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Future of Finance

Fintech's Brazil Moment

Equity Research

Brazil's overbranched banking system is ripe for disruption by new entrants

The global trend travels to Brazil

"Fintechs," or companies that leverage technology to provide financial services, are starting to emerge in Brazil, bringing with them the potential to disrupt the country's branch-dependent market. In this report, we survey the ecosystem and size the opportunity for new entrants, while also exploring the likely response and implications for incumbents.

Why is Brazil different from other markets?

While fintech disruption has proven a common trend in many countries, we believe the Brazilian financial system is particularly susceptible. The banking market is concentrated relative to global standards, and penetration, by most metrics, lags developed peers especially in lower income classes. Prices for financial services and spreads for loans are also among the highest in the world. We believe this unique market structure positions fintechs to have a larger impact in Brazil than in other developed markets.

Why are fintechs becoming more relevant now?

Several trends are converging that are likely to boost fintechs' relevance. Recent mergers have concentrated the financial system further, increasing the appeal for new entrants. Smartphones and internet access—key delivery mechanisms for fintech—are also increasing rapidly as Brazil's tech-savvy generation comes of age. We see fintechs taking an increasing share of mind against this backdrop, even if their share of wallet starts out small.

200+ fintechs with a potential revenue pool of R$75 billion

We identify a potential revenue pool of R$75 billion over 10 years for the more than 200 fintechs currently operating in Brazil. We examine several models for fintech services, with a special focus on credit card company NuBank and an interview with digital bank Banco Original. We also take a high-level look at increased venture capital activity in the space.

Incumbents to respond with IT investment, efficiency gains

We expect large Brazilian banks to respond to fintechs in part by copying the disruptive products but more so by increasing IT investment for greater operational efficiency. While incumbents are still likely to lose share to fintechs long-term, we see benefits to this investment. We believe they can improve ROE 300-600 bp by shifting 50% of their clients to digital platforms.

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Future of Finance series

This report is the latest in our series exploring the technology, regulation and new business models changing the shape of finance, and the implications for consumers and the industry. See inside for more.

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The prices in the body of this report are based on the market close of May 11, 2017.

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The Future of Finance

Technology, regulation and new business models are changing the shape of finance. From shadow banks to new tech platforms, an evolving class of competitors is emerging to go after the profit pools of traditional lenders and institutions. In a series of reports on the **Future of Finance**, we explore what these trends mean for how companies and consumers bank, lend, borrow and pay.

The Rise of the New Shadow Bank, March 3, 2015
Redefining the 'Way We Pay' in the Next Decade, March 10, 2015
The Socialization of Finance, March 13, 2015

PM Summary: The emergence of the Brazilian fintechs… and what it means to banks and other financials

Much as in other countries around the world, fintechs (companies that leverage technology to provide financial services) are starting to emerge in Brazil. They are spurred by increasingly favorable conditions, which should make them progressively more relevant to investors focusing on the financial sector. In this report, we examine how this transition will take place, why it will be different from those in more developed markets, why we see now as a starting point and how incumbents will respond. We also canvass the segments in which we see most fintech activity.

With time, we see fintechs capturing a relevant share of the financial services market, and being one of the main drivers of growth and penetration, as well as an agent to lower spreads and fees. Given the dynamics of the Brazilian market (concentration, penetration and pricing) we see this evolution happening differently from what has occurred in other markets, both developed and developing. In our view, the rise of fintechs is likely to spur incumbent banks to invest heavily in IT, reducing costs and improving efficiency. Even if in the short term fintechs are more likely to grab share of mind than share of wallet, we see their impact starting now.

Why is Brazil different? Market concentration, limited penetration and pricing

The impact of disruption in any market depends, in large part, on the shape of that market. In Brazil, we see conditions in place for technology-driven disruption to have a larger impact than in some developed markets, such as:

- **An oligopolistic market structure.** The top five banks in Brazil (excluding the development banks) hold 84% of the total loans in the system. The Herfindahl-Hirschman market concentration index for Brazil is in the top half of the range when compared to markets in other countries. This concentration is particularly evident in branch banking, where the top five banks have 90% of the branches. With the traditional distribution of financial services being disrupted by new technologies, thus breaking down barriers to entry, large banks in Brazil would seem to be more vulnerable to new entrants than peers in other countries.
- **Limited penetration, especially in low income.** Penetration of banking services in Brazil is low compared to global standards, though relatively close to peers in the same region and at the same development level. Penetration is lower, even relative to peers, when considering the usage of online/mobile means to make financial transactions. We see barriers to penetration arising from culture, regulation and market structure, all of which could be overcome by penetration of technology and the aging/education of the population.
- **Expensive pricing for loans, other financial services.** Interest rates on loans in Brazil are among the highest in the world, and fees for services also are expensive by comparison to those charged by banks for similar services in similar countries. We believe the problem is one of limited information, which increases risk and reduces the incentives for new competition. We see new technology helping to make information more widely available for bank clients and potential entrants, ultimately driving pricing downwards.

Fintech Spotlights Inside

The e-banking startup

Banco Original (p. 21)

Q&A, Guilherme Stocco Filho, Director of Innovation

The model: Small traditional wholesale bank that migrated to a full-service virtual retail model in 2015.

"Soon you will be able to open a bank account in the same way that you open your Facebook account, and that changes everything."

The bankless lender

NuBank (p. 25)

Company vignette

The model: The simple, free credit card startup partnering with banks to expand access to lending. It's already gained a reputation as a trustworthy and efficient provider—no small feat in Brazil.

Our take: NuBank's development followed a path that we believe may be replicated in other financial services segments—spurring incumbents to respond.

The evolving incumbent

Itaú Unibanco (p. 29)

Q&A, Livia Martines Chanes, Director of Digital Channels, User Experience & CRM analytics

The model: Leading bank in Brazil that has invested heavily in IT to better serve its clients.

"There is a strong change movement in our clients' behavior, which relates to the fact that people are, regardless of age, more connected to the digital world."

Why now? Convergence of increasing concentration, improving technology and recovering economic activity

We see conditions for fintechs to emerge in Brazil – both cyclical and structural – falling into place. Of these, we highlight:

- **Concentration has increased.** Over the last 15 years, the level of concentration in the Brazilian market has increased, boosting the attractiveness of the market for new entrants that use disruptive technology.
- **Growing smartphone and internet penetration.** The number of internet users in Brazil has grown 11% per year since 2003 (compared to a global average rate of 9%). At the same time, in 2015 86% of Brazilian adults owned a mobile phone, up from 73% in 2010, with 48% of all mobile phones considered smartphones, up from 19% in 2013. With many of the fintech platforms using smartphones as the delivery method for their services, the continued expansion in penetration is important.
- **A demographic bonus now coming of age.** The average age of the population in Brazil is rising, as the demographic bonus from the 1990s continues to age. As this generation enters its most productive and cash-generating years, it should also become more frequent users of financial services. At the same time, this generation is more educated and more technologically inclined than prior generations, which should help the acceptance of internet and mobile-based fintech solutions.
- **A recovering economy.** The Brazilian economy has contracted in real terms for the last three years, but is now emerging from the downturn. While investment and interest in new technologies was de-emphasized during the downturn, we expect these topics to assume a more prominent role as the economy recovers. Greater wealth should lead to more demand for solutions to manage, intermediate and deploy wealth.

Fintechs of all shapes and sizes

Different fintech associations count at least 210 different fintechs in Brazil, the largest number in Latin America, up from 54 in 1H2015. For the most part, these companies are located in the state of São Paulo and operate exclusively in Brazil, though the main technology used is fairly mixed, as are the final customers. We estimate that these companies are targeting a total revenue pool of R$75 billion in 10 years, across several different niche markets (with R$50 billion in four banking-related segments, and R$25 billion in insurance).

We feature a case study for NuBank, a successful new credit card company that leverages technology to identify and capture clients, and an interview with Guilherme Stocco Filho, the Head of Innovation for Banco Original (an online-only bank).

Exhibit 1: Fintechs spread through various niches and industries; we identify a potential revenue pool of R$75 billion
Breakdown of key fintech segments

Area	Rationale	Potential revenue pool in 10 years (R$ billion/yr)	Companies in Brazil	Comparables in US
Banking services	The Brazilian banking market is highly concentrated, which increases costs and limits penetration. Regulation and technology are breaking down barriers to entry related to distribution, clearing the way for new entrants that could shrink asset and liability spreads and increase penetration. Model would extend from full-service virtual banks to simple e-wallets.	**50**	Banco Original, Banco Neon, Zuum, Conta Um, E-dinheiro	ING Direct
Payments	Despite Brazil being in one of the most developed markets in Latin America, the Brazilian payments system is concentrated and offers limited functionality given older technology. New entrants leverage the latest technology in acquiring, payment processing, and money transfers, with solutions both in the P2P and B2B spaces.	**12**	Stone Pagamentos, PicPay, ValePresente, Ta Pago, PagPop	Venmo, Square, Braintree, Google Wallet
Personal finance management	Brazilians have historically had limited tools with which to manage personal finances, which has led to a greater usage of expensive loans and a poor allocation of resources. Companies are using internet-based solutions to help users manage accounts and renegotiate loans, as well as to provide market places for new loans and savings products.	**6**	GuiaBolso, Quero Quitar, Konkero, Organizze, Quanto Gastei, Poupa Certo, Meu Dinheiro, Ghaio Kitado, Acordo Certo	Credit Karma, Mint, Earn Up
Lending	The average annual lending rate in Brazil is 32%, but can reach up to 15% per month for certain personal loans. Part of this is driven by the limited amount of information borrowers and lenders have on each other, as well as shortcomings in distribution. Companies are using internet and mobile-based platforms, along with innovative business models, to bridge the gap between savers and borrowers, both within and outside the financial system.	**22**	NuBank, Geru, Nexoos, Credisphera, BKF Online	Lending Club, Sofi, Affirm, LendingTree, Credible, Lendio, Fundera
Investments, savings, wealth management, trading	Saving money in Brazil, particularly for the lower income strata, has been left to retail banking products with low yields, a result of limitations in distribution and information, as well as market concentration. Through user-friendly online platforms, new companies are offering clients alternatives to invest in equity and fixed income products, either directly or indirectly through comparison tools that highlight advantages and disadvantages of each product.	**10**	Magnetis, Órama, SmartBrain, Investeapp, Verios, SmarttBot, Warren, Easynvest, Yubb, Renda Fixa, Meus Ynvestimentos, controlAção	Betterment, Wellfront, Ellevest, Envestnet, Fundrise
Insurance	The insurance sector in Brazil has modest penetration as a result of high levels of real interest rates as well as limited distribution. While new companies cannot fight the problems created by high interest rates, they are seeking clients through smart, online distribution platforms, and improving underwriting efficiency by using a combination of big data and traditional actuarial practices.	**25**	Bidu, Thinkseg	PolicyGenius, Trov, Cuvva, Everquote, Onsurance, Insurify, Esurance

Source: Goldman Sachs Global Investment Research.

How will the banks respond?

We expect the large Brazilian banks (Itaú Unibanco, Bradesco, Banco do Brasil and Santander Brasil) to respond to the changing environment created by fintechs and their disruption.

One response will be to mimic the solutions developed by fintechs. This can happen by copying products almost entirely, such as the Bradesco/Banco do Brasil Digio card, or by rolling out digital-based platforms, like Itaú Unibanco's virtual bank. Banks can also replicate fintech marketplaces to their customers. Another response, which appears more cooperative, would be to bankroll fintechs by providing funding or hiring their services.

Banks are already engaged in a second approach: Using IT to improve operations. Banks have historically invested heavily in technology, and the emergence of fintechs should accelerate investments further. By shifting clients onto a digital platform, banks can close down branches and reduce headcount. We estimate that by shifting 50% of clients to a digital platform, annual bank ROE would increase, all else equal, by 300 to 600 bp. Furthermore, better information provided by technology should allow for better scoring of risk, which should in turn improve loan underwriting standards. This should also increase the addressable market for financial services, ultimately increasing penetration.

We feature an interview with Ms. Livia Martines Chanes, Director of Digital Channels, User Experience and CRM Analytics at Itaú Unibanco, a bank we consider to be at the forefront of change for Brazilian banks.

Ultimately, we expect the market for financial services in Brazil to become more efficient and more diverse. As such, we expect the change to:

- **Break down barriers to entry.** New distribution channels, driven by mobile internet, should break down barriers to entry created by branches. This would allow for more intense competition between incumbent banks and new fintech entrants.
- **Foster competition, lower spreads/prices.** Increased competition should lead to pressure in pricing for both loans and services. Marketplaces for loans and savings products reduce the information gap between banks and clients, leading to more competitive pricing for banking products.
- **Drive penetration.** The combination of a more powerful distribution tool (mobile phones) with competitive pricing should help to improve penetration. Outsiders that were priced out of the market or excluded because of distribution would be able to find an entry point. New solutions for niche segments, made economically viable by cheaper distribution, would attract others.
- **Change in client habits.** Over time we expect the habits of bank clients, who are highly branch dependent on a relative basis despite quick adoption of mobile banking, to change. Confidence should increase and feed further growth, adding speed to the transformation.

As a result, in ten years we expect incumbent banks to lose market share, but more so because newcomers will grow at a faster pace than because of an increase in the overall size of the market. We also expect spreads/fees to tighten, but see banks offsetting this by becoming more efficient as a result of migrating to digital platforms or otherwise employing technology more productively. Thus, we do not expect significant pressure on growth or profitability for large retail banks, despite market share loss and price pressure. In other words, we expect the overall profits within the system to increase, reflecting largely the greater penetration of financial services, and improved efficiency in delivery. As a result, the financial system should become more diverse and more efficient while remaining profitable.

