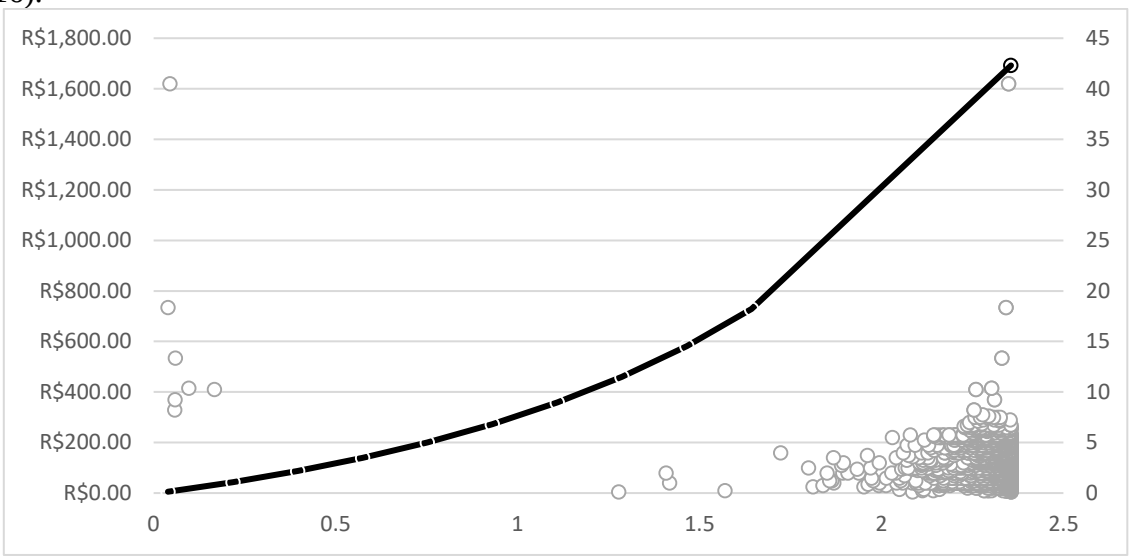
Source: Search Result

Note: The GDP is a mean value of period (2009-2016). TR is Total Revenue of all banks in analyzes. Dollar value is $ 2.03 from January of 2013.

The as ratio of DWL with respect of average GDP for a Time Deposit segment was not negligible. On average, annually, over one and a half billion ceases to be applied because banks conduct in this segment. This ratio represents between 0.05% to 0.11% of Brazil's average GDP (2009-2016) or approximately between 3.26% to 6.90% of average total revenue of banks in this segment. The Loans segment showed a greater gain in the deadweight-loss measures. Again, the values of the Deadweight are not negligible and indicate that approximately $7.0 billion are no longer undertaken annually due to the interest charged by financial institutions. This ratio represents an annual average between 0.24% to 0.31% of the average GDP or between 3.26% to 6.90% average total revenue of banks in this segment. The values presented in Table 7 are a median basis, however the distribution of elasticities presented in demand analysis are asymmetric to right for a Loans segment and to left for Time Deposit segment and each municipality can be a different price elasticity of demand.

Figure 1 shows the evolution of the DWL (principal axis) when the price elasticity of demand, in TD segment, increases (black line). The value of elasticities is for the third model. The secondary axis allows analyzing the relationship between the number of banks in each municipality and the price elasticity of demand of these municipalities. The rings are each county and itss positions is with relation to number of banks. Remember that price-elasticity of demand in TD segment is normalized for 100 thousand people.

Figure 1 – Evolution of the DWL with respect to elasticity variation in Time Deposit Segment (mean 2009-2016).



