

Access to Financial Services through Retail Agents and Household Expenditures: Evidence from Peru*

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Abstract

Given the recent massive introduction of financial retail agents across districts over the last years, we adopt a Fixed-Effects (FE) strategy to estimate the effects of access to financial services on household expenditure in Peru. We use the household panel data 2007-2011 from the Peruvian Household Survey (ENAHO) and the information on the number of retail agents available in the Peruvian districts gathered by the Financial Stability Authority of Peru (SBS). Our estimates suggest that the introduction of retail agents is associated with a reduction in total household expenditures and transportation costs. Moreover, we find evidence of a non-linear relationship between the number of retail agents in a district and household expenditure. Regarding rural households, our results are not conclusive due to the still low coverage of the financial system in this area and sample size limitations.

Keywords: Access to financial services, financial retail agents, economic development, fixed-effects estimation.

JEL Codes: I3, O12, O22

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1 Introduction

The sustained economic growth experimented by the Peruvian economy during the last decade has contributed significantly to the reduction of poverty and the improvement of several social outcomes at the household level. However, there is still a pending agenda for the Peruvian government to increase access to some basic services in the country, such as water, sanitation, electricity, telecommunications, health, education, and financial services.

The Peruvian government has developed some initiatives to improve the access to some of these services during the last decade. Recent studies like Beuermann (2011), Beuermann et al. (2012), Dasso and Fernandez (2013) and Dasso et al. (2014) have intended to estimate the effects of two of the most renowned interventions of the Peruvian government (electrification and telecommunication programs in rural areas) on rural social outcomes through non-experimental approaches. This paper follows up these attempts and intends to estimate the effects of the access to financial services (e.g. retail agents) on social outcomes of Peruvian households (e.g. expenditures) through the use of a similar approach. We exploit the dramatic change in the access to financial services channels generated by the massive introduction of retail agents since the year 2006 to estimate these effects. The focus of this paper is on a national sample (urban and rural households), but it also explores the possibility of differences in the estimated effects for households living in rural areas.

We apply a Fixed-Effects (FE) estimation using the household panel data of the Peruvian Household Survey (ENAHO) for the period 2007-2011. We present the estimation results for the whole sample of Peruvian households and households in rural areas. Meanwhile, information on the number of financial retail agents is collected from a database gathered by the Financial Stability Authority of Peru (SBS)¹. The analyzed treatment is the introduction of at least one retail agent in the district to which the household belongs. As the treatment

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happens at the district level, we take some considerations for the regression specifications and present the results as Intent-To-Treat (ITT) estimations.

The paper is organized as follows. In Section II, we review the existing literature and briefly discuss the channels through which access to financial services may improve social outcomes. In Section III, we present a description of the treatment (introduction of retail agents in districts) and discuss some of the benefits for households and financial institutions. Our empirical strategy is described in Section IV. In Section V, we describe the data and the variables. In Section VI, our results are presented. Finally, in Section VII, we summarize our conclusions. Section VIII presents our figures and tables.

2 Literature Review

There is a vast literature that identifies the mechanisms through which access to financial services can change the social outcomes of individuals and potentially make them get out of poverty (see Banerjee and Newman, 1993; King and Levine, 1993; Aghion and Bolton, 1997; Banerjee, 2004; Levine, 2005; IADB, 2005; World Bank, 2008; and CAF, 2011). According to Bankable Frontier Associates (2010), access to financial services is the capability of using available products and services offered by formal financial institutions. This access might be approached by physical proximity, considering the closeness of financial service channels to the population; or by price affordability, taking into account that prices could be a constraint to get into the financial system. For the purposes of this paper, we define access to financial services adopting the physical proximity approach, particularly through the proximity to financial retail agents. Meanwhile, the analyzed social outcome is household expenditure.

Access to the financial system plays a key role in bringing households closer to market benefits and creating opportunities for them. Some relevant uses of financial services for

households are the following (CAF, 2011): (i) families may receive credit to finance investment (initial capital to start a small business or to buy inputs for the business) or to finance expenditure needs (education for their children or to buy durable goods) that match the imperfect timing between income and expenditures; (ii) the financial system may offer insurance (to support the household under several shocks such as accidents, illness, or death of any of the members of the household); (iii) it facilitates several transactions and payment methods for the families (receive transferences, such as remittances or pay for utilities); and (iv) it allows to have a more secure place to save their money. The benefits mentioned above can improve some social outcomes (analyzed in this paper through household expenditure). However, as we will focus on the introduction of retail agents to approximate the effects of the access to financial service channels on household expenditure, we will only cover some of the potential benefits of financial services for Peruvian households. These benefits are discussed in Section III.

Despite the huge potential benefits of the financial system for vulnerable populations, credible evidence on whether an expansion of the access to financial services through retail agents can affect social outcomes is still null. One reason behind this fact is that the appearance of this kind of agents around the world is relatively new, explaining the lack of literature that analyzes the mentioned relationship. Another reason is the non-random nature of these initiatives. It is clear that financial institutions may bias their decision on expanding their financial services channels to richer areas, while the government may emphasize the propagation of these services in poor areas. This endogeneity problem makes the identification process of a causal effect of the access to financial services on social outcomes a difficult task.

