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**Abstract**[1]

Uruguay implemented an ambitious financial inclusion program that included a fiscal stimulus through VAT rebates and subsidies for point of sale (POS) adoption. One of its main provisions banned cash payment of wages and social benefits and forced financial institutions to open wage-accounts with extremely beneficial conditions. In the aggregate, the number of debit cards transactions increased sharply. We test the wage-banking channel of the financial program exploiting differences in the treatment intensity between public sector and private sector workers. We find that while the provision of bank accounts increased the number of debit cards, it had modest effects on the probability of payment with cards that are mostly produced by a more intensive use of debit cards by those who already had them before the Financial Inclusion Act went into effect. Thus, the aggregate effects must be produced by the fiscal channel of the financial inclusion program. Finally, we fail to find effects on either access to short-term credit or expenditure or savings.

**JEL classifications:** D12; G21; G50
**Keywords:** Financial inclusion, Banking, Payment choice, Savings, Credit

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# 1. Introduction

Uruguay financial inclusion program aims to foster access to financial services such as electronic payment instruments, saving instruments and credit. One of the first policy instruments was the reduction of 9 points in the VAT (value-added tax) on credit cards payments in restaurants. Later, the adoption of Point of Sale (POS) machines by small businesses was subsidized to facilitate the use of this technology. The key piece of the financial inclusion policy was the Financial Inclusion Act (LIF, Ley de Inclusión Financiera 19210 of 2014). Starting in August 2014, the LIF generalized the discount on VAT to all payments with credit or debit cards—2 and 4 percentage points, respectively—on a maximum VAT rate of 22 percent. The VAT reduction for payments with credit or debit cards was gradually reduced until August 2016. At that time, the VAT discount was eliminated for credit cards payments and reduced to 2 percentage points for debit cards payments. In January 2017 an additional rebate was introduced that took the VAT discount for debit card payments back to 4 percentage points. The LIF also included three main provisions: the requirement for employers (with very few explicit exceptions) to pay wages by electronic means, the freedom of employees and social security recipients to choose the financial institution where they receive their remunerations, and the conditions that financial institution must obey regarding these wage (and social benefits) accounts.[2] Although the LIF was approved in 2014 the mandatory banking of wage payments was implemented in May 2017.

These regulatory changes likely affected both the supply and the demand side of the payment system. From the demand side, the reduction in VAT increases the relative benefits of debit and credit cards vis-à-vis cash. From the supply side, the subsidy for renting POS machines and the reduction in credit and debit cards fees charged to merchants incentivizes stores into accepting credit and debit cards payments.

The LIF may also had an impact on households' savings and credit access through a supply and demand effect. Prior to the reform, unbanked individuals had few instruments to channel their savings and mostly had to be held in cash or durable assets. Access to financial institutions may facilitate savings and promote financial literacy. From the point of view of banks, access to the

[2] They cannot have any opening, acquisition, maintenance or closing cost, nor can they require minimum balances. They must allow the extraction of funds at any time, without the need for prior notice or minimum duration requirements. They must be associated with a debit card that should enable its holders to make cash withdrawals and electronic payments in stores at no cost to them. They must allow unlimited and free balance inquiries, as well as five or more withdrawals on an ATM network without costs.

income history of its new customers might be a useful instrument for credit evaluation that before had to be based only on public information relative to past credit non-compliance.

Uruguay has historically lagged in the adoption of electronic payment instruments, but after the LIF there has been a dramatic change. Between 2013 and 2017 the number of debit card issued increased by 42 percent, the number of transactions on ATMs increased by 36 percent, and the number of transactions with debit cards increased 2,150 percent (see Figure 1). Thus, it seems that the regulatory changes impacted both the extensive and intensive margins. Figure 1 also shows the evolution of the number of ATMs withdrawals; the use of ATMs increased until the end of 2016 and declined thereafter. The decline in the number of cash withdrawals happened at the same time cash payments were banned, and there was an additional reduction in VAT for debit card payments. We observe not only a decline in the number of ATM withdrawals, but also a decline in the average amount withdrawn, which in constant prices fell by 10 percent between 2014 and the end of 2016. Moreover, the average number of monthly cash withdrawals per debit card issued declined from 2.7 by the beginning of 2014 to just below 1.7 by the end of 2021. Conversely, the average number of monthly transactions per debit card increased from 0.3 to 7.7 during the same period.

**Figure 1. Number of Transactions with Debit Cards and ATMs Withdrawals**

(a) Number of transactions (in thousands)

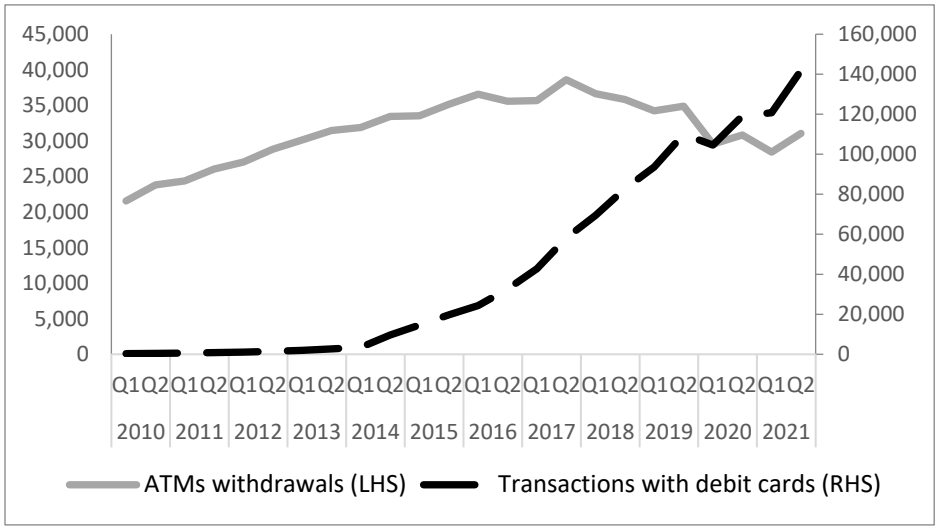
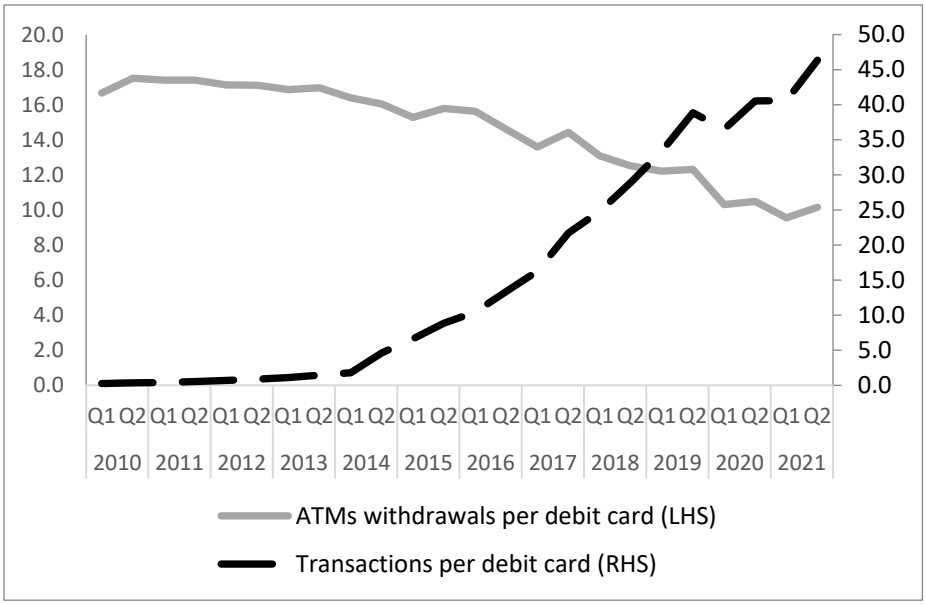


**Figure 1, continued**

(b) Transaction per debit card issued




*Source:* Banco Central del Uruguay.