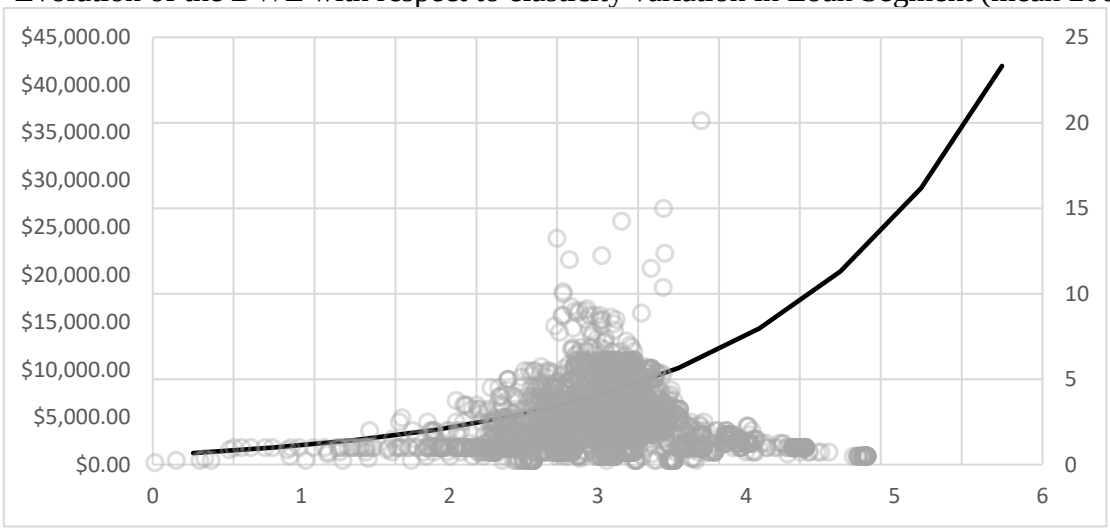
Source: Search Result

Note: Principal Axis y is one million of dollars of DWL. Secondary Axis is number of brand banks in each county. Black line is DWL and rings is the counties.

The optimal elasticity, in TD segment, occurs when the bank has inelastic demand. Most counties have a close elasticity between 2 and 2.5 (mean = median) with several banks ranging from 1 to 8 different brands. In these counties, the DWL value to go between $1,000 and $1,800 million of dollar. Few municipalities are on the competitive margins (they present a peculiarity to save regardless of the yield proposed by the banks).

In Figure 2, we have the evolution of the DWL for LO segment. Its analysis is the same that in previous figure. In the case of banks, what is not lent to the households or firms can be directed to the government financing that in the period presented expenses growing.

Figure 2 – Evolution of the DWL with respect to elasticity variation in Loan Segment (mean 2009-2016).



Source: Search Result

Note: Principal Axis y is one million of dollars of DWL. Secondary Axis is number of brand banks in each county. Black line is DWL and rings is the counties.

Note that the second order condition of DWL in Figure 2 is greater than zero and that it does not have a point that touches the competitive market structure. Therefore, given the current characteristics of the Brazilian banks elasticity, it seems difficult to say that the lending segment is a competitive segment, as Nakane (2001) stated.

In addition, Figure 2 also reveals that in most counties have, on average, three brands of banks and that these municipalities have as characterizing an elasticity that orbits between 3.05 and 3.10. In this point, the DWL represents about 0.18% of Brazilian GDP (Table 7). This is different of ratio presented in the median value (Table 7) and indicates that DWL can be at least $1B larger.

We will present the hypothesis test of the relationship between market power and price elasticities of demand in Table 8. We perform the test for third model (Three nested logit).

Table 8. Lerner-Elasticities Hypothesis test.

Variables	Time Deposit	Loans
Price Elasticity	0.01**	0.05***
	(0.00)	(0.01)
Constant	0.74***	0.46***
	(0.01)	(0.02)
Observations	25,965	25,957
Panel: Years	8	8
R-Squared	0.001	0.752