An important attempt to estimate this sort of relationship was developed by Burgess and Pande (2005). These authors analyze the policy-driven bank branch expansion experience across states in India (1:4 branch licensing policy) from 1969 to 1990, and estimate the effects

of this policy on poverty. They found that expansion of rural bank branches can explain a decrease of 14 to 17 percentage points in the rural poverty headcount ratio, which represents half of the overall drop during the implementation of the program. These authors use deviations from the pre-program linear trend relationship between the states initial financial development and rural expansion as instruments for the estimation strategy. This allows them to address the problem of nonrandom branch placement. We take this idea for our econometric specifications.

Regarding the literature that estimates the impacts of different types of services on social outcomes for the Peruvian case, we find recent work from Beuermann (2011), Beuermann et al. (2012), Dasso and Fernandez (2013) and Dasso et al. (2014). These authors have intended to estimate the effects of two of the most renowned interventions of the Peruvian government (electrification and telecommunication programs in rural areas) on rural social outcomes through non-experimental approaches.

Beuermann (2011) estimates the impact of the FITELE program on social outcomes of rural areas of Peru. The FITELE program intended to provide phones to isolated villages in rural areas during the period 2001-2004. The author uses a panel data at the village level to identify the impact of phones on agricultural profitability and child labor. Beuermann et al. (2012) develop a similar approach, but analyze the effect of mobile phone coverage on income, expenditure and assets of rural households in Peru for the period 2001-2007. They also use an interesting approach, similar to Burgess and Pande (2012), as they control for temporal patterns of coverage at the village level. They find no-statistically significant pre-coverage trends on the treatment effect of the program on social outcomes and indicate that this is evidence that mobile phone providers did not target coverage towards areas that were experiencing faster than average income or expenditure growth. This evidence supports the non-presence of time-varying fixed effects at the village level and that the best specification

is to control for time invariant fixed-effects at the village level.

Dasso and Fernandez (2013) exploit the rolling-out of the rural electrification program across districts over the period 2007-2010 and adopt differences-in-differences and fixed-effects strategies using a panel data to estimate the impact of electrification on labor market outcomes. They work with a specification that picks-up the effect of the treatment (access to at least one electrification project) and a specification that picks-up the treatment intensity (cumulative number of electrification projects concluded in the district). Dasso et al. (2014) follow a similar approach and estimate the impact of electricity coverage (through the electrification program) on educational outcomes in rural areas of Peru. They construct three specifications: (i) one covers the effect of the treatment; (ii) other covers the intensity of the treatment; and (iii) one picks-up the exposure to the treatment (the number of months that the district is exposed to the treatment).

3 Financial retail agents

One of the most successful policies launched by the SBS regarding financial inclusion during the last decade was the promotion of financial retail agents. According to current regulation², these agents are service points that work in either fixed or mobile establishments (belong to enterprises different from those that operate in the financial system), managed by an operator who executes authorized financial operations and services on behalf of the financial institution. The success of this innovative service channel involved a set of better results for stores, customers and for financial institutions.

The introduction of retail agents generates multiple benefits for financial institutions. Almazn and Mas (2011) mention five reasons why banks decide to move towards retail agents: (i) they decongest branches: very crowded banks take advantage of the presence of stores

²Resolución SBS N 6285-2013 and Resolución SBS N 4798-2015.

around their own branches and decide to use them as service channels to offer basic financial services; (ii) develop business in new locations: retail agents are low-cost ways to identify favorable locations for new branches; (iii) they create a transaction-based proposal targeting poorer segments: to serve the poor adequately it is necessary to find a profitable retail agents business model (in this case, a per-transaction pricing model may be convenient as poor people do many transactions - mainly involving small amounts of money - like deposits, micro-loans, payment of bills, send/receive remittances, etc.); (iv) refocus branches on selling financial products rather than handling cash: retail agents work as transactional channels in order to let the branches sell financial products and services; and (v) fill the competitive vacuum that others might otherwise fill: identify new business opportunities so as to offer other financial services (for example, the performance of retail agents permits to analyze the potential for electronic money services in certain geographical areas). Chart 1 compares the benefits of financial branches with those of retail agents for customers and financial institutions.

Some benefits for stores also appear from the introduction of retail agents. They collect a per-transaction fee, which gives an incentive to the store to promote the use of the platform. They may also acquire an insurance that covers losses caused by theft; and they probably experience a rise in customer traffic (due to the use of the agent), increasing the sales of the store. In the case of customers, they experience a transaction cost reduction. Mas (2009) considers that costumers benefit from lower costs related to travel time (they find a nearer place to do financial operations) and lower waiting time (faster attention because the store is less crowded than bank branches). Furthermore, we can add some other benefits from the introduction of retail agents: (i) more flexible and convenient attention hours than those from bank branches; (ii) a more personalized customer service, in which costumers are served by people with whom they are already familiar; and (iii) reduction in the monetary cost of using the services (per-transaction cost reduction).