Although interesting, aggregate statistics of this sort are unable to establish causal links or to differentiate between the effects of the tax rebate, the POS subsidy, and the mandatory wage payment. In this paper, we test the effects of the latter financial inclusion mechanism. As this requires microdata and a sound identification strategy, we use household-level data from three nationally representative sources: i) a traditional household survey carried out by the National Institute of Statistics, ii) a household financial survey, and iii) a household expenditure and income survey. Importantly, those data are available before and after the LIF intervention.

Identification is based on not all households being equally affected by the LIF. Public sector workers were already banked and had access to electronic payment mechanisms, while a substantial part of private workers were paid in cash. They thus constitute our control and treatment groups. Naturally, as there are reasons to be worried that public and private workers differ in their characteristics, we implement a propensity score matching mechanism to select the sample of public workers who, based on observable characteristics, are similar to private workers.

We study the effect of the policy change on three dimensions: the use of electronic payment instruments, households' savings, and short-term credit. The financial inclusion law is likely to have affected these three dimensions by making available new forms of payment, by facilitating

access to secure savings mechanisms and altering the incentives for precautionary savings, and by providing financial institutions with more direct and verifiable wage and social benefits information.

Summing up, the Uruguayan financial program employed a wide range of instruments. There were tax rebates of credit and debit card payments, subsidies for merchants that implemented POS machines, and provisions that banned cash wage payments. In the aggregate, the policy induced an increase in the transactions with debit card and a reduction in the number of ATM withdrawals, which could be the result of any of the instruments of the financial program. In this paper we provide a causal test of the wage-banking channel and fail to find statistically significant effects for most of the variables considered. Thus, the fiscal mechanisms of the financial inclusion program are the likely responsible of the aggregate dynamic. The policy was effective in universalizing debit cards to private formal workers, but our results suggests that those who most benefited from the VAT rebates and the wider accessibility of POS machines were those who were already being paid by electronic means even before the LIF and not those newly banked. A limitation of our study is that due to data availability our paper considers a short time window. A longer-term view might uncover different impacts.

## 2. Literature Review

This paper is related to the literature on the determinants of financial inclusion and the literature on payment choice. A few studies analyze the effect of expanding financial services access to low-income households in developed countries. Fitzpatrick (2015) studies the effect of changes in the UK Child Benefit program on access to a bank account and, as a result, on financial savings. Fitzpatrick (2015) exploits the exogenous variation in bank account holding due to the policy change (we follow a similar strategy in this paper). The author estimates a small, albeit significant, increase in financial savings for low-income households. While the effect on the probability of having a bank account is sizeable, the effect on financial savings is relatively small and for households with very small amounts of savings. Washington (2006) focuses on low-income households in the United States and finds, using a difference-in-difference empirical strategy, that changes in state regulations aiming to increase access to bank accounts resulted in a modest increase in the proportion of low-income households holding bank accounts.

The effect of financial inclusion laws or other regulatory changes that facilitate the access to financial services has also been considered in developing countries. For instance, Dupas et al. (2018) ran a field experiment of decreased barriers to open a bank account and study how the increase in access to bank accounts in Uganda, Malawi and Chile affects the use of financial services and savings. Although they find an increase in the use of financial services, they do not find sizeable effects on average savings, even after three years of the intervention. The increase in deposits in banks is mostly due to crowd-out of informal savings.

Similarly, Prina (2015) using a randomized field experiment for a sample of female household heads in Nepal, studies how having access to a bank account affects savings, asset accumulation, expenditure, and income. She shows that take-up is high; in fact, almost all the households that were offered a bank account opened one. Also, she finds an increase in monetary savings that is not crowding-out other types of savings, and an increase of investment in health and in education.

Chopra et. al. (2017) and Agarwal et. al. (2017) study a large financial inclusion program in India that resulted in new bank accounts for more than 250 million people. Both studies find a large increase in the proportion of households holding a bank account and in its use.

A second strand of the literature related to payment instruments choice has been widely studied in countries where households have access to banking and financial services but, probably due to data limitations, has not received much attention in developing countries or countries where access to financial services is more restricted, as in Uruguay. In this strand, Klee (2006) studies the relation between the use of payment instruments and households' characteristics using survey data for the United States. The author finds that the use of debit cards increases with the level of income and education. She attributes the income effect to households gaining access to financial services, but also to the substitution between other forms of payment and debit cards. She also finds a positive relation between age and convenience card use, but a negative relation with debit card use. Also using data from the United States, Borzekowski and Kiser (2008) estimate a rank-ordered logit model for payment instruments' attributes: older households suffer disutility from electronic and liquid attributes, that is, attributes associated with debit cards. Cohen and Rysman (2013), using a panel of consumers, find a negative relation between age and card use. On the other hand, they find a positive relationship between income and cards and checks use, while the relation

with cash is negative. Klee (2008) also finds that debit card use increases with income, while the use of cash, checks and credit card use decreases.

Several papers study the effect of supply side factors on payment instrument choice. Rysman (2007), for example, documents the existence of a positive feedback loop between consumer usage of a credit card and its acceptance by merchants. The rationale behind this result is that consumers value more a specific credit card if it is widely accepted by merchants, and vice versa. Huynh, Schmidt-Dengler and Stix (2014) study card acceptance at the point of sale and its impact on money demand. Their findings suggest a negative relation between acceptance and money demand. Finally, Arango, Hogg and Lee (2015) study why cash is still a popular payment method in Canada. They use data from the 2009 Methods of Payment Survey, a household survey specifically designed to study payment instrument choice by Canadian households, and find that cash is used mostly because it is widely accepted by merchants, is easy to use, and has a low marginal cost.

There are few papers based on the Uruguayan experienced related to these topics. Mello (2011) describes the credit card market in detail and studies market concentration and the interchange fees charged. The author concludes that, compared with other countries, the credit card market in Uruguay is not well developed and that there is a lack of competition on the supply side of the market. Lluberas (2014) studies the drivers of households' payment instrument choice. Using data from the 2005-06 income and expenditure survey, he finds that not controlling for transaction characteristics results in biased estimates of household characteristics effects. The author finds that once transactions characteristics are included in the estimations, income and age play a minor role in explaining households' payment instrument choice in Uruguay. Gandelman and Rasteletti (2015) study the impact of bank credit on employment formality and find that financial deepening decreases informality, especially for female and older workers. Sanromán and Santos (2014) use the Financial Survey of Uruguayan Households to study the determinants of accessing financial services, specifically having a credit card and a bank account. They find that household characteristics like income, education level and working status are the main drivers of the probability of using those financial services. Gandelman and Lluberas (2022) present harmonized indicators of household wealth, including financial debts and holding of financial assets, in Chile, Colombia, Mexico and Uruguay, using Spain as a comparison benchmark.

As far as we know there are only two studies analyzing the impact of the LIF: Brockmeyer and Saenz (2022) and Olivieri, Quagliotti and Sanromán (2022). Brockmeyer and Saenz (2022) study the effect of the LIF on tax compliance, arguing that wholesale trade firms were not affected by VAT rebates while retail traders were. This gives them exogenous variation to implement a difference-in-difference type estimation. They find that the effect of the law was to increase the adoption of debit cards as a payment instrument due to VAT rebates, but it had no effect on POS adoption by merchants. In turn, they do not find any effect of the LIF on VAT compliance, resulting in an estimated net fiscal cost of 1.5 percent of VAT revenue. Olivieri, Quagliotti and Sanromán (2022) argue, as we do, that since public servants were already banked, they were not affected by the banning of wage cash payments, while private sectors workers were more likely affected. Using a difference-in-difference framework, they find that the LIF increased access to debit cards but had no effects on credit cards.