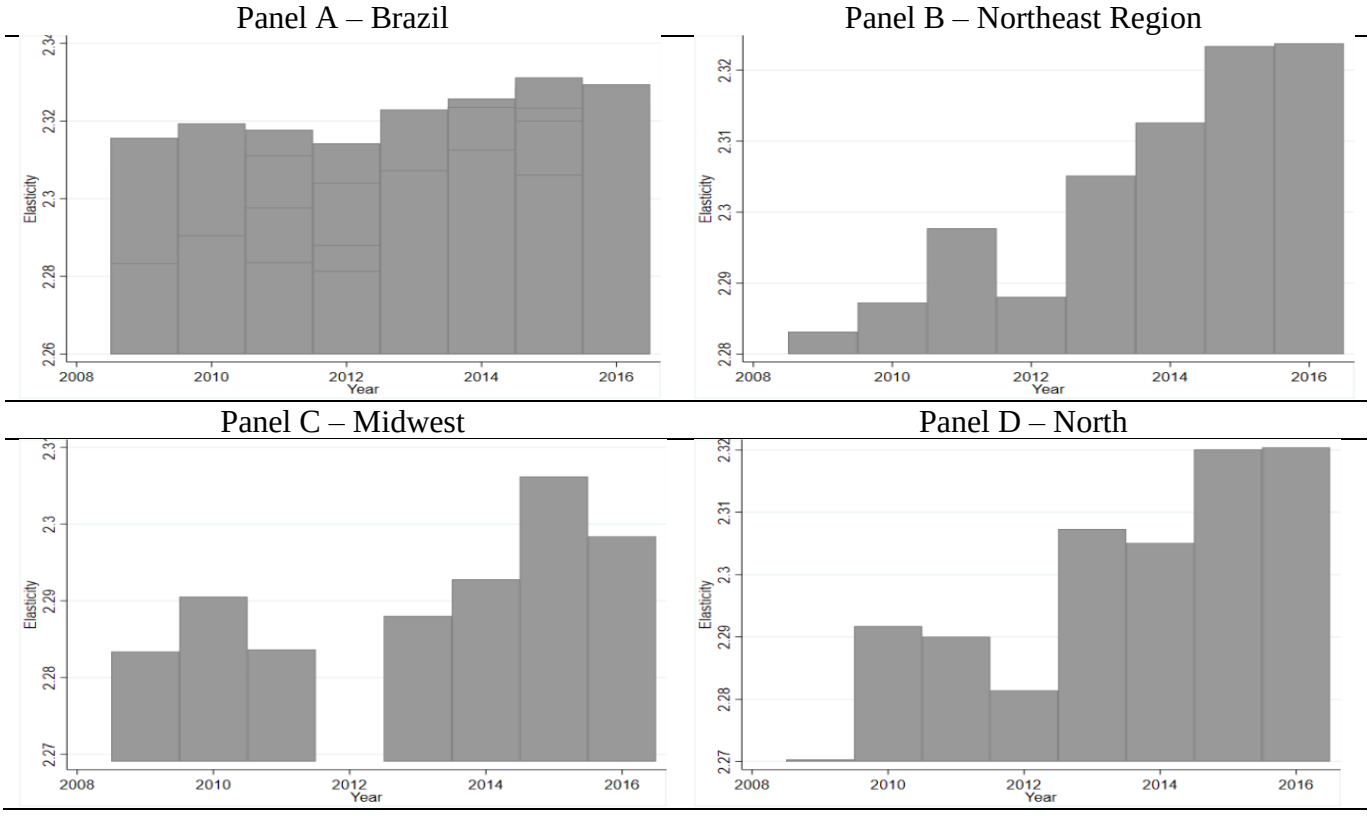
Source: Results of search * p<0,1; ** p<0,05; *** p<0,01.

Note: the test will be performed by panel with time as cluster and counties as observations in each cluster. We have a std. error in the parentheses

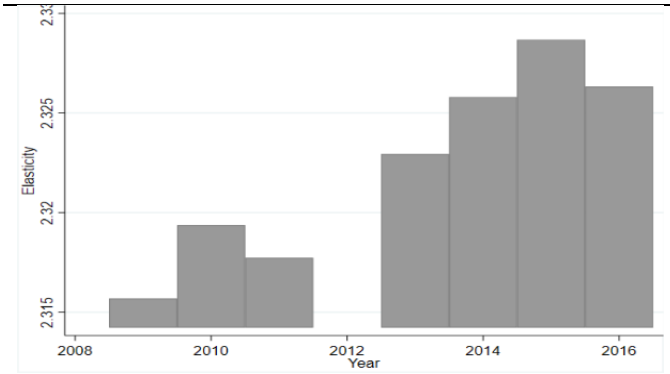
In loans analysis, we have an unbalanced panel for time with 3,493 counties and in the time deposit segment we also have unbalanced panel fort time with 3,435 counties. The results indicate us, for both segments, that our hypothesis holds and the relationship between the Lerner index and price elasticities of demand is positive.

The evolution of elasticity per year for the Time Deposit segment for whole of Brazil and itss five regions is in Figure 3. We use the third Model of elasticities to present these evolutions. The behavior of the elasticities does not change through the models, what changes are only the value of the elasticities. The five regions present a behavior different from Brazil. The elasticities increase over time, but in non-linear behavior.