Chart 1: Peruvian branches and retail agents: comparative benefits for customers and financial institutions

		Financial branches	Financial retail agents
Customer	Attention time	More waiting time	Less waiting time
	Attention hours	Usually from 9:00 hrs to 17:30 hrs.	From 6:30 hrs up to 22:30 hrs in case of minimarkets (Ipsos, 2014), but depends on the store.
	Personalized attention	Less	More
	Proximity	Further	Closer
	Per-transaction cost	Higher	Lower
	Permitted transactions	All	A subset of transactions
Financial institution	Set up cost	Invests in physical infrastructure, licenses, staff, training, equipment, etc.	Operator training, POS, etc. Uses the store's physical infrastructure.
	Operational cost	Pays salaries (fixed and maybe variable) to the staff.	Pays a per-transaction fee to the store.

In Peru, the regulatory framework proposed by the SBS has permitted to expand the coverage of financial services to individuals and enterprises that had previously no access to basic financial services, especially those in geographical areas where the presence of the financial system was minimum or null. The key feature behind this intervention is that offering services through retail agents has a very low relative cost compared to branch offices and it allows a huge potential to reach the farthest places in the country, in which opening branch offices or ATMs may not be profitable. We expect that the benefits of the introduction of retail agents that can be more easily monetized and captured, are related to the reduction in transaction costs (for example, transportation).

Regarding the expansion of the Peruvian financial retail agents, the financial institutions took advantage of the great dispersion of some establishments nationwide, like super-market chains, drug stores, mini-markets, internet kiosks, and mobile service channels. Figure 1 shows the evolution of the number of branches, ATMs and retail agents during the last decade in Peru. The trend of the total financial service points changed dramatically in 2006, reaching 15,082 in that year and 70,598 in 2014. This great expansion is mainly explained by retail agents, which were introduced precisely in 2006, and account now for 77% of the total financial service points. In 2006, the financial system was established in 24% of the

total Peruvian districts, potentially serving 75% of the total adults. By 2014, the extension of the scope of the financial system had reached 54% of the districts, representing a huge increase in the geographical coverage of the system. In these locations, we can find 92% of the total adults, who may potentially have access to a financial institution. Besides, in 2004 the financial system showed less geographic dispersion than previous years (48 service channels per 1,000 Km^2) and an important progress in coverage, with 362 service points per 100,000 adults (see Figure 2).

However, there are important differences between the access to financial services in rural and urban areas. Figure 3 and Figure 4 show the evolution of the coverage of the financial service channels in urban and rural areas. While the financial system has presence in practically every urban area, the coverage in rural areas reaches only 36% of the districts, where only 59% of adults can potentially use the financial channels.

The current low coverage in rural areas might be explained by the use that financial institutions give to retail agents. At the beginning, they decided to implement these agents to decongest branches in urban areas; later, after testing the potential of retail agents, financial institutions saw an opportunity to get into new markets (mainly urban, but rural as well). Following Mas and Siedek (2008), and Almazn and Mas (2011), during the first years of the propagation of retail agents (2006-2011), Peruvian private financial institutions adopted the retail agents model to decongest their branches in a cheap way, so the high increase of these attention points was essentially in urban areas where the financial system was already established. For that reason, few poor people started to use these service channels during the first years (Ivatury and Mas, 2008). Since 2012, the total retail agent network started to grow faster, not only in urban areas but also in rural (see Figure 5 and Figure 6). Here, it is relevant to mention the key role played by the Peruvian State Bank (Banco de la Nacin) that began offering financial services through retail agents in 2012, always oriented to include vul-

nerable population in rural areas to the formal financial system. In this sense, we expect the effects on expenditure in rural areas to be non-significant in the analyzed period (2007-2011).

4 Empirical Strategy

The introduction of retail agents did not follow an experimental design. Hence, any difference in household expenditure between treated and non-treated households under this context would be a biased estimate of the effect of the introduction of retail agents. To deal with unobserved confounders, we use a panel data of urban and rural households and apply a Fixed-Effects (FE) estimation³. As we work with panel data, we do not have to worry about systematic migration of households between districts biasing our estimates.

The main concerns in the estimation of the effects of the introduction of retail agents on household expenditure are related to the potential endogeneity problems. Clearly, the promotion of retail agents generated incentives to expand financial services where it was not profitable to offer them through conventional platforms. However, we may think that the financial institutions expanded the retail agent network more deeply in areas where average income levels were more attractive or had higher population density (which allows repaying faster the cost of the retail agent investment in those areas). In Table 1, we present evidence that supports this hypothesis. We pick some pre-treatment characteristics (monthly income and expenditure) of households that are never treated and those that are treated at some point in the future. We observe that pre-treatment income and expenditure levels of households living in never treated areas are significantly lower than households living in areas that were covered at some point in the future. This evidence supports the reverse causality problem.

³We follow a similar approach as the one used in Dasso and Fernandez (2013) and in Beuermann et al. (2012) for our Fixed-Effect (FE) estimations.

To solve this problem, we follow the approach of Beuermann et al. (2012), which is to use district fixed effects, in addition to the household fixed effects, to control for any time-invariant district characteristic that may influence the financial institutions decision of where to locate the retail agent. Nevertheless, this is an imperfect approach as some of these district features may vary across time and would still bias our estimates. Beuermann et al. (2012) also present another specification that covers these concerns by adding a variable that indicates the number of years that the district has been exposed to the treatment. This specification allows controlling for time-varying district features. We will follow this approach to minimize the endogeneity bias as much as possible.