Summing up, our paper contributes to the literature in several dimensions. On the one hand, the literature on the effects of banking on households is concentrated on poor countries or within the less affluent population. Instead, Uruguay has a GDP per capita above US$15,000 and, at least by the World Bank classification, is a high-income country. On the other hand, the literature on payment instruments choice has paid relatively less attention to effects on developing countries or countries where access to financial services are more restricted, as in Uruguay. Finally, the Uruguayan financial inclusion program was an all-encompassing policy with instruments that are likely to be part of any other country's financial inclusion program. We provide a test of the casual effects of the banning of wage cash payments and show this was not the main mechanism through which the policy impacted the payment system. Thus, the fiscal front must be responsible for the aggregate results.

## 3. Data

We make use of several household surveys to estimate the effect of the LIF on payment instrument choice, savings, and access to credit. First, the Encuesta Continua de Hogares (ECH) is a long-lasting national household survey aiming at gathering information about the labor market, poverty, and household income. The microdata are freely downloadable from the National Institute of Statistics website. Since 2012, the ECH registers whether workers received their salaries in cash or electronic means.

Second, we use data from the first and third waves of the Financial Survey of Uruguayan Households (Encuesta Financiera de los Hogares Uruguayos, EFHU). Questions about the household's financial situation, indebtedness, assets ownership, and use of payment instruments were asked to a sub-sample of the regular ECH. The first wave was collected between October 2012 and January 2013 (before the LIF) and ended up with a sample size of 9,156 households. The third wave includes 9,412 households and was collected during July-September of 2017 (after the LIF). The months when it was carried out are important because, although the LIF was approved in 2014, its implementation passed a milestone in the second quarter of 2017 (May) when the payment of salaries to almost all private sector workers by electronic means became mandatory. Both waves are representative of the Uruguayan population and can be accessed upon request from the Department of Economics of the Universidad de la República (dECON).

Third, we use data from the national income and expenditure survey, Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH), that was conducted between November 2016 and October 2017. Since the objective of the survey is the construction of an average consumption basket for the Consumer Price Index, data on consumption expenditures are very disaggregated. All forms of monetary and nonmonetary income are also computed. Financial capital gains (for example, increases in asset values due to price changes in capital markets) are not reported, but earned interest and dividends are. Thus, we can use information at the household level on types of purchases. The microdata are publicly available from the INE's website.

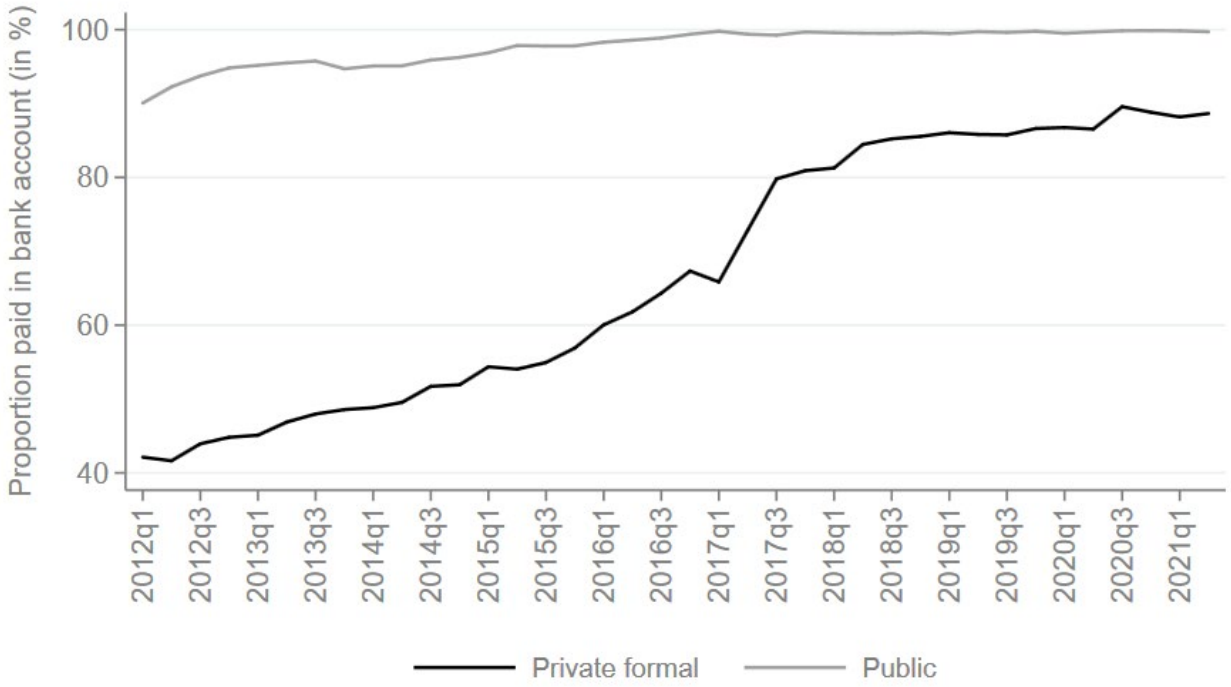
Finally, we complete this microdata with other control variables that are only gathered at the regional level like the number of POS machines per square kilometer or robberies per 100,000 inhabitants.

## 4. Empirical Strategy

In order to estimate the causal effect of the wage-banking channel of the LIF on households' payment instrument choice, savings, expenditure, and access to credit we follow a difference-in-difference (DID) strategy. Payment of wages and pensions using electronic means became mandatory in May 2017, and we exploit this policy change that affected differently public and private formal workers to identify the causal effect of the LIF on payment instrument choice, savings, and access to credit.

Figure 2 shows the proportion of workers being paid in a bank account according to their sector of employment. While the proportion of public sector workers that received their salary in a bank account was close to 100 percent in the first quarter of 2017, there was a sharp increase in the proportion of private formal workers that were paid their wages in a bank account between the first and second quarter of 2017. The introduction of the mandatory payment of wages in electronic instruments resulted in an increase of 14 percentage points in the proportion of private formal workers being paid in a bank account.

**Figure 2. Proportion of Workers Paid in a Bank Account by Economic Sector**




*Source:* Household surveys (ECH).

We use a Fuzzy DID design where the treatment group is defined as the one experiencing the largest increase in the treatment rate. In our case, the treatment group represents private formal workers.

Care should be taken when comparing public and private workers, since they may have different personal characteristics. While we cannot test differences in unobservable characteristics, we consider a wide range of observable characteristics and perform a propensity score matching to assure that the treated and control groups are balanced. In fact, Table 1 shows that in the raw

data there were more female public workers than female private workers. Public workers were also older, richer and more likely to have achieved tertiary education. Table 1 also shows that once we perform the PSM there are almost no statistically significant differences between our treatment and control groups.