BRAZIL'S BANKING SYSTEM in numbers

The System Today

UNDERBANKED POPULATION

12% (13% global avg) — Share of the population over age 15 that borrowed in the last year. (p. 11)

14% (21% global avg) — Percentage of the banked population that uses their account frequently. (p. 11)

12% (23% global avg) — Share of the population over age 15 that has saved at a financial institution. (p. 11)

OVERBRANCHED, AT A COST

90% — The percentage of Brazil's branches owned by the top five banks. The market has become more concentrated since the financial crisis: in 2007, the same statistic was 71%. (p. 9)

47 — The number of bank branches per 100,000 adults in 2015, making Brazil one of the most "branched" systems in the world. The branches are well-used, however; Brazil has the highest share of population reporting they go to a branch more than five times per quarter. (p. 10)

50% — The share of bank administrative expenses related to branch operations. (p. 28)

LENDING PAIN POINTS

50% vs. 12%

The interest rate Brazilian banks charge on loans, vs. the rate they offer depositors on savings. The lending spread, which signals a high cost of borrowing and high opportunity cost of saving, is greater only in Malawi and Madagascar. (p. 12)

57%

The share of total lending that government-owned Brazilian banks held at their peak (July 2016). This share growth has put pressure on capital levels, which are lower at government banks than at private institutions. (p. 19)

THE LONG ROAD…

-3.6%

Brazil's real GDP growth in 2016, the second-straight year of economic contraction. (p. 19)

The Future & Fintech

RO'e'

300-600 bps

The amount we estimate banks' return on equity could improve by shifting half their clients to digital platforms, all else equal. The technology should also allow for better scoring of risk, underwriting standards and overall use of banking services. (p. 28)

40% higher

The potential boost to operating income incumbents could expect from digital clients vs. traditional branch clients, in Itaú Unibanco's estimates. (p. 28)

TO RECOVERY

2.7%

Our economists' forecast for real GDP growth in Brazil in 2019, after returning to expansion this year. This should support the uptake of fintech. (p. 19)

NEW ENTRANTS

200+ — The number of fintech companies already operating in Brazil. The largest share (31%) are in the digital payments space, but the pool is diversified. (p. 4)

Why will the path in Brazil be different? Market concentration is high, penetration is limited, pricing is expensive

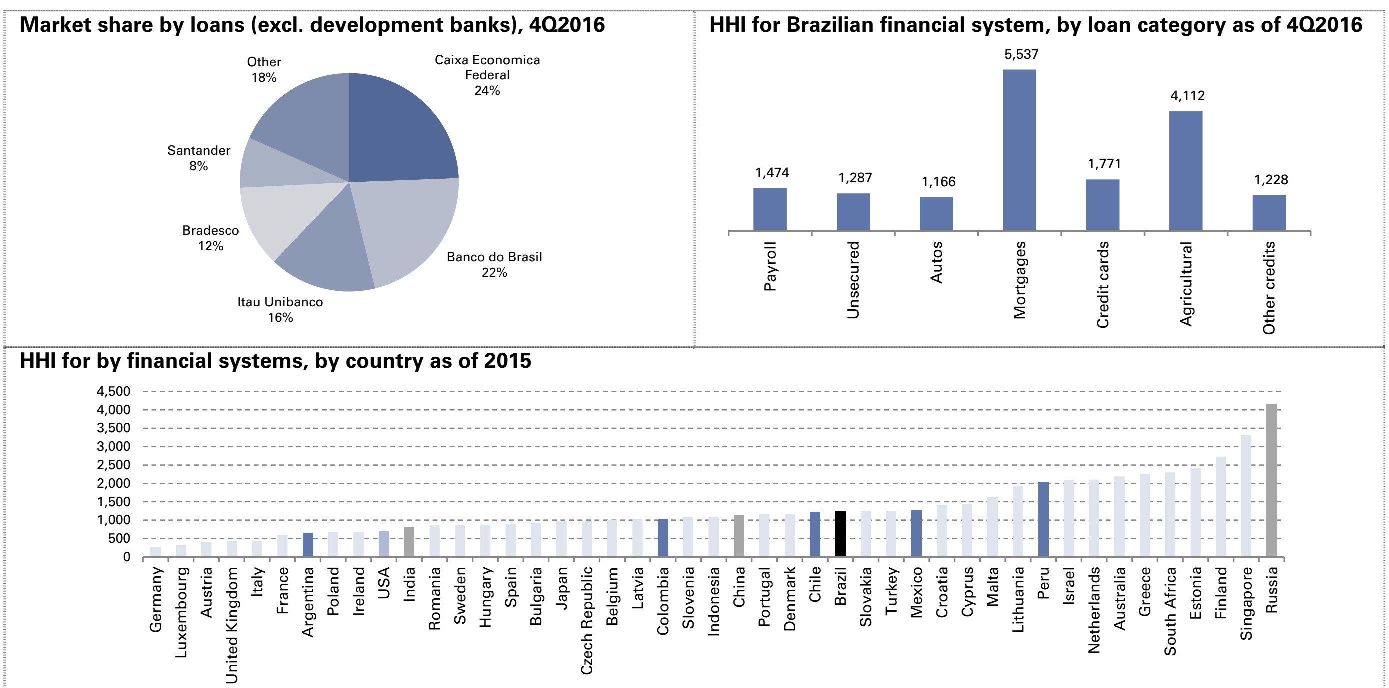
In the *Future of Finance* series, we have explored how changes in technology will affect financial markets and the way individuals secure products and services. In the United States, as well as the rest of the world, much of this evolution is driven by the shape of the market, as well as by regulation. These factors are different in Brazil, and as a result we expect them to have a differentiated impact. We see three main differentiating factors: market concentration, limited penetration of financial services, and pricing of products and services.

Concentration of the financial services market: Creating opportunities as barriers to entry are overcome

The Brazilian banking market is relatively concentrated when compared to other markets globally, and highly concentrated when compared to financial markets in more developed countries. The top five banks in Brazil (excluding BNDES, the state-owned national development bank) hold 84% of total loans, which although in line with some regional peers, is high compared to peers in more developed markets. Likewise, concentration in certain loan categories is high, especially in categories in which government banks have a large share (mortgages and rural).

Another way to measure concentration is through the Herfindahl-Hirschman index (HHI). While not a perfect metric of competition, it captures market concentration, with 10,000 representing a perfect monopoly and 1 representing perfect competition. The HHI for Brazil's financial system is at the upper end of the scale compared to global peers, and while it does not come off as high as financial sectors in some developing countries, it is much more concentrated by this metric than financial sectors in most developed markets.

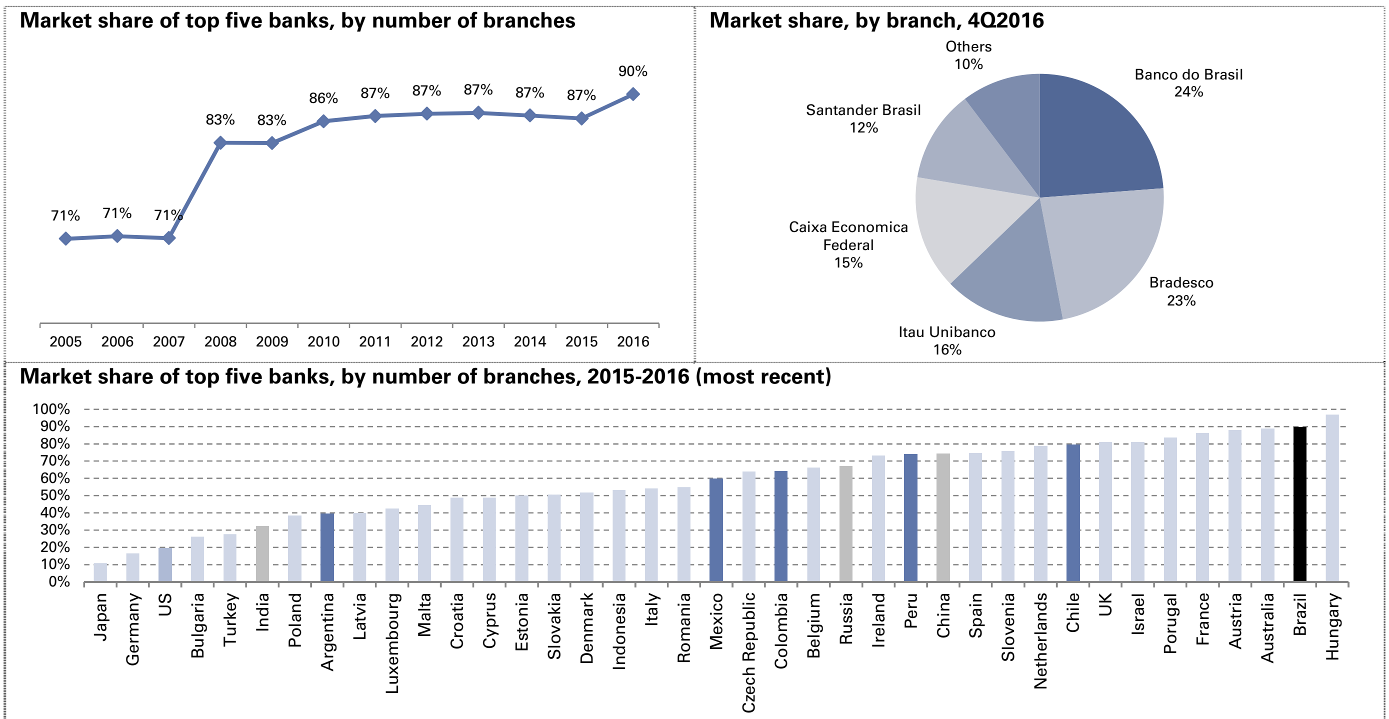
Exhibit 2: The Brazilian financial industry is concentrated relative to global peers, in general and per product
Key concentration metrics for Brazilian banks



Source: Brazilian Central Bank, European Central Bank

The level of concentration in Brazil has created barriers to entry to the market, largely based on distribution. To compete effectively in retail, banks need large distribution networks in order to capture deposits and reach potential clients. Banks that fall below that threshold generate suboptimal returns and have over time been merged into larger banks. Since 2005, Santander Brasil (at the time with 1,090 branches) acquired ABN Amro Brasil (at the time with 1,148 branches), Unibanco (at the time with 965 branches) merged with Itaú (at the time with 2,854 branches), Bradesco (at the time with 4,483 branches) acquired HSBC Brasil (at the time with 854 branches) and Itaú Unibanco (at the time with 3,843 branches) acquired Citi Brasil (at the time with 127 branches). Currently, the top five retail banks own 90.2% of all the branches in Brazil. This is up from 71% in 2005, and is high compared to levels for regional and global peers.

Exhibit 3: Concentration of market share by branches in Brazil is higher than by assets, and has been increasing
Brazil market concentration by branches



Source: Central banks or regulators by country, BIS Red Book, World Bank, SNL.

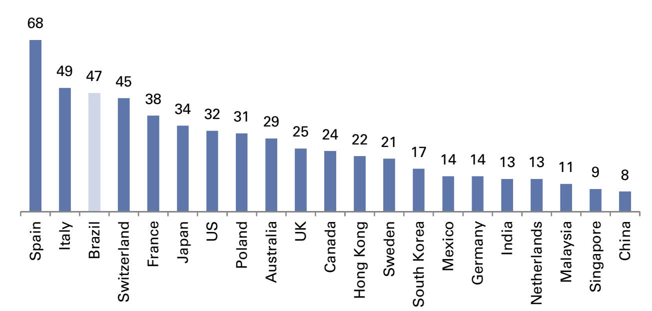
As highlighted in prior reports in the *Future of Finance* series, one of the main items disrupted by new technology is **distribution**. While large retail banks in Brazil attract and retain clients through a number of different means (e.g., service, branding, products and more recently, online service), the branch network is a powerful tool with which to anchor clients. By using a mobile app instead of going to a bank branch to transact in the financial sector, the barrier to entry created by branches can be surmounted. In our view, the relative concentration of the branch network in Brazil means the market is more vulnerable to disruption that affects distribution, and so the effects of disruption could be more visible than in other markets, such as the United States.

Penetration: Mixed, but with much room for improvement

On a global basis, penetration of financial services (% account ownership and usage, debit and credit card usage, propensity to save) is best explained by GDP/capita (R^2 is above 80%). That said, there are other factors that influence levels of penetration, such as culture, regulation and market structure.

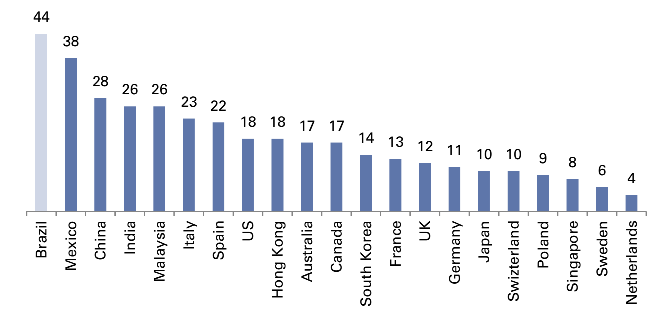
- **Culture.** In Brazil, branch banking is among the most widespread and intensive in the world. There are still significant numbers of branches relative to the total population (and even more relative to the banked population), and the average number of visits per client is higher than in most countries (see Exhibits 4 and 5). Part of this is driven by security concerns, given the relative safety a branch provides to transact. In our view, this limits access to financial services to those that have the time, money and desire to go to branches.

Exhibit 4: There are many branches in Brazil…
Commercial branches/100,000 adults, 2015



Source: Bain.

Exhibit 5: …that are most used than anywhere else
% of survey respondents that go to branches >5X/Q, 2015



Source: Bain.

At the same time, the informal culture in Brazil (companies and individuals that do not transact through formal channels to avoid taxes) contributes to keep people away from the financial system. The decline in informality over the last 15 years was a strong driver, in our view, to the sharp increase in penetration that took place over that period.

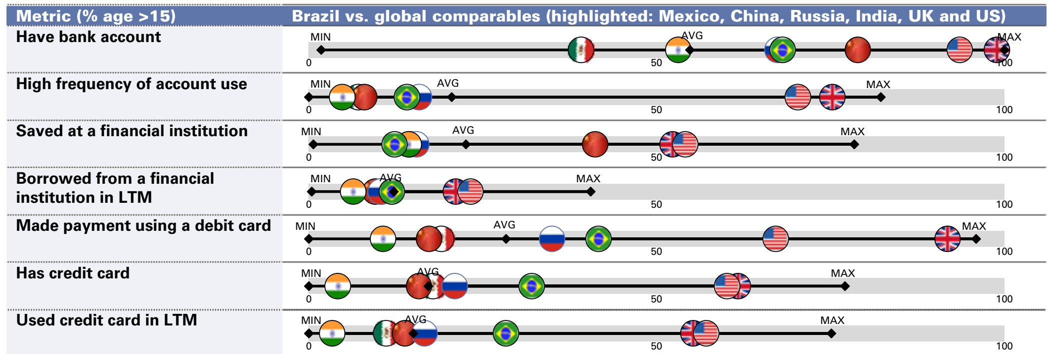
- **Regulation.** Regulation takes many forms, but in Brazil regulations can limit penetration by making certain potential banking clients unprofitable. While there are no interest rate caps on loans, there are a multitude of taxes, capital requirements and other regulation that push people away from transacting in the financial system. For instance, some microlenders avoid Brazil because the combination of regulation and taxes does not allow for adequate returns on risk.

- **Market structure.** The relative concentration at the top has worked, in our view, to limit the penetration of financial services into certain niches, and in particular the lower income segments of the economy.

All this considered, compared to other emerging market and developed market peers, overall penetration of financial services in Brazil is relatively low (Exhibit 6). While the penetration of bank accounts is above average, the bank accounts are not as frequently used as in other countries. Also, savings and borrowing levels are also below global standards. Where Brazil is at an advantage to emerging market peers, though still lagging developed peers, is in the payments space. Use of debit and credit cards is strong, having developed much in the last 10 years on the back of the interest-free installment feature available on most credit card purchases.

Exhibit 6: Outside of cards, penetration of financial services in Brazil is generally lower than global averages

Key financial services penetration metrics, 2015

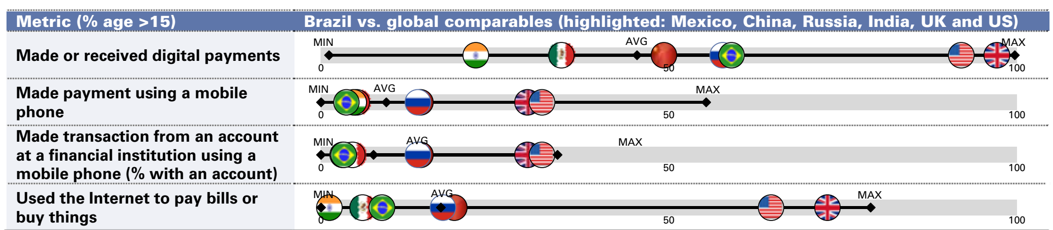


Source: World Bank.

Penetration is even lower when considering digital channels for banking. Brazilians make digital payments more frequently than peers (possibly as a result of bill payment technology that has been a staple for over 15 years). However, Brazilians make fewer mobile phone payments than peers (bank-related or not). Also, Brazilians use the internet less to make transactions (see Exhibit 7). Of course, this characteristic can also be a factor of the penetration of smartphones and the internet itself.