We use three different specifications. Our first specification assumes that the treatment for households is the access to at least one retail agent in the district at year t :

$$y_{idt} = \partial_i + \partial_d + \partial_t + \beta \times access_{dt} + \varepsilon_{idt} \quad (1)$$

where i indexes the household, d indexes the district, t indexes the year, y_{idt} is the household expenditure, ∂_i is the household fixed-effect, ∂_d denotes the district fixed-effect, ∂_t denotes the year fixed-effect, $access_{dt}$ indicates that the household belongs to a district where at least one retail agent is available at year t (therefore, β is the parameter of interest), and ε_{idt} is the error term, which is allowed to be correlated within households across time in the same district (standard errors are clustered at the district level). ∂_i captures the unobserved household heterogeneity. The use of this specification eliminates the concern on any time-invariant district characteristics that may have influenced the financial enterprises on whether to promote the expansion of retail agents in that district.

One of the main pitfalls of using this approach is that we cannot control for observable

household features that are invariant over time such as maternal language, education level of the head of the household, within others. The core assumption to use a FE estimation is that unobserved confounders are not varying across time. The identifying assumption seems reasonable under this context. However, we could think that some financial enterprises estimated the future income or population density in some of these areas and decided to place retail agents according to this analysis (meaning that unobserved confounders are varying across time). Following Burgess and Pande (2005) and Beuermann et al. (2012), to eliminate this concern, we estimate a second specification that allows the impact of the treatment to vary with the number of years that the treatment is available at the district:

$$y_{idt} = \partial_i + \partial_d + \partial_t + \sum_{z \neq 0} \Upsilon_z [\text{years treated} = z]_{dt} + \sigma_{idt} \quad (2)$$

where $[\text{years treated} = z]$ is a dummy variable indicating that the district has at least one retail agent available for z years, and σ_{idt} is the error term, which is allowed to be correlated within households across time in the same district (standard errors are clustered at the district level). This specification is helpful for two purposes. First, by including negative years of availability of the treatment (before the treatment), we can assess if there are trends in the outcome variables until the first year of the treatment. If there are no trends, it seems unlikely that financial enterprises based their decisions of whether to place or not a retail agent in that district on time-varying district features. Finding this evidence would eliminate the concern of estimating biased effects and will validate our identification approach through the use of equation (1). Second, using this specification, we could also see if the size of the effect of the treatment varies in time. This is very useful in this context because having a retail agent in a district for more years increases the likelihood that households use financial services more frequently and benefit from this interaction.

Following Dasso and Fernandez (2013), we construct a third specification that allows

controlling for the intensity of the treatment. We could think that households with access to more retail agents could benefit in a bigger magnitude from the access to financial services. This specification is the following:

$$y_{idt} = \partial_i + \partial_d + \partial_t + \pi \times intensity_{dt} + \delta \times intensity_{dt}^2 + v_{idt} \quad (3)$$

where $intensity_{dt}$ measures the cumulative number of retail agents in district d at year t , and v_{idt} is the error term, which is allowed to be correlated within households across time in the same district (standard errors are clustered at the district level). The parameter π measures the marginal impact of introducing an additional retail agent, conditional on being exposed to the treatment (having at least one retail agent by year t in the district). The identifying assumption for equation (3) is that the measure of intensity is uncorrelated with the error term after controlling for district and year fixed effects. We include the intensity variable squared to account for a potential non-linearity in the effect of the number of retail agents on household expenditure.

The results in all three equations should be interpreted as Intent-To Treat (ITT) estimates as we fail to identify which households are actually benefited from the access to financial services through retail agents in their districts. On the one hand, some households may have a retail agent in their districts, but decide to exclude themselves from using the financial services. On the other hand, some households, whose districts do not have any retail agent, may use such service channels placed within other neighboring districts.

We estimate all the specifications for the whole sample and also restricting the sample to households living in rural areas, because they are generally the most vulnerable population in the country. This additional specification intends to observe potential differences in the effects related to the vulnerable conditions of this group.

5 Data

We use the Peruvian Household Survey (ENAHO) conducted by the INEI on a yearly basis for our estimations. This survey includes information on household demographics, expenditures, access to assets, etc. It is representative at the national, urban and rural levels. All figures of income and expenditure are presented in local currency.

Since the introduction of the retail agents was in the year 2006, it would be desirable to use a panel data that also covers that year. However, the only available panel data is from the period 2007-2011, which will restrict us to capture the initial impacts of the introduction of retail agents in the first covered districts. Nevertheless, the specifications for equation (2) and (3) will allow to pick-up these effects. We do not have to worry about migration of the households of the sample among districts, because a condition for these households to remain in the panel sample is that they did not migrate from the location they were surveyed for the first time.

We also use the database of financial services channels from the SBS, which keeps track of the number of financial retail agents in each district of Peru on a yearly basis. We construct all of our treatment variables based on this information. The database only comprises the information reported to the SBS by regulated financial institutions on a frequent basis, so any source of informal financial services available for households is not considered.

The household expenditure used as the dependent variable in all the specifications comes from the ENAHO and is represented by the monthly total expenditure (in logs) and the monthly transportation expenditure (in logs)⁴. However, we include some additional expenditure categories to check if they are affected by the introduction of the retail agents:

⁴This expenditure includes transport and communications.

monthly food expenditure (in logs), monthly expenditure on durable goods (in logs)⁵ and monthly expenditure on entertainment (in logs)⁶.

