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A COMPARATIVE STUDY OF THE CREDIT CARD MARKET DYNAMICS IN
MEXICO AND BRAZIL

SUZANNE CORDEAU-ANDREWS

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Thesis presented to Escola de Administração de Empresas de São Paulo of Fundação Getulio Vargas, as a requirement to obtain the title of Master in International Management (MPGI).

Knowledge Field: Credit Cards

Advisor: Prof. Dr. Servio Tulio Prado Junior

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ABSTRACT

This research analyzes and compares the attractiveness of the Brazilian and Mexican credit card markets from a financial firm's perspective. The market dynamics in Latin America's two economic powerhouses are fleshed out with qualitative and quantitative data, using a strategic framework to structure the analysis. Since its adoption by both countries in 1956, credit card usage has experienced many years of double digit growth. However, penetration levels remain low compared with most developed countries. Brazil has a more developed credit card infrastructure, with more potential profit, and issuers might face fewer competitive challenges. Alternatively, Mexico, is witnessing a more favorable economy, a friendlier business and regulatory environment, combined with fewer financial products that compete with the credit card. Therefore, this paper concludes that Brazil and Mexico both offer market opportunities for credit card companies that can navigate the different technological, demographic, macroeconomic, and regulatory shifts in each country.

Keywords: Credit cards, payment industry, Brazil, Mexico

RESUMO

A complexa indústria do cartão de crédito é composta por vários agentes que são impactados imensamente pelas mudanças: tecnológicas, demográficas, macroeconômicas e regulatórias. Ademais, é um dos poucos setores que não parou de crescer desde que foi criado e as projeções apontam para um contínuo desenvolvimento acelerado. Apesar desta indústria ter crescido rapidamente desde a sua entrada no México e no Brasil, em 1956, a sua taxa de penetração permanece baixa quando comparada aos países desenvolvidos. Esta dissertação analisa e compara os atrativos destes dois mercados latino-americanos do ponto de vista de uma empresa que atua no segmento. As dinâmicas destes dois mercados são apresentadas graças a uma pesquisa baseada em dados quantitativos e qualitativos e uma estrutura de analise estratégica. O principal objetivo desta tese é de mostrar oportunidades para uma empresa querendo expandir geograficamente sua operação de cartão de credito no mercado brasileiro ou mexicano. A conclusão desta dissertação é que ambos países possuem vantagens. O Brasil tem uma infraestrutura de cartão de crédito mais desenvolvida e o mercado parece ser mais lucrativo e com menos barreiras competitivas que no México. Por outro lado, o México tem indicadores econômicos mais promissores que os do Brasil. E o país também oferece um ambiente mais favorável para fazer negócios, o cenário regulatório é melhor e existem menos alternativas de crédito.

Palavras-chave: cartão de crédito, meios de pagamento, Brasil, México

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LIST OF ABBREVIATIONS AND ACRONYMS

AML — Anti-money laundering

BCB — Banco Central do Brasil (Brazilian Central Bank)

Capex — Capital expenditures

CAT — Costo annual total (total yearly cost)

EMV — Europay, MasterCard and Visa

IBGE — Instituto Brasileiro de Geografia e Estatistica (Brazilian statistic institute)

IOF — Imposto sobre operações financeiras (Tax applied to financial operations)

KYC — Know Your Customer

Opex — Operational expenditures

POS — Point of sale

SCPC — Serviço central de proteção ao crédito (Brazilian Credit Union)

TPV — Terminal punto de venta (Point of Sale)

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1. INTRODUCTION

"A credit corresponding to his share of the annual product of the nation is given to every citizen on the public books at the beginning of each year, and a credit card issued him with which he procures at the public storehouses, found in every community, whatever he desires whenever he desires it" (Bellamy, 1888)

The earliest reference to a card being employed as a form of payment dates back to Bellamy's utopian novel, Looking Backward, quoted above. However, not before the mid-twentieth century did the idea actually materialize. Due to its extensive history and widespread use, notably in the more economically developed countries, many may believe that this payment method is a "red ocean", a saturated market (Kim and Mauborgne, 2005). Nonetheless, in emerging markets, penetration levels are still low. Credit card companies looking to expand would be able to find uncontested market space. Indeed, in 2014, about a third of the growth in card-based payments came from emerging markets, which were within the top 20 largest economies by GDP: China, Brazil, Russia, Indonesia and Mexico (Schneider, 2015).

This paper focuses on the two Latin American powerhouses from the aforementioned list. Given these supposed market opportunities, coupled with the rise in virtual money such as cryptocurrencies, and the general shift towards a digital, cashless future, investing in this sector would seem like a sound strategy. However, before doing so, it is primordial to understand the competitive forces that drive these markets, as well as the barriers to entry.

This work aims to aid companies or financial institutions in Latin America, or abroad, looking to strategically enter this payment segment. No previous studies that accomplish this goal, and do so by contrasting the two countries, were identified during the research phase of this thesis. Elements from various previous studies were, however, leveraged in order to come up with a more holistic view of threats and opportunities in the markets under observation.

In order to provide a comprehensive view of the subject and fully understand the dynamics of these markets, the paper first explains the functioning of a credit card, and the main players necessary for it to operate. Then, the methodology used to accomplish the dissertation's goals is laid out. Consequently, the existing literature about credit card markets and cardholder

behavior is discussed. A brief history of the credit card in the world, in Brazil, and in Mexico is then presented. Finally, the crux of the analysis is tackled, i.e. the market analyses and comparisons. This research is carried out using a quantitative-qualitative analysis based on secondary data. A top-down approach modeled on Porter's five forces inspired the framework of this paper (Porter, 2008). It starts with a macroeconomic view of both markets and makes its way down to the Brazilian and Mexican consumer, their behavior and likely future trends.

This study found that either country could be an interesting investment opportunity. The final section of this paper consists of a table which summarizes the findings.

1.1. Functioning of the Credit Card: What is a credit card?

The following section details how a credit card works, and the different players necessary for the platform to function. This information establishes the basis for the broader issues.

The credit card is a unique product. Not only does it intend to offer convenience and flexibility by allowing cardholders to pay for goods and services without showing any tangible money, it is also a credit mechanism. Indeed, institutions that issue credit cards, grant uncollateralized credit lines to individuals, and, therefore, entirely assume the risk of default. Through underwriting decisions, card issuers enable cardholders to "borrow money" by having a certain credit limit to purchase goods and services or receive cash advances. Establishments accept payment cards and retain a guarantee from issuers of reimbursement for what cardholders spend. Cardholders, on their side, have the duty to reimburse at least the established minimum amount of their statement within a defined period.

The line of credit on a credit card makes this financial product different from any other loan because it "revolves" and is renewed every time the cardholder fulfills their repayment responsibilities.

There are many different types of credit cards on the market. Each with numerous characteristics that meet the demands of different segments of consumers. However, regardless of the type of credit card employed, there are two types of credit card users:

1. **Revolvers**: Individuals who don't pay their bill in full at the end of the month and who incur interest rate charges. They use the credit card as a "credit mechanism."
2. **Transactors**: Individuals who pay their monthly statements in full. They use their cards as if they were "charge cards" (Ribeiro, Mazetto, Filho, Curi, & Arashiro, 2011)

1.2. Main Players Involved

Below is a descriptive table about the main players that constitute the credit card market. The third column contains some of the most important elements of their business models, especially in relation to the other players. The total number of unique roles within a system can vary from country to country, as some responsibilities are sometimes merged (Bott, 2010) (Ribeiro et al., 2011).

Player	Role	Business Model
Issuer	The financial institution that issues either their own credit card or a third-parties' to the cardholder. Since they bear the risk of default or fraud, they're responsible for the credit policy (i.e: who they issue a card to and at what limit). They're also tasked with the collection process of delinquent customers, and with administering the fees and rewards that apply to their cardholders. eg.: Itaú (bank), Nubank (financial institution).	*Revenues: Interchange fees, interest revenue and other fees (annual fees, late fees, etc) charged to customers.* *Costs: Card network fees for using their brand.*
Acquirer	This institution is the "merchant's bank". It processes customers' payments, pays merchants and authorizes merchants to accept credit cards. They supply merchants with the necessary infrastructure (eg: the terminals) to be able to process the customer's credit card payments. eg: Cielo, Rede. In Mexico, issuers are usually acquirers as well, and processor companies have the role of providing the payment infrastructure, instead of it being the acquirer's role.	*Revenues: Interchange fees charged to merchants.*
Card Network	These are the card-issuing institutions that allow issuers and merchants to use their brand. They set the transaction terms for merchants, and the banks in the credit-card network. They can also partner with other	*Revenues: Fees charged to issuers to use their brand and be part of their network.*

	institutions to help in credit card processing and electronic payments. Eg.: MasterCard, Visa, Discover, American Express.	
Merchant	The recognized establishments that accept credit cards as a form of payment.	***Revenues:*** *Arguably the additional sales from offering customers more payment type flexibility* ***Costs:*** *Expenses associated with being part of the card network, and interchange fees.*
Cardholder	These are the individuals who obtain a credit card from an issuer. They use the card as a method of payment to acquire goods and services from the authorized establishments (merchants).	***Revenues:*** *Credit card rewards.* ***Costs:*** *Fees and interest to the issuer.*
Third-Parties	These are companies that offer auxiliary services to the other players in the system. They can be card processing companies, telemarketing companies, chip or plastic suppliers, collection service providers, etc.	*Varying revenue streams.*

Table 1 - Main Players Involved in Credit Card System

According to Evans and Schmalensee (2005), the credit card market is structured in three or four parts, depending on whether the issuer and acquirer are consolidated.

4 Part network

```
                        Card
                       Network
```

Pays *fee* → Card Network ← Pays *fee*

Sets *Int₁*

Issuer → Acquirer

Pays P(1-Int₁)
Int₁= Interchange 1

Pays P(1-R)
R = Reward

Pays P(1-Int₂)
Int₂ = Interchange 2

Cardholder ← Merchant

Sells good or service
at price P

Total Interchange (*paid by Merchant*) = Int₁ + Int₂
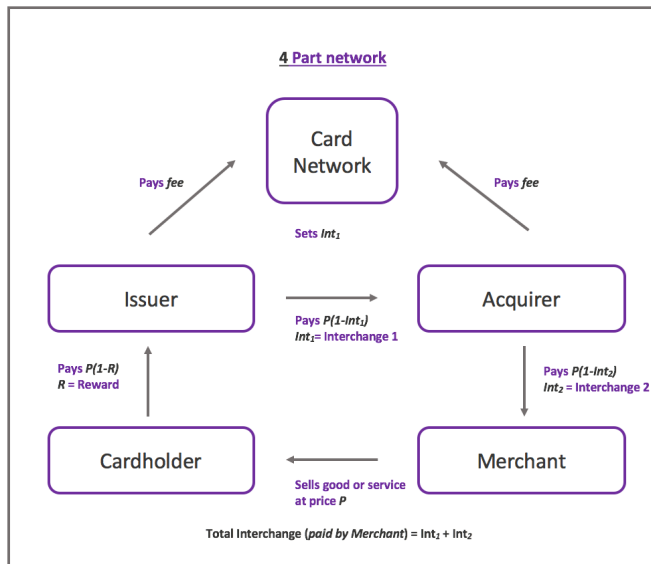
Figure 1 – The Four Part Credit Card Network

Created by author in December 2015

In the three-part diagram, the same unit acts as the issuer and acquirer. Amex, Hipercard and Diners are examples of this in Brazil.

3 Part network

```
         Card
        Network
```

Pays P*F
F = Fee

Issuer/Acquirer

Pays P(1-R)
R = Reward

Pays P(1 – Int)
Int = Interchange

Cardholder ← Merchant

Sells good or service
at price P
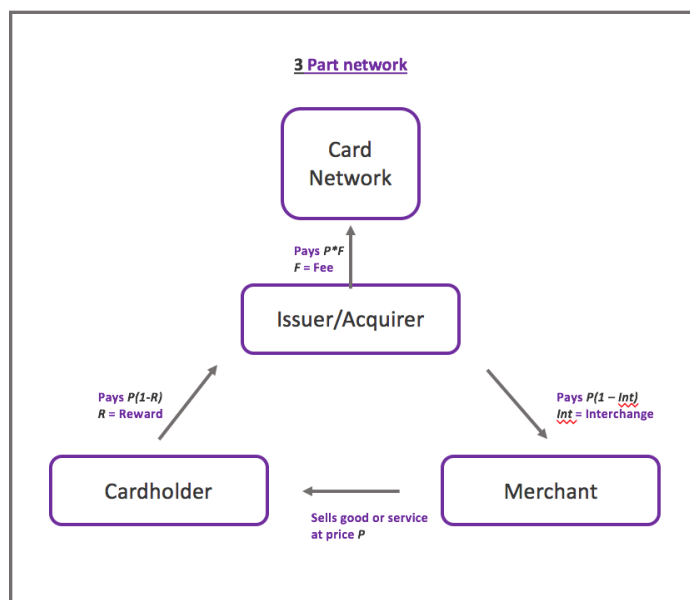
Figure 2 – The Three Part Credit Card Network

Created by author in December 2015

1.3. The Transaction Process

The following is a step-by-step explanation of how a transaction works (in both the three and four-part structure).

1. The cardholder presents their card to the merchant to pay for a good or service. The card is swiped, tapped or inserted into the terminal. The terminal transfers the transaction data (transaction type, card number, purchase amount) to the acquirer.

2. The acquirer communicates this transaction information to the issuer, who either accepts or declines the purchase. If accepted, the transaction is authenticated and the cardholder has obtained a good or service. Some smaller issuers in Brazil deal with card processors and the transaction goes through these companies before it's forwarded   to the issuer. They have their own rules for accepting or denying a transaction. In Mexico, transaction information goes from the acquirer to the acquirer's processing company, and then to the issuer's processing company before reaching the issuer. The issuer accepts or denies the transaction and sends the answer back through the same players, in the reverse order.

3. The issuer then needs to transfer the value of the purchase (at an interchange discount) to the acquirer who then pays the merchant (also at a discount). In Mexico, the processing companies are also involved in this liquidation step.

4. The cardholder must pay at least the minimum amount of their statement (which includes the purchase) by the due date in order to not fall into a delinquent state (Ribeiro et al., 2011).

In conclusion, the credit card is a unique product, with a peculiar business model and market. These basic tenets of credit card functioning will be developed and applied in the rest of this paper.

2. METHODOLOGY

The following section explains the methodological choices made to conduct the analysis.

2.1. Type of Study and Research Methods

In order to carry out a comparative study of the competitive structure of credit cards in Mexico and Brazil, a quantitative-qualitative approach based on secondary data was adopted. The quantitative data provided by surveys and other statistical sources yielded information which guided the rest of the analysis. The qualitative approach enabled the author to get closer to the researched object and thus analyze a phenomenon in its entirety (Vieira, 2004).

By leveraging a variety of sources from academic journals to market research reports, and by using the research methods explained above, it was possible to draw a comprehensive picture of the credit card market in two countries, and develop a framework which exhibits the different forces that drive each one.