Exhibit 7: Brazilians use mobile phones for financial transactions less than peers

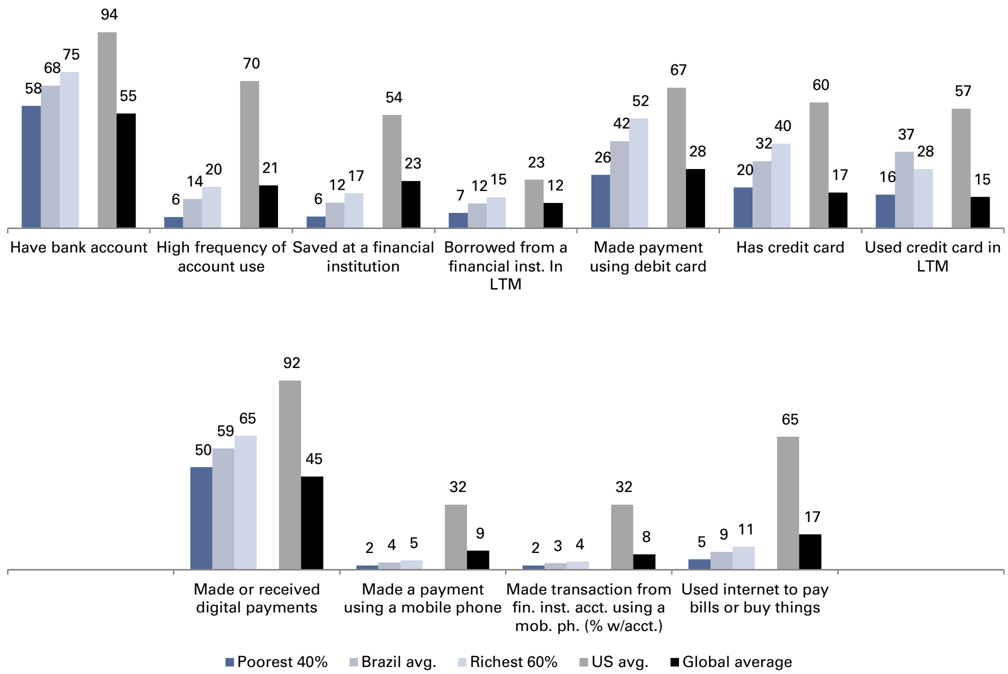
Key digital banking penetration metrics, 2015



Source: World Bank.

Penetration is even lower, however, in the lower-income parts of the population. By many metrics, the richest 60% of the population uses the financial system in line with or more than the global average (even if still well behind more developed peers). Although, the level of penetration for the poorest 40% of the population in Brazil falls well behind global averages in both penetration of overall financial services and digital financial services.

Exhibit 8: Penetration of traditional and digital banking is lower for lower income classes
Key financial services penetration metrics by wealth, % of people >15 years old, 2015



Source: World Bank.

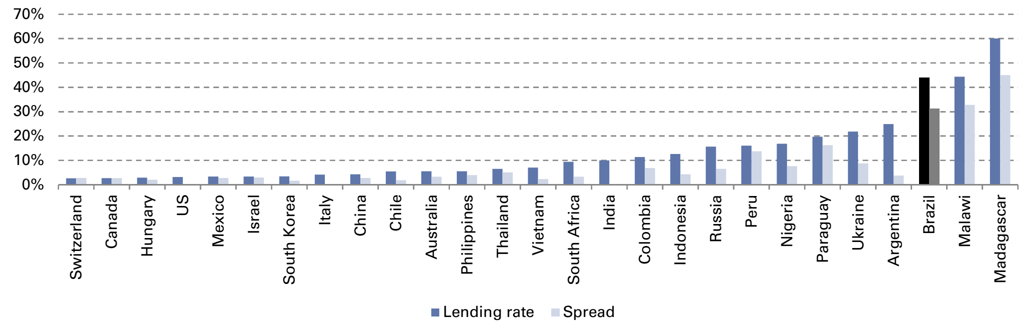
The opportunity for Brazil, in our view, lies in the further penetration of financial services and products into the entire economy. It would appear from the penetration data that the opportunity is more substantial for lower-income segments, which could see their access to financial services unlocked by technology.

Pricing: Expensive products, more expensive loan rates

Another feature of the Brazilian financial market is its cost. Loans are expensive to take, and generally rank high in terms of cost relative to global and regional standards.

Lending rates in Brazil are amongst the highest in the world. Comparisons of this sort are tricky given differences in mix, position in the rate curve, regulation and, more generally speaking, market structure (the World Bank, the source for these statistics, acknowledges the shortcomings). While absolute levels may be slightly or even moderately different, the overall position within the ranking should hold, and Brazil ranks close to the top. This is even clearer when comparing lending spreads (loan rates less deposit rates) as opposed to pure loan rates.

Exhibit 9: The cost of borrowing in Brazil is one of the highest in the world
Lending rate and spread per country, 2015

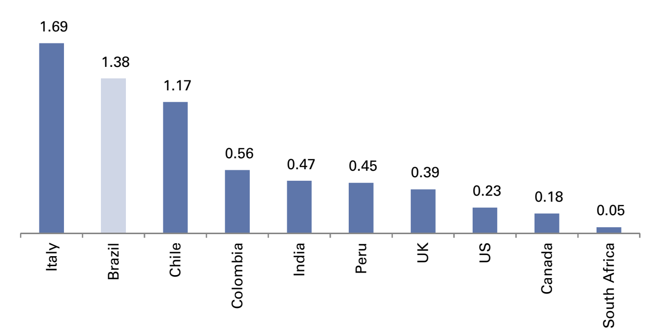


Source: World Bank.

There are specific reasons for rates and spreads in Brazil to be higher. Many have to do, as mentioned above, given regulation and taxes (particularly the latter). But others have to do with information, or the lack thereof. Brazil has a negative credit bureau (which tags the bad behavior of non-payers, but does not follow the good behavior of payers), but efforts to develop a positive credit bureau (which would reduce lending risks and spreads) have been mixed so far (though a more robust offering is in the works). Banks do not share borrower information with each other, thus increasing the chance of Type I and II errors. No information is shared with potential entrants, which limits competition by diminishing visibility on potential returns. Government is applying pressure on banks to lower spreads, but we believe competition – arising from disruptive technological advancements that improve the flow of information – would likely be more successful.

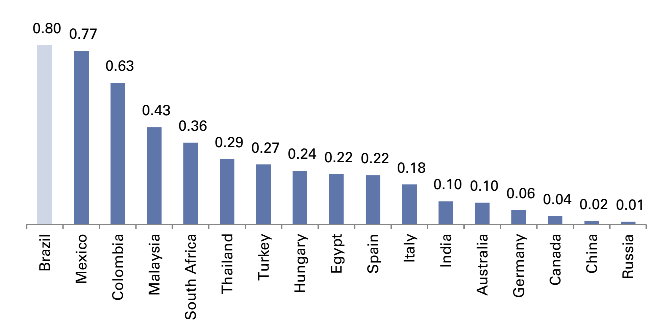
As for fees, consistent data are difficult to come by. Each country has a different set of regulatory requirements for basic services and pricing, and the degree of depth of these regulations also varies. Banks also provide discounts based on usage and account balance based on commercial strategy. As a result, there is no common basis for comparison, or even a database that catalogues bank fees across different countries.

Exhibit 10: Account maintenance fees in Brazil appear to be higher than those in other countries
Monthly account maintenance fee/GDP per capita, 2015-2016



Source: Company data, central banks, Goldman Sachs Global Investment Research.

Exhibit 11: Including income distribution also places Brazilian banks as one of the most expensive
Avg. bank fees / disposable income per capita x GINI coeff., 2015



Source: BCG.

Our analysis of average account maintenance fees (Exhibit 10) is based on data gathered from central banks and regulatory entities, as well as fees charged by the top banks in certain countries. Using GDP/capita as a measuring stick, it would appear that banks in Brazil charge relatively high account maintenance fees compared to peers – though we stress the relative position is more relevant than the actual figure. The Boston Consulting Group (BCG) also analyzed bank fees across several countries (Exhibit 11), comparing it to disposable income and the GINI coefficient – while the results are not exactly alike, Brazilian banks rank as expensive as well. This analysis also shows that the high fees affect the lower income population more disproportionately, stymying financial penetration.

In Brazil, in 2013 the central bank established basic services that are free of charge with every bank account (also at no monthly maintenance cost to the client). For additional services, the client would have to pay on an ad hoc basis or engage in one of four standard categories of basic checking accounts service packages (Exhibit 12). However, in many cases, the banks can waive fees for accounts that maintain a minimum balance or have payroll associated with them. Even thus, the account is not really free, as the maintenance fees associated with it would just go to subsidize another of the bank's businesses.

Exhibit 12: The amount of transactions included in standard service packages is limited
Number of transactions per month, average cost to client per package, 2017

Category	Checks	Withdrawals	Last 30 day statement	Other statement	Transfers to other banks	Transfers within bank	Average cost/ month (US$)
Basic	10	4	2	0	0	2	0.00
I	0	8	4	2	0	4	8.82
II	12	8	6	2	1	4	13.37
III	15	10	8	4	2	6	21.05
IV	20	12	8	4	3	8	26.85

Source: Brazilian Central bank.

Exhibit 13 shows the minimum, maximum and average fees charged for certain bank services in Brazil, as per the Brazilian central bank as of May 2017. When comparing the cost of these services to those rendered by banks in other countries, the differences in average wealth should be considered (GDP per capita in Brazil is US$8,500, while in the United States it is US$57,000).

Exhibit 13: Fees per bank service can vary dramatically in price from bank to bank
Range and average price for selected banking services, May 2017; in US$

Service	Min	Average	Max
Account opening fee	0.00	139.52	952.38
Additional check (per check)	0.00	1.44	19.05
NSF fee (per check)	0.00	9.44	31.75
ATM withdrawal (per withdrawal)	0.00	0.64	4.76
Transfer to other bank (per transfer)	4.76	4.76	4.76
Internet transfer to other bank (per transfer)	1.59	1.59	1.59
Transfer to same bank (per transfer)	0.00	1.40	15.87
Overdraft fee	0.00	12.65	92.06

Source: Brazilian Central Bank.

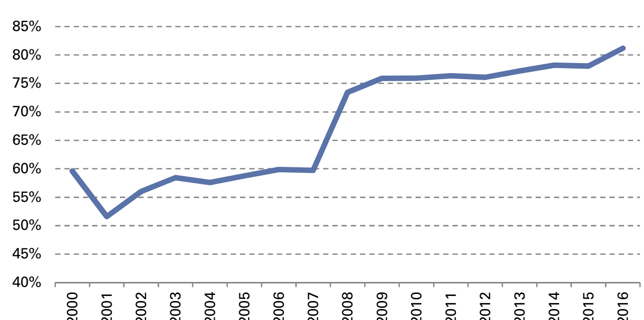
Why will fintechs make a difference now? Convergence of concentration, technology and economic cycle

Fintechs have, in one form or another, existed in Brazil for much of the last 10 years. As mentioned above, some of the conditions of the Brazilian market, in particular the strong concentration of banking and other financial services in the hands of a small number of companies, create a favorable environment for disruption, but they have also existed for some time. That said, in the past few years other factors have changed, which we see as creating a more receptive environment for disruption. First, concentration in the banking system has increased. Second, the penetration of technology, particularly smartphones, has increased to the point at which the business models of several of the fintechs can reach critical mass, benefitting also from demographics that are more open to change. Third, the downturn in the economic cycle, and the expected recovery in the next few years, could create the opportunity for new companies to emerge and grow with economic activity.

Market concentration: Increasing as mergers come through

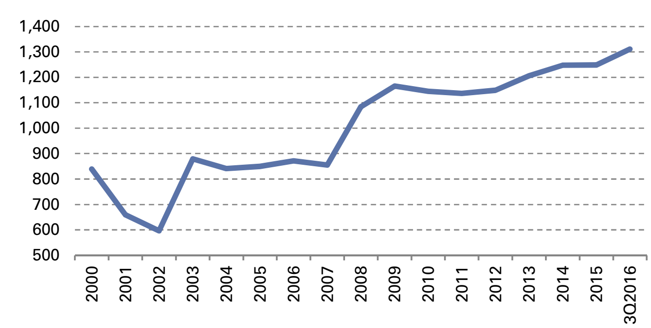
Market share concentration has been increasing in the Brazilian financial system for much of the last 20 years. Mergers between some of the largest banks in the system (Santander and ABN Real, Itaú and Unibanco, Bradesco and HSBC), as well as the growing presence of government-owned banks and the development of mortgages, have led the share of total loans of the top 5 banks (excluding development banks) in the system to increase to 84% in September 2016 from 62% in 2000.

Exhibit 14: The share of total loans for the top five banks in Brazil has increased consistently over time…
Top 5 bank share, excluding development bank



Source: Brazilian Central Bank.

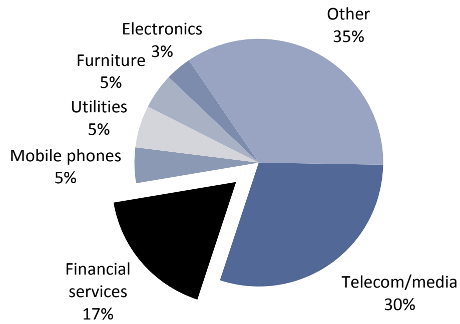
Exhibit 15: …As has the HHI index for the industry
Herfindahl-Hirschman Index by assets



Source: Brazilian Central Bank.

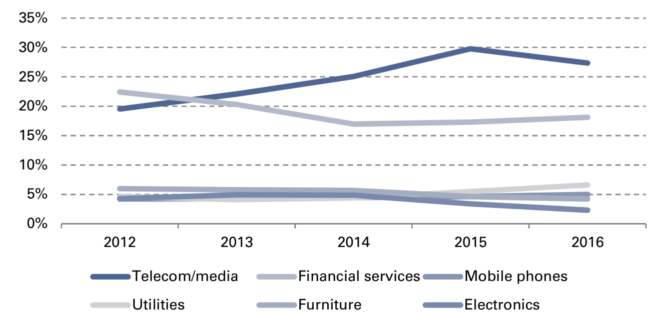
The effect of concentration can be observed, to some degree, in the satisfaction levels expressed by consumers. According to the Sindec report, which aggregates complaints to consumer protection agencies throughout the country, financial services is the categories with the second-most complaints, just behind media/telecom services but well ahead of other consumer-facing services and products. The level of complaints has risen slightly over the last three years, even as banks invested in technology and tried to improve the user experience.

Exhibit 16: Financial services receive the second-most complaints at consumer protection agencies
Share of complaints, consumer protection agencies, 2015



Source: Sindec report.

Exhibit 17: Despite significant investments in technology, the share of complaints has declined only slightly
Share of complaints over time



Source: Sindec report.

The more concentrated a market is, in our view, the higher is the barrier to entry created by a branch network, and as a result the more vulnerable the system is to disruption from new technology and mobile-based distribution models that erode that barrier to entry.