6 Results

Our main results are shown in Table 2, separated in three different panels, each with a particular specification for the whole sample (urban and rural areas). The first specification assumes that the treatment for households is the access to at least one retail agent in the district, and implements year, district and household fixed effects. As it was already mentioned, this approach eliminates the concern on any time-invariant district characteristics that may have influenced the financial enterprises on whether to promote the expansion of retail agents in that district. The results from the first specification, shown in Panel A, suggest that the access to at least one retail agent in the district has no effect on transport expenditure or total expenditure. However, there is a significantly positive effect on entertainment expenditure (17% increase) associated with the introduction of retail agents.

With the household and district fixed effects, we address the concern that retail agents placement may depend on time-invariant factors. Nevertheless, the results may still be biased if the placement decision depends on time-varying district characteristics. In order to address this concern, we implement a model that allows for heterogeneous impacts controlling for the duration of treatment. The results from this specification are shown in Panel B⁷.

The variables *before* and *after* represent the existence of pre-access and post-access trends in expenditure, respectively. The main conclusion from this specification is that it seems to

⁵This expenditure includes furniture, appliances and household maintenance.

⁶This expenditure includes entertainment, recreation, fun, social feasts, and family parties.

⁷Note that all coefficients in this table show effect sizes relative to the omitted group of zero years of access.

exist a negative effect from the access to financial services on total expenditure (a contraction close to 12%) and transport expenditure, mainly after the fourth year (total expenditure) and the third year (transport expenditure) that the access has been established. The effects on other expenditure categories also seem to be significant under this specification; nonetheless, the positive effect found for entertainment expenditure (Panel A) disappears with the introduction of pre-coverage trends. We find that these results are encouraging because they suggest that households experience a benefit in terms of savings after a certain period of exposure to the treatment. Unfortunately, the results show evidence of statistically significant pre-coverage trends in expenditure, as well. Given this, we cannot conclude firmly that the post-treatment effect is caused entirely by the treatment itself, but we can infer that it is somehow associated with an increase in savings.

Another important result relies on the third specification, which allows controlling for the intensity of the treatment. As it was already mentioned, we could think that households with access to a larger number of retail agents could benefit in a bigger magnitude from the access to financial services. The results from this approach are shown in Panel C. At a small number of retail agents, it appears that an increase in treatment intensity is negatively correlated with household expenditure, following the results from Panel B. Nevertheless, the specification also suggests the existence of a non-linear behavior in this relationship, resulting in a significant positive correlation between household expenditure and the access to retail agents at larger numbers of retail agents.

An interpretation for this relationship could be as follows: in the short term, the main effect of having a new retail agent is a reduction in transaction costs (for example, transportation costs). However, after a certain point, the effect of one more retail agent in the district tends to increase expenditure, responding perhaps to the increased likelihood of receiving monetary transferences (e.g. remittances), given the larger number of retail agents. Another

explanation may be related to the growing trend in household expenditure. Considering this fact, the larger number of retail agents could help to accentuate the positive correlation between the two variables. It is important to mention that, although statistically significant, the effects regarding the intensity of the treatment on total expenditure are very small in magnitude. In the case of transport expenditure, we can only observe significant effects in the linear relationship, showing that the more retail agents, the sharper the reduction in this expenditure category.

In addition to the analysis for the whole sample, we used the same specifications for rural households. Unfortunately, the results from the rural areas are not as encouraging as the ones from the whole sample. This might be because during the first years of development of retail agent network, the expansion was essentially focused on urban areas. In Table 3, the results from the rural areas are shown. Regarding total expenditure and transport expenditure, there is no evidence that the access to at least one financial retail agent itself (Panel A), or even after years from its placement (Panel B), has a significant impact on household expenditure. On the other hand, it appears to be a negative correlation between the number of retail agents in a district and households' total expenditure, supporting the intuition of a savings benefit.

The reasons behind the low significance in the results for the rural areas are presumably three: (i) an insufficient number of observations; (ii) the expansion of the network was not widespread in rural areas in the period 2007-2011, as discussed in previous sections; and (iii) the existing gaps in public services in rural areas (like infrastructure, telecommunications, and even sanitary), which can be a limitation to amplify the positive effects (or spillovers) of a retail agent. For example, it is more unlikely that a household without access to phone services (namely with little contact on a regular basis with relatives outside the district) would use a retail agent to receive monetary transfers.

7 Conclusion

The access to financial services in Peru has increased significantly over the last decade. One of the main pillars for this improvement has been the massive introduction of retail agents since 2006. To verify if this phenomenon actually contributes to the improvement of the well-being (expenditure reduction or savings) of the Peruvian households, we intended to estimate the impact of retail agents on household expenditure for the period 2007-2011, using a FE approach.

There are a few important points that must be taken into account in order to understand the focus and limitations involved in the estimations. Firstly, the results in all three equations should be interpreted as Intent-To-Treat (ITT) estimates as we fail to identify which households are actually benefited from the access to financial services through retail agents in their districts. This data limitation will be solved with the information provided by the forthcoming National Survey of Potential Demand of Financial Services and Financial Culture, which will not only show the access and usage of the financial services, but will also identify geo-referenced rural households, allowing to develop a deeper analysis. Secondly, the introduction of retail agents did not follow an experimental design, causing an endogeneity problem that limits any analysis of a causal effect of the treatment on household expenditure. The approach we use in this paper allows obtaining valid results, partially overcoming these limitations.