2.2 Analysis Framework

The framework employed in this thesis is based on Michael Porter's Five Forces Model. His model analyzes the threat of entry of new competitors, the threat of substitutes, the competitive rivalry among market players, and the buyer and supplier power. According to his work, these micro environment forces help determine the competitive intensity and attractiveness of a given industry. Most of the aforementioned forces were used in this thesis. In fact, in the author's framework, the threat of substitutes looks at payment and financial substitutes, the threat of entry covers scale, regulatory and access barriers, the competitive rivalry is analyzed when looking at the industry landscape, and when considering bargaining power amongst the main players and the buyer's power is considered when analyzing cardholders' influence. An extra element included in this paper's framework is a brief overview of the macroeconomic environment of both countries (Porter, 2008). Below is the Porter-inspired framework that guides the study. The main points discussed are presented in the final summary table.
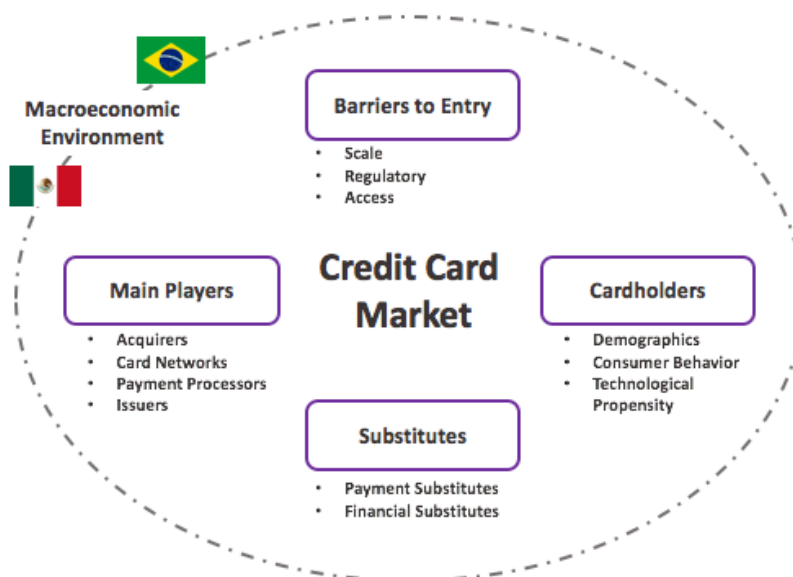
Figure 3 – Strategic framework of thesis

Created by author in December 2015

2.3 Sample and Selection Criteria

As mentioned above, Mexico and Brazil were the two countries selected for this quantitative-qualitative research. The reason why a comparative study was carried out rather than just an analysis of one country was to better understand why two states that share many historical, political and socioeconomic characteristics, possess credit card markets that display differences, even though digital payments arrived in both countries at the same time. In the context of qualitative research, employing comparisons is primordial to better contextualize information found (Rudnick, 2012). It could have been interesting to compare a developed market to an emerging one in order to, potentially, project in what direction the developing economy was going. However, since the goal of this study is to aid a company looking to expand to an emerging market where the credit card sector is not mature yet, then it is logical to compare and contrast two potential markets. This way, it would be possible to determine which country offered greater opportunity, and would be more feasible to operate in.

The timeframe selected for the comparison was from the moment the credit card arrived in Mexico and Brazil until the present year (1956-2016). The more important period to study was undeniably from 2000 forward, but to understand the current market dynamics, it was necessary

to look at the complete history of the credit card. Hence this paper including a section about the history of the credit card in either country.

2.4. Limitations

Since an important part of this thesis is a comparative study between two markets, limitations of such a research method must be highlighted. The main issue with this approach is that data sets in different countries may not use the same data categories, or they might define them differently. Thus, although the data sets employed provide a generally accurate overview of the questions asked, they may not always be completely comparable. Additionally, it was not always possible to find as much information about certain components of the market for both countries (either because it was not publically disclosed or well documented). Thus, in the analysis section, certain parts are more complete for one country than another. Although this may present an incomplete vision of reality, other research in this thesis supports the author's conclusions.

2.5. Paper Outline

This paper is divided into four parts. The first part consists of the literature review which covers cardholder behavior and general credit card market dynamics. The second part is the history of the credit card and how it arrived in Brazil and Mexico. This is presented to help set the context for the third part which is the comparative analysis itself. The final part is a table which summarizes the findings.

3. LITERATURE REVIEW

As mentioned above, no comparison about the dynamics of the credit card industry in Brazil and Mexico was identified during the research for this thesis. However, the credit card market structure, some limited competitive analyses, and studies about cardholder behavior do exist. The following literature review will cover these topics.

3.1. Competitive structure of the Credit Card market

A complex two sided-network

Just as the functioning of a credit card is intricate, the competitive forces that inhabit its market are also quite complex. Indeed, this market is characterized as being two-sided. It has no clear economic equilibrium for price and quantity, and the relative prices charged to each side matters greatly (Brown & Plache, 2006) (Ribeiro et al., 2011). In other words, products in two-sided markets deal with independent demands which must be satisfied simultaneously. One demand comes from customers who only desire a card if it is accepted in a wide number of establishments. The other demand stems from the establishments themselves who will only accept credit cards if there is a significant number of active cardholders. Thus, there is a "positive network effect" because the higher the credit card adoption rate, the more valuable the product becomes (Rochet and Tirole, 2005).

Alvarenga (2006) diagnosed this market as having a chicken-and-egg problem. Since market players face externalities and have needs that they cannot internalize by negotiating directly with one another, they need to interact through an intermediary or platform. Indeed, cardholders require a plastic card and auxiliary services to manage their account, merchants need terminals to process transactions and a system to receive payments, and issuers need rates to be high enough to compensate them for the risk they assume by granting credit cards. If rates were lower, issuers would have to be more conservative in their credit policies and thus issue fewer cards, and offer fewer rewards. This would lead to fewer customers and thus fewer merchants. In this complex scenario, rates cannot be established by the classic market price determination model of supply and demand. The intermediary helps minimize overall costs, create value for all parties involved and assist in cards being accepted more widely. The card network usually takes on this role and establishes a series of rules such as interchange fees and other related variables which all players must abide by. Sometimes, the network also resorts to subsidizing one group of users in order to attract the other. Consequently, there is often no direct relationship between the price charged on one side and the incremental cost of serving that side. Prices charged to optimize consumer benefit end up diverging from the cost-reflective ones. Moreover, if ever

there is an imposed price change on one side of the platform, the price on the other side is also impacted as a consequence. This is known as a waterbed effect.

In sum, the regulation instituted by the intermediary helps coordinate the market, it incentivizes institutions to join, and, ultimately, it enables platform users to overcome the chicken-and-egg problem (Alvarenga, 2006).

Oligopolistic Competition

Competition in two-sided network industries can be fierce. Existent platform leaders are able to invest their earnings in R&D or lower their prices. This hinders the entrance of smaller incumbents and turns the system into an oligopolistic structure.

Under this form of competition, and given their small number, there is an important interdependence between companies. Profits of each firm are, thus, at the mercy of the actions not only that they take, but that their rivals also take (Wang, 2007). In order to overcome the latter problem, collusive agreements are often formed. However, these contracts lead to decreased competition within the market, higher prices for consumers, and create higher barriers to entry (Green, Marshall, & Marx, 2013) (Rochet & Tirole, 2005). That is to say, collusive oligopolies are akin to monopolies, the least competitive of all market structures (Wang, 2007). This is evident with card networks. Indeed, there has not been any new important player in this sector in decades. Visa controls 50% of the worldwide market share, MasterCard controls 25%, and the rest is controlled by smaller players such as Amex, Discover and other companies (Karger, 2005).

Interchange fees

Baxter (1983) found that colluding not only helps increase revenues but it also contributes towards lower costs since it can eliminate expensive bargaining between issuers and acquirers. Surprisingly, despite costs decreasing, and card payments becoming more efficient as the payment card market has developed, market-determined merchant fees have historically tended to rise. As long as there is no government intervention, card networks are able to maintain

high price levels due to the peculiar functioning of the industry and the strong market power that they detain.

Merchants contend that these interchange fees are unjustifiably high. However, given their small bargaining power, and the popularity that credit cards have over other forms of payments, the opportunity cost for not accepting digital payments is high. In order to offset the interchange fees which eat directly into their margins, they often pass on this additional cost to customers in the form of higher prices for goods and services. This must be done with care, though, because too great of a price increase can impact sales (McAndrews & Wang, 2012).

As for customers, they both benefit and suffer from high interchange fees. Wang's model (2007) found that as interchange fees increased, so did the volume of transactions and customer rewards. In other words, the benefit that customers derive from additional rewards is funded by the additional transaction fees that the merchant must pay. Conversely, since all customers usually pay the same price for a good or service regardless of their method of payment, customers, who do not use credit cards, subsidize part of the additional cost which comes from credit cards being accepted in an establishment. Non-cardholders pay a "cross subsidy" for cardholders (Alvarenga, 2006).

MasterCard rebuts that these direct and indirect costs are justifiable; they represent the price that must be paid so that all three main stakeholders reap the benefits that derive from the existence of the credit card. Accordingly, thanks to this payment system, merchants are "[…] guaranteed payment, increased sales and lower [payment] processing costs." They are also able to "[…] attract and retain customers with a fast and efficient buying experience." In the US, the cost of paying interchange is lower than the benefit of guaranteed payment. As for governments, they "experience significant efficiencies while promoting financial inclusion when they distribute social benefits, collect receivables and enable services via electronic payments." Electronic payments also help decrease fraud and the black market. Finally, consumers can enjoy "convenience and safety, increased opportunity for financial inclusion, access to rewards and incentives and the choice of thousands of innovative credit, debit and prepaid payment products." Interchange revenue also enables issuers to provide cardholders with interest-free periods (MasterCard, 2015).

Competition for the issuer market in Mexico

Negrín & O'Dogherty (2004) analyzed competition amongst issuers in Mexico by looking at different indicators. They concluded that the issuer market was overall quite concentrated. In fact, it presented inelastic short-term interest rates, low competitiveness and high growing market power indices such as the Lerner index.

The researchers believed that various factors helped justify the low levels of competition. Firstly, there was information asymmetry between customers and banks. Banks had little information about their potential customer, which was why they usually only granted cards to individuals that they already did business with. On the customer side, it was difficult for them to choose between cards due to the multitude of possibilities that existed for them. They were faced with a "paradox of choice" (Schwartz, 2004).

Negrín & O'Dogherty also found there to be high switching costs for customers when transitioning from one bank to another. Their initial bank would offer them various additional services aside from the credit card. The second bank, with little information about the customer would be more conservative when granting credit lines. The customer with their various accounts and services in the first bank would feel little inclination to subscribe to a unique service in a new bank.

Despite all these indicators that point towards an uncompetitive market, the conclusion was that competition was not entirely absent from the market. Actually, the author noticed that big banks suffered more in times of hardship due to their higher costs and higher relative operational inefficiency. Thus, despite their market dominions, their inefficiencies hindered them.

Finally, Negrín & O'Dogherty projected that with greater competition, rates would decrease and access to credit would increase.

Now that the literature about the credit card market as a whole has been presented, the other important piece of this analysis, the cardholder, will be addressed.

3.2. Cardholder Behavior

There has been much debate whether or not credit cards actually improve consumers' well-being or whether they are "evil" contraptions that facilitate overconsumption and "can pull

you into a spiral of debt". Under the rational choice theory, credit cards could help contribute to consumers' welfare. Indeed, the neoclassical economics model assumes that individuals are rational agents that take into account all available information to autonomously determine the best course of action (Becker, 1992). According to William Stanley Jevons, the choices that agents make are to maximize their happiness or utility. Thus, with all public information disclosed to them and given a variety of payment options, individuals who choose to use a credit card would be employing the best means of payment possible to maximize their well-being (Brown, 2006).

However, in more recent years, the rational choice theory has been challenged with the arrival of behavioral economics, a new branch of social science which takes into consideration psychological factors in the decision-making process. Daniel Kahneman found that individuals are actually much more irrational than previously believed because emotional and cognitive factors hinder them from making the most welfare-maximizing choices (Kahneman & Tversky, 1981). The degree to which cardholders make the most optimal decisions when using and choosing credit cards was explored in previous literature. The following section looks at studies that address this question in both Brazil and Mexico.

Interest rate elasticity and card usage factors

Vieira (2010) explored interest rate elasticity across different Brazilian social classes. In his study, test participants were offered a credit line on their credit cards at varying interest rates. He found that higher income individuals were much more likely to accept the credit line when it was at a lower interest rate, and thus were much more interest-rate sensitive. The higher earning individuals who did accept a high interest rate tended to have a higher risk profile than the ones who did not. As for the lower income bucket, Vieira found that there was little difference in acceptance rates regardless of the interest rate offered. Vieira explained this outcome by the fact that the lower income individuals and the ones demonstrating a riskier profile were more limited in their financing options and thus more inclined to accept a higher interest rate.

This finding is in line with two of Ausubel's findings. In 1991, when looking at competition in the North American market, Ausubel found rates to be inelastic for consumers and that issuers, despite operating in a saturated market, still made huge profit margins. He

explained this lack of competitive rates by the fact that cardholders are insensitive to interest rates as they believe that they will never have to pay interest on their balances. Rather, cardholders hold a bias that they will always pay their statements in full and on time. Likewise, on the other side, even when the cost of funds does decrease, issuers are reticent to lower rates due to adverse selection (Ausubel, 1999). According to this theory, respondents to credit card offers generally have a higher risk profile and are more likely to default.

After Ausubel, numerous other theses explored similar topics. Some looked at empirical evidence in households which supports Ausubel's inelasticity theory. Calem and Mester (1995) found that the high rates can be explained by the high costs the cardholder must incur from getting information about different products offered by issuers as well as switching from one bank to another. On a theoretical level, Mester found that information access issues can provoke interest rate inelasticity. As for Brito and Hartley (1995), they considered that the high level and inelasticity of interest rates do not necessarily imply lack of competition. Rather, the price is justified by the fact that it's such a risky business for issuers and it provides consumers a flexibility that they can't find elsewhere (Negrín & O'Dogherty, 2004).

Keeping these findings in mind is very important for credit policies of credit card companies. On the one hand, it means that it is important to offer lower interest rates to higher income customers in order to attract the ones with a lower risk profile and thus mitigate future losses. On the other hand, it means that it makes little financial sense to offer products with lower interest rates to lower income individuals since rates don't influence acceptance levels, nor improve risk exposure. The financial institution ends up foregoing revenue by charging lower rates.

Another point that Vieira brings up is that interest rate elasticity depends on the magnitude of the interest rate offered. Interest rate elasticity for short-term financing such as a credit card tends to be much weaker in general terms. Cardholders who revolve their credit line in Brazil do not do so because of choice but often because it's the most convenient or only way to finance a purchase. Within this scenario, an interest rate decrease would not impact response rates necessarily because the rate is a variable with little impact. This contrasts with a personal loan where the client needs to ask for the loan and has better conditions to evaluate the offer. Vieira explains that, historically, no one in Brazil, independent of income level, was very sensitive to interest rates. As the credit offer was restricted, there was not much choice in credit

products and those who needed some sort of financing had to accept one of the few options available. This same phenomenon happened in developed countries. But, with time the offer grew and extended itself even to the lower socioeconomic classes. Thus, Vieira's study demonstrates the shift that is starting to take place across societal classes. Eventually, lower socioeconomic groups will have more financing options, similarly to their peers in developed countries.

Ponce (2008) made analogous conclusions when he observed interest rate sensitivity within the Mexican market. He analyzed Mexican cardholders between 2004 and 2005 which had more than one credit card and studied how they allocated debt, purchases and payments among their plastics. His aim was to understand whether they borrowed on their "cheapest card" (the card with the lowest interest rate). He ultimately found that the difference in the interest rates between homogenous cards did not impact how consumers used them. Consumers were nearly indifferent when it came to choosing between using a higher interest rate credit card or a lower rate one, even if there were little to no switching costs between them and available credit on both. This irrational behavior would cost them, on average, an additional 31% in financing (Ponce, 2014). Interest rates and other idiosyncratic card features were only considered for bigger purchases. Otherwise, cardholders were most likely to choose the card that they had used the most frequently the previous month. Consumers adopt a "front of the wallet" behavior because they're most inclined to using the oldest card that they own. When paying their statements, Mexicans were also most likely to make the minimum payment on cards with more debt and higher purchases rather than repay the card with the highest interest rate.

Ponce explained this conduct by citing behavioral heuristics and financial unsophistication. He found that Mexican cardholders preferred to go after a constant utilization rate, or, in other words, have an outstanding balance on both of their cards. This is considered a mental accounting heuristic. Ponce equally discovered that since few customers are aware of their interest rates or even take the time to calculate the most financially sound way in which to allocate their spending, financial education would help them and encourage competition in credit card markets.

Rocha (2007) also looked at purchase behavior, but for Brazilian cardholders. He discovered that Brazilians who were bigger credit card spenders than average, tended to consistently display this behavior month after month. They would also prefer to make all

purchases on their main credit card rather than use other payment means. As a result of this finding, credit card companies should take special care in retaining big spenders as they are likely to remain big spenders, and on the same card. This is similar to the "front of the wallet" behavior that Ponce found in Mexico.

