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could they work in Colombia?

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Abstract

More than 60 countries in the world have already implemented instant payment systems (IPS). However, in many cases they have been operational mainly for person-to-person transactions. This study looks at the challenges IPS may face in developing economies like Colombia as they advance further into the P2B transactions space. Using a survey on Colombian merchants (IV-2020), the study explores the factors associated with merchants' propensity to adopt instant payments and those associated with the adoption of current electronic payment alternatives. It shows that IPS will need to have a broad strategy to penetrate the P2B space, as they will have to compete with the low marginal costs and immediacy that cash already offers and the high levels of informality in the commerce sector, especially for micro businesses. Furthermore, IPS will have to meet the high expectations merchants have about instant payments enabling access to other financial services, enhancing their competitiveness, and increasing their bottom line.

Key words: instant payments, faster payments, mobile payments, cash and electronic payments, merchants, retail payments, cards, bank transfers.

JEL Classification: D23, D40, G20, G21, G28, E41, E58.

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Adopción de los pagos inmediatos en el comercio al por menor en Colombia

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Resumen

Más de 60 países en el mundo han implementado sistemas de pagos inmediatos. Sin embargo, en muchos casos dichos sistemas tan solo ofrecen transferencias entre personas. Esta investigación analiza los desafíos que deben enfrentar los sistemas de pagos inmediatos en economías en desarrollo como la colombiana para profundizar sus servicios en el comercio al por menor. Con base en la encuesta a comercios realizada por el Banco de la República en el cuarto trimestre de 2020, la investigación explora los factores asociados a la disposición de los comercios a adoptar pagos inmediatos y otras alternativas electrónicas de pago. Los resultados confirman que los sistemas de pagos inmediatos necesitan de una estrategia clara para lograr consolidarse en el comercio al por menor. En particular, estos deben competir con los bajos costos marginales y la inmediatez en la disponibilidad de los fondos que ofrece el efectivo y los elevados niveles de informalidad, especialmente entre los micro comercios. Además, los servicios de pago inmediatos deberán cumplir con las altas expectativas que tienen los comercios de mejorar el acceso a los servicios financieros, incrementar su competitividad y mejorar su rentabilidad.

Palabras clave: Pagos inmediatos, pagos móviles, pagos electrónicos, pagos en efectivo, comercios, pagos de bajo valor, pagos con tarjetas, transferencias electrónicas

Clasificación JEL: D23, D40, G20, G21, G28, E41, E58.

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I. Introduction

Retail payment systems have been rapidly changing as they have faced innovations such as new access methods, platforms, interfaces, and new users' demands (World Bank, 2020). Instant payment systems (IPS) are one of the recent developments in emerging economies through which payments are cleared and settled within a few seconds on a 24/7 basis, therefore, the funds are immediately available for the payee, resembling the immediacy offered by cash (Sablik, 2020).