We find evidence that access to financial services in the form of retail agents is negatively associated with households total expenditure, which can be interpreted as a savings benefit related to a reduction in transaction costs (mainly, transportation costs). Moreover, this relationship seems to be non-linear: the results suggest that, after a certain point, household expenditure increases as the number of retail agents in a district heighten. Some reasons behind these results could be linked to a higher inflow of monetary transfers (e.g. remit-

tances), or to the existing positive trend in household expenditure.

According to the results from this paper, the introduction of financial retail agents in Peru should be encouraged, as they seem to have a positive impact on household expenditure. Considering this fact, the National Financial Inclusion Strategy, launched by the Multisectorial Commission of Financial Inclusion⁸, considers the expansion of the retail agent network as an important task in the access pillar to enhance the financial inclusion levels. So, it is desirable that the Commission promotes the increase in the number of retail agents through the expansion of State Banks agents in the poorest areas, and encourage other financial institutions, for example through tax incentives, to implement these service channels within other poor areas. Furthermore, coordination with the district municipalities is necessary to avoid cost overruns that limit the expansion of the financial retail agent network⁹.

Using the same approach for a smaller sample of rural households leads to no conclusive results. The results for rural areas might be explained by the low coverage in these places, probably due to the private financial systems decongest-branches-strategy developed during the analyzed period. The low coverage of the financial system in rural areas (present in only 36% of the rural districts) could also be explained by the lack of access to electricity and internet services, necessary for the operation of financial retail agents. The Commission should consider this fact, as one of the Peruvian governments goals is to include the most vulnerable population into the financial system. Although some financial institutions promote the introduction of internet services in remote areas, its scope and penetration are still limited.

⁸The members of this commission are the Ministry of Economy and Finance, the Ministry of Development and Social Inclusion, the SBS, the Central Reserve Bank and the Peruvian State Bank (Banco de la Nación).

⁹According to the Multisectorial Commission of Financial Inclusion (2015), one of the main constraints to increase the access to the financial system is that some district municipalities charge excessive operating costs to retail agents.

As discussed in previous sections, the incursion of the financial system into poor areas would be better appreciated in years preceding 2012. In that year the retail agent network started to grow faster in rural areas due to the attempts of the Peruvian State Bank. In this sense, there is still a pending agenda for the financial inclusion literature to intend to estimate the effects of the access to financial system through retail agents in Peruvian rural areas.

Additionally, we find some significant effects involving other household expenditure categories (food, durables and entertainment), but we cannot firmly attribute them to the access to the financial system, since there is not a clear theoretical channel that explains the relationship between them.

Spreading out this network is even more necessary considering the ongoing electronic money initiative. As retail agents will convert themselves into cash-in and cash-out establishments for the electronic money platform, the Commission should ensure the expansion of the retail agent network properly adopting the functionalities of these electronic money establishments, especially in the areas where the financial system is absent.

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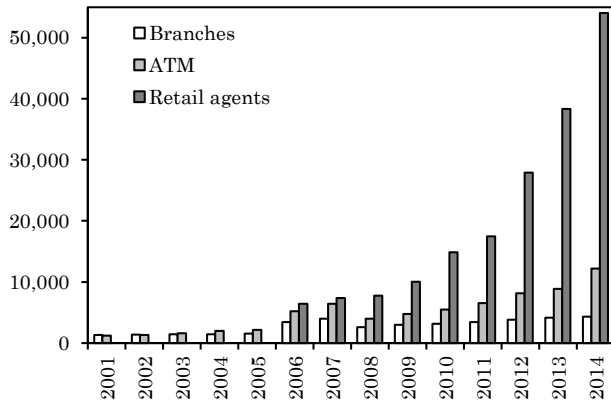
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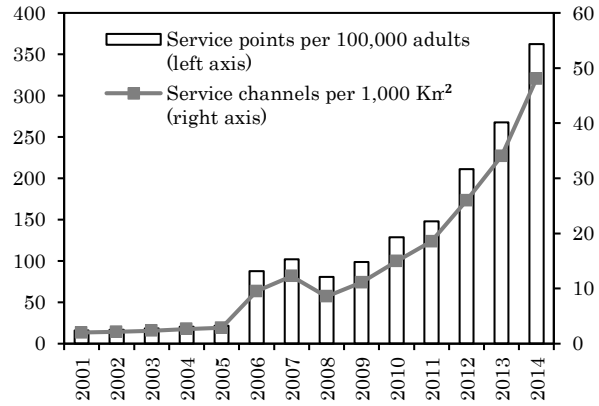
Figures