**Table 1. Balance Test: Household Observable Characteristics**

**A. ENIGH**

| | Without matching | | | After Propensity Score matching | | |
|---|---|---|---|---|---|---|
| | Mean Private | Mean Public | Difference | Mean Private | Mean Public | Difference |
| Women | 0.46 | 0.54 | -0.08*** | 0.46 | 0.42 | 0.04 |
| Age | 43.1 | 45.9 | -2.83*** | 43.1 | 43.1 | -0.02 |
| Income (monthly, USD) | 2,084 | 2,405 | -321*** | 2,084 | 2,109 | -25 |
| Years of education | 10.4 | 12.8 | -2.35*** | 10.4 | 10.5 | -0.11 |
| Capital City | 0.51 | 0.49 | -0.02*** | 0.51 | 0.54 | -0.03 |

**B. EFHU**

| | Without matching | | | After PS matching | | |
|---|---|---|---|---|---|---|
| | Mean Private | Mean Public | Difference | Mean Private | Mean Public | Difference |
| Women | 0.40 | 0.46 | -0.06*** | 0.40 | 0.37 | 0.03* |
| Age | 42.77 | 45.87 | -3.09*** | 42.77 | 43.19 | -0.42 |
| Income (monthly, USD) | 2,484 | 2,753 | -268*** | 2,484 | 2,529 | -45 |
| Years of education | 9.96 | 12.00 | -2.04*** | 9.96 | 9.93 | 0.03 |
| Capital city | 0.53 | 0.48 | 0.05*** | 0.53 | 0.53 | 0.00 |

In the next section we present the substantive results. For each dimension of analysis, we proceed in the same order. Before turning to the regression analysis, we present summary statistics of the dependent variables disaggregating the sample in the period pre and post-LIF and for the treatment (private sector workers) and control (public sector workers selected by the PSM). We show the mean difference-in-differences estimated as

$$DID = [E(Y_1|G = 1) - E(Y_0|G = 1)] - [E(Y_1|G = 0) - E(Y_0|G = 0)]$$

where the subindex 1 represents the period post LIF and 0 the period pre LIF. $G$ represents the treatment ($G = 1$, or private formal workers) or the control group ($G = 0$, public sector workers). Then, to study the statistical significance of the estimates we pooled observations (pre and post LIF) and estimate a classical difference in difference model:

$$Y_i = \alpha Private_i + \beta Post_t + \gamma Private_i Post_t + X_i + + \varepsilon_i$$

where the dependent variable $Y_i$ refers to either the payment instrument choice, savings, consumption or access to credit, $Private_i$ is a dummy for private workers, $Post_t$ is a dummy for observations gathered after the implementation of the mandatory electronic wage payment, and $X_i$ includes observable characteristics such as gender, region, education, and income. The coefficient of interest is $\gamma$. For robustness, in the Appendix we reproduce the regression tables using the whole set of public sectors (without PSM).

## 5. Results

### *5.1 Bank Accounts and Debit Cards*

Table 2 reports a sizeable increase in the percentage of household heads that receive their wage in a bank account. According to the ENIGH, the proportion of workers in the formal private sector being paid in a bank account increased from 66 percent in the pre-LIF period (November 2016 – April 2017) to 79 percent in the post-LIF period (May 2017 – October 2017). Moreover, there is a negligible increase among public sector workers, 98 percent of whom were already paid in a bank account before such payment was mandatory. That proportion increased to 99 percent post-LIF. This results in a DID estimate of 12 percentage points. If we look at the EFHU, for which we have data for October 2012 to January 2013 (pre-LIF) and for June to August 2017 (post-LIF), we find an increase from 49 percent to 83 percent among formal private workers and from 97 percent to 100 percent among public sector workers. The DID in that case is 30 percentage points. Thus, we find a sizeable increase in the proportion of private formal sector workers being paid in a bank account, either measured in a short time window with the ENIGH or a longer time window with the EFHU.

**Table 2. Bank Payment: Pre and Post-LIF**

| | | | Public sector | | Private formal sector | | **DID** |
|---|---|---|---|---|---|---|---|
| | Source | Pre/Post LIF | mean | S.E. | mean | S.E. | |
| Bank payment | ENIGH | Pre | 0.98 | 0.01 | 0.66 | 0.02 | **0.12** |
| | | Post | 0.99 | 0.00 | 0.79 | 0.01 | |
| Bank payment | EFHU | Pre | 0.97 | 0.00 | 0.49 | 0.01 | **0.30** |
| | | Post | 1.00 | 0.00 | 0.83 | 0.01 | |

*Notes:* Pre-LIF in the EFHU is October 2012 - January 2013, and in the ENIGH it is November 2016-April 2017. Post-LIF in the EFHU is July - September of 2017, and in the ENIGH it is May-October 2017. Bank payment is a dummy variable that takes the value 1 if the household head's salary is paid in a bank account.

Table 3 shows the determinants of the probability of bank payment estimated by a linear probability model. In columns (A) to (C) we use data from the ENIGH, while in columns (D) to (F) we use the EFHU. In columns (A) and (D) we estimate the causal effect of the mandatory payment of wages on bank payment for private sector employees.

We find that even after controlling for a set of observable characteristics, the policy increased the probability of wages being paid in a bank account among private formal sector workers. This increase was of 12 percentage points according to the shorter time horizon of the ENIGH or of 30 percentage points according to the longer time horizon of the EFHU. In columns (B) and (C) we split the ENIGH sample into the pre-LIF period and the post-LIF period. In both cases private formal workers are less likely to be paid in a bank account relative to public sector workers, but the coefficient declines (in absolute value) in the post-LIF period. A similar pattern is found if we look at a longer time horizon using data from the first and third waves of the EFHU (columns (E) and (F)) but, in this case, the decline is even larger. The rest of the explanatory variables have the expected signs: richer and more educated household heads are more likely to be paid in a bank account. Even though not statistically significant different from zero in all the specifications, women and older people are less likely to be paid in a bank account. Finally, we find that the coefficients are lower in the post-LIF period, suggesting that income, the level of education and living in the capital city are less important in explaining wages being paid in a bank account in that period. This is consistent with the LIF expanding the coverage of banked individuals; thus, the individual socio-demographic determinants have less explanatory power.

**Table 3. Probability of Bank Payment: Pre and Post-LIF**

| | Bank payment ENIGH PRE/POST (A) | Bank payment ENIGH PRE (B) | Bank payment ENIGH POST (C) | Bank payment EFHU PRE/POST (D) | Bank payment EFHU PRE (E) | Bank payment EFHU POST (F) |
|---|---|---|---|---|---|---|
| Private worker x Post LIF | 0.120*** | | | 0.305*** | | |
| | (0.0258) | | | (0.0166) | | |
| Private worker | -0.311*** | -0.310*** | -0.192*** | -0.472*** | -0.469*** | -0.169*** |
| | (0.0202) | -0.0202 | (0.0156) | (0.0144) | (0.0146) | (0.00812) |
| Post LIF | 0.00193 | | | 0.0266*** | | |
| | (0.0133) | | | (0.0103) | | |
| Women | -0.0343** | -0.0205 | -0.0461*** | -0.0498*** | -0.0653*** | -0.0374*** |
| | (0.0135) | -0.0212 | (0.0172) | (0.00943) | (0.0176) | (0.00887) |
| Age (In tens) | -0.00912 | -0.00136 | -0.0140* | -0.0112*** | -0.00980 | -0.0124*** |
| | (0.00633) | -0.00995 | (0.00822) | (0.00370) | (0.00630) | (0.00410) |
| ln(income) | 0.0762*** | 0.0985*** | 0.0580*** | 0.0884*** | 0.122*** | 0.0592*** |
| | (0.0125) | -0.0204 | (0.0155) | (0.00795) | (0.0137) | (0.00842) |
| ln(years educ.) | 0.138*** | 0.142*** | 0.139*** | 0.121*** | 0.144*** | 0.0977*** |
| | (0.0225) | -0.0356 | (0.0293) | (0.0157) | (0.0294) | (0.0145) |
| Capital City | 0.00920 | 0.011 | 0.00803 | 0.0263*** | 0.0393*** | 0.0171** |
| | (0.0134) | -0.0211 | (0.0169) | (0.00876) | (0.0152) | (0.00862) |
| Constant | 0.145 | -0.0697 | 0.308*** | 0.0733 | -0.242** | 0.383*** |
| | (0.0895) | -0.154 | (0.107) | (0.0652) | (0.113) | (0.0602) |
| Observations | 2,041 | 931 | 1,110 | 5,878 | 2,848 | 3,030 |
| R-squared | 0.206 | 0.231 | 0.159 | 0.326 | 0.350 | 0.145 |

*Notes:* Pre-LIF in the EFHU is October 2012 - January 2013, and in the ENIGH it is November 2016-April 2017. Post-LIF in the EFHU is July - September of 2017, and in the ENIGH it is May-October 2017. Bank payment is a dummy variable that takes the value 1 if the household head's salary is paid in a bank account. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

### *5.2 Payment Instrument Choice*

Next, we turn to payment instrument choice (Table 4). We look at payment instruments in both the extensive and the intensive margins. For the extensive margin, we consider a dummy whether the household head made any payment with card (credit or debit). For the intensive margin, we consider the percentage of total expenditure paid with cards.