Technology creating opportunity: Smartphones and internet access feeding demographics

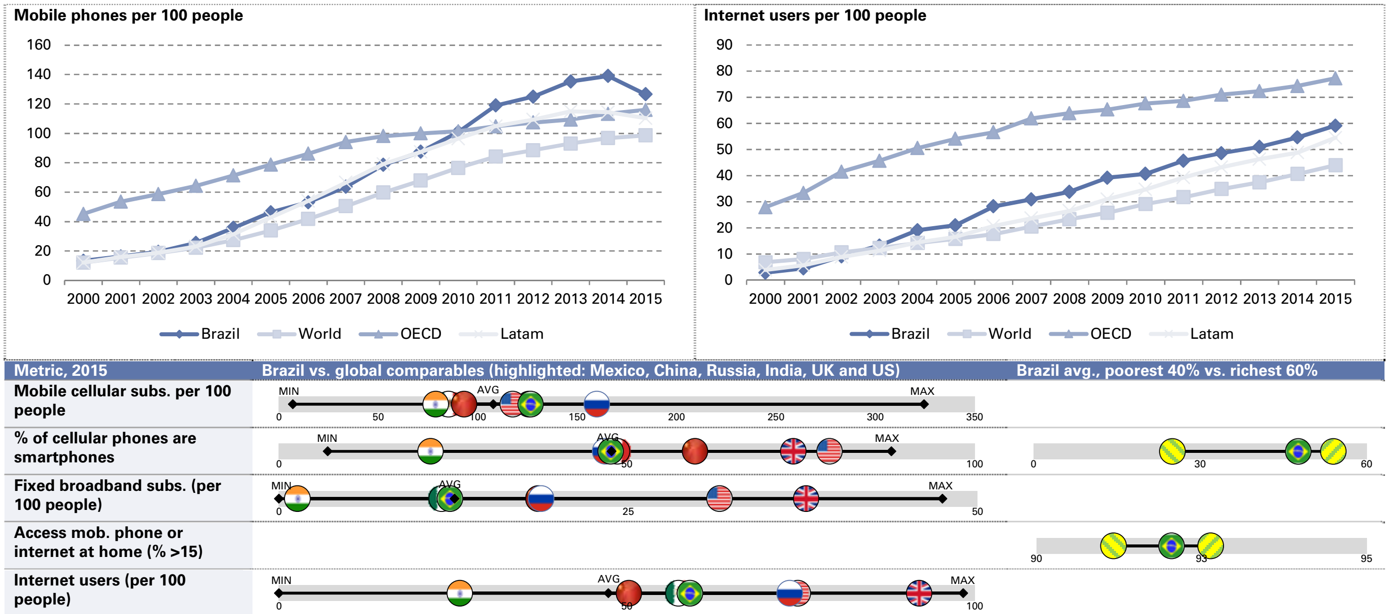
The second ingredient that is enabling the emergence of fintechs in Brazil is the combination of technology and demography. *Technology*, in large part, refers to the growth and penetration of internet-enabled mobile phones (smartphones), as well as desktop internet access. *Demographics* refer to the development of a generation of better-educated, more-connected individuals into the workforce and into the age bracket associated with greater consumption of financial services.

Internet and smartphones: On the rise

Internet use in Brazil has been increasing over much of the past decade (user numbers have been increasing at a CAGR of 11% since 2005), largely in line with global trends (CAGR of 9% since 2005). The number of internet users is above the overall global average, as per the World Bank, while the use of broadband to connect with the internet appears to be in line with the average. According to the Brazilian geography and statistical agency, the IBGE, internet use is higher in upper income levels than in lower income levels, and more prevalent amongst individuals with more years of education, as well as those between ages 15 to 34. Most users access the internet through a combination of desktop computers, mobile phones and tablets.

Penetration of mobile phones in Brazil is relatively high, with more mobile phones per capita than in the United States or the United Kingdom, according to the World Bank. The Pew Research Center has noted that in 2015 86% of Brazilian adults had a mobile phone, compared to an average of 86% in 39 countries researched (and up from 73% in 2010). Also according to the Pew Research Center, 48% of all mobile phones in Brazil as of 2015 were considered smartphones, compared to 19% in 2013. This level of penetration of smartphones is in line with the global average, but falls short of levels in developed markets.

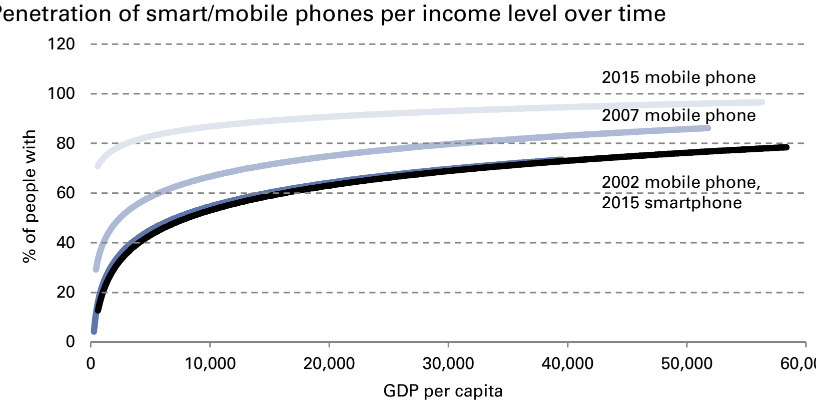
Exhibit 18: Mobile and internet usage has increased consistently, placing penetration in Brazil at the global average
Mobile penetration, key statistics



Source: World Bank, Pew Research.

There is a strong correlation between smartphone penetration and wealth (as measured by GDP per capita). In part, this relationship appears to replicate the one that existed between mobile phone ownership and wealth as of 2002. That relationship has, however, changed over time as technology and cost for mobile phones have advanced. It is possible that with time, lower costs and improved technology will lead smartphone penetration to be more similar to current mobile phone penetration.

Exhibit 19: Smartphone penetration today, which is correlated to GDP/capita, is at a similar level to mobile phone penetration in 2002
Penetration of smart/mobile phones per income level over time



Source: Pew Research, World Bank.

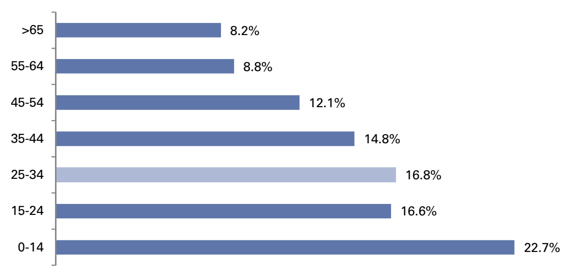
Demographics: A generation comes of age

There are two demographic trends that should help support adoption of technology in Brazil.

The average age of the Brazilian population is rising. This is as much driven by the greater longevity of older generations as it is by the demographic bonus from the 1990s, when there was a large surge in population growth. This generation from the 1990s is tech-savvy, having grown up with mobile phones and the internet, and has little memory of the difficulties of the high-inflation/low-growth 1980s. It is now entering its years of greatest productivity, which means more wealth to acquire technological products and services, as well as a greater propensity to use them.

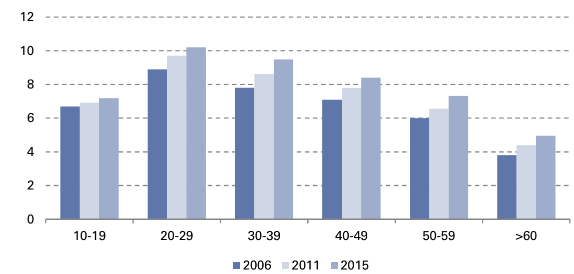
At the same time, this generation has also been one of the most educated in Brazilian history. This was driven by the proliferation of college-level education throughout the country, as well as financing made available by government programs to pay for college level education. Given the strong correlation between level of education and tech familiarity and usage, this generation is much better prepared to use internet and mobile-based products and services than any before it at the same part of the life cycle.

Exhibit 20: Brazil's demographic bonus is now entering its most productive years
% of the population by age



Source: IBGE.

Exhibit 21: The average amount of time of education has increased consistently in the last 10 years
Years of education

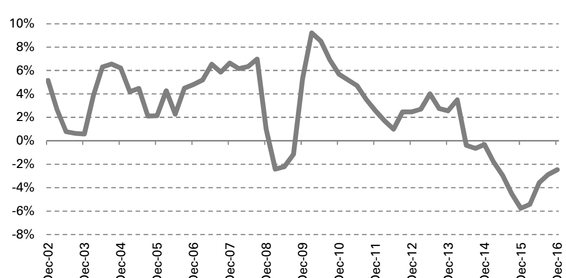


Source: IBGE.

Economic recovery: Emerging from a deep dive

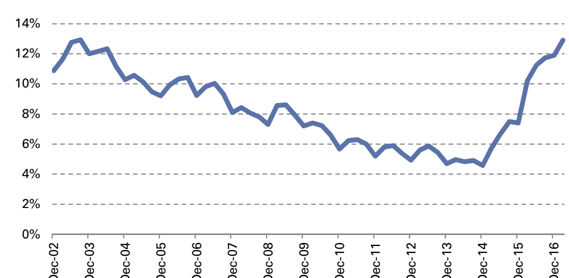
The Brazilian economy has been going through a poor economic cycle, with real GDP contracting for much of the last two years. Unemployment has climbed to the highest levels since 2002, and real wages have contracted by 5% since the peak in January 2015.

Exhibit 22: Economic activity declined significantly in the last three years
Real yoy growth in GDP



Source: IBGE.

Exhibit 23: Unemployment has reached the highest levels in the past 20 years
Unemployment rate



Source: IBGE.

However, over the past nine months economic trends appear to be shifting. Inflation, which had been high and had hurt economic activity, has declined, allowing the central bank to reduce benchmark interest rates. Structural reforms have been approved in Congress, with more on tap to be discussed in the next 12 months. While on a nominal basis the Goldman Sachs Latin American economists still expect benchmark interest rates to fall below 10% by year-end 2017, the combination of structural reforms and fiscal discipline could create the conditions for an even more substantial decline in interest rates, which would unlock key markets (such as life insurance, equity markets investing, and others) that have historically been stymied.

Even if the road ahead is not completely clear, the arrow for the Brazilian economy appears to be pointing upwards, which in our view helps the development of fintechs in the country. Goldman Sachs economists have GDP growth accelerating to 0.6% in 2017, and then up to 2.6% in 2018.

Exhibit 24: GS economists have the Brazilian economy posting a recovery over the next three years
Main economic forecasts, Brazil

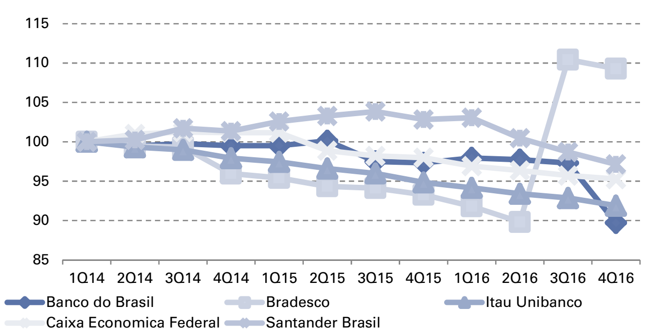
	2015	2016	2017E	2018E	2019E
Real GDP growth	-3.8%	-3.6%	0.6%	2.6%	2.7%
CPI	9.0%	8.7%	4.1%	4.6%	4.4%
Benchmark rate (SELIC)	14.3%	13.8%	8.8%	8.8%	8.8%
Unemployment	8.3%	11.3%	13.1%	12.6%	11.7%
Fiscal balance (% of GDP)	-1.9%	-2.5%	-2.0%	-1.5%	0.0%
Public sector debt (% of GDP)	35.6%	46.0%	40.5%	42.0%	43.0%
FX rate (R$/US$)	3.90	3.26	3.25	3.30	3.37

Source: Goldman Sachs Global Investment Research.

Economic cycle hitting banks: Banks pulling back, reducing footprint

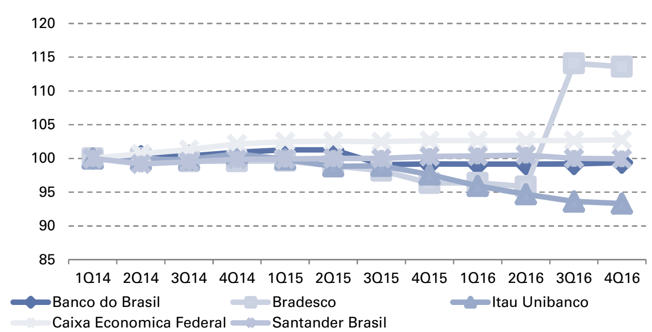
Brazilian banks have been actively managing their cost bases, in terms both of headcount and of branch network. This process has continued since 2012, with the objective of improving profitability – at first to counteract the effects of record low benchmark rates, and then to counter the impact of the ongoing NPL cycle. While this has not, for the most part, perceptibly affected revenue generation for the banks, we believe it may have kept some potential clients away from the financial system. In part, we see fintechs filling the space that was vacated by traditional retail banks.

Exhibit 25: Banks have cut both headcount…
Headcount per bank, 1Q2014=100



Source: Company data.

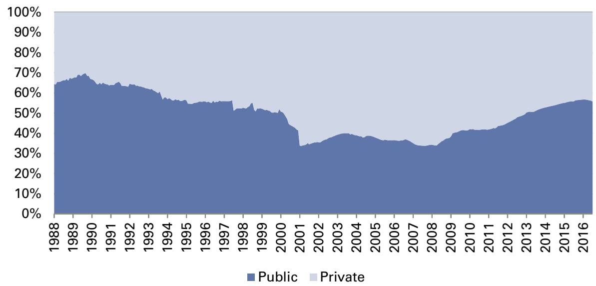
Exhibit 26: …and their branch network size since 2013
Branch network, 1Q2014=100



Source: Company data.

Another trend that could help is the crowding-in of the financial system. Since the end of 2008, government-owned banks have gained market share in total lending in Brazil, peaking at 56.7% in July 2016 from 40% in 2008. This crowding-out happened in a number of categories (including corporate and consumer) and for all government owned banks (Banco do Brasil, Caixa Economica Federal and BNDES). However, this strong growth, along with relatively low levels of profitability, has put pressure on capital levels, which are well below those of private sector peers.

Exhibit 27: Government-owned banks increased their market share in the last five years
Market share by bank ownership



Source: Brazilian Central Bank.

Exhibit 28: Capital levels for government-owned banks are generally lower than for private-sector peers
Capital ratio breakdown, 4Q2016

	BB	CEF	BNDES
Core Tier I ex-hybrid instruments	**7.2%**	**3.1%**	**8.7%**
Hybrid instruments elegible for Core Tier I	1.0%	6.3%	5.8%
Core Tier I	**8.2%**	**9.5%**	**14.5%**
Complementary capital	3.2%	0.0%	0.0%
Tier I	**11.4%**	**9.5%**	**14.5%**
Tier II	4.7%	4.1%	7.2%
Total capital ratio	**16.1%**	**13.5%**	**21.7%**
	ITUB	**BBD**	**BSBR**
Core Tier I ex-hybrid instruments	**15.8%**	**11.2%**	**14.0%**
Hybrid instruments elegible for Core Tier I	0.0%	0.0%	0.0%
Core Tier I	**15.8%**	**11.2%**	**14.0%**
Complementary capital	0.1%	0.8%	1.1%
Tier I	**15.9%**	**12.0%**	**15.1%**
Tier II	3.2%	3.4%	1.2%
Total capital ratio	**19.1%**	**15.4%**	**16.3%**

Source: Company data.

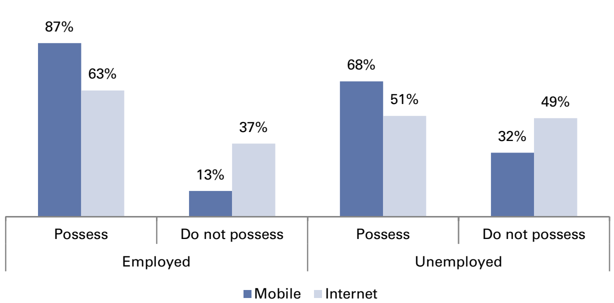
As economic activity recovers from the downturn, we expect loan growth and financial intermediation to recover as well, even though we see that recovery happening at a slow pace. However, with the government-owned banks less capable of expanding their balance sheets given tight capital levels, this could open the door to private market banks/ companies gaining share. This “crowding-in” as growth resumes could create an untapped market for fintechs to breach, providing support for the initial stages of companies’ development cycle.