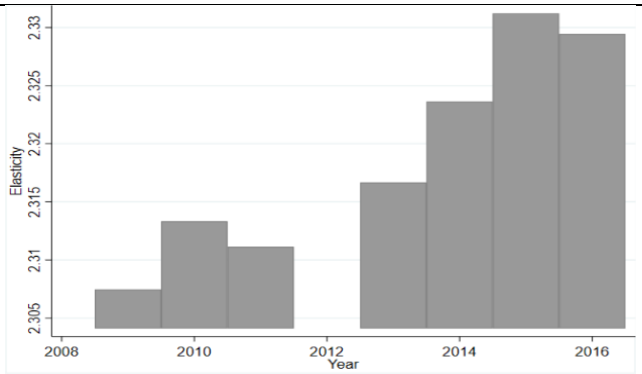
Figure 3 – Elasticity evolution for Time Deposit segment for whole Brazil and it five regions.



Panel E – Southeast



Panel F – South



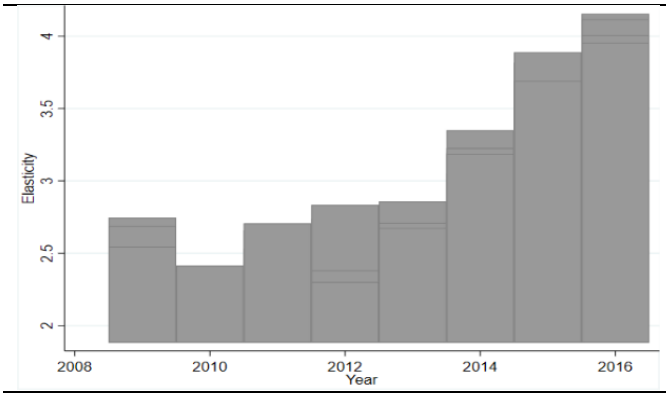
Source: Search Result

In northwest region, the increase of elasticity of time deposit bank demand represents a relative reduction in the market power of banks in this sector. The emergence of other source of financial investments like increase of BM&F Bovespa participations or forex applications may responds these variations. However, it is a source for another analyzes. The same question may be applied in another regions, but the increase of elasticity around the period is not a clear like in the northwest region.,

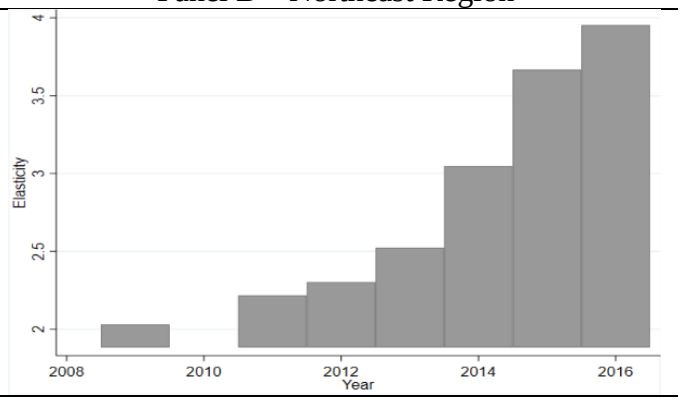
The evolution of elasticity per year for the Loans segment for whole of Brazil and the five regions can be followed in Figure 4. In this segment, the five regions present a same behavior from Brazil. The elasticities increase over time.

Figure 4 – Elasticity evolution for Loans segment for whole Brazil and it five regions.