The EFHU survey asks whether regular purchases (food, cleaning products, clothing, etc.) are paid either exclusively in cash and checks, mostly in cash and checks but also using debit or

credit cards, mostly using debit or credit cards, or all of the above in similar proportions. We construct a dummy variable that takes the value 1 when these day-to-day purchases are not performed exclusively in cash or checks, i.e., there is at least some use of other means of payment.

Using the EFHU for the extensive margin, we find that the proportion of private formal workers not paying exclusively with cash or checks their day-to-day purchases increased from 39 percent to 66 percent after the introduction of the LIF. A similar increase is observed for public sector workers, from 46 percent before the LIF to 72 percent in the post-LIF period.

If we look at payment instrument in the ENIGH, we find a DID estimate in the proportion of private sector workers using cards of 8 percentage points, explained mostly by the decline in the proportion of public sector workers using cards. If we separate the use of cards into debit and credit cards, we find that the decline in the use of cards among public sector workers is due to credit cards. While the proportion of public workers using debit cards stayed constant at 60 percent in the pre and post-LIF periods, it declined from 63 percent to 54 percent for credit cards. On the other hand, for private sector workers we observe a relatively constant proportion of households using credit cards and a 5 percentage point increase in the use of debit cards. The DID estimate is 0.05 for debit cards and 0.09 for credit cards, the latter effect driven by the control group.

For the intensive margin, we find a small DID effect of 0.01 for the percentage of expenditure paid with cards that is due to different effects for debit and credit cards. For debit cards the DID is -0.02, and for credit cards it is 0.03. Among private sector workers the percentage of spending with credit cards increase from 15 percent to 16 percent, and the percentage of spending with debit cards increased from 7 percent to 8 percent. Among public sector workers, consistent with the decline in the proportion of households paying with credit card, we observe a decline in the proportion of total expenditure paid with credit cards and an increase for the proportion paid with debit cards. These effects are a rational reaction to the wider tax rebates for debit card payment rather than credit card payments that affect both the treatment and control group.

**Table 4. Payment Instrument Choice: Pre and Post**

| | | | Public sector | | Private formal sector | | DID |
|---|---|---|---|---|---|---|---|
| | Source | Pre/Post LIF | mean | S.E. | mean | S.E. | |
| Regular purchases not with cash | EFHU | Pre | 0.46 | 0.01 | 0.39 | 0.01 | **0.02** |
| | | Post | 0.72 | 0.01 | 0.66 | 0.01 | |
| Used card | ENIGH | Pre | 0.81 | 0.01 | 0.71 | 0.02 | **0.08** |
| | | Post | 0.72 | 0.02 | 0.71 | 0.02 | |
| Used debit card | ENIGH | Pre | 0.60 | 0.02 | 0.46 | 0.02 | **0.05** |
| | | Post | 0.60 | 0.02 | 0.51 | 0.02 | |
| Used credit card | ENIGH | Pre | 0.63 | 0.02 | 0.59 | 0.02 | **0.09** |
| | | Post | 0.54 | 0.02 | 0.58 | 0.02 | |
| % expenditure with card | ENIGH | Pre | 0.18 | 0.01 | 0.15 | 0.01 | **0.01** |
| | | Post | 0.18 | 0.01 | 0.16 | 0.01 | |
| % expenditure with debit card | ENIGH | Pre | 0.09 | 0.00 | 0.07 | 0.01 | **-0.02** |
| | | Post | 0.12 | 0.01 | 0.08 | 0.00 | |
| % expenditure with credit card | ENIGH | Pre | 0.09 | 0.01 | 0.07 | 0.00 | **0.03** |
| | | Post | 0.05 | 0.00 | 0.07 | 0.00 | |

*Notes:* Pre-LIF in the EFHU is October 2012 - January 2013, and in the ENIGH it is November 2016-April 2017. Post-LIF in the EFHU is July - September of 2017, and in the ENIGH it is May-October 2017.

Table 5 reports the estimation of the classical difference-in-differences model on alternative measures of payment instrument choice. Using the EFHU, we do not find statistically significant results. Using the ENIGH, we find a positive impact of the LIF on the probability of using cards. The effect is only statistically significant at 10 percent. The point estimate is economically meaningful with a marginal effect of about one tenth of the unconditional probability. We do not find any effect on the proportion of expenditure paid with cards. But when we split card payments into debit and credit cards, we observe an increase of 3 percentage points in the proportion of expenditure paid with credit cards and a reduction of similar magnitude in the proportion of expenditure paid with debit cards. This is mostly driven by the control group, as public sector workers, on average, increased the intensive use of debit cards more than private formal workers, while they reduced the intensive use of credit cards.

The rest of the coefficients have the expected sign. We find, in line with previous literature that younger, more educated, and richer individuals are more likely to pay with cards.

## Table 5. Impact of the LIF on the Probability of Paying with Credit Card, Debit Card or Bank Transfer

| | Extensive margin | | | | | Intensive margin | |
|---|---|---|---|---|---|---|---|
| | Used cards daily purchases | Used cards | Used credit card | Used debit card | % expenditure with card | % expenditure with credit card | % expenditure with debit card |
| | EFHU Prob. margins | ENIGH Prob. margins | ENIGH Prob. margins | ENIGH Prob. margins | ENIGH OLS | ENIGH OLS | ENIGH OLS |
| Private worker x Post LIF | 0.00955 | 0.0748* | 0.0781 | 0.0268 | -0.000324 | 0.0330* | -0.0290* |
| | (0.0339) | (0.0447) | (0.0579) | (0.0565) | (0.0246) | (0.0177) | (0.0165) |
| Private worker | -0.0544** | -0.0735** | -0.0273 | -0.110*** | -0.0222 | -0.0179 | -0.00863 |
| | (0.0255) | (0.0327) | -0.0471 | (0.0426) | (0.0213) | (0.0171) | (0.0123) |
| Post LIF | 0.237*** | -0.0905** | -0.112** | 0.000365 | 0.000179 | -0.0409** | 0.0344** |
| | (0.0292) | (0.0408) | (0.0524) | (0.0522) | (0.0226) | (0.0164) | (0.0151) |
| log(crime) | | 0.0893* | 0.206*** | -0.0819 | 0.00336 | 0.0215 | -0.0138 |
| | | (0.0504) | (0.0625) | (0.0653) | (0.0209) | (0.0153) | (0.0118) |
| log(POS) | | 0.0322*** | 0.0205 | 0.0594*** | 0.0194*** | 0.00354 | 0.0161*** |
| | | (0.0119) | (0.0150) | (0.0144) | (0.00506) | (0.00323) | (0.00384) |
| Women | 0.0331** | 0.000929 | 0.0345 | 0.0312 | 0.0134 | 0.000569 | 0.00962 |
| | (0.0166) | (0.0222) | (0.0291) | (0.0282) | (0.0126) | (0.00866) | (0.0087) |
| Age (In tens) | -0.00210*** | -0.0160 | -0.00787 | -0.0311** | -0.0110** | -0.000665 | -0.0101** |
| | (0.000747) | (0.0101) | (0.0131) | (0.0124) | (0.00498) | (0.00268) | (0.00396) |
| ln(income) | 0.172*** | 0.188*** | 0.183*** | 0.214*** | 0.0790*** | 0.0246*** | 0.0457*** |
| | (0.0153) | (0.0180) | (0.0219) | (0.0227) | (0.0091) | (0.00614) | (0.00673) |
| ln(years educ.) | 0.141*** | 0.189*** | 0.217*** | 0.289*** | 0.103*** | 0.0213 | 0.0754*** |
| | (0.0276) | (0.0340) | (0.0449) | (0.0455) | (0.0195) | (0.0135) | (0.0133) |
| Capital City | 0.125*** | -0.0296 | -0.0583 | -0.121* | -0.0295 | -0.00306 | -0.0361 |
| | (0.0170) | (0.0620) | (0.0775) | (0.0732) | (0.0284) | (0.0174) | (0.0223) |
| Constant | | | | | -0.641*** | -0.304** | -0.288*** |
| | | | | | (0.1750) | (0.1280) | (0.1010) |
| Unconditional probability | 0.57 | 0.73 | 0.58 | 0.54 | 0.17 | 0.07 | 0.09 |
| Observations | 5,551 | 2,080 | 2,080 | 2,080 | 2,080 | 2,080 | 2,080 |