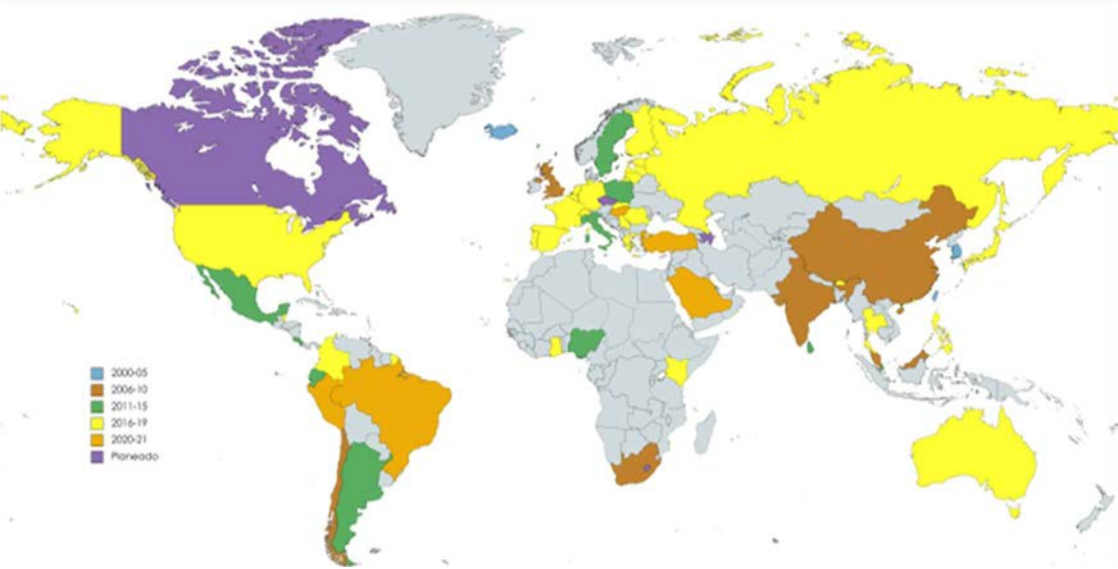
Besides the enhanced security of digital payments, instant payment transactions can be made through mobile phones, with the use of near-field communication (NFC), quick response (QR) codes and biotechnologies. Instant payments (IP) have great potential to become ubiquitous by leveraging on Fintechs, Bigtechs and other financial and non-financial payment service providers (PSP). Finally, favored by innovations in consumer databases (e.g. phone numbers, national identity, *alias*) IPS promise to make the know-your-client and onboarding processes almost frictionless.

Along with mobile banking, IP also would provide transactional information about consumers and businesses that opens the access to other financial services, enabling financial inclusion (Hartmanh et al., 2019). This should help to unlock the full potential of the digital economy as technologies offer an effective way to overcome access barriers (D'Silva et al., 2019). For example, India has shown that IP and digital technology contributes to close the access gap to the banking and financial system (D'Silva et al., 2019). Also important is the potential of IPS to improve the efficiency of governmental social transfers to citizens.

A recent survey conducted by the Bank of International Settlements (BIS) shows that IPS are becoming the new normal, and as innovation is taking place, new Fintechs and other PSP are appearing with interesting solutions. Over 60 countries now have an instant payment system, while several others have announced their plans to go live (Figure 1).

In the case of Latin America, several countries have already implemented an IPS, including the largest economies, Brazil with PIX and Mexico with CoDi, which promise to redefine the payment landscape in the region.

Figure 1. Countries that have implemented Instant Payment Systems by year of adoption