On the Mexican side, once again, Garrido (2010) also explored factors that impact credit card adoption. His main results reiterate what had been found in previous studies: higher income, higher education and younger households were more likely to use credit cards (Klee, 2006) (Mester, 2006). The new insight that his work contributes is that the probability of a household using a credit card increases substantially with the number of bank branches and credit card points of sale (POS) in the locality of the household. This is consistent with the fact that the Mexican credit card market isn't as developed as the Brazilian one. Credit card infrastructure is much more developed in Brazil, and thus does not impact use as much. Garrido found that the two factors that would most lift credit card adoption rates are reward programs, and, especially, the installation of more POS.

Furlan (2007), also found reward programs to be an important card characteristic for Brazilians. However, what most impacted card choice, according to a survey carried out by Banco do Brasil, was whether or not a card carried an annual fee. Accordingly, Brazilians immensely dislike having to pay an annual fee. They are also very likely to reject a certain credit card if it seems to lack credibility, if its security seems questionable and if the application process is very bureaucratic.

In conclusion, the literature discussed above indicates that there is consistent evidence of irrational behavior amongst cardholders in Brazil and Mexico.

The following section presents the global history of the credit card, as well as its arrival in Brazil and Mexico. This context will set the stage for the main goal of paper: the comparative market analysis.

4. HISTORY OF CREDIT CARD MARKETS

Consumer credit has existed for many decades. Over a century ago, owners of rural general stores would record transactions in a ledger and allow customers to pay for their

purchases at a later date. Farmers found this to be especially practical as their cash flows tended to be irregular.

In the 1900s, this payment system spread to urban areas as department stores, hotels and gas stations also started extending credit. These retailers would offer charge cards linked to store credit accounts with the aim of improving customer service, payment flexibility and loyalty. Customers could buy today and be billed at a later date. The major impracticality of these cards, however, was that they could only be used in the one store. Consumers shopping at numerous establishments would have to lug around dozens of these cards and hold numerous accounts.

The 1950s saw the arrival of the first universal card, and with it, the complete revolution of consumer retailing and lending (Steiner, 2013).

According to Cardmonitor (2008), in 1949, Frank McNamara, the head of a credit corporation, was having a business dinner in New York with Alfred Bloomingdale, a Bloomingdale's heir, and Ralph Sneider, his attorney. McNamara recounted how one of his customers was unable to pay back the loan he had borrowed because he had lent a department card to some poor neighbors who were in turn unable to pay him back. At the end of the meal, McNamara reached into his pocket and realized he had forgotten his cash and check book to pay for his meal. Inspired by the night's events, the lending of payment cards and not having cash on hand, the three men thought up the idea of a universal credit card and created the Diners Club. This card was the first ever middleman between customers and companies. The Diners Club assumed the collective risk that separate companies were previously taking, and would offer credit to individuals, bill them later and then pay the companies.

In order to generate revenue, the Diners Club would charge merchants 7% for each transaction (the first interchange fee) and an annual fee to customers of $3 (Rosenberg, n.d.). It is important to point out that these cards were initially only *charge cards* and not *credit cards*. Although these terms are used interchangeably, their distinctions are notable. Whereas with charge cards, the total outstanding balance is, usually, expected to be paid on the due date (or the customer is charged a late fee), a credit card enables a customer to "revolve" their balance and only pay the minimum on due dates. In the latter case, interest is charged in order to make up for the additional risk.

At the beginning, merchants and customers were reluctant to adopt this new payment method. Merchants were unwilling to pay the transaction fees and have competition for their

own private-label cards. As for customers, they did not want to sign up and pay annual fees unless the card was already accepted in numerous establishments. This is the chicken and egg problem that Alvarenga (2006) alluded to. Eventually the concept caught on. Merchants found the fees cheaper than what it cost them to run their own store accounts. By the end of the 1950s, 20,000 Americans were actively using the card. American Express and Bank Americard (the former Visa) joined the game in 1958 and were key in establishing a truly revolving credit financial system.

It did not take very long after that for the practical and revolutionary payment method to spread abroad.

4.1. History of Credit Cards in Brazil

Credit cards arrived in Brazil in 1956 when Hanus Tauber, a Czech business man, purchased a Diners Club franchise. As was the case in the US, the first cards in Brazil were only charge cards. These cards were extremely elitist and were only granted to individuals who knew existing cardholders, similarly to a private club. This limitation coupled with the fact that few establishments accepted these cards, greatly hindered initial growth.

In 1968, the Banco Brasileiro de Descontos launched the Bradesco card which led to the establishment of the Brazilian card network Elo. In 1970, the Brazilian subsidiary of Citibank launched the City Card. In 1971, it created Credicard with Itaú and Unibanco. In fact, Credicard is considered the first official credit card in Brazil. It had a key role in the consolidation and propagation of credit card culture in the country. That same year, the Brazilian Credit Card Organization (ABECS) was created with the mission of developing the electronic payment market.

In the late 1970s, Credicard had issued more than 180,000 cards and dealt with close to 15,000 merchants. This rapid market growth attracted numerous international companies. In 1980, American Express landed in Brazil with a target market of higher-earning individuals.

The entrance of numerous international competitors in the Brazilian market stimulated the desire of local players to also capture their customers' international transactions. Thus, banks started partnering with international card networks. Credicard, for instance, decided to affiliate itself to Visa in 1983. The move paid off and by the end of that year, the company boasted

approximately 550,000 cards, or about a third of all issued cards in Brazil. Bradesco, however, maintained its place at the top with its 1.2 million cards in circulation.

In 1984, Credicard increased its market share by purchasing Diners Club. It then started issuing two types of cards: Credicard and Diners. Since Diners was for Class A only, it competed directly with American Express. In 1987, Credicard broke its contract with Visa International when Visa refused to give them exclusivity to their card network. They then partnered with MasterCard who agreed to grant them exclusive use of their name. Consequently, Credicard substituted its entire base of cards to MasterCard cards and Visa disappeared from the Brazilian market entirely.

As Visa had to start all over, they shifted their strategy to one of an "open system"; each issuer could choose which card network would distribute its cards, and there would be no more exclusivity. The first Brazilian bank to adopt this approach was Banco do Brasil in 1988. Initially, the major problem was to be affiliated with merchants. The bank ended the year with 600,000 Ourocard Visa cardholders and 60,000 affiliated merchants.

In 1989, the Banco Nacional, who had been issuing credit cards since 1971, chose Visa as its card network in order to improve its brand image. Many other banks followed suit and by 1991, Visa had 35% of the Brazilian Market versus 44% for MasterCard. In 1991, the government finally allowed Brazilian issued cards to be used abroad. It thus became strategically important for many issuers to partner with an international card network to improve their competitiveness. Throughout the following years, there was a lot of product diversification, and, aside from international cards, domestic and gold cards emerged.

Any bank that wanted to issue credit cards had to choose Visa, since it was the only open system. The other option was to partner with Credicard or American Express (who had MasterCard exclusivity), and offer those cards to customers. Banks that chose the latter option would act as distributors of those cards and be remunerated based on sales and quantity of accounts approved in the credit analysis phase. Undeniably, it was more attractive to have your own card as you had more autonomy, total control of your strategy and greater brand awareness.

Visa's growth tapered once it had partnered with the main banks. As for the banks who were dealing with Credicard or American Express, they were unhappy with the little control they had in their credit card divisions. Thus, they started pressuring Credicard and American Express to let them have a greater stake in operations, aside from simply receiving a commission.

Pressure tactics were successful and some major banks were able to participate more directly in their credit businesses. At this point, the market was quite concentrated with six main issuers:

- Credicard: MasterCard and Diners
- American Express: Amex and Sollo
- Banco do Brasil: Visa
- Nacional: Visa
- Bradesco: Visa
- B.F.B: Visa

Due to their comfortable positions, all major issuers were quite content with the status quo. Credicard and American Express had adopted a more flexible stance vis-à-vis their bank partners and were able to maintain a high number of banks associated to their system. As for Visa, it had some problems in closing new partnerships. Institutions wishing to become issuers faced high entry barriers caused by the important initial capital outlay required to enter the market. Regardless, the six main issuers were comfortable dominating a market valued at about 7.8 million cards with a potential of 20 million. The main focus for all of them was to grow their client bases.

During the 90s, many card-processing companies appeared. They offered services that enabled banks to share scaling costs, and, therefore, not need to partner with an administrator. Consequently, numerous new banks started issuing their own credit cards and saw an important client portfolio growth. Banks, in general, also started offering various types of cards (credit as well as debit) to their already existing client base.

The Plano Real of 1994 equally had a big impact on the credit card market. Its set of economy stabilizing measures enabled credit cards to gain much greater market penetration. Moreover, co-branding took off at around the same time and further helped the digital-payment market develop. Credicard with Fiat was the first big co-branding partnership in Brazil.

The monopolistic card network structure, which entitled each bank to affiliate itself to a single company only, persisted until 1996 when Nacional (Visa) was acquired by Unibanco (MasterCard). Unibanco became the first issuer to deal with both major card networks.

Soon after this purchase, came the creation of Visanet (currently Cielo) and Redecard which are now the two largest Brazilian card acquirers. Before their foundation, each bank possessed its own transaction network and authorizing bank for processing services, and

merchants had to own various terminals in order to process the cards from each of the different banks. This was costly and inefficient for both players. To remediate this issue, the banks decided to come together and consolidate their transaction networks into the two operators mentioned above (CardMonitor, 2008).

Today, Brazil boasts an important credit card market, which has been, generally, growing strongly year after year. The year 2015 saw a drop in consumption due to the economic slowdown, but payment transactions still increased in total value terms. The main driver of growth remains the relatively low penetration of credit cards within consumer payments, as well as the growing banked population. What's more, the country has used the best card technology since 2002-2003 when it started issuing chip (EMV) cards. This transition helped mitigate transactional fraud and develop the industry.

4.2. History of Credit Cards in Mexico

As in Brazil, Mexico saw its first credit cards when a Diners franchise was purchased in 1956 by an association named Club 202. Initially, Diners cards were issued in the country without any laws regulating them. In 1968, Banamex in association with Interbank (MasterCard today) launched the first Mexican card Bancomático. This was the first bank credit card in Latin America. The following year, another major bank of Mexico, El Banco de Comercio, affiliated with BankAmericard (Visa) introduced their own system with the Bancomer card. Soon after, other Mexican banks also launched their own cards. In order to save on operating costs, many banks (Banco Serfín, Multibanco Comermex, Banco Internacional, Banco Confía, Banco del Atlántico and Banco Mexicano Somex) decided to unite. *Prosa* was thus born with the mandate to issue and manage credit cards for each of the banks in the consortium (under the brand name Carnet). Carnet consequently affiliated itself to MasterCard and Visa, which enabled it to issue international cards

The usefulness and security features of credit cards helped them gain important market penetration at the beginning of the new century as Mexico's e-commerce segment experienced significant growth. Despite this development, Mexican card adoption rates are less than half of those seen in Brazil (Banco de México, 2015a).

Currently, Mexican credit cards are as technologically advanced as Brazilian ones. As a matter of fact, in 2013, the country's credit card companies started issuing chip cards in order to mitigate security risks, and establishments began the process of converting over their terminals to be EMV enabled.

5. CREDIT CARD ECOSYSTEM

The next section is the top-down analysis of the credit card markets in Brazil and Mexico. First the overall health of each economy will be analyzed to see how favorable the business conditions are. Then the different dynamics governing the Brazilian and Mexican payment markets will be examined. Finally, the cardholders' current behavior and trends will be assessed.

5.1. Macroeconomic Environment

5.1.1. Brazil: A Macroeconomic Analysis

Brazil is Latin America's largest economy by GDP. From 2000-2010, Brazil had an important consumption and credit-led growth which was the result of decade-old reforms, expanding labor income and favorable external conditions. These reforms, coupled with strong social policy interventions and important real increases in the minimum wage, enabled over 26 million of families to transition out of poverty. Access to education and health increased whereas inequality decreased immensely. Unemployment rates went from 11.7% in 2002 to a low of 4.5% in mid-2014 (Worldbank, 2015).

Recession, Public Debt and Corruption

However, at the beginning of 2016, the Brazilian backdrop is rather bleak. The economy grew only 0.1% in 2014, contracted in 2015 (3.7%), and is expected to shrink a further 2.5-3% in 2016 (IBGE, 2015) (World Bank Group, 2016). It is, in fact, the worst contraction in a quarter of a century. This is due to various factors. Some were uncontrollable such as the fall of commodity prices which greatly decreased export levels. Others can be attributed to poor management of the

country. From 2011-2014, the Worker's Party (PT) government spent public money unwisely on higher pensions and unproductive tax breaks for favored industries. As public expenditures were much greater than revenue, the fiscal deficit increased five-fold from 2% in 2010 to 10% in 2015. Consequently, public debt also increased and now finds itself at about 70% of GDP, which is very worrisome for a middle-income country ("Brazil's Fall", 2015).

On top of making poor investment choices, the leader of the governing party since 2011, Ms. Rousseff, is facing impeachment hearings in congress for disguising the size of the budget deficit. What's more, the whole coalition government has been discredited by a bribery scandal involving the state-controlled oil company Petrobras.

Lower Investment and Productivity levels, Higher Unemployment and Private Debt

As with public debt, household indebtedness is also very high. It may only represent half of the US's proportion of debt over income, however, it is the high interest rates that worry analysts. Indeed, the country has one of the highest interest rate environments in the world. The interest free rate (Selic) is currently at 14.2% and it is reflected in the extremely high credit card APRs and credit lines (BCB, 2015). In order to encourage consumer spending, there was a government intervention in 2012 that forced public banks to cut rates. Private banks were forced to follow suit. However, rates ended up increasing again.

The inflation rate is also very high. At about 10.5% at the end of 2015, it represented a 12 year high (BCB, 2015). The BCB has had to employ monetary tightening in order to decrease inflation rates as the target level is 4.5%. Measures taken have only increased borrowing costs. As a result, private investments have decreased, banks are very cautious in their underwriting decisions and the country is experiencing very sluggish credit growth. Loans to companies in 2015 plunged to levels unseen since 2004 (BCB, 2015). This prudence is not unfounded as credit to GDP is at 15.7%. Anything over 10%, has in the past indicated an important risk of banking strains occurring within three years. Banco do Brasil, Latin America's largest bank by assets, has increased provisions for bad loans by 21%.

This contraction is likely to continue as unemployment levels have increased to 8.7% in August 2015, nearly double the levels of 2014, and wages have decreased (IMF, 2015). The unemployment rate is expected to surpass 10% in 2016 (Papp, A.C. Gerbelli, L.G., 2015). As a

result, household consumption decreased 0.6% throughout 2015. The first decrease in over ten years (IBGE, 2015).

Sound institutions

On a more positive note, Brazil has the 8th greatest international reserves ($\cong$ USD 357 bn) and a solid financial sector. Having important reserves can help a country manipulate exchange rates to provide a more favorable economic environment, and it is a good indicator of the ability to repay foreign debt. Furthermore, the banks' capital ratios are above the minimum requirement and the liquidity risk for the entire banking system as a whole is low. But, this is also due to the general lending disinclination mentioned above. All things considered, the overall banking structure is sound (IMF, 2015).

The Economy Going Forward

The country is caught in a debt trap forcing it to borrow more, and hindering its future growth. In 2015, due to its budget deficit, political turmoil and deeper-than expected recession, two of the three big credit rating agencies, S&P and Fitch, downgraded Brazil's debt to junk status. This will likely further increase borrowing costs for the government and Brazilian companies, and deter foreign investment. Country taxes are likewise expected to increase as it is the most viable tactic to fight the budget deficit.

For the country to achieve higher economic growth and free itself from the recession, it will need to increase productivity and competitiveness. What had been the main drivers: credit-fueled consumption, labor expansion and the commodity boom are all receding. Going forward, the focus will need to be placed on more strategic and higher investment, as well as gains in productivity Many analysts believe that the economy is unlikely to improve before 2018 ("Brazil's Fall", 2015).

5.1.2. Mexico: A Macroeconomic Analysis

Mexico is Latin America's second largest economy by GDP after Brazil. The Tequila crisis of 1994 caused a severe recession and high levels of poverty and unemployment in the country. It took a few years to recover, but for the past decade, Mexico has made steady economic progress. It even recovered relatively quickly from the 2008-2009 financial crisis. There was some sluggishness during a few years due, in part, to a government caution in spending. However, the election of the new reform-minded government has helped stimulate growth (Economist Intelligence Unit, 2013).