Recovery helps usage: Use of technology improves with employment, wealth

Improved generation of wealth should lead to greater usage of financial services provided by intermediaries: the prevalence of deposits, payments, spending, investment and financing is positively correlated to wealth. In addition to that, greater levels of economic activity could lead to more penetration of internet/mobile telephony use.

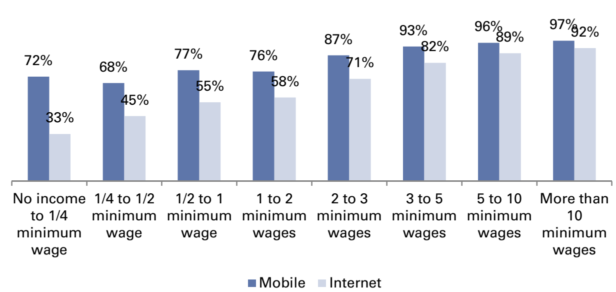
The IBGE tracks internet and mobile telephony usage according to social class level and employment. Both internet and mobile telephony usage are positively correlated to social class and employment. As the economy recovers, with employment and real wages going up, individuals should use more of the internet and mobile phones, both of which are gateways for fintechs.

Exhibit 29: Employed individuals are more likely to own mobile phones and use the internet
% ownership of mobile phone/internet use, 2015



Source: IBGE.

Exhibit 30: Mobile, and in particular, internet use increases as income increases
% ownership of mobile phone/internet use, 2015



Source: IBGE.

Interview with Banco Original

"We believe a broad-based recovery in economic activity in Brazil should lead to greater usage of the financial system, and of more interest in services that provide alternatives to the traditional financial system."

-Guilherme Stocco Filho (Director of Innovation)

What do you say have been the main developments (regulatory, technological, etc.) in the last few years that have allowed you to compete with incumbent banks on more of an equal footing?
The digitization of the economy is breaking down the boundaries between the traditional and the incumbent banks. Financial services are digital products and the main entry points to transact are the web and mobile devices; this shift has given a lot of power to banks that are using new technology and don't need to manage legacy systems. Creating a new bank nowadays, with the latest technology, is much easier than it used to be; the cloud, blockchain and the penetration of smartphones help in all of that.

The regulators are aware of that – we have started to see a trend around the world to help the incumbents, in Europe with the advance of PSD2 and in Singapore and the UK the Regulatory Sandbox. In Brazil, Banco Original was the first bank to be approved by the central bank to use the cellphone to open a bank account.

Soon you will be able to open a bank account in the same way that you open your Facebook account, and that changes everything as all the population will have access to banking services.

How do you differ from incumbent banks in what you offer to you clients (price, quality, accessibility, etc.)?
Pure Digital Banks have fewer costs than traditional ones – the use of new technologies and the lack of legacy systems help – but that is not the only factor: new business models and a new culture help to create new opportunities for cheaper, powerful services. If you create a human-centric app and use AI to help you to understand your client you will always be more relevant and cheaper than traditional systems.

What are the key challenges you are facing over the next three years?
In my opinion, in five years the financial industry will change hands; different people and companies will lead. To survive in this complex world the banks will need to be agile, change culture and embrace new technology, which must happen quickly if they want to participate in this new and challenging world.

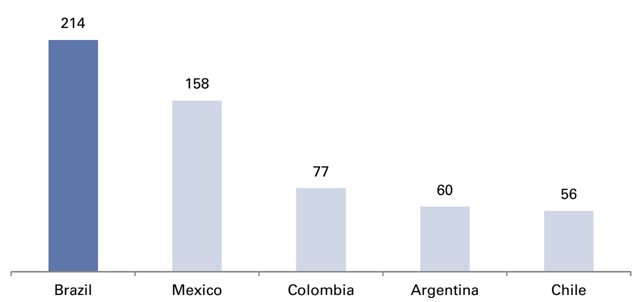
Which banking segments (cards, asset management, deposits, insurance, etc.) do you believe are more vulnerable for incumbent banks, and what have you learned from international peers?
All of the verticals are ready for disruption. Credit card infrastructure is expensive and depends on plastic cards to work – soon we will have only mobile payments. Insurance will use personal data to customize its services for each individual at the right time. Asset managers will need to compete with sophisticated robot advisors. The list goes on with frequency trading, blockchain and globalization. Soon we will not be talking about incumbent banks but Fintech startups, who will be challenging even the incumbent banks. That is why "agile" is the key word for survival.

Canvassing fintechs: 200 strong and growing

Finnovista, a Mexico-based fintech accelerator, counted at least 214 fintechs in Brazil as of November 2016. Fintechlab, a Brazil-based fintech monitor, tallied 247 fintechs in Brazil as of February 2017. As noted by Fintechlab, the number of fintechs has increased from 54 in August 2015.

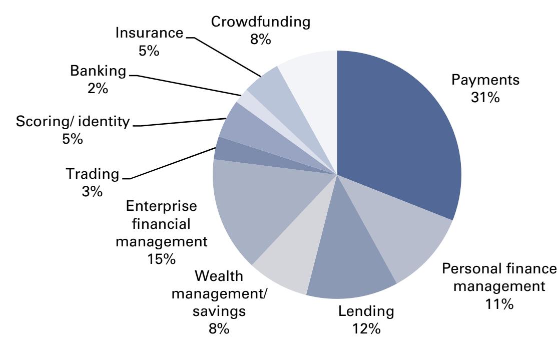
According to Finnovista, this is the highest tally in the Latin American markets it tracks, well ahead of Mexico and the Andean countries. Most of the fintechs in Brazil are focused on the payments space, though there are still many in personal finance management, lending and enterprise finance management.

Exhibit 31: Brazil has the largest number of fintechs in Latin America
Fintech companies per country



Source: Finnovista.

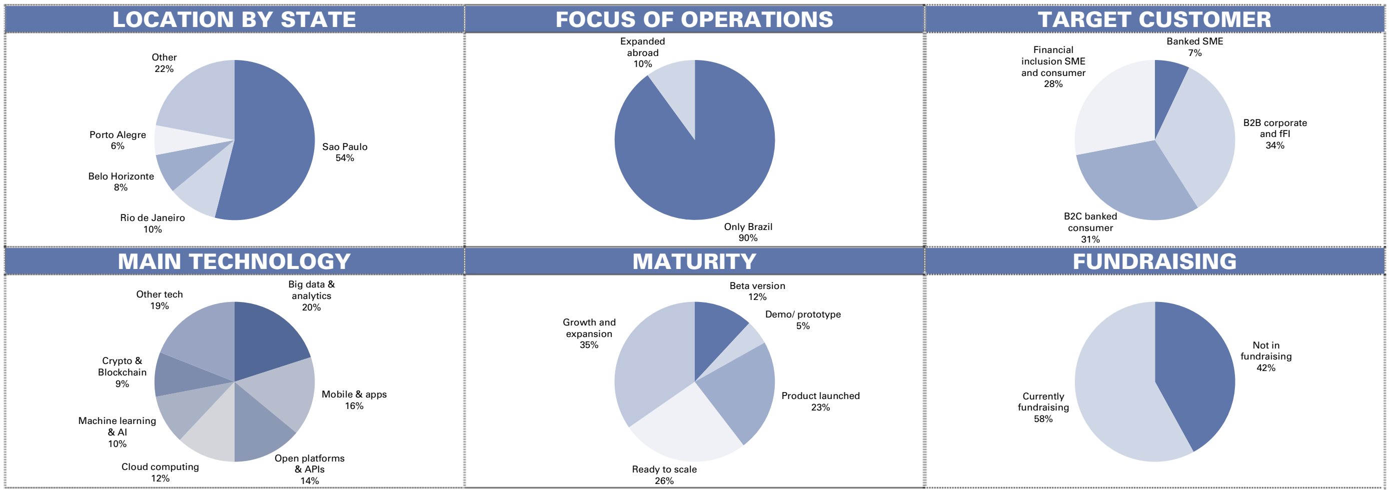
Exhibit 32: Most fintechs are in the payments space, but the spread is diversified
Brazilian fintechs per industry



Source: Finnovista.

The companies are, for the most part, located in the state of São Paulo, which accounts for roughly 30% of the Brazilian economy, though there is a presence in Rio de Janeiro and in the south of Brazil. Most of the companies are focused exclusively on Brazil, though some have a presence abroad (largely if they themselves are subsidiaries of fintechs established in other countries). Most of the companies target retail clients, be they SMEs or consumers, though there is no predominant IT platform or strategy. Just over a third of the companies are expanding their presence, while less than 20% are in the early development stages of the business. As such, more than half of the fintechs in Finnovista's poll are raising funds to support future growth.

Exhibit 33: Most Brazilian fintechs are in São Paulo and focus only on Brazil, but otherwise target a diverse set of customers using different technologies
Key metrics for Brazilian fintech



Source: Finnovista.

Exhibit 33 shows the main areas targeted by fintechs, the rationale behind the companies, the potential revenue pool in 10 years for each area, and examples of companies in Brazil and counterparts in the United States.

For the estimated potential revenue pool in 10 years, we estimated market growth based on nominal GDP and an average market share of 15% for new entrants. The estimated revenue pool for banking services is the equivalent of the sum of the revenue pools for payments, personal finance management, lending and investments/wealth management. As a result, we see a total profit pool for new entrants of up to R$75 billion in 10 years.

For more details on segments and profiles on specific companies, please see the Appendix.

Exhibit 34: We classify Brazilian fintechs into six major categories
Breakdown of Brazilian fintechs

Area	Rationale	Potential revenue pool in 10 years (R$ billion/yr)	Companies in Brazil	Comparables in US
Banking services	The Brazilian banking market is highly concentrated, which increases costs and limits penetration. Regulation and technology are breaking down barriers to entry related to distribution, clearing the way for new entrants in a process that could shrink asset and liability spreads and increase penetration. Model would extend from full-service virtual banks to simple e-wallets.	**50**	Banco Original, Banco Neon, Zuum, Conta Um, E-dinheiro	ING Direct
Payments	Despite Brazil being one of the most developed in Latin America, the Brazilian payments system is concentrated and offers limited functionality given older technology. New entrants leverage the latest technology in acquiring, payment processing, and money transfers, with solutions in both the P2P and B2B spaces.	**12**	Stone Pagamentos, PicPay, ValePresente, Ta Pago, PagPop	Venmo, Square, Braintree, Google Wallet
Personal finance management	Brazilians have historically had limited tools with which to manage personal finances, which has led to greater usage of expensive loans and poor allocation of resources. Companies are using internet-based solutions to help users manage accounts and renegotiate loans, as well as to provide marketplaces for new loans and savings products.	**6**	GuiaBolso, Quero Quitar, Konkero, Organizze, Quanto Gastei, Poupa Certo, Meu Dinheiro, Ghaio Kitado, Acordo Certo	Credit Karma, Mint, Earn Up
Lending	The average annual lending rate in Brazil is 32%, but can reach up to 15% per month for certain personal loans. Part of this is driven by the limited amount of information borrowers and lenders have on each other, as well as shortcomings in distribution. Companies are using internet- and mobile-based platforms, along with innovative business models, to bridge the gap between savers and borrowers, both within and outside the financial system.	**22**	NuBank, Geru, Nexoos, Credisphera, BKF Online	Lending Club, Sofi, Affirm, LendingTree, Credible, Lendio, Fundera
Investments, savings, wealth management, trading	Saving money in Brazil, particularly for the lower income strata, has been left to retail banking products with low yields, a result of limitations in distribution and information, as well as market concentration. Through easy-to-use online platforms, new companies are offering users alternatives to invest in equity and fixed income products, either directly or indirectly through comparison tools that highlight advantages and disadvantages of each product.	**10**	Magnetis, Órama, SmartBrain, Investeapp, Verios, SmarttBot, Warren, Easynvest, Yubb, Renda Fixa, Meus Ynvestimentos, controlAção	Betterment, Wellfront, Ellevest, Envestnet, Fundrise
Insurance	The insurance sector in Brazil has modest penetration as a result of high levels of real interest rates as well as limited distribution. While new companies cannot fight the problems created by high interest rates, they are seeking clients through smart, online distribution platforms, and improving underwriting efficiency by using a combination of big data and traditional actuarial practices.	**25**	Bidu, Thinkseg	PolicyGenius, Trov, Cuvva, Everquote, Onsurance, Insurify, Esurance

Source: Goldman Sachs Global Investment Research.

NuBank: Becoming a force in credit cards

History

NuBank was launched in May 2013 in São Paulo by David Velez. The objective was to change the way Brazilians used credit cards, from the application to obtain a card, to the purchase, to the revolving credit line. The first purchase with a NuBank-issued card was in April 2014, and the company has since expanded to over 500,000 cardholders. Since its launch, the company has received over US$200 million in funding from six venture capital/private equity funds.

Business model

The main features of the NuBank card (all with the MasterCard brand) are that it is uncomplicated and free. There is no annual fee for the card, regardless of the purchase history or time with the card, which represents a sharp break from tradition in Brazil. To obtain a card, an applicant needs to be invited by another cardholder, and then go through a credit scoring system based on proprietary technology. Once with the card, there is no paperwork – all bills and interactions between cardholder and issuer are done through a mobile phone app (though a website is available). Different from other issuers in Brazil, there is also no need to go to bank branches or ATMs to activate the card. Because NuBank is not a financial institution, lending is carried out by partner banks, with funding supported by a receivables guarantee fund. The call center is operated in-house, to assure quality in every interaction with clients. The company also recently launched a rewards program for cardholders. One differentiated feature is that cardholders can pre-pay installments from interest-free installment purchases.

Evolution

Since its inception, NuBank has received over 9 million applications for credit cards, and currently has over 500,000 cardholders, making it by far the fastest-growing issuer in the period. In 2016, the company generated R$77 million in revenues (a seven-fold increase over 2015), and a net loss of R$122 million (compared to a loss of R$32 million in 2015). While other operating metrics are unavailable, the company says that its NPL ratio is well below industry standards, both a result of its mix of clients and its strict loan underwriting standards. NuBank has also gained visibility among clients as a trustworthy and efficient provider of financial services, a substantially different perception from that of the banks.

Response

With NuBank's advance, incumbent banks felt the need to respond. While there was some investment in technology to make payments and access to credit cards more transparent, the main competitive response came from Banco do Brasil and Bradesco, which launched a digital card named Digio. Similar to NuBank, Digio's main cardholder interface is a mobile app. Also similarly, it charges no annual fee. However, there is no revolving credit feature – all unpaid balances can be converted to installment loans. To obtain a card, a simple application is required, which can also be done at Bradesco and Banco do Brasil branches.

Our take

NuBank's development followed a path that we believe may be replicated in several segments. To start, the credit card market, with its high lending rates, complex fee structure and relatively tight market share, appeared to be primed for a change. Then, a newcomer with a differentiated and disruptive technology launches a user-friendly product that is able to gain much visibility and some market share. Incumbent banks respond by launching a product with similar features, beginning to establish a new competitive balance while at the same time improving the client's experience and lowering prices. This should increase penetration, expanding the market and partially offsetting lower prices. We expect there will be companies in other segments that will also initiate a process of disruption that should dislodge or affect incumbents, although – because of the initial state of the market – changes could take longer to materialize.