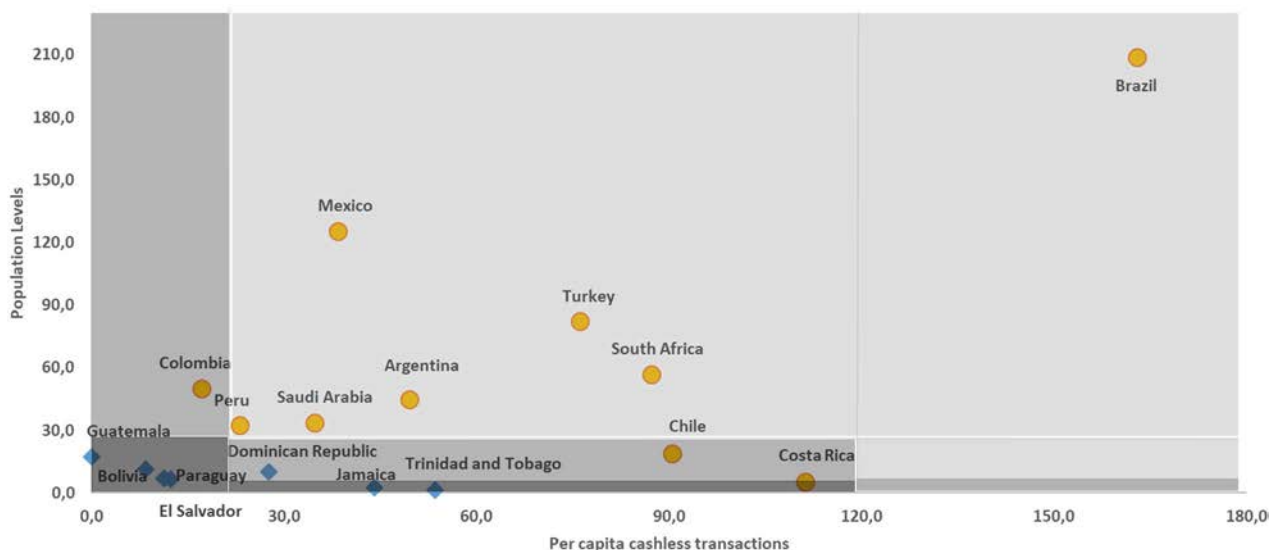


Source: Authors’ elaboration based on information from BIS (Morten et al., 2020) and Central Banks.

IPS started offering person-to-person (P2P) payments which limited their scope, but as the use of these systems expanded other payments such as person-to-business (P2B), business-to-business (B2B) and transactions between people and businesses, and the government are now considered. In fact, industry research shows that the real impact behind IP is in the sphere of P2B and B2B transactions.

Even when IPS seem to be a must have, countries should evaluate readiness before committing to such a move. Using data from 17 developing economies, Figure 2 shows the IPS readiness index proposed by Balakrishnan (2016) that classifies each country from 1 to 9 according to their population level and per capita cashless transactions. Of the 17 countries, 7 score high, 4 score medium and 6 score low. All countries that score high already have an IPS in place. The ratio of adoption is 3 out of 4 for countries that score medium and 0 out of 6 for the ones that score low.

Figure 2. Instant Payments System readiness index, 2018



Note: darkest shade of grey =low levels of readiness, mid-shade of grey=medium, lightest shade of grey= high. Cashless transactions include: Credit transfers, direct debit, e-money payment transactions and card payments. In circle the countries that already implemented IP.

Source: BIS Red Book and CEMLA Yellow Book.

According to this index, Colombia scores 3 (medium), which contrasts with the index levels of Mexico, Chile and Brazil. Yet, in Colombia a private IPS called Transfiya has been operating since 2018. This system complements the existing offer of electronic transfers that includes: two automated clearing houses (ACH- Colombia and CENIT), ATM networks and card networks. Transfiya offers P2P transactions, has a limit of five transactions per day, and a cap of USD 64 per transaction. However up until now the system has reached only one million transactions, the user experience is still cumbersome, and interoperability and PSP access is limited. Thus, the Central Bank is pondering about the modernization of its ACH to offer IP services that (i) Allow for broad access, (ii) enable any type of retail transfers between people, businesses and government, and (iii) are user friendly (easy to access and use) and affordable.

This article contributes to the debate by addressing the issues that IPS may face to permeate the P2B space. The study uses a survey on merchants conducted by the central bank in the last quarter of 2020 (MPS20). The survey covers merchant’s adoption of electronic payments both as payees (sales) and as payors (operational expenses). The survey also includes a section that prompts merchants about their intentions to adopt a hypothetical IPS. Using Probit models of adoption of current electronic payment instruments as well as models of the intention to adopt IP, the study provides a dashboard of the challenges IP adoption may face in the P2B space.

The main findings of the study are:

- Colombian merchants are rapidly embracing electronic payments, but cash is still the predominant payment method used by their customers and for their operational expenses. The strong recent adoption is in part due to the pandemic. Indeed, 41.1% of the acceptance

of direct mobile payments, 26.3% of online bank transfers, and to a lesser extent, 11.6% of EFTPOS card acceptance were instilled by the pandemic.

- Merchants' socioeconomic factors such as size, technical competences in payments, formal-informal economic status, and liquidity needs, have been strongly present in their decisions to accept current electronic payment instruments and will be key in their adoption of IP.
- Incentives will also play a key role in IP adoption. First, merchants are relatively inelastic to per- transaction costs (especially micro merchants). And prices will have to be significantly low to compete with the low marginal cost of cash and entice them to adopt IP. Second, IP will have to be embedded into attractive financial service packages to lure merchants into adoption. Third, IP needs to improve merchants' bottom line by fulfilling their sales-growth expectations and reducing their costs. All in all, IP must provide merchants with a better proposition than they currently enjoy with cash.
- Finally, the last mile of IP, that is the configuration of the means to access the IP by end users (consumers and merchants), must be well designed. Merchants are already adopting mobile payments, which would be a natural set up for the IP's last mile. Yet, adoption of mobile payments is significantly associated with merchants' perceptions of their efficiency, costs and risks, compared with cash.