Country Growth

Despite losing steam during the first half of 2015, the country expanded at a moderate annual growth rate of 2.5%. This growth is expected to increase to 3% in 2017 (Tradingeconomics, 2016). Future expansion will mainly depend on the growth of private consumption and investment (World Bank Group, 2016). Thanks to these higher activity levels, unemployment is expected to decline through 2018 at a CAGR of -4.1%.

As for public debt as a % of GDP, it has remained steady at about 38% since 2010, which is still within a healthy range (and about 50% lower than Brazil's levels). Inflation has also remained relatively steady at about 4% from 2011 to 2014 and has now moved to below 3%, which is the lowest it has ever been (Worldwide Inflation Data, 2016).

The complicated global environment will have a big impact on the country's development as has the substantial depreciation of the Mexican peso vis-à-vis the U.S. dollar over the past year. This decrease in value has raised price and financial stability concerns. To help resolve this, authorities intervened moderately in the currency market and announced plans for fiscal consolidation. On the flip side, the weak currency will provide the country with a competitive boost and help output.

In sum, Mexico has relatively healthy economic indicators and should cope fairly well, even in a difficult international scenario. With the full implementation of the planned reforms, it should keep growing. The boost in FDI that the country has seen in the last few years, and the reverse migration that has taken place from the US to Mexico in the last 5 years reflect the positive sentiment in the country (World Bank Group, 2016) (Pew Research Center, 2015).

Increase in Consumption, Demographic Boom

The higher employment levels and stability that Mexico has seen for the past few years are also reflected in private spending levels. Despite some belt tightening that occurred in 2014 due to financial volatility that impacted a lot of emerging markets, and taxes that were raised on a lot of households, consumer spending has increased 5.9% CAGR from 2011 to 2014. It is projected to remain at similar levels until 2018. Mexico also has the highest disposable income of all of the Latin countries (10% vs 5% for Brazil). This means that Mexicans have a greater purchasing power to be spent or saved as need be.

Part of the reason why consumer spending is expected to increase so much is due to favorable socioeconomic conditions. The average age in Mexico is 27 which is younger than in Brazil and in China. Thus, there is a big working-age population. By 2018, 1.6 million households are expected to join the middle class. This is reminiscent of the big leap out of poverty that Brazil experienced about a decade earlier.

Credit granted decreased dramatically due to the Tequila Crisis of 94/95. Nonetheless, in the last couple of years, credit and bank deposits (through credit cards) have recovered. The credit card market has grown enormously in Mexico, but it is still quite small compared to international standards (16 million cards circulating in a country of about 120 million).

The Country Going Forward

As mentioned above, the future expansion depends greatly on the full implementation of the reforms. The opening of the energy sector has been successful thus far, and implementation of other reforms should provide growth dividends in the medium term (World Bank Group, 2016). The financial sector will benefit substantially from the boost in consumer spending, and the higher incomes and greater aspirations will drive a greater need for credit.

5.1.3. Macroeconomic Environment Conclusions

Mexico and Brazil are resource-rich upper middle-income countries that share many similarities. However, Mexico's economic outlook looks much rosier than Brazil's as most of the

former's main economic indicators are currently healthier (see table below). Doing business in Mexico would therefore seem much more appealing for companies.

In fact, when considering ease of doing business in either country, Mexico outranks Brazil in nearly all dimensions. In terms of access to credit, Mexico ranks 12th in the world, which is nearly 80 spots ahead of Brazil. As for starting a business, it takes 102 days for an entrepreneur to do so in Brazil, whereas it requires only 6 days in Mexico. Once a company is up and running, the Brazilian labor laws are equally prejudicial for business owners. In fact, they are still modeled on Mussolini's decrees. Consequently, it is very expensive to fire incompetent employees. This, undeniably decreases productivity and deters international competition. In fact, despite having one of the top GDPs, Brazil has one of the lowest manufacturing productivity levels when compared with the top 41 economic countries.

A final point to take into consideration is that the tax code is quite onerous in Brazil. A typical Brazilian manufacturing firm spends 2600 hours a year complying with tax laws. To put that into perspective, the American average is 356 hours. This ranks Brazil in the 177th global spot in this respect, whereas Mexico is in the 103rd. Compiling all these scores together, for the overall ease of doing business, Brazil ranks 166th and Mexico 63rd (OECD) ("Brazil's Fall", 2015) (Doingbusiness, 2015).

Indicator	Brazil	Mexico
Interest rate	14.15% (annual)	3.25% (overnight lending rate)
Inflation	10.5% (annual)	2.8% (annual)
GDP growth 2015	-3.7% (annual)	2.5% (annual)
Unemployment	8.7% (annual)	4.25% (annual)

Table 1: Main Economic Indicators

Sources: IMF, BCB, Banxico

5.2. Industry: Competitive Landscape

Now that the general macroeconomic backdrop has been painted, this study will dive one level lower and examine the competitive forces in the Brazilian and Mexican credit card markets, from an issuer's point of view. The general credit card and banking landscape will first be

explored. Subsequently, the barriers to entry, the competitive rivalry between platform players, and the threat of substitution will be discussed.

5.2.1. General Country Landscape: Banking levels and credit card statistics

5.2.1.1. Brazil: Banking and Credit Card Penetration

Since 2009, bank assets have grown at a compounded annual growth rate of 15%, and banking penetration has mimicked this trend. Brazil has the highest percentage of banked population in Latin America. But, in comparison to other middle-income markets, banking levels are still quite low (60% in Brazil versus 64% for China and 75% for South Africa).

The five largest Brazilian banks in terms of asset values (Bradesco, Itaú, Caixa Economica Federal, Banco do Brasil and Santander) also hold just under 90% market share in credit cards. In 2009, Brazil was the fourth greatest country globally in terms of credit cards circulating (175 million) (Euromonitor International Marketing Data and Statistics, 2011). In the last few years, however, due to the country's economic problems and the fact that banks have started to cancel inactive cards to save on operating costs, the total number of credit cards outstanding has tapered. It found itself at about 170M total active cards at the end of 2014 (BACEN, 2015). Penetration levels are not actually that high though. It is estimated that there are currently between 50 million to 75 million active Brazilian credit card users (depending on sources). This would mean that many individuals have more than one card, and that about 40% - 60% of adults are card users (SPC Brazil, 2015), (Tecnocom, 2014). This makes Brazil the Latin American leader in terms of strongest preference for paying by card.

Card penetration seems to have a low beta as it is not necessarily negatively impacted by poor macroeconomic conditions. In fact, during the first semester of 2015, when Brazil was already facing economic hardship, 2.2 million households started using credit cards to pay for basic necessities (Nielsen Report, 2015). Moreover, looking at the country's history, regardless of the economic conjuncture, the credit card adoption rate has grown consistently.

However, purchase volume appears to be impacted by economic conditions. During more prosperous years, from 2008 to 2014, spending per card in terms of number of transactions and purchase volume rose at a CAGR of about 15%. But this growth rate dropped to 8.8% from mid-

2014 to mid-2015. In 2016, due to poorer buying power and lower household consumption, this rate is expected to decrease to 6.5% and totalize R$1.15 trillion in total debit and credit transactions.

Another positive and surprising fact is that card default levels have not displayed much of an increase despite the country being in a recession. Indeed, credit card default sat at 7.5% at the end of June 2015, which is 1% lower than levels during Brazil's more economically prosperous year of 2012 (ABECS, 2015). Of course, this may also be due to other factors such as more sophisticated credit underwriting models or better collections processes.

5.2.1.2. Brazil: Card characteristics

Credit cards do not come cheap in Brazil, especially if they are used as credit cards, and not charge cards. Indeed, and as mentioned above, Brazil has one of the world's highest APRs. At the end of 2015, the average APR was 400% (Anefac, 2016). On top of that, cardholders incur an amalgam of other fees such as withdrawal, late and over-limit fees. The most important of additional costs are the annual fees which can be up to R$900, depending on the class of card.

Currently, just over 10% of the cards in circulation are Premium. The rest are corporate ($\approx$5%), basic ($\approx$70%) or intermediary ($\approx$10%) (BCB, 2015). Premium cards have been gaining market share and represent a greater number of total transactions, which is beneficial for issuers as they have a higher interchange fee (BTGPactual, 2015). They also incur higher costs for issuers, which gets passed on to customers, usually in the form of higher annual fees.

5.2.1.3. Mexico: Banking and Credit Card Penetration

Banking levels are quite low in Mexico. According to the World Bank, less than 30% of adults have a bank account. This is in part due to the Tequila Crisis which led to extremely high interest rates in the country. Mexicans faced with these higher rates and lack of liquidity found it more difficult to open a new deposit or savings account and thus moved away from banks.

Now that the country has regained economic stability, more Mexicans are using the financial system. Mexican Banks worked hand in hand with the government to try and simplify the banking system and make it accessible to more people. The 90s were known as a consolidation period and many banks merged while others were sold. This led to a modern

Mexican private banking system. Bank services and products were also simplified thanks to electronic banking. Today, a higher percentage of Mexicans have access to loans from banks and, thanks to economic growth, they have more money to open a savings or deposit account.

The country saw a decrease in issued cards and outside credit in 2008-2010, but there's been a sustained recovery in recent years. In December 2012, credit granted through credit cards represented 47% of the total credit granted by banks. Nowadays, the main method in which Mexicans contract a loan is through credit cards. Credit card transaction and purchase volume followed a similar growth path as card issuance.

According to Banco de Mexico indicators, in mid-2015, there were 16.2MM credit cards in the country. This represents a penetration rate of 20% - 35%, depending on sources. In Mexico, and contrary to Brazil, some cards are consistently used for revolving purposes. In mid-2015, these represented more than half of all outstanding cards, which was a decrease of 4% over the year.

BBVA Bancomer, Banamex and Santander are responsible for just under 70% of the cards in the market today. The total credit line exposure in mid-2015 represented 256Bn pesos, of which 200Bn pesos were revolving credit lines (Banco de México, 2015b). In other words, nearly 80% of the outstanding credit line incurs interests.

5.2.1.4. Mexico: Card characteristics

The average APR in Mexico is much lower than in Brazil. In mid-2015, the pondered average APR was 23.4% and the average revolving APR 30.2%. Only about 10% of the outstanding credit line was granted at a rate higher than 50%. What's more, Mexico offers credit lines at 0% ($\approx$20% of the total credit line had this APR). As a general trend, cardholders who have higher credit limits tend to have lower average APRs.

In terms of the types of cards, classic cards make up about two-thirds of the market share (similarly to Brazil), gold about a quarter and platinum about 16%. Annual fees go up to 1250 Mexican pesos (R$ 276), which is cheaper than in Brazil. Below we see the breakdown of type of card by annual fee, as well as a table summarizing this section.

	Brazil	**Mexico**
Banking penetration	60%	30%
Active Credit Cards	170 MM	16MM
Penetration level	40%-60%	20%-30%
APR	400%	23.4%
Annual Fee	R$0-R$900	Mex$0-Mex$1250

Table 2: Relevant Banking and Card Characteristics

Sources: ABECS, BCB, Banxico

5.2.2. Barriers to Entry

There are usually three main barriers to entry in the credit card market: scale, regulation and access to essential inputs. Scale is important to cut down on operational costs. Regulatory barriers are implemented by financial authorities to ensure that the system is stable. Finally, access to certain payment infrastructure inputs and information is necessary for issuers to offer their products. The following section will cover all three.

5.2.2.1. Scale

The capex and opex costs to enter the payment industry are quite high. Historically, issuers needed a network of branches to receive payments for credit card statements. In Mexico, the introduction of *corresponsales*, establishments such as shops and supermarkets where individuals can make small financial operations, has helped reduce the scaling problem. This has also helped the under-banked population gain access to credit cards. In Brazil, the creation of processing companies in the 90s helped issuers share the scaling costs. The advancement of technology and the adoption of online/mobile banking in both countries further helped decrease the necessity of new entrants of having their own network of branches and ATMs to receive payments. Thus, scale is not an insurmountable barrier, and, as technology adoption increases, it will only get smaller (CEPAL, 2006).

5.2.2.2. Regulatory

It is usually in governments' interest to encourage the adoption of credit cards, as it helps create a paper trail and rid countries of shadow economies. Also, this payment mechanism generally has a much cheaper processing cost than money does, and it helps stimulate greater spending. Indeed, MasterCard claims that "average debit and credit transactions range from two to four times the size of a cash transaction in developed markets and to over 20 to 30 times respectively in others." Thus, regulation for issuers is usually not too constringent.

Regulatory Barriers in Brazil

As this market grew in Brazil, so did the preoccupations surrounding the protection of competition in this industry. This concern first appeared in Brazil in 2004 with a gas station price war that took place in Brasilia. That year, a new station opened which decided to offer a promotion for customers who did not pay with credit cards. This triggered a price war which spread throughout the whole city. The issue became quite polemic and the consumer protection agency received numerous complaints as a result. Some consumers were content with the lower prices, whereas others argued that it was price discrimination. The Brazilian Judiciary decided to intervene by positioning themselves on the consumer's side and ban price discrimination (Alvarenga, 2006).

Currently, several authorities regulate the payment card industry. Unsurprisingly, the consumer protection side of the industry is composed of a robust and sophisticated legal framework. At its core is the National System for Consumer Protection and Defense (SNDC). As for the payment side of the industry, it is the CMN (National Monetary Council) and the Central Bank that oversee payment clearing and settlement systems. Equally important to note is that Brazil is a member of the Financial Action Task Force which means it follows all the main anti-money laundering principles such as Know Your Customer (KYC) requirements in its financial regulations.

The following presents some of the laws decreed by the Brazilian Central Bank. Firstly, there are five main fees that issuers are legally allowed to charge customers: annual fees, fees for issuing a second card, withdrawal fees, fees for paying bills with the card and fees when

customers ask for an emergency credit limit increase evaluation. A further obligation in the case of annual fees is that they must be higher for premium cards than for basic cards. This makes sense as premium cards provide many more benefits (rewards, travel insurance, etc.) to customers than basic ones do.

Concerning interest rates, they are up to the issuers' discretion, and can be as high as they wish them to be. The only "rate" that must be respected by all is an IOF tax charged by the government. This rate can be applied on a variety of operations from late balance charges (0.38%) to international transactions (6.38%).

There also exists regulation at the bill payment stage. On the issuer's side, a monthly statement containing a variety of information (credit limit, purchases made, etc) must be provided to customers. Moreover, when dealing with cardholders who have a debit account tied to their credit card, and have given consent to do so, card companies are allowed to automatically debit the sum owed. On the customer's side, the legal obligation that they must follow for their account to stay in good standing is to pay at least 15% of their monthly bill (BCB, 2015).

Thus, there is some level of regulation in this market, but it is far from being deal breaking.

Regulatory Barriers in Mexico

Over the past few years, the Bank of Mexico, in collaboration with other financial authorities, has introduced numerous measures to decrease regulatory entry barriers. For instance, in 2005, a law (Ley de Instituciones de Crédito) was introduced which enables credit underwriting without being a bank (this also goes for Brazil). New entrants in Mexico can focus on only one line of financial services and are not required to comply with as many regulations as banks do. As for new players who would like to enter as fully functional banks, they do not need as much up-front investment; the minimum capital necessary has decreased. Despite this, MasterCard and Visa still establish certain rules that issuers need to comply with in order to partner with them. One of these rules is to have a minimum deposit.

Moreover, before granting credit to customers, issuers are required to obtain a credit report about them. If they do not do so, issuers must have provisions in place to offset potential

losses. This requirement increases issuance costs for issuers, but it might also decrease charge-offs (Banco de México, 2015c).

As for rates, no regulatory body dictates the minimum or maximum interest rate that can be charged. However, there are governmental guidelines that card companies must follow which will, indirectly, impact the level of interest rates that they can charge. Mexican financial institutions also have KYC and AML guidelines to abide by.

Consumer protection laws are equally very robust in Mexico as they are in Brazil. Most of them have to do with the initial contract which needs to explain how interest rates are charged and calculated. Others specify the information that needs to be included in statements, similarly to Brazil. Moreover, there exist consumer protection laws that are intended to decrease switching costs and increase customer mobility. For instance, banks must accept checks and transfers from other banks when debtors pay loans and other services (Circular 26/2004). Also, a law was enacted in 2013to promote and facilitate electronic transactions through a mobile device. Equally, a national digital strategy is being rolled out by governments to increase access to information.