*Notes:* Used cards is a dummy for paying at least once with card (1), credit card (2) or debit card (3).
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

In our estimations we also include context characteristics variables like the log of the number of POS machines per square kilometer at the department level and the level of crime. As discussed above, a key feature of the LIF was the subsidy to merchants to adopt POS machines. Thinking of the payment market as a two-sided-market, the policy changes introduced by the LIF affected both sides of the market, consumers, and merchants. In that sense, we find that the number of POS machines in the region increases the probability of paying through debit cards and the proportion of total expenditure paid with debit cards.

### *5.3 Savings and Credit*

Table 6 shows the pre and post average monthly income, expenditure, savings, savings rate and non-housing (short term) credit for both the control and treatment groups. We do not find any substantial differences in the periods pre or post the introduction of the LIF on monthly income, which is to be expected since income is one of the variables used for the PSM. Monthly expenditure increased for both groups, but slightly more among private formal workers, resulting in a DID estimate of USD 71 per month. The small difference in income together with the increase in expenditure explains the negative DID estimate for monthly savings of USD-43. That is a relatively large figure, equivalent to about 9 percent of pre-LIF private workers' savings. This result is due to a decrease among private formal workers compared to a negligible increase among public sector workers.

Redoing the same exercise with the savings rates produce qualitatively similar results. The DID estimate suggests a relative decline of 7 percentage points in the saving rate of private formal vis-à-vis public sector workers that is produced by an absolute level reduction in the savings of private workers and a small increase in the savings rate of public workers.

Another reason behind the introduction of the LIF was to facilitate access to credit. Credit markets in Uruguay are relatively underdeveloped, and households' credit is relatively scarce and expensive compared to countries of similar income. For instance, according to the World Bank World Development Indicators, domestic credit to the private sector as a proportion of GDP in 2020 was 27.9 percent in Uruguay, compared to 124.6 percent in Chile or 54.3 percent in Colombia. In terms of use of short-term credit, we find a decline for both private and public sector workers. Since the decline among private formal workers is larger, this results in a DID estimate of -3 percentage points.

Overall, this preliminary evidence suggests a slight increase in monthly expenditure and a decline in savings among private sector workers compared to public workers. As shown in Table 7, however, we find no statistically significant effect of the LIF on either household savings or the savings rate. While our results for savings are not statistically significant, the point estimate suggest a sizeable reduction in savings that is mainly channeled through increased consumption. Our failing to capture these effects might be due to lack of power in our estimations. Among the controls, we find that savings increase with income in line with what was reported in Gandelman (2017) for most Latin American countries and in Dynan et al. (2004) for the United States.

In the regression result for short-term (non-housing) credit, the interaction term between our treatment group and the post-LIF dummy is also not statistically significant. Thus, we fail to find statistically significant effects of the LIF on credit access. In line with Table 6, we do find that private sector formal workers are less likely to have access to short-term credit compared to public sector workers. The control variables show that women are more likely to have short-term credit and that the probability of having access to short-term credit also increases with income and declines with age.

**Table 6. Income, Expenditure, Savings and Credit: Pre and Post-LIF**

| | | | Public sector | | Private formal sector | | **DID** |
|---|---|---|---|---|---|---|---|
| | Source | Pre/Post LIF | Mean | S.E. | Mean | S.E. | |
| Monthly Income (in USD) | ENIGH | Pre | 2,052 | 56.61 | 2,011 | 59.38 | **28** |
| | | Post | 2,160 | 48.08 | 2,148 | 61.1 | |
| Monthly Expenditure (in USD) | ENIGH | Pre | 1,545 | 31.55 | 1,522 | 46.1 | **71.4** |
| | | Post | 1,648 | 40.07 | 1,697 | 51.97 | |
| Monthly Savings (in USD) | ENIGH | Pre | 507 | 49.24 | 489 | 38.18 | **-43.4** |
| | | Post | 512 | 33.4 | 451 | 46.58 | |
| Saving rate | ENIGH | Pre | 0.16 | 0.02 | 0.14 | 0.03 | **-0.07** |
| | | Post | 0.18 | 0.01 | 0.10 | 0.04 | |
| Short term credit | EFHU | Pre | 0.57 | 0.01 | 0.38 | 0.01 | **0.03** |
| | | Post | 0.49 | 0.01 | 0.33 | 0.01 | |

*Notes:* Pre LIF in the EFHU is October 2012 - January 2013, and in the ENIGH it is November 2016 – April 2017. Post LIF in the EFHU is July – September 2017, and in the ENIGH it is May-October 2017.

**Table 7. Impact of the LIF on Savings, Expenditure and Access to Credit**

| | Savings | Saving rate | Expenditure | Non-housing Credit |
|---|---|---|---|---|
| | OLS | OLS | OLS | Prob. margins |
| Private worker x Post LIF | -75.43 | -0.0697 | 43.01 | 0.0286 |
| | (106.5) | (0.0672) | (96.39) | (0.0353) |
| Private worker | 72.61 | 0.00670 | 93.13 | -0.185*** |
| | (82.21) | (0.0477) | (73.57) | (0.0257) |
| Post LIF | -11.76 | 0.0146 | 51.26 | -0.0971*** |
| | (93.09) | (0.0461) | (79.41) | (0.0315) |
| Women | 88.89 | 0.0123 | -1.845 | 0.0272 |
| | (59.08) | (0.0265) | (48.37) | (0.0183) |
| Age (In tens) | 47.99* | 0.00287 | 9.909 | -0.00241*** |
| | (26.45) | (0.0146) | (21.45) | (0.000803) |
| ln(income) | 1,033*** | 0.454*** | 1,145*** | 0.0591*** |
| | (93.86) | (0.105) | (57.15) | (0.0165) |
| ln(years of education) | -412.9*** | -0.398*** | 552.7*** | -0.213*** |
| | (76.52) | (0.0920) | (75.06) | (0.0306) |
| Capital City | -89.01* | -0.107** | 128.1** | -0.0648*** |
| | (50.15) | (0.0425) | (50.19) | (0.0184) |
| Constant | -6,487*** | -2.288*** | -8,396*** | |
| | (654.4) | (0.576) | (440.7) | |
| Mean | 492.20 | 0.13 | 1683.44 | 0.44 |
| Observations | 2,080 | 2,080 | 2,080 | 5580 |

*Notes:* Dependent variable is either absolute value of monthly savings, the savings rate, monthly expenditure in USD or a dummy for the household holding non-housing credit. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

### *5.4 Heterogeneity*

Given the lack of statistical significance in most of our results, in this section we further extend the analysis of payment instrument choice. We consider whether there is heterogeneity in the effect of the policy across three dimensions: type of store, geographic zone (to proxy POS availability) and type of product.