Figure 1
Peru: Number of financial service points



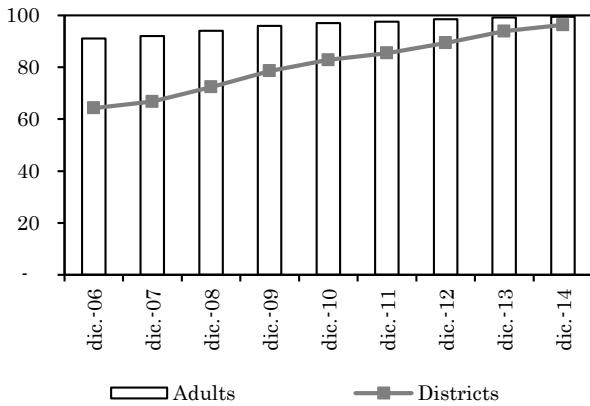
Source: SBS

Figure 2
Peru: Number of financial service points per 100,000 adults and number of service channels per 1,000 Km²



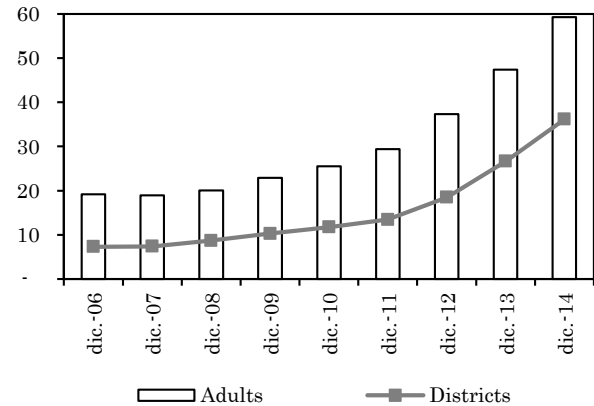
Source: SBS

Figure 3
Urban Peru: Financial service channels coverage (in percentage)



Source: SBS

Figure 4
Rural Peru: Financial service channels coverage (in percentage)



Source: SBS

Figure 5
Rural Peru: Number of financial service points

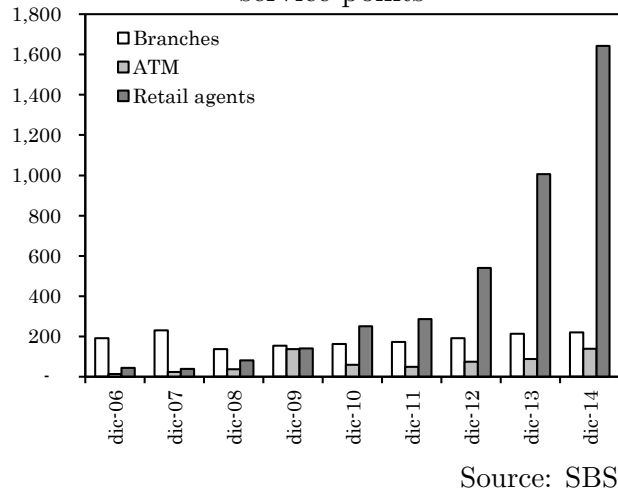
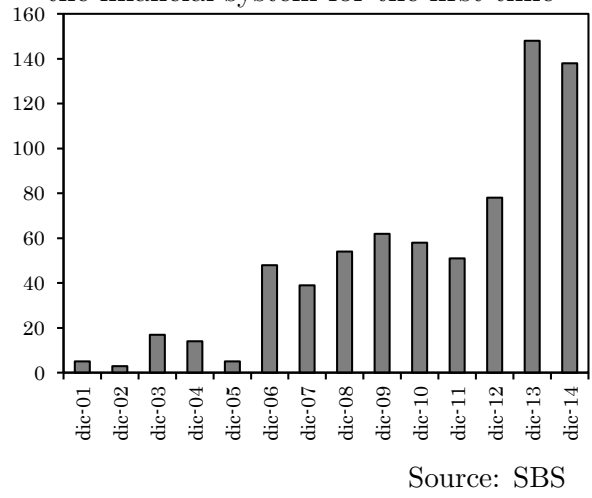


Figure 6
Peru: Number of districts with presence of the financial system for the first time



Tables

Table 1: Comparing Treated and Non-Treated Households

	Treatment Status		
	Never Treated	Pre-Treatment	Post-Treatment
Monthly Income			
2007	686.1 (38.4)	1185.1 (77.4)	1892.2 (65.2)
2008	870.9 (63.0)	1125.6 (71.7)	2025.7 (65.8)
2009	922.2 (58.57)	1073.1 (100.3)	2096.4 (65.9)
2010	1077.7 (68.9)	1154.2 (114.0)	2176.6 (80.4)
2011	1277.8 (124.5)	. (.)	2229.4 (67.7)
Monthly Expenditure			
2007	652.4 (30.3)	1032.9 (51.3)	1600.4 (44.2)
2008	738.7 (33.2)	1046.8 (60.8)	1687.2 (41.0)
2009	808.7 (35.99)	906.2 (68.6)	1693.9 (41.9)
2010	849.7 (35.5)	1042.5 (100.1)	1728.9 (42.9)
2011	938.8 (41.4)	. (.)	1770.7 (44.7)

Standard errors shown in parenthesis.