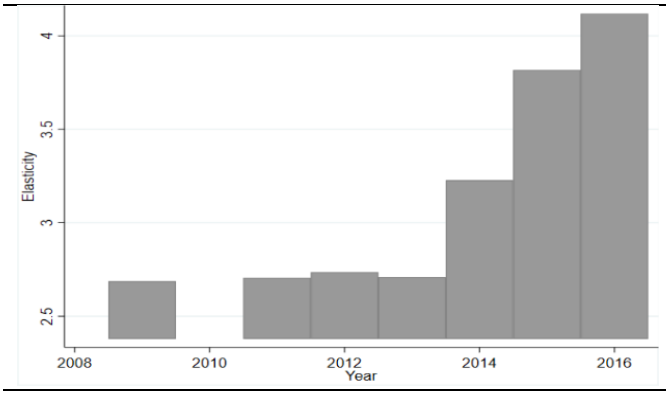
Panel A – Brazil



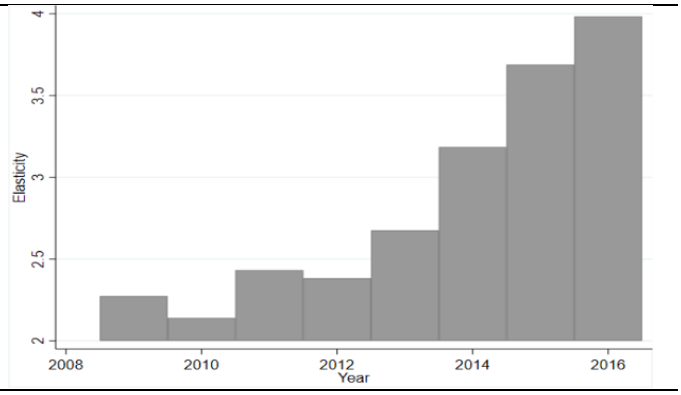
Panel B – Northeast Region



Panel C – Midwest

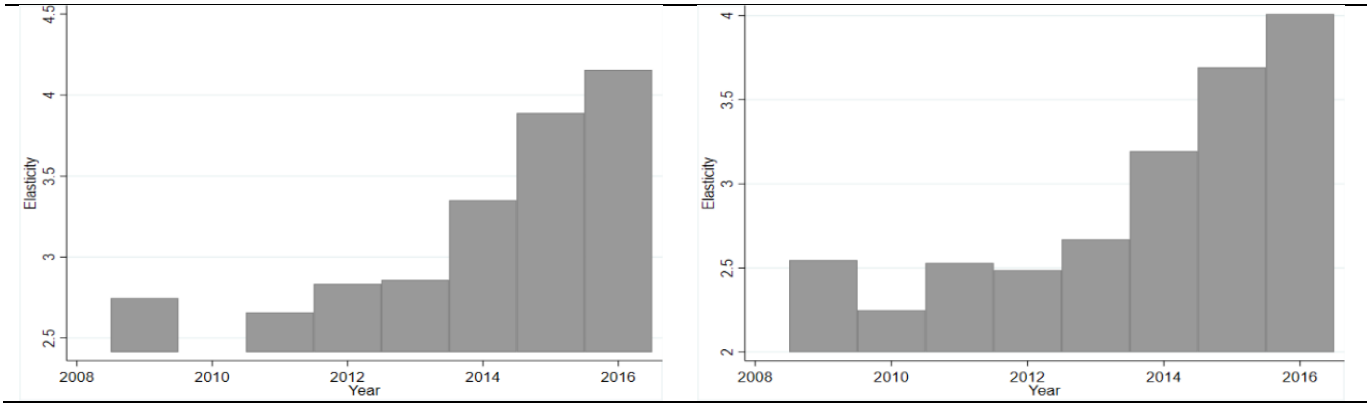


Panel D – North



Panel E – Southeast

Panel F – South



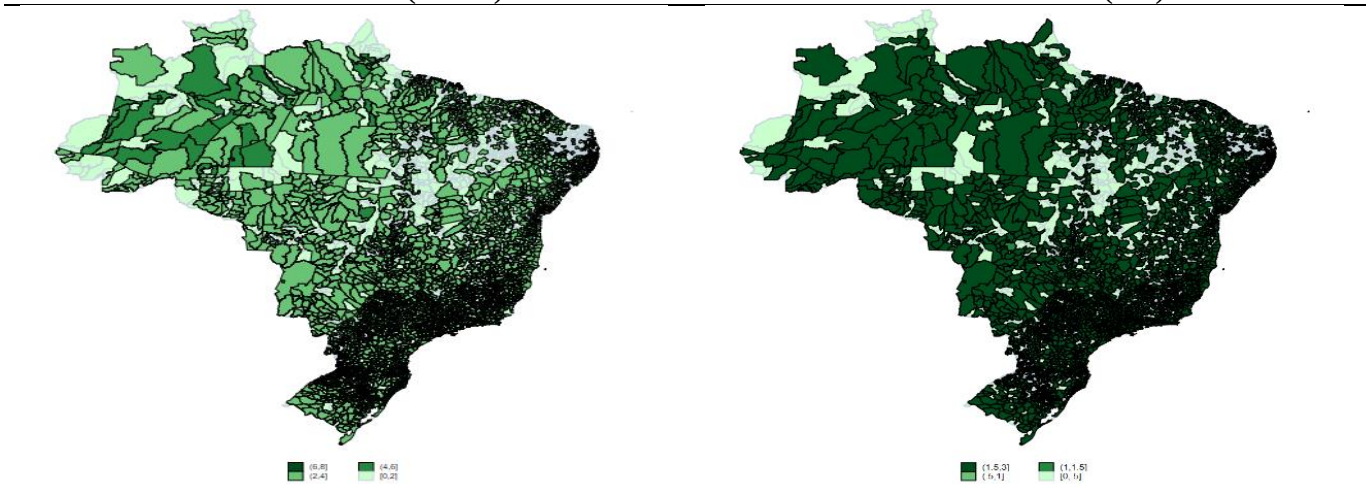
Source: Search Result

In Panel A of Figure 5 we can see the relationship presented in Figure 4. The region with more elastic demand of Brazil is southeast and south. In these regions there is also a greater banking concentration. The appeal for competition is greater and the existence of surrogates as well. This relationship shows the effectiveness of financial intermediation for local development. As an example of interpretation of Figure 5, the counties of the northeast that do not have banks are those located in the northwest of Bahia and, south of Piauí. The hinterland of this region is the one with the lowest elastic demand, while the coastal region has a greater sensitivity to the variation of interest rates.

The results of Panel B of Figure 4 follow the Panel A in places of demand relations. However, the distribution of elasticities intervals is the most homogenous between the five regions. Note, in figure 3, that the increase occurs in a small relative interval. The cost region has a more elastic demand, mainly in south, southeast regions and the Distrito Federal in Midwest region.

Figure 5 – Elasticity distribution for Brazil in Loans and Time Deposit Segments

Panel A – Brazil (Loans)	Panel B – Brazil (TD)



Source: Search Result

Our result is in line with those found by Maudos and Guevara (2007) for EU-15 countries (0,42% in the Brazilian case against 0.52% for European banks). However, our values are relatively higher than those found for Mexico by Solis & Maudos (2008). Silva and Lucinda (2017) shows that switching cost average duration between the bank and costumer is about 12.2 years. Thus, the Lerner-Demand hypothesis indicates that an increase of competition endogenously, with increase of credit without political interest, may to redistribute the demand between the firms, because the price elasticity of the market is limited by price elasticity of demand and to reduce the lock-in time between bank and costumer or to reduce the cost of this lock-in effect. As Cardozo, Azevedo and Barboza (2018) show, an increase in bank competition is associated with a greater supply of credit. In line with our results, this greater credit supply means a reduction of the social expectative here verified, since more projects will be approved. This relationship