In Table 8 we restrict the transactions with cards in different types of stores: supermarkets, drugstores and gas stations that most likely have already accepted cards before the LIF. In that sense, if we found an effect of the policy, we would assume it must reflect the demand side of the policy. Nevertheless, we do not find a statistically significant effect of the LIF neither in the extensive nor in the intensive margin in any of the three types of stores considered.

**Table 8. Card Payment in Different Types of Stores**

| | **Supermarkets** | | **Drug stores** | | **Gas stations** | |
|---|---|---|---|---|---|---|
| | Used cards | % expenditure with card | Used cards | % expenditure with card | Used cards | % expenditure with card |
| | Probit. Marginal effects | OLS | Probit. Marginal effects | OLS | Probit. Marginal effects | OLS |
| Private worker x Post LIF | -0.0449 | -0.0258 | 0.0172 | -0.0104 | -0.133 | -0.127 |
| | (0.0630) | (0.0430) | (0.0812) | (0.0801) | (0.167) | (0.207) |
| Private worker | -0.0343 | -0.0146 | -0.0439 | -0.0526 | -0.234** | -0.229* |
| | (0.0502) | (0.0328) | (0.0646) | (0.0629) | (0.107) | (0.131) |
| Post LIF | 0.0450 | 0.0510 | 0.0357 | 0.0451 | 0.229* | 0.194 |
| | (0.0581) | (0.0391) | (0.0723) | (0.0733) | (0.129) | (0.182) |
| log(crime) | 0.0917 | 0.0390 | -0.111 | -0.0495 | -0.386 | -0.178 |
| | (0.0715) | (0.0452) | (0.150) | (0.110) | (0.280) | (0.184) |
| log(POS) | 0.0442*** | 0.0173* | 0.0404 | 0.0190 | 0.148*** | 0.111** |
| | (0.0161) | (0.0103) | (0.0251) | (0.0163) | (0.0495) | (0.0520) |
| Women | 0.00821 | 8.40e-05 | 0.0619 | 0.0529 | -0.0119 | 0.0625 |
| | (0.0323) | (0.0223) | (0.0472) | (0.0475) | (0.0887) | (0.114) |
| Age (In tens) | -0.0398*** | -0.0228*** | -0.0410** | -0.0375* | -0.115*** | -0.106*** |
| | (0.0140) | (0.00846) | (0.0202) | (0.0196) | (0.0318) | (0.0393) |
| Capital city | -0.116 | -0.0110 | 0.00972 | 0.0760 | -0.286 | -0.165 |
| | (0.0808) | (0.0537) | (0.108) | (0.0796) | (0.213) | (0.220) |
| ln(income) | 0.163*** | 0.110*** | 0.110*** | 0.0846** | 0.0451 | 0.0613 |
| | (0.0242) | (0.0181) | (0.0361) | (0.0335) | (0.0706) | (0.0773) |
| ln(years educ.) | 0.177*** | 0.142*** | 0.181** | 0.156** | -0.138 | -0.268 |
| | (0.0525) | (0.0360) | (0.0715) | (0.0652) | (0.174) | (0.261) |
| Constant | | -1.124*** | | -0.312 | | 2.163 |
| | | (0.369) | | (0.889) | | (1.421) |
| Observations | 1,962 | 1,962 | 855 | 855 | 90 | 90 |
| R-squared | | 0.125 | | 0.123 | | 0.284 |

*Notes:* Data from ENIG. Used cards is a dummy for paying at least once with card in each type of store. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

In Table 9 we study heterogeneity by geographic zone, focusing on the effect of the policy change in the capital city of Montevideo, with a POS density of 52 per square kilometer, vis-à-vis the rest of the country. We estimate a model with a triple interaction of a dummy variable capturing the capital city, a dummy variable for private formal workers, and a third dummy variable capturing the post LIF period. In the extensive margin (probability of using cards), the triple interaction is statistically significant suggesting that the policy had a stronger effect in the capital city where wage cash payments (and informality) were less prevalent before the LIF and where there was a denser network of POS connections.

For our last analysis we study whether there was a different effect of the policy across several type of products. Previous evidence (Lluberas, 2014) showed that not only consumer demographic characteristics but also transaction characteristics matter in explaining payment instrument choice. What and where a product is bought help to explain how people pay. In that sense, Table 10 shows the effect of the policy expenditure paid by cards across different types of products: food, alcohol and cigarettes, leisure and clothing. Again, we fail to find an effect of the policy change on the use of cards among these products.

## Table 9. Card Payment by Geographic Zone

| | Used cards | % exp. with card |
|---|---|---|
| | Probit. Marginal effects | OLS |
| Capital City x Private worker x Post LIF | 0.301*** | -0.000851 |
| | (0.0989) | (0.0459) |
| Private worker x Post LIF | -0.0326 | 0.000858 |
| | (0.0569) | (0.0243) |
| Capital City x Post LIF | -0.217** | 0.0238 |
| | (0.0908) | (0.0422) |
| Capital City x Private worker | -0.324*** | -0.0301 |
| | (0.0748) | (0.0384) |
| Private worker | 0.0493 | -0.00452 |
| | (0.0427) | (0.0186) |
| Post LIF | -0.0226 | -0.0127 |
| | (0.0514) | (0.0217) |
| log(crime) | 0.124*** | 0.0321 |
| | (0.0468) | (0.0209) |
| Capital City | 0.340*** | 0.0633 |
| | (0.0726) | (0.0385) |
| Women | 0.00506 | 0.0150 |
| | (0.0218) | (0.0127) |
| Age (In tens) | -0.0144 | -0.0108** |
| | (0.0102) | (0.00496) |
| ln(income) | 0.197*** | 0.103*** |
| | (0.0337) | (0.0186) |
| ln(years educ.) | 0.188*** | 0.0813*** |
| | (0.0180) | (0.00924) |
| Constant | | -0.898*** |
| | | (0.170) |
| Observations | 2,080 | 2,099 |
| R-squared | | 0.21 |

*Notes:* Data from ENIG. Used cards supermarket is a dummy for paying at least once with card in the supermarket. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## Table 10. Heterogeneity by Type of Product

(% expenditure with card)

| | Food | Leisure | Clothing |
|---|---|---|---|
| | OLS | OLS | OLS |
| Private worker x Post LIF | -0.0189 | 2.21e-05 | -0.0197 |
| | (0.0322) | (0.0467) | (0.0342) |
| Private worker | -0.00121 | 0.00547 | -0.0161 |
| | (0.0247) | (0.0375) | (0.0273) |
| Post LIF | 0.0442 | 0.00565 | 0.00445 |
| | (0.0290) | (0.0422) | (0.0315) |
| log(crime) | 0.00574 | -0.0566 | 0.0405 |
| | (0.0274) | (0.0471) | (0.0272) |
| log(POS) | 0.0221*** | 0.0270*** | 0.0182*** |
| | (0.00759) | (0.00871) | (0.00659) |
| Women | 0.00583 | 0.0268 | 0.00193 |
| | (0.0172) | (0.0250) | (0.0175) |
| Age (In tens) | -0.0139** | -0.00790 | -0.00151 |
| | (0.00673) | (0.0104) | (0.00679) |
| ln(income) | 0.101*** | 0.102*** | 0.0759*** |
| | (0.0131) | (0.0199) | (0.0153) |
| ln(years educ.) | 0.121*** | 0.175*** | 0.139*** |
| | (0.0288) | (0.0388) | (0.0269) |
| Capital City | -0.0353 | 0.0323 | -0.00532 |
| | (0.0438) | (0.0483) | (0.0370) |
| Constant | -0.880*** | -0.471 | -1.027*** |
| | (0.219) | (0.391) | (0.227) |
| Observations | 2,071 | 1,901 | 2,021 |
| R-squared | 0.152 | 0.149 | 0.150 |

*Notes:* Data from ENIG. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## 6. Conclusion

Uruguay implemented an ambitious financial inclusion program that was staggered in several dimensions. Fiscal incentives were provided in the form of tax rebates for credit card and debit card payments and subsides for merchants to incentivize the adoption of POS machines. The financial inclusion program also banned cash payment of wages and social benefits and forced financial institutions to open wage accounts with extremely beneficial conditions. We present evidence that in the aggregate the policy was successful in increasing the number of transactions with cards while reducing ATM withdrawals. This happened because both more debit cards were issue and individuals made a more intensive use of them.