The article is organized as follows. The second section describes the current landscape of electronic payments in Colombia and the nascent provision of IP services. The third section explores the factors that are statistically associated with merchants' electronic-payments adoption decisions. The fourth section focuses on merchants' intentions to adopt IP. The last section discusses the key challenges for IP to reach ubiquity in the P2B space.

II. Instant payments in Colombia

Historically, Colombia has been a cash driven economy, however, there has been an increase in the use of electronic payment methods. Results of a Central Bank's survey show that from the consumer side about 88% of adults use largely cash for their daily payments (Banco de la República, 2021). From the merchants' side, the MPS20 reveals that cash is the most accepted means of payment as 98.9% of the merchants surveyed accept cash, followed by 50.1% that accept electronic transfers (Arango-Arango et al., 2021a). Acceptance of cards is nearly 42%, nonetheless there are important gaps between the card acceptance rate of micro merchants (40.3%) and medium and large merchants (92.4%).

Digital P2B payments in Colombia are dominated by debit and credit cards. There are two switches, Redeban and Credibanco, in charge of the clearing and settlement of Visa and Mastercard transactions. Both switches can process any payment regardless of the franchise.

There is a high degree of vertical and horizontal integration in the provision of payment services. This market structure is not desirable due to the loss of competition, despite of the efficiencies that

economies of scale and scope may provide. The most prevalent private banks of the country own the ACH Colombia. In addition, they have controlled the cards acquisition market through Redeban and Credibanco. Finally, they are the main providers of transaction accounts, the last mile in cards and bank transfer services (Arango-Arango et al., 2021b).

The current market structure is the result of a regulatory framework that has prioritized safety over efficiency and wide accessibility. However, because of the rapid innovations in payments and the growth in the digital economy the Colombian government is pushing an agenda to deepen the use of electronic payments. In December 2020 the Ministry of Finance enacted the Decree 1692 which aims to improve the openness and transparency in the market for retail payments in Colombia. This regulation defines a new set of conditions to tackle conflict of interest of integrated services, facilitate the participation of non-financial PSP, and increase transparency in pricing and service contracts to improve the delivery capacity of the payment ecosystem.

A. Bank transfers in Colombia: predecessors of instant payments

CENIT is the Colombian public ACH operated by the Central Bank. The creation of CENIT was a result of a set of recommendations that the World Bank presented to the government in 1996 to improve and upgrade Colombia's payment system.

Despite the agreement of the implementation of a unique ACH that would serve both the State and commercial banks, in 1997 private banks decided to create ACH Colombia. Since then, the presence of a public and a private provider of ACH services has led to a segmented market. As of 2020, 5% of the volume of ACH transfers were made through CENIT, mainly State transactions, and the remaining 95% through ACH Colombia.

Market segmentation is also evident with respect to the fee structure among the two ACHs. Until 2018 payee participants in both ACHs invoiced an interbank fee to payor participants. This fee responds to the cost related to guaranteeing the availability of funds in the payee's account (specially cash handling costs). However, the ACH Colombia decided to eliminate these interbank fees. Nonetheless, the banks, owners of the ACH Colombia, continue to charge interchange fees in CENIT.

Even though, CENIT's market share is low, it has pushed service innovations. Since 2007 CENIT operates in batch through five cycles within the day, which brought clearing and settlement from t+1 to intraday. This decision made the private ACH to follow suit, implementing the same settlement cycles. However, the lack of competition has led some banks to make funds available to the receiver on a next-day basis.