What will happen to banks? Moving from bricks to clicks

As the fintechs in Brazil start to gain market share in each of their respective markets, as well as open some new markets that are as yet unexplored, we expect Brazilian banks to react. This reaction could come in several ways, with the most visible, in our view, being to mimic the products and services being launched by fintechs. We believe the one with the greatest impact, however, to be the adoption of virtual banking. Both processes, however, accelerate the migration from bricks to clicks, and as such validate the changes being brought about by the fintechs. The end result, in our view, is that banks may lose some market share (more a factor of experiencing slower growth than foregoing growth completely) and margins (as a result of competition), but both these negatives can be offset by gains in efficiency, reduced cost of risk and greater penetration.

Copycat: Mimicking fintech solutions

One of the strategies being used by banks to stem the flow of fintech innovations and disruption has been to imitate the products and services being launched by fintechs. However, many times the banks add their own spins to the products, which sometimes change what has made the product successful for fintechs. Examples of this practice are:

- **Digio, by Bradesco and Banco do Brasil.** In November 2016, Bradesco and Banco do Brasil launched a new credit card named Digio. It was a fully virtual card, attempting to replicate the model successfully used by NuBank. Much like NuBank, all interactions were to be done via mobile, on a simple platform, and there is no annual fee. However, different from NuBank, there is no network vetting of applicants, and the cards can also be applied for in Banco do Brasil and Bradesco branches.

- **Distributing third-party funding alternatives.** Recently, large retail banks have started distributing funding products from other smaller banks to selected groups of clients (usually high net worth clients). This is a response to Orama and Easynvest, which offer several different savings products through their online platform. However, the banks charge a higher fee in distributing the funding products from other banks, which makes the yields less attractive than the same products offered by fintechs. At the same time, it is a reflection of the large amount of excess liquidity in the Brazilian financial system, in part a result of the limited amount of loan growth in the last few years.

- **Virtual banking platforms.** Itaú Unibanco has over one million clients enrolled in its virtual banking platform. Through this platform, the bank interacts with clients primarily via internet, mobile and telephone, offering branch-like services in a virtual form 18 hours a day (as opposed to six hours of branch banking). Clients are generally of the upper income levels, which the bank believes would prefer this new model of interaction.

  Bradesco is considering launching a fully virtual bank, which would be separate from its regular branch-based offering, though still operating within the same IT platform. Services would be similar to the ones provided by Banco Original or Banco Neon.

  However, because the services (for both Bradesco's new online bank and Itaú Unibanco's virtual banking operation) would still be provided within the framework of a retail branch-based bank, they would be subject, in our view, to the limitations of the processes and procedures laid out for branch banking. Moreover, the culture of the new ventures would still largely be that of the underlying banks, making it more difficult to adopt and develop truly disruptive technology.

- **Bankrolling fintechs.** Both Itaú Unibanco (Cubo) and Bradesco (InovaBRA) have established fintech accelerators. These accelerators host conferences for fintechs, and many times hire services from the companies on a temporary or permanent basis. Other times, the banks invest directly in fintechs, mostly through minority stakes. That said, the most visible and successful fintechs (such as NuBank and GuiaBolso) have not come from these accelerators.

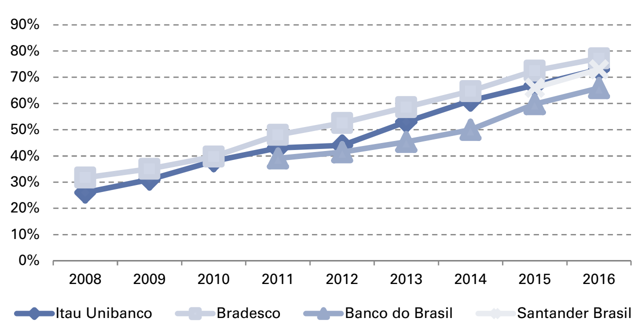
Breaking the traditional model: Drive to virtual banking

One of the main trends set to shape the Brazilian banking market over the next 10 years is the drive to virtual banking. Even if the banks do not currently appear to have the culture to truly drive such a disruptive process, they will adopt new technology over time and this will change the way they interact with clients, deliver and price new products, manage their physical footprint and deploy their capital. The clear areas for improved performance come from, in our view, improved operational efficiency, better loan underwriting practices and greater penetration of financial services.

Improved operational efficiency: Beyond branch closing

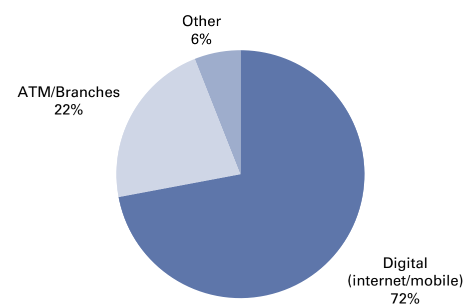
Banks constantly pursue improvements in operational efficiency, but as mentioned above this process has intensified in the last few years. This has largely taken the form of branch closings and headcount rationalization. But because the Brazilian economy has undergone a long and deep recession over the last three years, it is difficult to separate the adjustments made for cyclical reasons (the recession) from those made for structural reasons (the changing nature of branch banking). That said, we expect the structural adjustments to start gaining steam over the next two to three years, leading to more significant investments in IT, further branch closings and reductions in headcount.

Exhibit 35: Digital transactions (internet and mobile) have become increasingly relevant for banks over the last years
% of transactions done through internet/mobile platforms



Source: Company data.

Exhibit 36: Roughly three quarters of all bank transactions in the top Brazilian banks are digital
Breakdown of transactions, Bradesco, Itaú Unibanco, Banco do Brasil



Source: Company data.

Brazilian banks are amongst the country's largest investors in IT. Investments in systems, storage and software have increased consistently over the last ten years. Itaú Unibanco is currently investing over US$3 billion in a state-of-the-art data center 100 km from São Paulo that, when completed, will multiply the bank's processing capacity by 16 times and increase storage space by 25 times, with the possibility of further upscaling. As banks migrate further into virtual banking, we expect investments in IT to continue to grow – though a part of the expansion may ultimately be driven by outsourcing.

The expense savings from the push to virtual banking would come from a smaller physical network, in terms both of headcount and other operational costs. As client interactions move online, the optimal amount of branches to operate would change (assuming that branch banking will still be a partially viable model with at least some of the population in 10 years). At the same time, estimating potential cost savings from branch closures is tricky, as banks do not provide a breakdown for expenses that discriminates between expenses at the branch level and at corporate. We estimate that in 10 years banks will be able to improve ROE by between 300 bp and 600 bp from expense savings associated with branch closings (see Exhibit 37). There could be gains on the fee or interest income side that are not considered in our estimate.

Exhibit 37: We see banks improving ROE by up to 600 bp with branch closings and other improvements from a push towards digital banking

Bank savings from virtual banking

Estimating branch closings		Cost associated with bank banking		Benefit to the bottom line
Itaú Unibanco's foray into virtual banking offers a proxy. In 2016, the bank added 631,000 clients into its virtual banking platform (up to 1.7 million out of nearly 26 million total clients). At the same time, the bank reduced the branch network by 168 locations (down to 3,653). Assuming that 30% of the reduction in the branch network was motivated by the economic cycle, we estimate that if in 10 years 50% of the bank's clients have moved to the virtual banking platform, the bank would be able to reduce its branch network by roughly 50%. We believe the ratio should be similar at other banks.	+	We estimate that roughly 30% of bank employees work in branches, which, together with expenses for security, transport, rent and others end up being responsible for 50% of total admin expenses. As a result, a 50% reduction in the total number of branches would lower overall admin expenses by 25%. However, we expect this reduction would be partially offset by greater IT costs, including outsourcing, which would limit the overall improvement to 15%-20%.	=	**+300 bp to 600 bp** to ROE *That said, there could also be additional benefits: Itaú Unibanco says that operating income per virtual client is up to 40% higher than for traditional branch clients, likely a combination of higher revenues and lower expenses.*

Source: Goldman Sachs Global Investment Research.

Information gains support better loan underwriting

A virtual model is likely to give banks more touch points with clients, and as a result more information with which banks can make their loan underwriting decisions. For instance, at the moment Brazil essentially operates only a negative credit bureau (though a more robust model for the positive credit bureau is in the process of being approved in Congress), so information on borrowers is limited. Banks are forced to rely on statistical analyses of information provided by borrowers, which increases the chances of Type I and II errors. An online banking experience would generate significantly more data that banks can use to determine credit risk for retail borrowers, which when combined with the power of big data-like analysis could help banks grant loans to the right borrowers at the right time. Even if a more robust positive credit bureau were not in development, technology and big data could in part mimic its function. Academic research shows that positive credit bureaus, when replacing negative credit bureaus, increase the amount of lending and lower the cost of risk, which ultimately translates to lower spreads. The combination of these factors would have appositive impact on bank results.

Greater penetration of financials services: Skipping the branch

A migration to digital banking would necessitate a change in the banking culture in Brazil, as well as in the way in which banks treat their clients. But at the same time it could serve to attract more clients to the financial system. Because branch banking is typically seen as a necessary inconvenience, particularly among younger clients, bypassing the branch and offering products and services directly to clients via mobile or web-based applications could increase their penetration and sales. It would be easier to unbundle services and products and as a result charge tailor-made fees, attracting parts of the population, particularly in the lower income segments, that currently are not a part of the financial system. While a substantial part of these new clients could be captured by fintechs, banks should also benefit from greater levels of financial activity and, to some degree, additional flow from clients.

Interview with Itaú Unibanco

Livia Martines Chanes, Director of Digital Channels, User Experience and CRM Analytics

Can you outline the bank's current investments into technology, and in what areas they are focused?
We are aware of the rapid changes the world is going through and we are further strengthening our digital focus to remain a constantly present and ideal bank considering each of our client's profile. Our Internet banking is a comprehensive channel of fundamental services to our account holders since it was launched. In addition to the Internet channel, we have accelerated our investment in mobile applications, given their fast growth over the last four years, to also deliver the best of the bank through this channel.

How successful has the bank's push to digital banking been so far, both with regards to client acceptance and the bottom line?
We already have 73% of our total transactions made through the internet and mobile channels. We are now working to improve the offerings of products that are less frequently used, but are still very important to offer a complete digital bank. In 2008, only 25% of transactions were made through digital channels. There is a strong change movement in our clients' behavior, which relates to the fact that people are, regardless of age, more connected to the digital world, and the bank is moving forward at a fast pace toward a more digital offering. More than 6 million account holders are using our mobile app every month and the bottom line of our digital channel business has grown significantly in the last two years.

Which current technologies (blockchain, etc.) or business models (fintechs, competitors, etc.) do you think have the most potential for disruption of the bank's business and how is the bank working to counteract them?
We see blockchain as an opportunity to promote the financial system's evolution, with banks and regulators working together, focusing on increasing the safety and efficiency of banking transactions. Many see blockchain as a technology to reduce costs, but that is only part of its potential. Its great power is in transforming actual business models and the creation of new businesses through more collaborative models, with greater transparency, automation and trust. It should also be a catalyst for collaborative economics and to create autonomous organizations. We are alert to the innovation brought by fintechs and are following the evolution of User Experience and business models inside Itaú, integrating them into traditional features of banking.

What role does the bank see for bank branches in the next 10 years?
Our clients' needs and the way they access the bank are changing, and we are always trying to understand the process and identify what makes the difference in their relationship with the bank, with service and solutions that are really perfect for each user. Evidently, the growth of digital imposes the necessity to upgrade the role of the branches in the client's experience with the bank. We understand that the branch has an important role for a great part of our clients – as the main channel or additional to digital. Therefore, we will adjust the branches and our multi-channel experience to our new clients' expectations, always aiming to deliver an integrated and impeccable experience.

Our view of the outcome: A more efficient – and more diverse – financial sector

As fintechs emerge, and banks adjust to compete, we expect the sector to transform from its current structure. In our view, the outcome will be a sector that is both more efficient and more diverse, both to the benefit of the consumer, but not necessarily to the detriment of existing players. Some key developments we expect will take place in the next 10 years are in Exhibit 38.

Exhibit 38: We see the financial sector becoming more diverse and efficient with the disruption caused by fintechs
Main fintech-driven changes to Brazilian financial sector in next 10 years

Breaking barriers to entry created by branches	Retail banks provide two separate sets of basic services: transactional branch banking and intermediation between savers and borrowers. Traditionally, branches gathered deposits and supported lending, creating a barrier to entry based on physical footprint. Technology is leading to an unbundling of the services provided by banks, allowing new entrants with a digital footprint to compete on relatively even terms. This means that, with more services and deposit taking being transferred online, branches should lose relevance over time, breaking down barriers to entry. As a result, we see fintechs (current and future) taking a share of the market, and we do not rule out established banks that still do not have a presence using this mechanism to enter.
Competition leading to lower spreads/prices	The greater transparency and dispersion of information, should, in our view, lead to stronger competition amongst players and lower pricing for loans and services. Marketplaces for loans and savings products should reduce the information gap between lenders and borrowers. For example, a marketplace for loans, in which small lenders compete head-to-head with large lenders on rates, terms and other conditions should shift some power to the borrower, who will be armed with more information to make a decision. While credit risk will still be a limiting factor for the decline in spreads, we expect competition will nonetheless lead to some tightening.
Penetration into untapped markets	Technology, as offered by fintechs and banks, will increase accessibility to financial products, allowing previously unbankable individuals to become potential clients. The potential clients range from those with little or no contact with the financials system (individuals in either the informal sector or in the low income strata) to those who are unaware of products because of the limitations of the current distribution system. New products that are economically unviable with the current distribution scheme could suddenly become interesting options. We see this as promoting more sustained growth in loans and financial services, and pushing overall levels of penetration (measured by loans to GDP or card spend per private consumption expenditure, for instance) to increase.
Changing habits of the bank client	Even though Brazilians are still heavy branch users, we believe that the development of new technology that takes bank transactions online, combined with a growing penetration of smartphones and internet terminals, as well as the continued emergence of a generation more used to dealing with technology, should lead to a change in the habits of clients for financial services. This is in part visible through the fast adoption of mobile banking at Itaú Unibanco and Bradesco. Change in habits should lead to greater adoption, which ultimately should accelerate overall growth.

Source: Company data, Goldman Sachs Global Investment Research.

The end result, in our view, in the next 10 years fintechs will take a part of the market, but that market will grow faster because of the advent of fintechs that it would otherwise. Banks' market share (based on assets, fees and other metrics) will decline, but we see it more as a result of slower growth compared to that of new entrants than outright loss. Banks should, though, suffer from pressure on lending margins and pricing for services, which we expect to be partially or completely offset by reduction in the branch network and other IT-driven gains. In other words, we expect the overall profits within the system to increase, reflecting largely the greater penetration of financial services, as well as the improved efficiency in their delivery. As a result, the financial system should become more diverse, more efficient and increasingly profitable.

That said, what we do not expect is for fintechs to completely displace the banks, or to drive pricing of loans and services to levels where profitability of the banks is significantly impaired. We also do not expect banks to remain idle as fintechs encroach on markets they find attractive – we see banks reacting and investments/strategy for IT to become an even more important topic for management and investors.

In the short term, however, we see changes as limited, given that fuller penetration of smartphones will still take some time and, more importantly, cultural attitudes towards changes in the provision of financial services are likely to be adopted slowly. Yet the innovative nature of solutions brought forth by fintechs is likely to buy them a relatively large share of mind, even if the share of wallet in the short term is still small.