In the aggregate, it is not possible to distinguish the relative importance of the different mechanisms working concomitantly. We exploit differences in pre-LIF banking conditions among public sector and private sector workers as a source of exogenous variation to test the impact of the banking channel.

We find that the mandatory electronic payment of wages indeed increased the holding of debit cards. Nevertheless, we do not find robust evidence of changes in the payment instrument choice, savings, or access to credit card that could be attributed to the mandatory opening of wage-accounts in financial institutions. Thus, we must conclude that the fiscal stimulus of the financial inclusion program is responsible for the aggregates results of the policy and that those already holding cards before the LIF benefited the most from the VAT rebate.

We acknowledge two limitations of our study. First, the post-LIF information refers to one quarter, so our effects are short term and we cannot rule out other longer-term effects. Second, some of our results are control driven. This suggests that the tax rebates might have had stronger effects among public workers who were already banked and already had debit cards, which is not the most stylized framework for a natural experiment.

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# Appendix

## Table A.1. Impact of the LIF on the Probability of Paying with Credit Card, Debit Card or Bank Transfer (without PSM)

| | Extensive margin | | | | | Intensive margin | | |
|---|---|---|---|---|---|---|---|---|
| | Used cards daily purchases | Used cards monthly purchases | Used cards | Used credit card | Used debit card | % expenditure with card | % expenditure with credit card | % expenditure with debit card |
| | EFHU | EFHU | ENIGH | ENIGH | ENIGH | ENIGH | ENIGH | ENIGH |
| | Prob. margins | Prob. margins | Prob. margins | Prob. margins | Prob. margins | OLS | OLS | OLS |
| Private worker x Post LIF | -0.0206 | -0.0451* | 0.00568 | 0.0443 | -0.0178 | -0.0110 | 0.0268*** | -0.0376*** |
| | (0.0261) | (0.0232) | (0.0389) | (0.0440) | (0.0417) | (0.0172) | (0.0103) | -0.0129 |
| Private worker | -0.0199 | -0.00339 | -0.0142 | -0.00774 | -0.0611* | -0.0251* | -0.0150* | -0.00981 |
| | (0.0188) | (0.0190) | (0.0303) | (0.0344) | (0.0318) | (0.0133) | (0.00797) | -0.01 |
| Post LIF | 0.263*** | 0.419*** | -0.0249 | -0.0777** | 0.0414 | 0.0101 | -0.0355*** | 0.0430*** |
| | (0.0213) | (0.0169) | (0.0335) | (0.0374) | (0.0355) | (0.0146) | (0.00873) | -0.011 |
| log(crime) | | | 0.0893** | 0.145*** | -0.0218 | 0.0189 | 0.0292** | -0.00919 |
| | | | (0.0384) | (0.0480) | (0.0466) | (0.0193) | (0.0115) | -0.0145 |
| log(POS) | | | 0.0407*** | 0.0380*** | 0.0617*** | 0.0145*** | 0.00224 | 0.0126*** |
| | | | (0.00933) | (0.0115) | (0.0109) | (0.00462) | (0.00276) | -0.00347 |
| Women | 0.0365*** | -0.0180* | 0.000473 | 0.0222 | 0.00728 | 0.00832 | 0.000608 | 0.00736 |
| | (0.0125) | (0.0108) | (0.0176) | (0.0203) | (0.0193) | (0.00795) | (0.00476) | -0.00597 |
| Age (In tens) | -0.00211*** | -0.000737 | -0.0150* | -0.0112 | -0.0311*** | -0.0125*** | -0.00156 | -0.00948*** |
| | (0.000529) | (0.000461) | (0.00769) | (0.00900) | (0.00847) | (0.00353) | (0.00211) | -0.00265 |
| ln(income) | 0.182*** | 0.130*** | 0.178*** | 0.198*** | 0.192*** | 0.0862*** | 0.0328*** | 0.0442*** |
| | (0.0112) | (0.00983) | (0.0144) | (0.0166) | (0.0158) | (0.00675) | (0.00403) | -0.00507 |
| ln(years educ.) | 0.159*** | 0.263*** | 0.201*** | 0.183*** | 0.328*** | 0.105*** | 0.0235*** | 0.0783*** |
| | (0.0187) | (0.0168) | (0.0261) | (0.0314) | (0.0294) | (0.0126) | (0.00756) | -0.00949 |
| Capital City | 0.122*** | 0.109*** | -0.115** | -0.160*** | -0.169*** | -0.0146 | -0.00467 | -0.0206 |
| | (0.0119) | (0.0103) | (0.0495) | (0.0589) | (0.0555) | (0.0234) | (0.0140) | -0.0175 |
| Constant | | | | | | -0.804*** | -0.425*** | -0.323*** |
| | | | | | | (0.153) | (0.0917) | -0.115 |
| Unconditional probability | 0.55 | 0.33 | 0.73 | 0.6 | 0.53 | 0.17 | 0.07 | 0.09 |
| Observations | 5579 | 5542 | 2,099 | 2,099 | 2,099 | 2,099 | 2,099 | 2,099 |

*Notes:* Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## Table A.2. Impact of the LIF on Savings, Expenditure (without PSM)

| | Savings | Saving rate | Expenditure | Non-housing Credit |
|---|---|---|---|---|
| | OLS | OLS | OLS | Prob. margins |
| Private worker x Post LIF | 84.35 | -0.00612 | -39.52 | 0.0292 |
| | -103.5 | -0.0815 | -97.88 | (0.0278) |
| Private worker | -33.57 | -0.0524 | 140.8* | -0.157*** |
| | -79.98 | -0.063 | -75.65 | (0.0206) |
| Post LIF | -165.5* | -0.0471 | 127.5 | -0.0944*** |
| | -87.6 | -0.069 | -82.86 | (0.0232) |
| Women | 120.5** | 0.0415 | -42.72 | 0.0258* |
| | -47.76 | -0.0376 | -45.17 | (0.0135) |
| Age (In tens) | 51.73** | -0.00881 | 16.12 | -0.00169*** |
| | -21.25 | -0.0167 | -20.1 | (0.000575) |
| ln(income) | 1,002*** | 0.504*** | 1,196*** | 0.0441*** |
| | -40.41 | -0.0318 | -38.22 | (0.0123) |
| ln(years of education) | -490.7*** | -0.496*** | 596.3*** | -0.167*** |
| | -76.05 | -0.0599 | -71.93 | (0.0199) |
| Capital City | -18.86 | -0.0959** | 85.94* | -0.0837*** |
| | -48.28 | -0.038 | -45.66 | (0.0131) |
| Constant | -6,039*** | -2.346*** | -8,904*** | |
| | -310.7 | -0.245 | -293.8 | |
| Unconditional mean | 492.2 | 0.13 | 1683.44 | 0.3898419 |
| Observations | 2,080 | 2,080 | 2,080 | 5608 |

*Notes:* Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1