B. Instant payment systems

Since 2006, the Government has prioritized financial inclusion as one of the long-term goals. As a result, Congress has passed several bills to develop an electronic retail payments ecosystem. These have included regulation on e-money and deposits, reductions of requisites to open deposit accounts, and the introduction of simplified banking licenses for the provision of e-money deposits and payments (Sociedades Especializadas en Depósitos y Pagos Electrónicos -SEDPE-, Bill 1735/2014). At the end of 2020, there were five SEDPE operating in Colombia.

In the race to improve financial inclusion one of the biggest commercial banks launched in 2011 a closed mobile payment scheme called Daviplata, that was followed by Nequi in 2016 and the SEDPE Movii in 2018. These systems are closed because even though they allow interbank transfers their business model seeks to maximize operations in their platform. Currently, Daviplata has nearly 12 million users, Nequi 4 million and Movii 1.5 million users, equivalent to a one third of Colombia's population.

In 2017, the Central Bank discussed with private banks the need of an interoperable IPS in Colombia. As a result, in 2018, ACH Colombia launched Transfiya, an IPS that clears and settles P2P transactions in real time 24 hours a day, 365 days a year. Today, Transfiya has 13 participants, most of them banks, and two SEDPE (Movii y dale!), which limits its penetration. Moreover, there has not been a commercial strategy aimed to promote its use in the P2B realm and the user experience is still cumbersome, probably to avoid cannibalization with debit and credit card services. Thus, the Colombian Central Bank is discussing the pertinence of modernizing its ACH with instant payment services that may complement those services offered by the private sector.

III. Cash and electronic payments among Colombian merchants

The Colombian central bank held a merchants' payments survey in the fourth quarter of 2020 (MPS20). The survey provides an evaluation of the current state of digitalization of payments in the commerce sector in Colombia and the factors that affect payments decisions. This, together with a diagnosis of the use of cash in the P2B space, helps to assess the potential for IP to transform the retail payments ecosystem in the country.

The sample size was 1999 merchants that have physical presence in large, medium and small cities. Micro merchants (those with less than 10 workers) are 58.3% of the sample, followed by small merchants (32.3%) and medium and large merchants (9.4%).

Although there is a large difference in acceptance of electronic payments between micro- and larger merchants, around 40% of micro merchants accept payment cards and 50% electronic transfers (Table 1). In general, these high acceptance levels have been reached recently. Indeed, 41.1% of the acceptance of direct mobile payments, 26.3% of online bank transfers, and to a less extent, 11.6% of EFTPOS card acceptance were instilled by the pandemic. Also, acceptance of electronic payments is higher among formal merchants but one in two informal merchants accepts electronic payments (Figure 3).

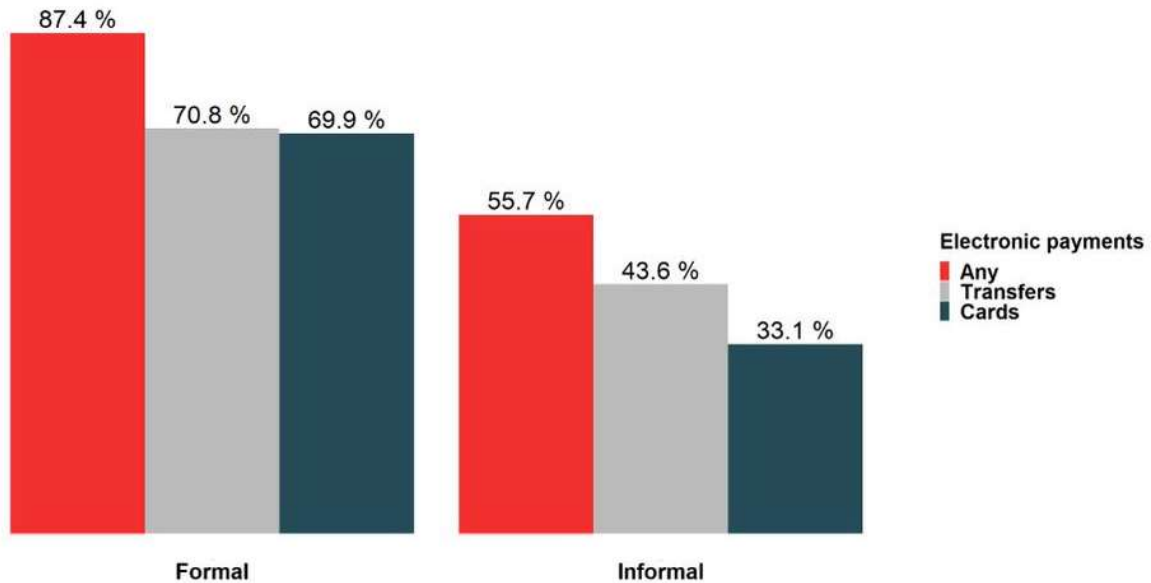
Table 1: percentage of adoption of different payment instruments