Finally, and similarly to Brazil, establishments cannot charge a surcharge rule if a customer chooses to pay by card (Sempere, 2008).

In sum, regulation is not a major barrier to entry in Mexico either. The requirements that do exist, in terms of rates and contract content, are not significant. Thanks to the more lenient laws, some institutions that aren't banks were able to enter the market in more recent years. However, the issuer market still remains quite concentrated. In 2003, only 13 banks made revenue from credit cards. Of those, 4 of them had 90% of the market. This may be due to the characteristics of this market (economies of scale, of network, and externalities) (Garrido, 2010). During the decade that followed 2003, the number of banks increased dramatically, especially as international banks were allowed to enter (SHCP & CNBV, 2014). In 2013, there were 45 banks, and, despite there not being an extra initial cost of capital to do so, less than half actually issued credit cards (Banco de México, 2015c).

5.2.2.3. Access

Credit card issuers require access to information about customers. This is true to overcome the credit risk of customers as well as the fraud risk. Difficult access to information would represent a high entry barrier.

Credit bureaus

Credit bureaus request, organize and consolidate information about individuals'/companies' credit history. They then issue credit reports to creditors. In these reports they present the behavior of debt holders in relation to their past creditors. These databases can be composed of negative information (payment delays, and defaults) as well as positive information (punctual payments).

Credit bureaus are very important for the credit market and economy in general as they help decrease information asymmetry between debt holders and lenders. They are beneficial for customers, because they enable them to build a good credit history and be rewarded through higher credit limits and better rates. They are also useful for issuers as they enable them to price riskier individuals to compensate for extra risk assumed. What's more, these agencies are an added incentive for good repayment behavior. Debtors who do not pay in a timely manner risk having their name "dirtied" and their score worsened.

Credit Bureaus are also beneficial in terms of competition since they enable all issuers who contract their services to have access to the same information from the pool of potential customers. This information facilitates the mobility of good customers between lenders and decreases entrance barriers for smaller players. This can lead to lower interest rates for these customers and the industry as a whole (Banco de México, 2015c).

The price structure of credit bureaus usually depends on the number of enquiries, the higher the number, the cheaper the unitary inquiry. This can be a barrier for smaller issuers who require less information and who have a small bargaining power given their slighter market share.

Brazilian Credit Bureaus

There are three main private credit reporting firms in Brazil: Serasa Experian, BoaVista SCPC and Equifax. Serasa Experian, owned by the international Experian group and created in

1968 by the Brazilian Federation of Banks, is the largest credit agency in Latin America. They base themselves on data models that take into consideration characteristics of the young Brazilian credit market to generate credit scores.

Unfortunately, in Brazil, only negative activity is reported. Thus, it is possible to see only a partial view of an individual's credit history. Accordingly, once someone's score is tarnished, subsequent good payment behavior is not taken into consideration and it becomes very difficult to possess a respectable credit rating (Serasa Experian, 2016)

According to doingbusiness (2015), 80% of adults have credit bureau coverage in Sao Paulo and the depth of credit info is 7.0 (out of 8). Thus, despite only reporting negative behavior, there is relatively good access to credit information in this country.

Mexican Credit Bureaus

There are three main credit bureaus in Mexico. Trans Union Mexico and Dun & Bradstreet operate together under the umbrella name "El Buró de Crédito". The third bureau is Círculo de Crédito which gathers information about companies and individuals.

El Buró de Crédito is a private organization owned by the country's banks. It prices credit risk, shares information and keeps records of borrowing behavior. It has a lot of power in the country, and not just for credit underwriting. As 100% of adults are listed in this registry, some employers even look at it when deciding whether to hire someone (Búro de Crédito, 2016).

In sum, more Mexicans are covered by credit bureaus than Brazilians are. The credit reports issued in Mexico, which look at both positive and negative behavior, also provide a more complete picture of an individual.

Fraud

Identity and transaction fraud are important risks in the credit card business. Issuers who are unable to access the necessary tools or implement the right processes to deal with these issues risk bankruptcy. Identity fraud occurs when an individual steals someone else's identity in an attempt to take out a card in their name and max it out. A well designed acquisition process which requires a sufficient amount of proofs of identity helps mitigate this type of fraud. As for

transaction fraud, it happens when a card is cloned or stolen and used by a third party who has no intention of paying for the goods or services received. The following paragraphs will explore the risk of transactional fraud in both Mexico and Brazil.

Fraud in Brazil

Brazil has a reputation for being a hot bed for credit card fraud, and especially with foreign cards. However, this can be explained by the fact that many foreign cards used in the country possess the outdated magnetic stripe technology which is 50 years old. The way to operate them is to swipe their magnetic "head" through a card lecturer which reads the stored information. The fabrication costs for this type of card are quite low, but so is the difficulty to clone it.

Chip-cards are the latest technology. They may be costlier to produce, but they are also much more difficult to steal information from. The chip, which is similar to a computer, is a microprocessor operational system which holds memory in a secure way thanks to cryptography. Even if stolen or lost, one would need to know the pin in order to use it in a brick and mortar establishment. Additionally, it contains a secure code on the back which allows an extra layer of protection, especially online. Finally, the card's messaging system enables it to be easily blocked. Countries that use EMV cards have much lower levels of card present fraud, which means fewer losses for issuers.

These more modern cards have been used in Brazil for over a decade now. The switch started in 2002, and over 200 million chip cards have since been issued. According to ABECS (Brazilian Credit Card Organization) (2015), over 85% of card transactions in Brazil are made with chip cards and 100% of terminals are equipped to accept this type of card.

Thus, most Brazilian credit card fraud happens with online transactions. Similar to a magnetic stripe card, for online purchases, you would need to steal all credit information and the secure code on the back in order make a fraudulent web purchase. This information usually gets stolen if the cardholder's computer or a store's terminal or server is compromised.

Mechanisms to block online fraud are only slowly being developed. There is little incentive to do so on the acquirer's or issuer's end since they are not liable for these losses. Brazilian law protects the consumer in such cases. Most of the time, the loss liability falls on the

establishment that processed the purchase. Online websites suffer a great deal because of this law. However, they have no choice but to accept credit cards as most purchases are made using this method of payment. The online fraud problem has worsened as e-commerce has become more popular, and fraudsters have become more sophisticated. It is also the main reason why online companies go out of business (allpago, 2016).

Fraud in Mexico

Mexico is the country with the world's highest incidence of card fraud. Indeed, with over 44% of cards falling prey to fraud, this number is higher than in the US (42%). This is mostly due to the proximity of the US where cloned cards and fraudulent accounts can easily be used. In Mexico, merchants are the ones most impacted by fraud as they are obliged to cover the costs (Forbes Staff, 2014). Indeed, merchants have to cover costs up to 10x greater than banking institutions and 20x greater than consumers. Not only is there a monetary cost due to fraud, but also a reputational cost. Victims of card fraud can be inclined to take their business elsewhere (Gerens, 2012).

According to Moody's Analytics, between 2008 and 2012, 800 million dollars disappeared from Mexico's GDP because of electronic payments. These high fraud rates help explain the low card penetration. After all, security was mentioned above as being a very important factor in Mexican consumers' purchase decisions and payment type choices.

Now, however, nearly all POS terminals are equipped to accept chip cards and most credit and debit cards have a chip. At the end of 2015, the US started the shift towards the use of microchip-embedded credit cards, and merchants who do not adopt the chip-enabled terminals have the liability placed on them in fraud cases. In the past, the issuers had to assume the losses. This should help decrease spillover fraud in Mexico.

However, as banks have migrated towards only issuing chip cards, there's been an increase in online fraud cases, similarly to Brazil. e-commerces can help quell consumer fears and limit losses by providing 3D secure and CVV checks when selling goods and services online. They can also use a risk analysis tool or deal with a third-party company which guarantees the revenue from sales. PagSeguro, UOL or Bcash are some of the companies who

charge an intermediation fee on every transaction in exchange for guaranteeing payments (Vásquez, 2015).

In conclusion, new entrants in the credit card market have reasonable resources to manage credit risk in both Brazil and Mexico. With regard to fraud, thanks to improved card technology, this component has also become much more manageable. It will be important to invest in R&D to create even more secure cards and compete with fraudsters' more sophisticated technology. What's more, as long as liability falls on merchants for online fraud, issuers have little to worry about.

5.2.3. Competitive Rivalry

5.2.3.1. Brazil: Competitive Rivalry

The next section looks at the main companies that make up the Brazilian and Mexican credit card ecosystem. It analyzes the competitive forces that they face amongst one and another, and, their bargaining power vis-à-vis the issuer.

Brazil: Acquirers

As explained above, the role of these companies is to act as the merchant's bank, manage the transaction network for their associated merchants, and provide them with the POS terminals necessary to process and transmit credit and debit card transactions. With over 4.4 million POS in Brazil in 2015, acquirers have an important number of customers (ABECS, 2015).

The main source of revenue for these companies is the transaction fee of 3-6% charged on every transaction made in their merchants' establishments, and the auxiliary services that they provide. For instance, for merchants to be part of the transaction network, they need to rent out a card terminal which costs about 100 reais per month. Purchases in installments incur the highest transaction fee, whereas debit cards the lowest.

Acquirers also have the role of a liquidator (bank), and pay merchants 27 days after a purchase is made. This is much longer a time period than in other countries and it can greatly impact merchants' cash flows. However, merchants have little bargaining power when dealing

with acquirers. Establishments can choose to receive installment revenue up front (rather than wait for each monthly installment). However, it costs them 8-12% of the value of the purchase.

An important risk that acquirers face is in the case of in-store returns or chargebacks. If the establishment is unable to reimburse the customer, then the acquirer has to assume the costs (DeGennaro, 2006).

Historically, all acquirers in Brazil were associated with affiliated credit card networks. MasterCard, Visa, Diners Club and American Express all had exclusive acquirers in the country. In 2009-2010, however, the Brazilian Federal Reserve and the Brazilian Council for Economic defense decided that this monopolistic environment was an important barrier to entry. They introduced a new regulation which encouraged the entry of new acquirers. To date, these changes did not diminish the market dominance, nor make the market any less saturated. Cielo and Rede, the two oldest acquirers, still process close to 90% of all transactions in Brazil.

The greatest acquirer, Cielo was created in 1995 by Bradesco, Banco do Brasil, Banco Real and Banco Nacional. Initially it was called Visanet as it had monopoly over the Visa network. It became public in 2009, and then, in 2010, it changed its name to Cielo and started capturing payments from MasterCard and other networks such as Elo, American Express, Diners Club and Discover. Cielo, likely thanks to its initial founders, has developed many partnerships with financial institutions and card networks. It invested greatly in e-commerce and mobile device platforms for small business, which enabled it to differentiate itself and gain market share.

Redecard, the second biggest acquirer company was founded in 1996 by Citibank, Itaú and Unibanco after the Brazilian financial services company Credicard diverged their payment capturing company from their other operations. Main ownership for this company was taken over by Itaú in 2012 and it changed its name to Rede in 2013. Rede is associated with the same card networks as Cielo apart from American Express and Elo. They offer similar services as Cielo (BCB, 2014).

The biggest competitor to Cielo and Rede is GetNet which was bought by the bank Santander in 2013. It differentiates itself by providing more modern solutions for payments in the country, such as virtual top-up of pre-paid telephone subscriptions. It also provides fraud detection and data center services. It retains about 6% of the acquirer market share in the country and is present in more than 100,000 retailers.

Other smaller Brazilian multi-network acquirers include Vero (Banrisul bank) and Stone (BTG Pactual, Panamericano and Arpex Capital). There also exist a few North American-owned smaller acquirers such as Elavon, Global Payments and Bin.

Given that acquirers are owned by the major banks, it is no wonder that they are able to maintain their prices so high and create immense barriers to entry. Cielo and Rede, the dominators of this oligopolistic and concentrated market, even own private-label cards and loyalty programs such as Multiplus. This means that card issuers must also compete with them (Tech in Brazil, 2015).

Since the major acquirers charge similarly steep prices for their services, it would seem that they've made tacit collusive agreements, and thus act together like a monopoly (Ribeiro et al., 2011). In fact, in 2009, Brazil was the second most important country in terms of the acquirer market's profits (BTGPactual, 2015).

In sum, the acquirer market is extremely difficult to enter. New entrants could differentiate themselves by offering a more competitive price and term structure for merchants. On the flip side, if few customers use the cards that these new acquirers are associated with, merchants will be disinclined to deal with them. Given their oligopolistic dynamic and their importance in the credit card platform, they have a very strong bargaining power that new issuers must take into consideration.

Brazil: Card networks

As mentioned above, card networks do not make revenue off of interchange rates. They do however set them, based on "the value delivered by the issuing bank" and the "benefits of accepting electronic payments". Not fully regulated by the government, it is up to the networks to find the ideal level. If they set the rate too high, merchants will refuse to accept cards, if they set it too low, there is little incentive for issuing banks to take on the risk of granting credit cards. The networks set various rates depending on the type of merchant group in question. Issuers need to pay them to be part of their network.

MasterCard and Visa have about 90% of the market share in Brazil. Local company Elo, Diners and Amex own the rest. Over the past few years, Visa has been losing market share to MasterCard in both debit and credit cards. When it comes to number of credit card transactions, in 2008, Visa had 52% market share when MasterCard had 37%, but at the end of 2014, it decreased by 4% and MasterCard increased by 6%. With debit cards, the situation is even worse because Elo is a more relevant player; Visa had 57% of transactions in 2008 versus 41% for MC. At the end of 2014, it decreased to 45%, MC had 41% and Elo had 10%. MasterCard has reached an agreement with Itaú which will help it gain even more market share. Visa will likely do the same with Cielo/BBDC/BBAS (BTGPactual, 2015).

Thus, this player is also part of a very concentrated and oligopolistic market. Issuers looking to partner with either one of them have very little negotiation leverage.

Brazil: Issuers

The issuer is at the core of the credit card platform because it is the entity that actually manages the credit cards.

In Brazil, the issuer, analogously to the other players discussed, operates in a concentrated market. As stated, the five greatest Brazilian banks in terms of asset values (Bradesco, Itau, Caixa Economica Federal, Banco do Brasil and Santander) also hold most of the market share in credit cards. Depending on the years, Bradesco or Itaú is the leader in terms of volume of cards. At the end of 2014, the market share was as follows: Itaú (29%), Bradesco (24%), Banco do Brasil (14%), Santander (9%) (end of 2014) – Out of about of 170 million credit cards. The total credit line exposure was R$594bn, and Itaú was responsible for just under 30% (Cardmonitor, 2015).

Some smaller players, such as mid-sized banks also offer credit cards, e.g.: Pan Americano and Banco BMG. Then there are many large retailers that operate their own private label card programs with bank partners, e.g.: Walmart, Marisa and Renner. The store Renner is an interesting case, as it is the first non-financial company in the world to be authorized to issue cards for MasterCard/Visa without having a bank behind the operation.

The different issuers all offer cards with relatively high APRs, and none have distinguished themselves much from one another. Studies show that consumers found little

differentiation between cards of different banks. Due to their commodity-like nature, lower pricing would be the best way to differentiate them (Morgan Stanley & alphawise, 2012).

5.2.3.2. Mexico: Competitive Rivalry

Mexico's credit card network is made up of three main players. The first is the issuing market in which banks compete against each other to provide credit cards to consumers. The second is the acquirer market in which banks offer the card acceptance service to merchants. The third market is the payment processing market which replaces the role of the card network in Brazil. In the following section, we will look at each of these markets.

Mexico: Acquirers

In Mexico, the issuer and acquirer markets are dominated by the same banks and there exists little competition between different platforms. In 2014, there were 18 acquirers that were banks and two that weren't. The banks own 89% of the acquirer market share (SHCP & CNBV, 2014). In this context, there is a strong likelihood of collusion. It also signifies that smaller issuers, not affiliated to an acquirer may face some issues entering the market.

In 2013, there were over 600,000 POS operating in just under half a million establishments. This represents only 10-15% of merchants in the country (99% of which are micro, small or mid-size companies). To put it into perspective, this represented approximately 524 terminals per 100,000 adult habitants, or 15% of the number in Brazil. It would appear that there is still an important market opportunity for the acquirer business (MasterCard, 2015).