Risks: Regulation, reaction, growth

The emergence of fintechs in Brazil, and subsequent reaction by the banks, is subject to a series of risks. The most significant, in our view, comes from regulation, though we also see a negative reaction by incumbent banks and weak underlying economic activity that stifles innovation as concerns.

Regulation: Limiting growth and protecting the incumbent

We see risks from regulation coming from two sources:

- **Speed limits for growth: Playing catch-up.** Because of the pace at which technology and innovation are advancing, regulation (coming almost entirely from the Central Bank) has consistently been playing catch-up. Historically, regulators have had difficulty in recognizing new trends and adjusting regulations to address new solutions. That said, entrepreneurs from fintechs and government regulators should both find common ground in creating a framework that will promote innovation that is helpful to clients.

  Historically, the Central Bank's main objective has been to preserve the integrity of the financial system. It has done this by enforcing capital adequacy and provisioning rules, as well as capital and regulatory-based barriers to entry. However, more recently, the Central Bank has shown growing interest in promoting competition and reducing spreads and transaction costs. For instance, regulation in the payments sector is forcing exclusive distribution agreements between acquirers and networks to be undone. Another example is the new rule to open bank accounts: as of August 2016, clients opening an account no longer need to go physically to a bank branch, but can open an account with an online signature (as long as banks comply with know-your-client rules).

  That said, the pace of change and innovation, in Brazil and around the world, continues to be rapid. It is unclear whether the Central Bank will be able to keep up, and there could be potential markets that are rendered unsuitable because of an inappropriate regulatory framework. This could hamper the development of fintechs and slow the transition to a more competitive environment for all financial companies, including banks.

- **Rebuffs that inadvertently protect incumbents.** Fintech entrepreneurs say that the Central Bank has been receptive to conversation, and is showing growing awareness of the ongoing changes. However, the bank's main outstanding goal still is to preserve the integrity and stability of the Brazilian financial system. By failing to identify how certain new developments would play out, and acting on the objectives of stability and integrity alone, the Central Bank could actually promote regulation that hurts existing and prospective fintechs. This regulation could be in the form of minimum capital levels, access limitations or requirements to reduce the advantage afforded by new technologies (such as requiring clients to go to a bank branch for certain transactions). While done in good spirit, such regulatory oversight could damage the ability of fintechs to thrive and could ultimately be negative for the market as a whole.

Even though we find the risk of such a development (i.e., poorly thought-out new regulations) more damaging than not promoting regulation that enables innovation, we think unfavorable new regulation would be much more damaging. Disruption finds ways around existing regulations, but can be killed by new regulations.

Negative reaction by incumbents: Not embracing change

We believe that incumbents will react to the threat from fintechs by embracing disruption and similarly seeking out new ways to create value to clients. However, it is possible that banks attempt to block fintechs in other ways, such as denying access to information and undermining marketplaces, not to mention lobbying for regulations that block and slow the effects of new technology. An example is a lawsuit filed by Bradesco to keep GuiaBolso, a personal finance management website, from accessing client information. Nevertheless, with few exceptions, banks have embraced disruption, and have moved to improve their product offerings within the context of technological change.

Economic development and growth: Volatility and sluggishness

Part of the incentive to develop new technologies and invest in new companies comes from the belief that economic growth, after three years of subpar performance, will normalize. If this growth does not return it could reduce the number of companies entering the market, as well as slow the pace of innovation in the country. Even though prospects for economic growth are generally improving, we believe much still is dependent on the implementation of structural reforms and the outcome of Brazil's 2018 presidential elections. That said, we expect a negative turn is more likely to slow the emergence of fintechs rather than completely thwart it.

Appendix: Fintech sector breakdown

Estimated number of fintechs:

10

Estimated revenue pool in 10 years:

R$50 bn

Banking services

Scope of the opportunity	The Brazilian banking market, particularly in retail banking, is highly concentrated, with the top five banks holding over 84% of total loans. Regulation and technology are enabling a virtual banking model, in which the importance of branch banking is significantly reduced. This model would break down the current barriers to entry (largely distribution-based) and allow banks with advanced and user-friendly IT platforms to take share in both lending and deposit-taking, as well as some fee-based services. Entrants starting to explore this niche have been bolstered by a regulation issued in August 2016 that allows banks to open accounts without clients going to the physical branch to sign documents.
Estimated size of revenue pool	A 10% share of the Brazilian retail banking market total revenue pool (including post-provision net interest income and fee revenues) in 10 years, which we believe is the target market for new entrants, would represent R$50 billion.

Exhibit 39: The entrants into the virtual banking market aim at taking clients out of the branch
Examples of banking fintechs in Brazil; year of entry specified in each case

Company	Business model	Potential for disruption	Other similar companies	US comparables
Banco Original (2012, 2015 for retail operations)	Small traditional model wholesale bank that migrated to a full-service virtual retail model (mobile and desktop), with deposits, loans, asset management, agricultural loans and corporate banking. Operates only two branches, with all services being rendered online via app or webpage. Already a profitable business (though at a low ROE of 2%), with total loans of R$4.6 billion and shareholders' equity of R$2.2 billion. Owned by the J&F Group.	Currently, the bank remains mostly corporate and agribusiness driven, but if the transition to virtual-based retail banking is successful, it will provide evidence that having a large branch network is no longer a requirement for entry into the banking sector in Brazil. This would further shake up the business models for banks in Brazil, and could lead to changes in strategies and, eventually, profitability levels for the system.	Sofisa Direto, Intermedium	ING Direct, Moven, Bank Purely
Banco Neon (2015)	Basic mobile-based virtual banking, taking deposits (with FDIC-like deposit insurance), issuing credit and debit cards (Visa network), accepting payments and transferring funds. There are no maintenance fees, and transaction fees are reduced. Targeting millennials, the bank has opened 5,000 initial accounts, and target is to reach 100,000 active accounts by end of 2017. Funded by angel and private equity investors.	Basic mobile banking with no fees is a significant departure from the current banking model employed by incumbents in Brazil. While the target market of millennials is relatively contained, it could expand with time to reach other clients. If sustainable, the model could lead to a significant reduction in the fee revenue streams for banks, potentially with a negative impact on profitability.	SDBank	Simple, Bank Mobile
Zuum (2013)	A joint venture between MasterCard and mobile provider Vivo. Via a smartphone app, offers users accounts that can take deposits (at banks and other correspondents such as retailers), make bill payments, obtain a debit card, and withdraw money from ATMs. Can also transfer money to other users for no charge. As of year-end 2016, had over 600,000 clients.	Provides an inexpensive, simplified alternative to banks for bank transactions. While this effort is limited to Vivo clients, could eventually be extended to other mobile phone clients and limit growth opportunities for banks.	Conta Um, E-dinheiro	LevelUp, Sail, Lemon Wallet

Source: Company data, Goldman Sachs Global Investment Research.

Payments

Estimated number of fintechs:

70

Estimated revenue pool in 10 years:

R$12 bn

Scope of the opportunity	The payments market in Brazil is one of the most developed in Latin America, with card spend representing more than 30% of private consumption expenditures compared to less than 20% for other countries. While money transfers and payments have always been efficient as a result of Brazil's history with hyperinflation, much of the payments industry is currently concentrated in the hands of few companies that are owned or sponsored by large incumbent banks. The combination of regulatory change supporting competition and technological developments (particularly smartphones and online commerce) has created an entry point for fintechs. Companies have divided between B2C and B2B opportunities, with C2C not developing as quickly given the strength of the existing banking technology.
Estimated size of revenue pool	Based on the total amount of card spend (R$1 trillion in 2015), as well as the amount of financial transfers in Brazil (1.5 billion transactions in 2015) and a market share of 20%, we estimate the total revenue pool to be R$10 billion in 10 years.

Exhibit 40: The main fintechs in payments target both consumers and companies
Examples of payment-based fintechs in Brazil

Company	Business model	Potential for disruption	Other similar companies	US comparables
Stone (launched in 2010)	A merchant acquirer sponsored by private equity that is not associated with incumbent retail banks. Provides traditional merchant acquiring services with a state-of-the-art IT platform, as well as receivables discounting and other services to merchants.	Has taken advantage of the changes in regulation in merchant acquiring encouraging competition, as well as IT systems that are in some ways superior to those of incumbents. Currently has 2.5% market share based on transaction value, but targets 5% by 2020.	Paggcerto, Pagpop, Mercado Pago, Acqio, SumUp, Payleven, BelaViagem	Square, Braintree, Ebanx, Worldpay
Picpay (2013)	End-to-end payment solution, with e-wallet features. Allows cash transfers between users over a smartphone app via SMS, with connection to the user's bank account or credit card. At the same time, allows users to pay for goods at merchants that have the system. Also acts as a merchant acquirer for merchants.	Can disintermediate the financial system's robust money transfer systems, and create parallel e-wallets that are outside of the financial system, which would lower fees charged by banks on transfers. End-to-end solution could hurt similar solutions provided by banks.	PagTag, Ewally, Mob2all, PayKey, E-dinheiro, PayU, Muxi, Zup, UniPay	Venmo, Google Wallet, Popmoney, Square cash
ValePresente (launched in 2011)	A prepaid card issuer with end-to-end capabilities, from printing cards to processing transactions (all within the MasterCard network). Issues over 500,000 cards per year and authorized more than R$1.5 billion in transactions in the last 12 months.	Prepaid card growth outpaced card market growth in the United States through most of the last 10 years, and the market in Brazil is still in its early years. Further penetration could accelerate the shift from paper to plastic, and change reward structures for merchants, service companies and banks.	Way up, ZenCard, Todo Cartões, Meo Cartão, Acesso, PoupeCompre, Pismo	Isis, Pex, Mango
Tá Pago (2013)	Mobile payment platform with proprietary technology not associated with any bank or telecom company, with presence in food and transportation vouchers. Transaction is made through SMS, so smart phones are not necessary. Focuses in the interior of the state of São Paulo; presently at 276 merchants.	Pure mobile payments (not associated with cards or financial institutions) in Brazil have not enjoyed much success since they started being deployed six years ago, largely because acceptance at the merchant level has been low. We see limited room for change in the near term, given the pace of technological change in other means of payment.	PraPagar, Celcoin	Paytm, PayU
Gerencianet (2007)	Helps SMEs to bill clients in a wide array of methods, including registered invoices, checks, subscriptions, SMS, cards and other means. The company also creates marketplaces for online retailers. The system consolidates payments and streamlines cash management for the user. All services are provided online.	An efficient gateway that streamlines payments and obscures the differentiating characteristics banks have, improving visibility on fees and increasing competition. This could have an impact on the cash management fees that banks receive.	PagueVeloz, MundiPagg, PayZen, AZPay, Asaas, Koin, Smartbill, Vindi, AceitaFacil, Moneto	Hybris, BlueVine, NowAccount

Source: Company data, Goldman Sachs Global Investment Research.

Estimated number of fintechs:

25

Estimated revenue pool in 10 years:

R$6 bn

Personal finance management

Scope of the opportunity	Desktop-based personal finance management software like Quicken has not flourished in Brazil, given the historical complexities of downloading financial information. This means that Brazilians, even those in the more affluent income segments, have limited tools with which to monitor and manage their income and spending. New tools being developed by fintechs give users the ability to track spending and indebtedness, and manage their financial condition better than ever before. GuiaBolso says that new users reduce their use of overdraft and revolving credit card loans by 25% within three months. Much like Credit Karma, the potential may ultimately lie in providing users with a marketplace in which smaller lenders can offer loans and, eventually, savings products. This would bypass the current bank-client relationship, and could drive down spreads for loans and funding.
Estimated size of revenue pool	Based on fee revenues for Brazilian banks (R$122 billion in 2016), excluding asset management and card-related revenues, and a 10% market share.

Exhibit 41: Personal finance management fintechs add a layer between banks and clients
Examples of personal finance management fintechs in Brazil

Company	Business model	Potential for disruption	Other similar companies	US comparables
GuiaBolso (2012)	A personal finance management app for desktops and smartphones that tracks user spending, income and indebtedness from accounts in several banks and financial institutions. Compiles information from users to create a "financial condition score" (proxy for a FICO score, given the absence of a positive credit bureau in Brazil). Offers a marketplace for users to obtain loans and make investments. Expanded to 3.1 million users by end of 2016 from 240,000 at the end of 2014. Funded by the IFC, Kaszek Ventures, Ribbit Capital and QED Investors. One of the most downloaded mobile apps in Brazil.	Compiling information over the platforms of different banks reduces the brand recognition that banks have with clients. Better management of accounts that the service allows has helped users reduce indebtedness, reducing interest payments to banks. However, the most potential for disruption comes from the virtual marketplace for loans and investments. It would level the distribution playing field for banks, allowing smaller banks to offer products and compete on cost. While large banks could still take a large share, the market would become more efficient, leading to lower returns.	Organizze, Quanto Gastei, Poupa Certo, Meu Dinheiro, Ghaio, Mobills, Simplifica, Nibo	Credit Karma, Mint, Moneysoft, Pocketbook
Quero Quitar (2014)	Offers users an online platform to renegotiate loans with banks and other lenders/companies. Users include borrowers with delinquent loans/ payments to be renegotiated, and inputs include the terms and conditions sought to renegotiate. The renegotiation process is driven by a proprietary algorithm that matches the demands of lenders with the capabilities of borrowers. Supported by Bradesco.	Could accelerate renegotiation of loans during an asset quality cycle, reducing NPL ratios for banks and improving the success of collections/recoveries. Could also provide a marketplace for clients to seek out other lenders to refinance loans at a lower rate.	Kitado, Acordo Certo, PagoSim	Earn Up
Konkero (2012)	Independent website that seeks to inform and educate users on personal finances through articles and interviews. Also compares pricing on loans, deposits, fees, insurance and other financial products, allowing users to click through to apply for the products. Revenue comes from ads and sponsored links.	Limited financial education, particularly given the complexity of the Brazilian financial system, has hurt financial system clients, limited growth and led to larger cycles. Lack of information has historically benefitted incumbents, as clients were not aware of alternative service providers or differences in pricing.	EduCity	Wallet Hub, Credit Sesame

Source: Company data, Goldman Sachs Global Investment Research.

Estimated number of fintechs:

20

Estimated revenue pool in 10 years:

R$22 bn

Lending

Scope of the opportunity	As of December 2016, large incumbent retail banks in Brazil concentrate 83% of all consumer loans, including 81% in credit card loans, 79% in payroll loans and 98% in mortgages, as well as 70% of loans to SMEs. Because of subscale distribution capabilities and limited information on borrowers (no positive credit bureau), small lenders have traditionally struggled to gain share. New technologies (largely smartphone-based) and greater acceptance of alternative distribution methods (internet and correspondent banking) have allowed smaller lenders to expand activities. This could be further strengthened by new rules bolstering the credit bureau and providing incentive to competition. The government's commitment to lowering lending spreads would seem to us to play into the strengths of fintechs, which use technology and segmentation to target borrowers and drive growth.
Estimated size of revenue pool	Based on the penetration of personal and SME loans in Brazil compared to global peers, we estimate a total revenue pool (net interest income post provision) in 10 years of R$22 billion.