Table 2: Effects of financial retail agents on expenditure, whole sample

	Log (Expenditure)				
	Total	Transport	Food	Durables	Entertainment
Panel A:					
Access	-0.0291 (0.0410)	0.0016 -0.1180	0.0010 (0.0775)	0.0277 (0.0798)	0.1730** (0.0803)
Observations	5,645	4,688	5,539	5,487	5,505
R-squared	0.711	0.510	0.592	0.515	0.609
Panel B:					
Before 4	0.2890* (0.1480)	0.1070 (0.5390)	0.3980** (0.1790)	0.1580 (0.2140)	0.4490 (0.3240)
Before 3	0.1470** (0.0604)	0.0283 (0.2640)	0.2080 (0.1630)	0.0606 (0.1350)	-0.0352 (0.1560)
Before 2	0.0704 (0.0625)	0.1640 (0.1700)	-0.0469 (0.1210)	0.0877 (0.0923)	-0.0553 (0.1230)
Before 1	0.0897 (0.0555)	0.2260* (0.1220)	0.0577 (0.0967)	0.0431 (0.0653)	-0.1020 (0.0865)
After 1	0.0119 (0.0396)	-0.1240 (0.1100)	-0.0483 (0.0709)	-0.0958 (0.0649)	-0.0158 (0.0787)
After 2	0.0004 (0.0519)	-0.1960 (0.1320)	-0.1260 (0.0776)	-0.0855 (0.0722)	-0.0489 (0.0903)
After 3	-0.0687 (0.0549)	-0.3740** (0.1610)	-0.1760* (0.0919)	-0.2620*** (0.0815)	-0.1730 (0.1110)
After 4	-0.1110* (0.0666)	-0.4350** (0.1940)	-0.1940* (0.1020)	-0.1630* (0.0937)	-0.1260 (0.1200)
After 5	-0.1380* (0.0734)	-0.6220*** (0.2240)	-0.2330* (0.1300)	-0.3370*** (0.1060)	-0.2840** (0.1430)
Observations	5,645	4,688	5,539	5,487	5,505
R-squared	0.714	0.515	0.594	0.518	0.611
Panel C:					
Intensity	-0.00127*** (0.00039)	-0.00284** (0.00141)	-0.00200** (0.00084)	-0.00214*** (0.00072)	-0.00144* (0.00084)
(Intensity^2)/100	0.00016*** (0.00006)	0.00031 (0.00019)	0.00029** (0.00012)	0.00028** (0.00013)	0.00015 (0.00012)
Observations	5,645	4,688	5,539	5,487	5,505
R-squared	0.712	0.511	0.593	0.516	0.608

All regressions contain year and district dummies.

Robust standard errors clustered at the district level are shown in parenthesis.

* p<0.10, ** p<0.05, *** p<0.01

Table 3: Effects of financial retail agents on expenditure, rural sample

	Log (Expenditure)				
	Total	Transport	Food	Durables	Entertainment
Panel A:					
Access	-0.0720 (0.0593)	-0.1640 (0.1830)	-0.0310 (0.1200)	0.0191 (0.0938)	0.0821 (0.1190)
Observations	2,085	1,479	2,041	2,026	1,985
R-squared	0.655	0.422	0.542	0.513	0.573
Panel B:					
Before 4	0.3220** (0.1570)	0.1480 (0.5860)	0.4670** (0.1870)	0.1640 (0.2290)	0.4860 (0.3460)
Before 3	0.1700** (0.0722)	0.0478 (0.2880)	0.2240 (0.1720)	0.0453 (0.1430)	-0.0334 (0.1780)
Before 2	0.0876 (0.0871)	0.2150 (0.2190)	-0.0844 (0.1600)	0.0088 (0.1170)	-0.0855 (0.1630)
Before 1	0.1110 (0.0776)	0.1640 (0.1710)	0.1080 (0.1420)	-0.0498 (0.0760)	-0.1020 (0.1080)
After 1	0.0457 (0.0706)	-0.2260 (0.1830)	-0.0596 (0.1020)	-0.0328 (0.0941)	-0.0704 (0.1390)
After 2	0.0912 (0.0899)	-0.0445 (0.2370)	-0.1740 (0.1240)	-0.0811 (0.1150)	0.0456 (0.1490)
After 3	-0.0723 (0.0879)	-0.1360 (0.3000)	-0.2860* (0.1470)	-0.1550 (0.1280)	0.0002 (0.2070)
After 4	-0.1610 (0.1050)	-0.3330 (0.3630)	-0.3870*** (0.1300)	-0.0644 (0.1760)	0.0583 (0.2270)
After 5	-0.1190 (0.1160)	-0.3100 (0.3660)	-0.3940** (0.1710)	-0.0311 (0.2150)	-0.1160 (0.2760)
Observations	2,085	1,479	2,041	2,026	1,985
R-squared	0.660	0.425	0.548	0.514	0.577
Panel C:					
Intensity	-0.00930* (0.00504)	-0.00560 (0.0156)	-0.0107** (0.00537)	0.00339 (0.00863)	-0.000520 (0.00843)
(Intensity^2)/100	0.00391 (0.00253)	0.00332 (0.00777)	0.00240 (0.00263)	-0.00371 (0.00430)	-0.00152 (0.00438)
Observations	2,085	1,479	2,041	2,026	1,985
R-squared	0.656	0.421	0.543	0.514	0.573

All regressions contain year and district dummies.

Robust standard errors clustered at the district level are shown in parenthesis.

* p<0.10, ** p<0.05, *** p<0.01