Merchants can buy card terminals for between 2000 and 5000 pesos or rent it for 300-700 pesos per month. The interchange rate is between 0 and 4.5% depending on the transaction amount (MasterCard, 2015).

Mexico: Payment Processors

To be part of this market, card issuers need to have access to services that payment processors provide such as *cámaras de compensación* or *switches*. These players provide the

payment infrastructure necessary for the authorization, compensation and liquidation of denominated operations. Mexico has two main processing agencies: Prosa and E-Global. Both of which are owned by bank consortiums. Prosa (Santander, HSBC, Banorte-IXE, Scotiabank, Invex and Banjercíto) and E-Global (BBVA Bancomer, Banamex, HSBC). Prosa is the main player when it comes to offering services to card issuers that aren't one of its shareholders. Since processors are owned by banks, there may be a conflict of interest when new issuers enter the market, which may result in a barrier to entry.

Mexico: Issuers

Like Brazil, the Mexican issuer market is quite concentrated. In mid-2015, BBVA Bancomer was responsible for 27% of the cards in the market, Banamex for 25%, Santander for 15% and Banorte-Ixe Tarjetas for 7% (Banco de México, 2015a).

Issuers compete in the Mexican market using a variety of instruments as well as different interest rates and fees. An important amount of capital is usually invested in marketing in order to attract the best customers. Reward programs are one of the most important competitive factors in this market. The idea is to help distinguish cards, but today there exist over 155 different credit card products, which makes it difficult for consumers to distinguish them. This, ironically, makes cards seem like commodities, as is the case in Brazil. An issuer to succeed in this market would need to find a way to stand out, aside from having an important reward program.

5.2.4. Threat of Substitutes

As the credit card has two main functions: a payment instrument and a financing means, there are two groups of substitutes.

5.2.4.1. Payment Substitutes

As a payment means, debit cards and pre-paid cards are very close substitutes to the credit card. However, the credit card has the added attribute of financing that debit and pre-paid cards don't have.

Until 2000, due to the history of hyperinflation, Brazil was very much a check-based culture. Although, as explained above, there's been an important growth in payment card adoption in the last decade. In the graph below we see the obvious decline in the number of check transactions.
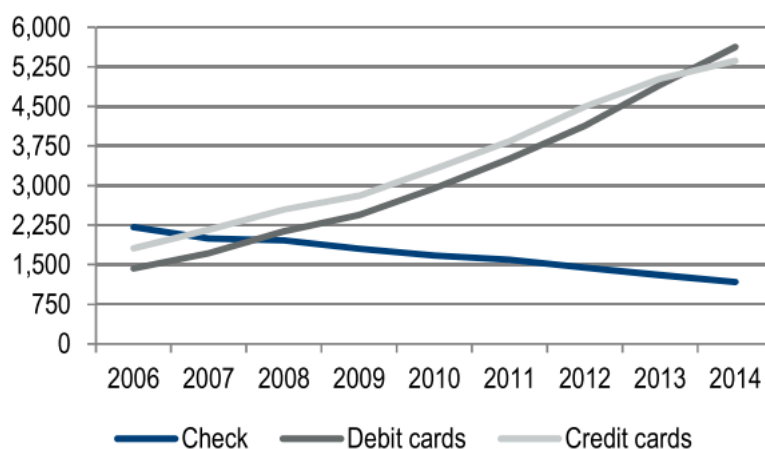
Figure 4 – Number of transactions per means of payment (MM)

Source: BTG Pactual Report, BCB

Debit and credit cards are the preferred transaction method and represent nearly 30% in household consumption (ABECS, 2015).

As for Mexico, in line with the fact that they have a lower electronic card penetration, they still use many old-fashioned payment methods. For instance, as mentioned above, they can undertake small financial operations at convenience stores (corresponsales). Interestingly enough, even online transactions can be paid for at convenience stores. Another widespread method of payment is bank deposits, even for online purchases. Thus, using debit and credit cards is not as necessary as in Brazil.

 In fact, only 61% of online transactions are made with payment cards and bank transfers. 17% comes from PayPal and the rest comes from convenience store and bank deposits (allpago, 2016).

All things considered, there exist payment substitutes for the credit card in both Mexico and Brazil. Nonetheless, the credit card has the added benefit of being more practical. One does not

need to go to a convenience store to finalize a purchase when using it. Also, the money does not need to be directly debited from one's account.

5.2.4.2. Financial Substitutes

The next section details the financial substitutes for the credit card. Some of the most relevant and unique ones are detailed below.

Financing Substitutes: Brazil

Cheque especial is a widely used mechanism to access credit easily. It is an automatic credit that a bank grants to a customer directly in their account. It is usually employed in emergency situations when an accountholder needs to make a payment or transfer money, but has no outstanding limit. It is quick and easy, but has extremely high interest rates (APR of 285% in November 2015).

Consorcios, a Brazilian invention from the 60s, are also frequently used, especially by individuals who are unable to get a loan from a bank under reasonable terms. These consortiums are a planned buying system that unite individuals who would like to purchase a similar good or service (eg: car, trip, house). Consortiums are cheaper than other mechanisms due to the fact that there is no interest rate. However, there are fees if you are late to pay one of your monthly instalments, and an administration fee to be part of the group. Fees and contracts vary depending on the type of consortium, its duration, and the moment in the consortium's life. Participants receive the loan that they want either at maturity, sporadically through televised draws or through bidding.

Undeniably, the main downside with this financing mechanism is that you must be able to wait before being able to buy the good or service you desire. There is also the risk of inflation which can impact your purchasing power when you do receive your money. Finally, there is the risk of other members defaulting which impacts the final amount of money you receive (Unifisa, 2015).

Parcelados or installments are one of the favored ways that Brazilians finance larger purchases. One needs a credit card to use them, and therefore they are not an entirely independent substitute. However, since they are one of the main reasons why customers don't

use credit cards for its revolving purposes, it is important to detail their functioning in this section.

In many establishments, merchants offer customers the possibility to pay for purchases, and especially larger ones, in installments. Interestingly, the "headline" price for many goods and services is the monthly price rather than the total cost of the item. This alternative is very popular as they are usually interest free. In terms of value, 50% of credit card purchases in Brazil are made in installments and 50% are paid in full. Customers tend to use installment plans for bigger purchases. In 2015, the average à vista (in full) ticket was R$47.70, and for interest-free installments R$220 (ABECS, 2015).

Installments with interest: Certain issuers offer this option at the bill payment stage. Rather than revolve at a very high rate, cardholders can choose an installment repayment scheme which has more affordable interest rates. This method has shown to decrease customer charge-off rates. According to the Central Bank of Brazil, only 0.6% of cardholders who are repaying their debt with the installment and interest plan are late more than 90 days, whereas 35% of pure revolvers are delinquent at this stage (CardMonitor, 2015).

Consignados or Payday loans are a credit mechanism to help refinance credit card debt. They enable borrowers to cut interest rates by two-thirds. Rates are still quite high, and are a risk for individuals who have a poor financial education. Following a presidential decree, lenders must enable creditors to have credit lines of up to 35% of their monthly income. This lending is considered among the least risky for banks because they get paid back through direct deposit from borrowers' salaries. However, for consumers, it is more of an emergency credit mechanism and it forces them to have less available income, which is quite damaging in the current high inflation and deteriorating labor market (Marcelino, 2015).

The table below summarizes some of the main substitutes in the market

Type	Rate (APR)	Amount Nov 2015 (R$ billion)	Default rate (later than 90 days) (% of portfolio)
Cheque Especial	284.8	27.1	15.1
Personal Credit -	28.4	273.3	2.3

Consignado			
Personal Credit - not Consignado	120.4	132.3	8.8
Rotativo	415.3	34.3	35.4
Parcelado with Interest	134.8	12	0.6
A vista and parcelado without juros		118.3	

Table 3 - Comparison of Brazilian Credit Substitutes

Source: BCB

Financing Substitutes: Mexico

Mexican banks offer loans specifically designed for the purchase to be made:

- **Crédito automotriz** are loans granted for the purchase of cars. The collateral in these purchases is the car itself.
- **Crédito ABCD** are loans granted for durable goods such as house appliances
- **Crédito quirografario** are loans granted for short periods of time to help individuals cover their liquidity needs. No collateral is needed and there is no third party that guarantees payment. The debtor needs to follow a repayment schedule, and in the case of default, the bank can claim the debtor's assets. Through court procedures, the creditor can gain ownership of the assets and sell them to recover the money lent.

Pawnshops (Crédito prendario) grant loans that can be used to purchase any good or service that the debtor desires. However, personal property must be left in exchange as collateral (eg: jewelry, a computer, art). The most famous pawnshop is Nacional Monte de Piedad which is a 240 year-old not-for-profit that has branches all over Mexico. It was initially established to provide interest-free or low interest loans to the poor. It mostly gives out microloans to families with emergency needs secured through pawned objects. It seeks to grant loans in the most favorable conditions possible, and without thinking about financial gains. Individuals who default on their crédito prendario do not have their name reported to credit bureaus. This is also because with the valuable left behind, it is almost as if the loan were pre-paid (Banco de México, n.d.).

Conclusion: threat of Substitutes

In sum, on the financing side, and in both Brazil and Mexico, there are many credit card substitutes. However, most of these don't have the useful revolving trait that credit cards have. In Brazil, this is not a valid advantage since few cardholders revolve their credit line. Rather, they use them like they would charge cards. As explained previously, this is in part due to the high interest rates and some of the alternative methods of payment which they have grown accustomed to using. Since Brazilians don't exploit the revolving benefit of credit cards as much as Mexicans do, it would seem that the threat of substitution is higher in Brazil than in Mexico.

However, the other credit card traits give this product an advantage over other substitutes. For instance, credit cards can be used and reimbursed with more flexibility. Most financing mechanisms have a fixed term with pre-determined repayments. The credit card is much more flexible in all these aspects as long as usage is maintained within the credit limit bounds, and the cardholder pays at least the 15% minimum payment every month. Credit cards can also be used in more establishments.

As for Mexico, given some of the archaic alternative payment methods listed above such as pawnshops and convenience stores, it would seem that Mexicans are slow adopters of new technologies and modern financing methods. However, there is some innovation, which reflects a shift in consumer behavior. For instance, since 2015, pawnshop loans can be contracted online (Cordova, 2015).

A final point worth mentioning, applicable to both countries, is that each type of credit card (black platinum, gold and classic) could be considered indirect substitutes. Each category has its own characteristics in terms of limits, benefits, terms and rewards. From a demand point of view, these aren't always substitutes as not all consumers are eligible to receive a platinum card with a high limit. However, from an offer perspective, a bank that already issues classic cards, can start issuing platinum cards if they turn out to be more profitable. In that respect, they are another category of financing substitutes.

5.2.5. Industry Analysis Conclusion

In conclusion, after a general industry analysis, it appears that the credit card markets in both Brazil and Mexico offer many opportunities. Penetration levels are still quite low, which implies that there is space for new issuers. Furthermore, due to the low banking levels, an important percentage of the population is unable to access the main credit substitutes such as bank loans. Credit cards from financial institutions that are not banks could solve this issue.

As for the different players that make up the credit card platform, they all operate in saturated markets with little competition. These markets could be difficult to perform in due to the oligopolistic and collusive behavior some institutions may have adopted. However, on a brighter note, the barriers to entry have decreased greatly lately thanks to improvements in technology, the arrival of third parties that help decrease operational costs, the institution of laxer regulations, non-discriminatory access to information and the implementation of competition laws.

Nevertheless, there is still much room for improvement. Brazilian and Mexican Governments could start off by decreasing switching costs for cardholders. On the consumer side, there would need to be more transparency, or access to information, so that customers are able to recognize whether issuers are charging rates that are too high with respect to the services offered. There is also a need to roll out massive financial education campaigns. Cardholders often do not know how to properly use their card, and much less how to complain or switch card providers.

On the issuer side, services that benefit good payers such as balance transfers need to be promoted. This aforementioned credit card product enables cardholders to transfer an outstanding balance from one credit card to another. It greatly decreases switching costs as the rate on the new card is inferior to the old card's. Only a few issuers offer this option in Mexico, and they only do so with heavy restrictions. Undeniably, this attitude is uncompetitive (Negrín & O'Dogherty, 2004).

5.3. Cardholders

This next section plunges down to the consumer level. In order to be successful and distinguish itself from the competition, it is imperative that credit card companies adequately

understand the needs and behaviors of their target market. Only by achieving this will they be able to effectively segment their potential customers and create cards that best suit them.

5.3.1. Country Demographics

Brazil and Mexico share many similar demographic characteristics. The two countries are the most populous in Latin America (200.4 million in Brazil and 122.3 million in Mexico) (World Bank, 2015). They also have very important working age populations, as the median age in both is rather young (31 in Brazil and 27 in Mexico) (CIA World Factbook, 2015) (BCG, 2015).

Finally, the great majority of habitants live in urban areas (86% of Brazilians and 78% of Mexicans).

5.3.2. Brazilian Consumers

Cardholder Behavior and Usage Habits

Credit card usage steadily increased in 2015, albeit for smaller average tickets. This could be explained by the negative economic scenario forcing consumers to pay on credit more often. Since credit cards are accepted in a great number of establishments (4.4 million POS) and there is usually no minimum amount required for a card transaction, it is easy to do so. Currently, and according to a 2015 ABECS survey, 95% of cardholders use their card every month and 48% use it weekly. Most purchases are for basic necessities since the main sectors in which consumers make purchases is food (53%), clothing (43%) and pharmacy (41%).

In terms of type of consumers, ABECS estimates that, in any given month, 14% of consumers are revolvers, 85% are transactors and 1% don't pay their bills. With respect to purchase volume, the scenario is a bit different; 72% of the outstanding credit was acquired in full (à vista) or installments without interest, whereas 28% is revolving credit or installments with interest. This indicates that the average revolver's statement amount is superior to a transactor's. However, when individuals do revolve, they only do so for about 18 days, which means that they employ this financing mechanism only for emergencies. Most revolvers belong

to class B and C which may be because of fewer financing options or poorer financial education. Interestingly, despite the deterioration of the economy, as interest rates have increased, there's been a 12.8% decrease in the total volume of rotating credit during the first semester of 2015 (ABECS, 2015).

Comparably to revolvers, Classes B and C and poorer states (North and North-East) are the ones that most use the installment option when purchasing goods and services. Women also use it much more than men (69% vs 60%). According to a SCPC report (2015), by buying in installments, consumers feel as though they are not even purchasing anything. Similarly, installment plans encourage about 93% of cardholders to buy on impulse, and in amounts greater than they can afford. If this option did not exist, nearly three-quarters of consumers would have made fewer purchases during the previous month. Furthermore, 34% of cardholders don't know their credit limit and 96% don't know their interest rate. These statistics demonstrate the presence of behavioral irrationality and lack of financial education.
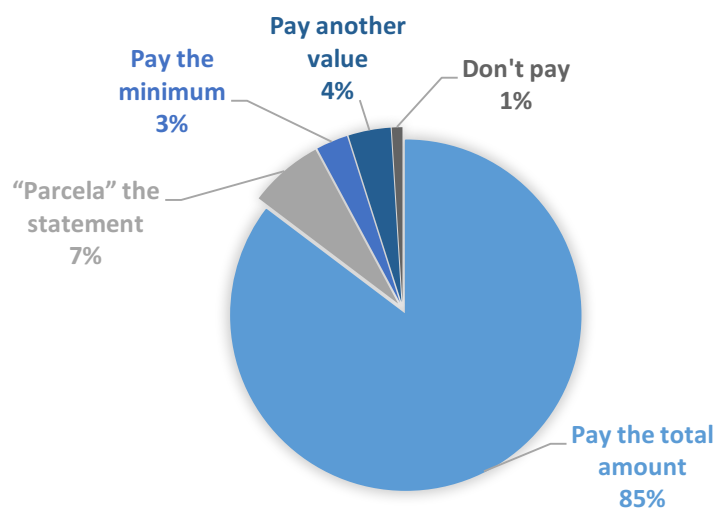
Figure 5 – Brazilian cardholder repayment behavior

Created by author December 2015

Given that few Brazilians are aware of their interest rates and that few revolve, it would seem that APRs are inelastic. However, according to a MS Stanley (2012) report, this is not the case. For card issuers to witness greater elasticity, monthly rates would have to decrease to 2%. Average credit card debt would then increase by 6% and interest charged by 49%. To maximize

income, banks would have to offer 4-5% per month. However, no existing card offers such low rates.