Exhibit 42: High spreads create an opportunity for fintechs in lending
Examples of lending-based fintechs in Brazil

Company	Business model	Potential for disruption	Other similar companies	US comparables
NuBank (2013)	No-fee stand-alone credit card company (MasterCard network), targeting millennials and young professionals. Applications are accepted only by referral, and all interactions with users are made through a proprietary smartphone app. Credit scoring is based on financial and behavioral metrics. The company has received over 9 million applications for cards. Funded by Sequoia Capital, Kaszek Ventures, Tiger Global Management and Founders Fund. See our case study on page 25.	Digital-only interaction with clients is different and easy to use, and can create stickiness. Data-based credit scoring model appears to be more precise than the one used by traditional banks, granting users access to credit at lower rates. Offers to clients an alternative to banks, which have a poor reputation especially amongst millennials. While lending is still in the early stages, it should provide an alternative to banks.	Trigg, Digio	Affirm, My Swipe Card, Loop Pay, Klarna
Geru (2013)	An online platform in which borrowers can take loans (up to US$10,000) at lower rates than overdraft/credit card lines offered by banks. The loans are made by a partner bank, which then repackages the risk as receivables funds that are then sold to investors/ savers. Scoring of credit risk is done through proprietary mechanisms, in addition to data from credit bureaus, and cash is disbursed in up to 10 days.	Disintermediates the banking process, providing a direct link between borrower and saver. With the emergence of virtual financial marketplaces, distribution becomes less of a challenge. Even if incumbents do not lose significant share, this should with time apply pressure on spreads and improve penetration of loans.	Credisfera, Creditas, Biva, Portfy, Finanzero, Avante, Simplic, Lendico	Lending Club, Sofi, Activehours, Credible, CommonBond, Lendkey, LendingTree
Nexoos (2014)	A platform that acts as a bridge between SMEs that need credit and individuals that want to invest. It originates loan demand from SMEs in several sectors, credit scores these SMEs and offers individual investors the opportunity to provide parts of the loans. The loan is ultimately provided by a partner bank, which then issues a time deposit for the investor that is linked to the loan.	By providing a direct link between SME borrower and saver, the business model disintermediates banks. Distribution still limits penetration, but further adoption of digital banking by SMEs should level the playing field and allow for stronger growth in borrowers.	Credito Samba, BizBank, Capta Money, Intoo	Square Capital, iZettle, Lendio, Fundbox, Fundera

Source: Company data, Goldman Sachs Global Investment Research.

Investments, savings, wealth management, trading

Estimated number of fintechs:

15

Estimated revenue pool in 10 years:

R$10 bn

Scope of the opportunity	Saving in Brazil has historically been constrained to the upper income social strata, which usually are the only ones with disposable income available to save. Even so, much of the saving has been driven by bank relationships, with limited individual investing or non-bank saving. In part, this was a result of the high level of real interest rates offered by government securities over most of the last 20 years, which limited risk taking by savers and crowded out alternative investment types. With interest rates coming down and the level of financial education increasing, a change to this situation is underway. Platforms that provide savers with a user-friendly way to compare investment options and deploy funds seamlessly could start to draw savers away from traditional banks. While more complex modes of investment, such as equity and other structured products, will likely still take time to develop, we see growth coming from alternative distribution platforms, which should impinge on current market share held by the banks and lead to tighter funding spreads.
Estimated size of revenue pool	Based on the AUM for the Brazilian asset management industry excluding banks (R$880 billion in 2016), as well as equity trading volumes for individuals (R$360 billion in 2016), and a 20% market share, we estimate total revenue pool in 10 years of R$10 billion.

Exhibit 43: Investment and wealth management fintechs add more options for clients
Examples of investment and wealth management fintechs in Brazil

Company	Business model	Potential for disruption	Other similar companies	US comparables
Magnetis (2012)	A robo-advisor (both mobile and desktop-based) that takes the user's investment goals and risk appetite to build a tailor-made portfolio of investments in fixed income, equity and FX. Charges a flat fee of 0.4%, in addition to transaction and depositary fees. Investments are made through a partner brokerage firm. Funded by Redpoint and Monashees.	Passive investing in Brazil typically entails investing in fixed income funds sold by banks, which are statically allocated and charge high management fees. Dynamic allocation via algorithms is an important selling point, but we see more disruption in the low fees charged by the company relative to comparable products.	Verios, SmarttBot, Warren, Alkanza	Betterment, Wealthfront, Ellevest
Órama (2011)	Full-scale online broker that allows users to compare fees, performance/yields and terms for investment funds (active and passive, equity and fixed income), bank time deposits and other investment products offered by the company, small banks and third-party asset managers. Investments are made through the company's platform.	Information on investment funds, while available on regulatory websites or with the management company, is not easy to sort or understand for unsophisticated investors. In particular, comparability of fees and past performance could lead to fee compression and greater competition with an industry still dominated by large banks.	Easynvest, Yubb, Renda Fixa	Envestnet, Personal Capital
SmartBrain (2009)	Offers an online platform to manage investments in equity, fixed income and bank deposits. Users can sort through their portfolios based on several metrics, and simulate trades. Charges a flat monthly fee based on the type of asset being monitored.	Allows users to disengage from traditional brokers to manage investment portfolio. Given the limited amount of active investors in Brazil, the scope for disruption is small until the market expands.	Meus Ynvestimentos, controlAção, LiveCapital	Fundrise
Investeapp (2015)	Allows users to invest in government securities via the Tesouro Direto framework through a mobile app. Investments are made through a partner brokerage firm.	While limited in scope, the securities available for investment in the Tesouro Direto framework offer better returns than those offered by traditional bank savings products. An easy way to invest in those securities could disintermediate the banks.		Motif Investing

Source: Company data, Goldman Sachs Global Investment Research.

Insurance

Estimated number of fintechs:

15

Estimated revenue pool in 10 years:

R$25 bn

Scope of the opportunity	Insurance has traditionally been an underpenetrated market in Brazil, in part as a result of the relatively high levels of interest rates faced in the country that basically keeps out several life insurance/annuity products. Another challenge has been regulation, which requires the use of brokers to sell products, thus limiting options for direct sales. Sustainably lower benchmark rates could eventually lead to greater demand for life products, which would, we believe, to some disruption of the current distribution model dominate by bancassurance. In the meantime, most opportunities will lie in disrupting the current brokerage model by pushing it online and promoting greater transparency (thus leading to more competitive pricing by insurance companies) or providing differentiated products (like pay for use) with pricing based on big data or other technology-intensive processes. While the initial impact could be limited, in the long term we see the potential for much disruption – particularly if benchmark rates decline further.
Estimated size of revenue pool	Based on total earned premiums (excluding complementary pension and premium bonds, but including health) in the insurance sector (R$240 billion in 2015) and a market share of 5%, we estimate a total revenue pool of R$25 billion in 10 years.

Exhibit 44: Insurance fintechs for now focus more on delivery/brokerage than underwriting
Examples of insurance fintechs in Brazil

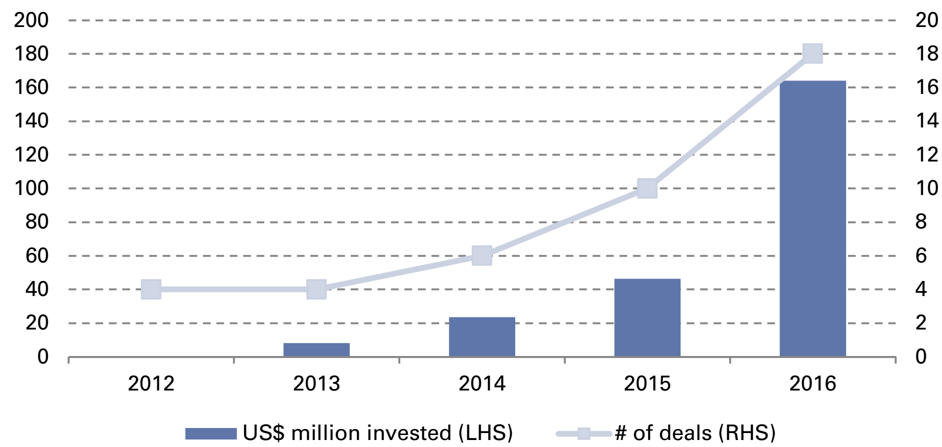
Company	Business model	Potential for disruption	Other similar companies	US comparables
Bidu (2011)	An online insurance broker employing proprietary technology that allows users to quickly and simply compare offers from major insurance companies in Brazil, and then seamlessly sign up for coverage. The company currently operates only with auto, residential and travel insurance. Funded by Amadeus Capital, Monashees Capital, Bertelsmann and Otto Capital Partners.	Distribution of insurance is one of the main barriers to entry for the Brazilian market. Another barrier is the limited availability of information for insurance buyers to compare offers by insurance companies. A platform that allows seamless comparison could lead to greater competition and lower pricing, as well as to greater penetration of insurance products.	Genial Seguros, Segurar.com, Smartia, Minuto Seguros, Sossego Seguros, VisionX	PolicyGenius, Everquote, Onsurance, Insurify
Thinkseg (2016)	A digital insurance company focusing, at first, on auto insurance. Potential clients need to be invited by selected brokers to join, and all interactions are made through a proprietary smartphone app. The company employs a "pay for use" concept and uses a data-driven underwriting mechanism based in part on each client's digital footprint. Launched by a former BTG Pactual partner.	More so than the distribution strategy, which in and of itself is innovative, the most potential for disruption comes from the model of insurance sold (price per use is uncommon in Brazil) and the use of innovative concepts to underwrite risk. While the outcome is still unclear, if successful it could lead to a change in how insurance companies in Brazil approach pricing products, potentially leading to further market penetration.	Youse	Cuvva, Esurance, Metromile

Source: Company data, Goldman Sachs Global Investment Research.

Venture Capital Horizons Inside: Brazil fintech

Developments in venture capital are an increasingly important part of the investment process, regardless of the investor or investment. As new technologies, business models, and capital structures are developed, venture's share of public market funds and corporate capital grows, resulting in disruption of existing industries and companies and the creation of new opportunities. Through our Venture Capital Horizons (VCH) series, we attempt to monitor venture capital broadly, as well as focus on specific areas of investment that our industry analysts believe are important within the context of the greater investment landscape. In this VCH Inside, we focus on private equity and venture investment in Brazil Fintech.

Exhibit 45: Investment in fintech companies in Brazil has accelerated over the last three years
Metrics for VC investments in fintech in Brazil



Source: CB Insights, Goldman Sachs Global Investment Research.

Top investors in the last five years by deal participation count include Kaszek Ventures (11), Redpoint e.ventures (10), Monashees Capital (7), QED Investors (6), Ribbit Capital (6), Sequoia Capital (5), and Tiger Global Management (4).

Exhibit 46 shows the fintechs that received venture capital funding since 2013. The company that received the most funding, both in total amount and in number of rounds, was NuBank, which also is one of the standard bearers for the industry in Brazil and also the most developed. In terms of mix by number of deals, financial management companies (GuiaBolso, ContaAzul) have received multiple rounds, but lending businesses (Creditas) have also stood out.

Exhibit 46: Venture capital has funded a broad spectrum of Brazilian fintech, headlined by Nubank

Top 25 Brazilian fintech venture capital deals, US$ million

Company	Round	Date	Latest Funding ($mn)	Total Funding ($mn)	City
Nubank	Series D	7-Dec-16	$80	$235	Sao Paulo
Nubank	Series C	7-Jan-16	$52	$235	Sao Paulo
Nubank	Series B	2-Jun-15	$30	$235	Sao Paulo
Creditas	Series B	20-Feb-17	$19	$27	Sao Paulo
GuiaBolso	Series C	11-May-16	$17	$24	Sao Paulo
Nubank	Series A	26-Sep-14	$14	$235	Sao Paulo
ContaAzul	Series C	20-Dec-14	$9	$19	Santa Catarina
GuiaBolso	Series B	21-Aug-15	$7	$24	Sao Paulo
RecargaPay	Series A	17-Jun-08	$7	$9	Sao Paulo
MUXI	Series A	17-Apr-17	$5	$5	Rio de Janeiro
Creditas	Series A - II	10-Jun-16	$4	$27	Sao Paulo
ContaAzul	Series B	4-Nov-13	$3	$19	Santa Catarina
Creditas	Series A	3-Aug-15	$3	$27	Sao Paulo
ContaAzul	Series A	8-Jan-13	$3	$19	Santa Catarina
Moneto	Seed VC	8-Dec-15	$3	$3	Sao Paulo
ContaBilizei	Series A	9-Jun-16	$2	$2	Curitiba
Pagus PoupeCompre	Pre-Seed	1-Dec-16	$2	NA	Sao Paulo
Nubank	Seed VC	19-Jul-13	$2	$235	Sao Paulo
Meus Pedidos Software	Seed VC	15-Apr-15	$2	$2	Joinville
FinanZero	Unatt. VC	24-Mar-16	$1	$1	Sao Paulo
BizBank	Seed VC	25-Oct-16	$1	$1	Rio de Janeiro
BizCapital	Seed VC	Unknown	$1	Unknown	Rio de Janeiro
aSaaS	Seed VC - II	30-Jan-17	$1	$2	Joinville
Pismo	Seed VC	30-Nov-16	$1	$1	Sao Paulo
Moneto	Seed VC - II	6-Oct-16	$1	$3	Sao Paulo

Source: CB Insights, Goldman Sachs Global Investment Research.

Rating, pricing and price target information

Exhibit 47: Rating and price target information for covered Brazilian banks discussed in this report
Currency as indicated

	TICKER	RATING	12-MONTH PRICE TARGET	METHODOLOGY	KEY RISKS
Brazilian banks					
Itaú Unibanco Holding (R$/sh)	ITUB4.SA	Neutral	41.60	DDM	Asset quality rebound, stronger margins, regulation, and competition.
Itaú Unibanco Holding (US$/sh)	ITUB	Neutral	13.20	DDM	Asset quality rebound, stronger margins, regulation, and competition.
Itaúsa (R$/sh)	ITSA4.SA	Buy	12.00	Sum of the parts	Taxation, regulation, performance of Itaú Unibanco, weaker-than-expected macro trends, sizable diversification, and M&A
BTG Pactual Group (R$/sh)	BBTG11.SA	Neutral	19.70	Sum of the parts	Volatility, competition, regulation, and dependence on key executives.
Banco Bradesco (R$/sh)	BBDC4.SA	Neutral	32.00	DDM	Different-than-expected economic growth in Brazil, benchmark interest rate cuts, integration of HSBC Brasil, and regulation changes.
Banco Bradesco (US$/sh)	BBD	Neutral	10.18	DDM	Different-than-expected economic growth in Brazil, benchmark interest rate cuts, integration of HSBC Brasil, and regulation changes.
Banco do Brasil (R$/sh)	BBAS3.SA	Neutral	34.60	DDM	Conflicts of interest with controlling shareholder, regulation, competition, and different-than-expected economic growth.
Banco Santander Brasil (R$/sh)	SANB11.SA	Sell	21.60	DDM	Stronger-than-expected economic growth, higher fee income mainly from merchant acquiring business (GetNet), higher gross loan growth, improved efficiency, and cost control.
Banco Santander Brasil (US$/sh)	BSBR	Sell	6.80	DDM	Stronger-than-expected economic growth, higher fee income mainly from merchant acquiring business (GetNet), higher gross loan growth, improved efficiency, and cost control.

Source: Goldman Sachs Global Investment Research

Rating and pricing information

Banco Bradesco (N/N, $10.04), Banco Bradesco (N/N, R$31.63), Banco do Brasil (N/N, R$34.39), Banco Santander Brasil (S/N, $8.72), Banco Santander Brasil (S/N, R$27.65), BTG Pactual Group (N/N, R$19.15), Itaú Unibanco Holding (N/N, $12.57), Itaú Unibanco Holding (N/N, R$39.75) and Itaúsa (B/N, R$10.27).

Disclosure Appendix

Reg AC

We, Carlos G. Macedo, Marcelo Cintra, Steven Goncalves and Nelson Catala, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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