may be capable of generating new jobs, taxes for the government and feasibility of projects in various regions of Brazil.

5. CONCLUDS

The financial intermediary sector has big importance for developing country. The main theories and hypotheses of literature seek to analyze the bank market from financial optics. However, bank does not is a regular firm because there is the social expectation under efficiency in its function of intermediation. At this point we raise the hypothesis that there is a positive relationship between market power and the demand behaviors, and we draw the objective of measuring the size of the deadweight-loss generated annually by the conduct of the Brazilian banks. In short, our objective was to measure the size of the Dead Weight-loss generated annually by the conduct of the Brazilian banks.

Our results indicate that DWL practice is maintained in practically all counties to which banks operate. There were 3435 counties analyzed for the Time Deposit segment and 3493 counties for the Loans segment. The results indicate that the deadweight loss is around 0.5% and 0.11% of the average Gross Domestic Product of the period 2009 and 2016 for the term deposit segment and between 0.24% and 0.31% of GDP for the loans segment in the same period. In all segments, Brazil ceases to produce around $8 to $12 billion of Dollars annually because of the conduct of the banks. Thus, we do not refute our initial hypotheses that DWL is not significant to test the Lerner-Elasticity relationship.

This study provides insights in terms of social, financial and economic implications. Our results indicate that in the period the conduct of banks was in elastic part of demand for almost all counties of analyzes in both segments (deposits and loans). This is evidence that Lerner-Elasticity hypothesis is true, but nothing talks about efficiency, and capacity of generating profit in the period. Therefore, it is advisable that policy makers should concentrate on possible market fail generated by conduct of commercial and multiple banks. Thus, for continuity of this research, we recommend the test of efficiency, allocative and scale of banks from Relative Market Power Hypothesis.

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