The same report found that Brazilians use credit cards for their convenience and the possibility to pay in installments. The card characteristics given highest priority are acceptance and spending limit. Interest rates, fees, rewards, and security are secondary concerns. In fact, loyalty programs in Brazil are not as coveted as in Mexico because they are hard to use. Accordingly, 70% of loyalty program members claim to be willing to switch credit-card issuers for rewards at another bank. This helps decrease the cardholder mobility issue (Morgan Stanley & alphawise, 2012).

Technology Adoption

Brazilians have been showing a strong adherence to online and mobile channels and this trend should continue. It has had a significant impact on the payments industry as these are important channels in banks' customer relationship strategies. Furthermore, with approximately 50 million smartphone users in the country, this technology is an effective way to reach customers of all classes. In fact, more than a third of smart phone owners are Class C (Nielsen Mobile Report, 2014).

Despite this technological growth, ATMs are still the preferred method for customers to make withdrawals, deposits and payments. Banks must therefore not neglect ATMs in the relationship strategy they have with their customer. Thus, many banks are investing in modernization of ATM networks (touch screens, real-time deposits, etc). Some important players such as Banco Bradesco and Tecnologia Bancária (TecBan) are looking to incorporate biometric technology into their ATMs in the near future.

In line with the growth in digital banking, e-commerce has been seeing a strong surge. According to eMarketer, retail ecommerce sales in Latin America are growing at a rapid pace. In 2014, they increased by nearly 30%. Unsurprisingly, the two greatest economies of Latin America, Brazil and Mexico, also hold the top two spots in terms of sales. As this growth is projected to continue, the role of credit cards should also gain in importance (eMarketer, 2015). According to ABECS (2015), 18.6% of transactions with a credit card are online. The preferred method of payment online is equally the credit card (87%).

In conclusion, the country has an important young population which has been an avid adopter of social media and technology in general. It is important keep technology in mind when entering this market. Focusing on Class C is also key as more and more of them are becoming cardholders and are smartphone users.

5.3.3. Mexican Consumers

Cardholder behavior usage habits

The number of transacting customers in Mexico increased between mid-2014 to mid-2015 from 43.1% to 45.9%, and the number of revolvers decreased 3.9%. This could be indicative of a better economy or more financially savvy customers. Regardless, as described previously, the culture of revolving is much greater in Mexico than it is in Brazil. This may be due to the fact that purchasing in installments is not as widespread. Indeed, there are special periods of the year when banks partner with stores and offer installment purchases without interest. This is not common, but many Mexicans still fall trap to this technique and purchase above their means, similarly to Brazil.

In general terms, consumer spending is projected to increase across all payment methods due to the favorable socioeconomic conditions discussed above. Mexicans are expected to be selective in their purchases, and the middle-class to remain budget conscious. Still, consumption is expected to increase 7% annually for the next few years.

Due to the consumption growth across classes, financial institutions will need to develop products for people at the bottom of the pyramid who have limited work and credit history, but will ascend to higher social levels. Companies that can cater to their needs, will be well positioned (BCG, 2015).

A variety of financial products for lower income individuals may be lacking, but this is not the case for wealthier classes. In 2013, there were 155 different credit card products, and this number is on an upward trend. Financial institutions issue various cards of the same type (classic, gold, platinum), but with different rewards in order to attract different segments of consumers. However, given the vast array of options, it is complicated for customers to

differentiate between products and choose the card that best suits their needs, without conducting a fair amount of research. To help consumers, the Mexican Financial Authorities created a tool called CAT which provides consumers the total cost of a credit card (considering interest rates, credit limit and fees). This instrument has its limitations though. The extra layer of complexity arises due to the "packages" that banks offer. Customers who sign up for numerous services in a bank receive benefits and discounts. Indeed, issuers usually have a predilection for current customers, as they have more information about them. For the customer it can also be beneficial as they can resolve all their banking issues in a centralized location. This hinders customer mobility between financial institutions (CEPAL, 2006).

Technology adoption

The telecom infrastructure is not as developed in Mexico as it is in Brazil. Banks wishing to leverage technology in order to interact with customers have a hard time doing so. Even if the infrastructure were better, according to a 2014 Tecnocom report, the demand for electronic payment means is much smaller in Mexico than in Brazil (37% versus 70%). In fact, of the Mexicans who have a bank account and are internet users, only about 20% use online banking. The adoption rate is expected to grow in coming years but remains low compared to other countries. For companies, dealing with customers online or through SMS is operationally much cheaper than the more traditional ways such as direct mail or phone. It also is much more practical for customers (Tecnocom, 2014).

However, not all technological advances have been shunned by Mexicans. Smartphone use has grown substantially; from 14 million subscriptions to 105 million between 2000 and 2014. Given that they are much more accessible technologies, cellphone and tablet sales have increased much more rapidly than that of computers. It is in everyone's best interest to encourage the use of online banking. As stated in the literature above, Mexicans are concerned about security and ease of use with new technologies. These may be some of the reasons blocking adoption. Financial institutions should keep this in mind when developing products and rolling out new marketing campaigns. Banks should also consider communicating to customers through their mobile devices as much as possible as this may be the easiest and cheapest way to reach

customers. Moreover, R&D should be invested in developing solid cellphone banking applications and making portable devices into means of payment (allpago, 2016).

As discussed previously, Mexico has an important e-commerce segment which is projected to keep growing at 20% per year until 2018. This is 4% higher than the world average. In terms of volume, sales are even meant to outpace those of Brazil in 2016. Greater credit card issuance will be necessary to help support the increase in spend and e-commerce sales.

In sum, due to the predicted boom in spending and economic growth in Mexico, companies should act now to position themselves in the market, get their brands known and improve their supply chains (BCG, 2015).

6. PAYMENT INDUSTRY FUTURE TRENDS

Over the next couple of years, the card payment sector should experience some important shifts, mostly due to advances in technology.

Payments are heading in the direction of being contactless. Transactions will be completed more and more through devices such as phones and smart watches. Thanks to Near Field Communication (NFC), it will be possible to send out a pulse from mobile devices to contactless card readers which will enable customers to make purchases more rapidly. In Brazil, the telecommunications company Claro and the bank Bradesco have already partnered to roll out the technology in the country. Their customers can benefit from a prepaid contactless card. At the time of payment, they simply need to approach their phone to the card lector.

Furthermore, currencies themselves will be challenged with the greater use of crypto currencies. These digital currencies bypass some of the middlemen in a transaction, which decreases costs. Acquirers would still be necessary, but a large bank or payment network acting as an intermediary to process transactions would not be necessary. This would increase competition payment between payment processors. Crypto currencies also help fight cybercrime, as their network is much more secure and protected from financial harm than the traditional credit card's is.

In fact, payment security, in general, will be an important topic going forward. Due to all the cybercrime in recent years, tokenization, EMV and encryption will become very important. EMV (chip cards) help prevent the use of counterfeit cards, as discussed above. Tokenization,

which generates a substitute and temporary account number for the purpose of a transaction, helps keep consumers' data safe as it breaks the link between their identity and their financial account data. As for encryption, it ensures that a customer's data cannot be stolen in a merchant's network. There will also be much more ODCV (On Device Consumer Verification). With this technology, consumers will have to use biometrics (or something of the sort) to make a purchase. This should help decrease fraud levels.

There will also be a development of data analysis capabilities as merchants and issuers start using big data much more. Merchants will be able to offer tailor-made offers linked directly to customers' credit cards or mobile devices, and depending on their purchase history and habits. Issuers will be able to improve the relevance of rewards programs (Schneider, 2015).

Another compelling change within this industry has to do with demographics. As technology evolves so does the comfort level of each consumer group with respect to different technologies. Younger segments have adopted mobile payment methods much faster than any other segment has. They also have much fewer security qualms. In a recent study of US consumers by AlixPartners, younger segments were much more inclined to share personal data with companies (55% of under 35 year olds were "very" or "extremely comfortable" to share personal data whereas less than a third for ages 45-54). Companies must therefore keep in mind that millennials, for reasons beyond considerations of income, are more inclined to respond to rewards and offers from corporate advertisers or social media companies.

In the US, wealthier individuals tend to prefer electronic payments over cash and are also much more likely to have a bank account. They are the ones who most dictate adoption of new technologies. However, in emerging markets, it's the unbanked or under banked that are driving the technologies in the electronic payment industry. Thus, most payment solutions still tend to be local or regional in nature, PayPal being the exception (Tecnocom, 2014).

These trends are all important to keep in mind before entering any payment market, and in order to have an adequate long-term strategy.

7. SUMMARY TABLE

	Determinant	Brazil	Mexico
Macroeconomic Environment	Economic Growth	• GDP 2015: -3.7% • GDP 2016+: Expected to contract	• GDP 2015: +2.5% • GDP 2016+: Expected to grow
	Private sector	• High Unemployment: 8.7% • Low private spending, low disposable income (5%) • High inflation: 10.5% • Low *Ease of Doing Business* score: 166th position	• Low Unemployment: 4.25% • Spending levels expected to increase due to favorable demographics (+7% annually), more disposable income (10%) • Low inflation: 2.8% • Average *Ease of Doing Business* score: 63rd position
	Public sector	• High public debt/GDP: 70% • Unstable political situation, corruption scandals and calls for impeachment of the President • Weak currency (favorable for exports)	• Healthy public debt/GDP: 38% • Relatively stably economic situation • Weak currency (favorable for exports)
General Country Landscape	Banking	• Highest banked population in Latin America: 60% • Five major banks hold 90% in credit	• Low banked population: <30% • Three major banks hold nearly 70% of cards in the market today

		card market share	
	Credit Cards	• Number of credit cards circulating: ~170MM • Mid-high penetration levels: 40-60% • High APR: 400% (average) • Annual fee: Up to R$900 • 70% cards are classic (basic)	• Number of cards circulating: ~16 MM • Lower penetration levels: 20-30% • Lower APR: 23.4% (average) • Lower annual fee: up to R$ 276 • 66% of cards are classic (basic)
Barriers to Entry	Scale	• Scale barrier decreasing thanks to processing companies and adoption of online/mobile banking	• Scale barrier decreasing thanks to *corresponsales* and adoption of online/mobile banking
	Regulatory	• Important consumer protection laws • Freedom in deciding rates	• Important consumer protection laws • Freedom in deciding rates, some governmental guidelines • New laws to encourage the entrance of financial institutions • New national digital strategy being rolled out to increase access to information
	Access	• Negative credit bureaus • Relatively good credit coverage of citizens	• Positive and negative credit bureaus (more complete information about citizens)

		• Fraud levels expected to become more manageable thanks to adoption of chip cards	• Fraud levels expected to become more manageable thanks to adoption of chip cards
Competitive Rivalry	Characteristics of Main Players	• Issuers seen as offering commodity-like products • Issuer, acquirer markets very oligopolistic, collusion likely • 4-part market: Issuers different than acquirers (for the most part). Makes it easier for new entrants	• Issuers seen as offering commodity-like products • Issuer, acquirer markets very oligopolistic, collusion likely • 3-part market: Issuers and acquirers together (for the most part). They have a high bargaining power • Payment processors owned by banks (potential conflict of interest)
Threat of Substitutes	Payment Substitutes	• Check and money being used less • Credit card seen as practical and flexible. Debit and Credit cards are the preferred payment methods	• Many old fashioned financing/payment methods still employed (bank deposits, convenience store transfers)
	Financial Substitutes	• Many financial substitutes (eg.: cheque especial). • Credit card used as a charge card due to high rates and the possibility of buying in installments. Not used as a revolving instrument.	• No close financing substitute. • Credit card used much more for its revolving feature. Installments not as prevalent.

Cardholders	Demographics	• Most populous country in Latin America: 200 million • Young median age: 31 • Important urban population: 86%	• Second most populous country in Latin America: 122 million • Young median age: 27 • Important urban population: 78%
	Behavior	• Technology inclined population. Strong adherence to online and mobile channels. • Young population: avid adopters of social media • Many smartphone users (~50MM users). • Poor financial education, irrational behavior. • Few revolvers. • Ecommerce growing greatly. Credit card preferred method of payment (87% of transactions)	• Less technologically inclined, lower percentage use online banking • Many smartphone users (~40MM users). • Poor financial education, irrational behavior. • Many revolvers • Ecommerce growing greatly. Credit card not as important a payment method. 60% of payments made with debit and credit cards and bank transfers

Table 4 – Thesis Summary Table

8. CONCLUSION

8.1. General Conclusions

In conclusion, Mexico and Brazil are two important world economies that possess significant uncontested market space across numerous industries. The credit card, for example, has existed for over 50 years, and yet its penetration rates still have room to grow in both countries. This thesis explored the digital payment sphere in each Latin American powerhouse to try and understand what was impeding adoption rates from reaching levels of mature economies, and determine whether it was a sound investment to expand into either market.

On a macroeconomic level, Mexico faired much better than Brazil across most indicators. The North American country is expected to witness GDP growth, a decrease in unemployment, an increase in consumer spend, and, generally, economic stability. Brazil, on the other hand, is in the midst of a recession, is highly indebted, lost its investment grade, and is expected to experience dark times for the next coming years. 2015 in Brazil proved that the credit card sector is not necessarily impacted by poor economic conditions as numerous households became cardholders, and default rates did not increase. These lower classes which are new cardholders could be an interesting market to target. The average ticket however decreased and as unemployment increases, default rates in the mid-term might as well. What's more, the ease of doing business score of Mexico is much greater than Brazil's. In this respect, a new entrepreneur would find it much easier in Mexico.

In terms of the credit card markets themselves, the two countries displayed many similarities. The credit card platforms in both countries are relatively concentrated and reveal certain uncompetitive traits. However, public organizations in either country are aware of this problem and have instituted laws to help improve competition. It may be easier to enter Brazil's market as acquirers and issuers are generally separate entities and Brazilian issuers do not have to deal with payment processors, which could have conflicts of interest. Brazil also counts many more POS than Mexico does, on a per habitant basis, and its telecom infrastructure reaches more of its citizens. Designing robust credit underwriting models may be easier in Mexico given the greater credit history coverage and the positive credit bureaus. The country also has fewer direct

financial substitutes. However, in terms of payment substitutes, Mexicans are more divided across forms of payment. In Brazil, the credit card is the preferred means of transaction.

As for cardholders, both Mexicans and Brazilians lack adequate financial education. They display irrational behavior, fall prey to offers such as installments and are unaware about the interest rates on their cards. An issuer looking to differentiate its product in either market may find it difficult given the overall population's poor financial education and the great number of credit card products that already exist. A new issuer would have to come up with a radically different value-proposition for its product to not be commodity-like. As for technological propensity, Brazilians are currently more digitally inclined. But, Mexico, with its average age of 27 is showing strides in that direction.

In terms of profitability, and as mentioned above, the main sources of revenue for an issuer is: interest fees, interchange fees and other general fees. Although, Mexico may seem like a more profitable market given its much greater percentage of revolving customers, it may not necessarily be the case. The average revolving APR in Mexico is about 30% and in Brazil it's 400%, or 13 times greater. Thus, even though there are four times more revolvers in Mexico, the difference in rates remains much greater. What's more, interchange revenue is much more interesting in Brazil (3-6%), compared to Mexico where it is 0-4.5%. Finally, another important fee which is the annual fee, can go up to an amount which is more than three times greater in Brazil than it is in Mexico. The distribution of classic to premium cards is similar in either country. However, the premium card market is increasing in Brazil, and, usually, the interchange revenue and annual fees are greater for this product. Thus, assuming equal costs in both Mexico and Brazil, Brazil may be a better market in terms of profitability.

Overall, both countries display attractive traits and there is opportunity in both countries. The most important is for issuers to keep in mind consumer preferences and behavior, and invest in technology in order to remain on top of the shifts occurring in the industry.

8.2. Challenges and Limitations of the Study

As explained in the introduction, the comparative study has its limitations since each country has different ways of collecting data. What's more, it was not always possible to find the same information for both countries, nor across the same years. Thus, the situation may have changed in either country since the information was last collected. Furthermore, different

sources, at times, yielded very different statistics, especially in Brazil. In fact, precise information about credit cards was much more difficult to come by for this country than in Mexico. This may be indicative of something else, i.e. poor transparency in this sector. If this is true, then this is a worrisome indicator, and a deterring factor from entering this market.

8.3. Implications for Further Research

Interesting future research would be case studies about new credit card companies entering either market and the challenges they faced. Although the present dissertation offers numerous real life examples, it does not provide the full story of any given card issuer in Brazil or Mexico.

10. REFERENCES

ABECS. (2015). *Monitor, 1ˢᵗ Semester 2015*.

Allpago. (2016). *Online Payments in Brazil a Business Case by allpago.*

Allpago. (2016). *Online Payments in Mexico a Business Case by allpago*.

Alvarenga, B. R. (2006). *A regulação do mercado de cartões de crédito no Brasil: uma análise à luz da Teoria dos Jogos.*

Ausubel, L. M. (1999). *Adverse Selection in the Credit Card Market*.

Banco Central do Brasil. (2014). *Relatório de vigilância do sistema de pagamentos brasileiro 2014.*

Banco de México. (2013). *Reporte sobre las condiciones de competencia en el mercado de emisión de tarjetas de crédito*.

Banco de México. (2015a). *Reporte sobre el Sistema Financiero*. Retrieved from: www.banxico.org.mx

Banco de México. (2015b). *Reporte sobre las condiciones de competencia en el otorgamiento Reporte sobre las condiciones de competencia en el de crédito a las pequeñas y medianas empresas (PYME) crédito a PYMES.*

Baxter, W. (1983). Bank Interchange of Transactional Paper: Legal Perspectives. *Journal of Law and Economics. 26*: 541-588.

Bazolli, A. (2016). Crédito para empresa cai ao nível de 2004. Retrieved from: http://www.televendasecobranca.com.br/credito/credito-para-empresa-cai-ao-nivel-de-2004-56442/

BCG. (2015). *Is It Mexico's Moment? Preparing for the Inevitable Consumer Boom*.

Becker, G. (1992). The Economic way of Looking at Life. *Revista Universidad EAFIT. 29(89).* 7–21.

Bellamy, E. (1996). *Looking backward.* New York: Dover Publications.

Bott, R. (2010). *Report on the Brazilian payment card industry*.

Brazil Demographics Profile 2014. (2015). Retrieved from:
http://www.indexmundi.com/brazil/demographics_profile.html

Brazil Overview. (n.d.). Retrieved from: http://www.worldbank.org/en/country/brazil/overview

Brazil's fall. (2015). *The Economist*. Retrieved from:
http://www.economist.com/news/leaders/21684779-disaster-looms-latin-americas-
biggest-economy-brazils-fall

Brito, Dagobert L., & Peter R. Hartley. (1995). Consumer rationality and credit cards. *Journal of
Political Economy*. 400-433.

Brown, T., & Plache, L. (2006). *Paying with Plastic : Maybe Not So*.

BTGPactual. (2015). *Brazilian Payment Industry*.

Buro de Crédito.(n.d.). Quienes somos. (n.d.). Retrieved from:
https://www.burodecredito.com.mx/quienes-somos.html

Calem, Paul S., y Loretta J. Mester, 1995, Consumer behavior and the stickiness of credit- card
interest rates, *The American Economic Review*, Vol. 85 No. 5 December.

CardMonitor. (2008). *Manual de lançamento de um cartão*.

CardMonitor. (2015). *Indicadores de Crédito*.

CEPAL. (2006). Competencia Bancaria en México. *Estudios Y Perspectivas*, 62 (México D.F.),
1–93. Retrieved from: http://www.cepal.org/publicaciones/xml/5/27295/L722.pdf

CIA World Factbook. (2015). Retrieved from: https://www.cia.gov/library/publications/the-
world-factbook/geos/mx.html

Como funcionam os cartões de crédito. (2012). Retrieved from:
http://www.mundodosbancos.com/cartoes-de-credito/

Conceição, A. (2015). Mercado prevê inflação de 10,04% e queda de 3,1% para economia em
2015. *Valor*. Retrieved from: http://www.valor.com.br/brasil/4317158/mercado-preve-
inflacao-de-1004-e-queda-de-31-para-economia-em-2015

Conciliadora. (n.d.). A historia do cartão de crédito. Retrieved from:
http://www.conciliadora.com.br/blog/a-historia-do-cartao-de-credito/

Cordova, C. (2015). Préstamos prendarios llegan a Internet. *El Economista*. Retrieved
from:http://eleconomista.com.mx/sistema-financiero/2015/04/14/prestamos-prendarios-
llegan-internet

Credit Card Acquirers in Brazil. (2015). Retrieved from: http://techinbrazil.com/credit-card-
acquirers-in-brazil

DDM Staff. (n.d.) Condusef recomienda: La historia de las tarjetas de crédito. (n.d.). Retrieved
from: https://www.diariodemorelos.com/article/condusef-recomienda-la-historia-de-las-
tarjetas-de-crédito-parte-2-de-2

DeGennaro, R. P. (2006). Merchant Acquirers and Payment Card Processors: A Look inside the
Black Box. *Economic Review*, *91(1)*, 27–42. Retrieved from:
http://papers.ssrn.com/abstract=904027

Economic indicators. (2016). Retrieved from: http://www.bcb.gov.br/?INDICATORS

Economist Intelligence Unit. (2013). Country Report - Mexico.

El origen del plástico. (n.d.). Retrieved from:
http://www.condusef.gob.mx/Revista/index.php/credito/tarjeta/200-el-origen-del-plastico

eMarketer. (2015). Brazil Ranks No. 10 for Retail Ecommerce Sales Worldwide. Retrieved from:
http://www.emarketer.com/Article/Brazil-Ranks-No-10-Retail-Ecommerce-Sales-
Worldwide/1011804#sthash.aEVktq3x.dpuf

Erhardt, W. El crédito prendario. (2014). *Forbes México*. Retrieved from:
http://www.forbes.com.mx/el-credito-prendario/

Estados Unidos começam, enfim, a adotar cartão de crédito com chip. (2015). *Veja*. Retrieved
from: http://veja.abril.com.br/noticia/economia/estados-unidos-comecam-enfim-a-adotar-
cartao-de-credito-com-chip/

Evans, D.; Schmalensee R., Paying with Plastic: The Digital Revolution in Buying and
Borrowing. Second Edition, *The MIT Press*, London, 2005.

FAQ - Cartão de Crédito. (n.d.). Retrieved from:
http://www.bcb.gov.br/?CARTAODECREDITOFAQ

Forbes Staff. (2014). 40% de las tarjetas de crédito son víctimas de fraude. Retrieved from:
http://www.forbes.com.mx/40-de-las-tarjetas-de-credito-son-victimas-de-fraude/

Furlan, R. (2007). *Motivos da rejeição do uso do cartão de crédito pelos clientes do Banco do Brasil*. Retrieved from: http://www.lume.ufrgs.br/handle/10183/14190

Garrido, S. G. C. and D. (2010). *Tenencia y uso de tarjetas de créditos en México. Un análises de los datos de la Encuesta Nacional de Ingresos y Gastos de los Hogares 2006.*

Gerens. (2012). *Análisis de la falta de Competencia en el Mercado de Adquirentes de Tarjetas de Crédito y Débito Bancarias*.

Green, E. J., Marshall, R. C., & Marx, L. M. (2013). *Tacit Collusion in Oligopoly*.

Grüne-Yanoff, Till (2012). *Paradoxes of Rational Choice Theory*. Handbook of Risk Theory. pp. 499–516

How corrupt is your country? (2014). Retrieved from:
https://www.transparency.org/cpi2014/results

IBGE Censo 2010. (2010). Retrieved from:
http://www.censo2010.ibge.gov.br/sinopse/index.php?dados=12

Inflation Mexico 2015. (2015). Retrieved from: http://www.inflation.eu/inflation-rates/mexico/historic-inflation/cpi-inflation-mexico-2015.aspx

IMF. (2015). Brazil: IMF Country Report.

Juro do crédito sobe pela 15ª vez e cartão tem maior taxa desde 1995. (2016). *Valor*. Retrieved from: http://www.valor.com.br/financas/4382710/juro-do-credito-sobe-pela-15-vez-e-cartao-tem-maior-taxa-desde-1995

Kahneman, D., & Tversky, A. (1981). *The Framing of Decisions and the Psychology of Choice.*

Karger, H. (2005). *Shortchanged: Life and Debt in the Fringe Economy*. San Francisco: Berrett-Koehler

Kim, W. C., & Mauborgne, R. (2005). Blue ocean strategy: How to create uncontested market space and make the competition irrelevant. Boston, MA: Harvard Business School Press.

Klee, E. (2006), Families' Use of Payment Instruments Du ring a Decade of Change in the U.S. Payment System. *Finance and Economics Discussion Paper*. Board of Governors of the Federal Reserve System.

Luis, J., & O'Dogherty, P. (2004). *Estructura y competencia en el mercado mexicano de tarjetas de crédito.*

Login Imprensa. (2015). Retrieved from: https://www.spcbrasil.org.br/imprensa/pesquisas/732-52milhoesdebrasileirosusamocartaodecreditocomoformadepagamentodizspcbrasil

Marcelino, F. (2015). Brazil Gives Borrowers with Record Debt a Lifeline: More Credit. *Bloomberg*. Retrieved from: http://www.bloomberg.com/news/articles/2015-07-30/brazil-gives-borrowers-with-record-debt-a-lifeline-more-credit

Martello, A. Juro do cheque especial fecha 2015 no maior patamar em quase 21 anos. (2016). *Globo*. Retrieved from: http://g1.globo.com/economia/seu-dinheiro/noticia/2016/01/juro-do-cheque-especial-fecha-2015-no-maior-patamar-em-quase-21-anos.html

MasterCard - What we do. (2015). Retrieved from: https://www.MasterCard.us/en-us/about-MasterCard/what-we-do/interchange.html

MasterCard. (n.d.). Información para comercios NO afiliados. Retrieved from: http://www.mastercard.com.mx/site/downloads/Comercios-no-afiliados.pdf

McAndrews, J. J., & Wang, Z. (2012). *The economics of two-sided payment card markets: Pricing, adoption and usage.* Federal Reserve Bank of Kansas City Research Working Paper, (08-12).

Mester, L. J. (2006). *Changes in the Use of Electronic Means of Payment: 1995-2004*. Federal Reserve Bank of Philadelphia Business Review 2, pp. 26-30.

Morgan Stanley, & alphawise. (2012). *Getting Ready for Credit Cards: An AlphaWise Survey of Brazilian Cardholders (Vol. 1).*

Negrín, J. L., & O'Dogherty, P. (2004). *Estructura y competencia en el mercado mexicano de tarjetas de crédito.*

Nielsen Report. (2015). *Brazil Credit Card Statistics. Internal Report*.

Nóticias. (2016). Segmento deverá crescer em 2015. Retrieved from:
http://www.abecs.org.br/noticia/comercio-eletronico-deve-crescer-18-e-faturar-r-56-8-bi-em-2016

Papp, A.C. Gerbelli, L.G. (2015). Taxa de desemprego no Brasil deve atingir 10% em 2016.
(2015). EXAME. Retrieved from: http://exame.abril.com.br/economia/noticias/taxa-de-desemprego-no-brasil-deve-atingir-10-em-2016

Pesquisa diz que usuários de cartão não sabem administrar o crédito. (2015). Globo. Retrieved
from: http://g1.globo.com/sao-paulo/sao-jose-do-rio-preto-aracatuba/noticia/2015/06/pesquisa-diz-que-usuarios-de-cartao-nao-sabem-administrar-o-credito.html

Pew Research - Immigration. (n.d.). Retrieved from:
http://www.pewresearch.org/topics/immigration/

Pomerancblum, G. (2015). Brazil's current account deficit to narrow. (2015). Retrieved
from:http://www2.anba.com.br/noticia/21869997/macro-en/brazils-current-account-deficit-to-narrow/

Ponce, A., Seira, E., & Zamarripa, G. (2009). *Do Consumers Borrow on Their Cheapest Credit
Card? Evidence From Mexico*.

Ponce, A., Seira, E., & Zamarripa, G. (2014). Borrowing on the Wrong Credit Card: Evidence
from Mexico. *Banco de México Working Papers*.

Porter, Michael E. "The Five Competitive Forces That Shape Strategy." Special Issue on HBS
Centennial. Harvard Business Review 86, no. 1 (January 2008): 78–93.

Pronina, L. Beardsworth, T. (2015). China, Brazil Among Emerging Markets at Risk of Bank
Crisis. *Bloomberg*. Retrieved from: http://www.bloomberg.com/news/articles/2015-09-13/china-brazil-among-emerging-markets-at-risk-of-banking-crisis

Rapoza, K. (2015). The Likely Fallout from Brazil's Investment Grade Loss. (2015). *Forbes*.
Retrieved from: http://www.forbes.com/sites/kenrapoza/2015/12/22/the-likely-fallout-from-brazils-investment-grade-loss/

Ribeiro, F., Mazetto, D., Filho, E. M. G., Curi, A. Z., & Arashiro, T. (2011). *Análise econômica
dos benefícios advindos do uso de cartões de crédito e débito*.

Rocha, P. G. A. J. S. (2007). O Consumidor e o cartão de: valores esperado e real da fatura e intenção de reutilizar esse meio de pagamento.

Rochet, J., & Tirole, J. (2005). *Two-Sided Markets : A Progress Report*.

Rosenberg, J. (n.d.).The Incredible True Story of the Very First Credit Card. (n.d.). Retrieved from: http://history1900s.about.com/od/1950s/a/firstcreditcard_2.htm

Rudnick A. (2012). A philosophical analysis of the general methodology of qualitative research: a critical rationalist perspective. Health Care Analysis. Retrieved from: http://download.springer.com/static/pdf/930/art%253A10.1007%252Fs10728-012-0212-5.pdf?auth66=1406819622_300aa5c2d49d63821dd527f8ea66e9f7&ext=.pdf

Schneider, J. (2015). The Future of Finance Redefining "The Way we Pay" in the Next Decade. Goldman Sachs Global Investment Research, (January).

Schwartz, B. (2004). *The paradox of choice: Why more is less*. New York: Ecco.

Sempere, J. (2008). *Competencia en el mercado de tarjetas de pago en México*.

Serasa. (n.d.).Quem Somos. Retrieved from:http://www.serasaexperian.com.br/quem-somos/

SHCP, & CNBV. (2014). *Regulación de la redes de medios de disposición*.

Sistema financiero, educación. (n.d.). Retrieved from: http://www.banxico.org.mx/divulgacion/sistema-financiero/sistema-financiero.html

Steiner, S. (2013). The evolution of credit cards. Retrieved from: http://www.bankrate.com/finance/financial-literacy/the-evolution-of-credit-cards-1.aspx

Taraborelli, A. (2015). Apesar de acumular alta, compras no cartões desaceleraram em 2014. *Finanças*. Retrieved from: http://brasileconomico.ig.com.br/financas/2015-02-13/apesar-de-acumular-alta-compras-no-cartoes-desaceleraram-em-2014.html

Tecnocom. (2014). *Trends in Payment*.

Tradingeconomics - Mexico GDP Growth Rate. (2016). Retrieved from: http://www.tradingeconomics.com/mexico/gdp-growth

Unifisa. (n.d.). O que é Consórcio. Retrieved from: http://www.unifisa.com.br/o-que-e-consorcio

Vásquez, J. (2015). *Cómo desarrollar EMV para banca en canales virtuales : ¿instrumento de autenticación o sólo sistema de pago?*.

Vieira, M. (2004). Por uma boa pesquisa (qualitativa) em administração. In M. Vieira, & D.

Wang, Z. (2010). *Market structure and payment card pricing: What drives the interchange?*

World Bank Group. (2015). Getting Credit. Retrieved from:
http://www.doingbusiness.org/data/exploretopics/getting-credit

World Bank Group. (2016). *Global Economic Prospects Spillovers amid Weak Growth*.

World Payments Guide. (2015). Retrieved from:
https://www.pacnetservices.com/wpg/country.php?alpha2=BR