	Micro merchants	Small merchants	Medium and large merchants
Cash	98.9%	97.8%	97.5%
Cards	40.3%	78.9%	92.4%
Electronic transfers	48.9%	75.4%	93.4%
Cheques	10.2%	38.8%	65.8%

Source: Authors' calculations.

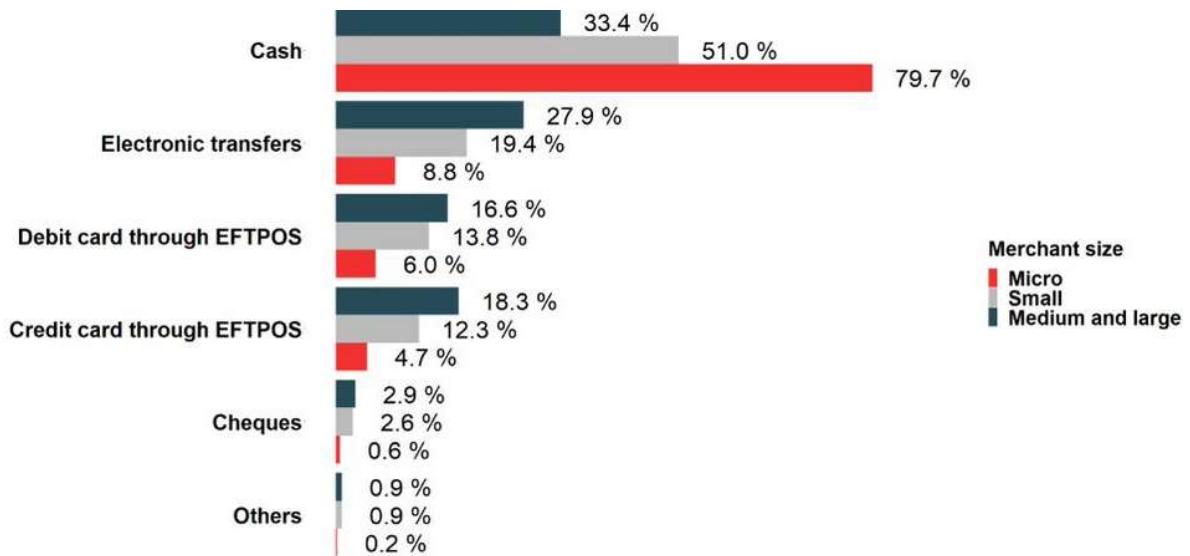
Despite increasing levels of electronic payment acceptance cash remains the predominant payment instrument, covering about 78.5% of merchants' sales in terms of value and volume. By merchant size, cash dominates among micro merchants (79.7%) but drops significantly among small (51%) and medium and large merchants (32.4%) (Figure 4). Even at transactions above USD 70, cash is still the most used payment instrument, accounting for two thirds of transactions. It is worth mentioning that direct transfers account for almost half of the sales made with electronic payments, similar to cards sales. This is relevant given that direct transfers, including transfers with mobile payment applications, do not impose transaction fees for merchants compared with cards.

Figure 3: Electronic payments acceptance by formal and informal merchants



Notes: Authors' calculations. The category "Any" refers to the acceptance of any electronic payment instrument such as cards, direct transfers through online banking, electronic wallets or transfers with mobile payment applications.

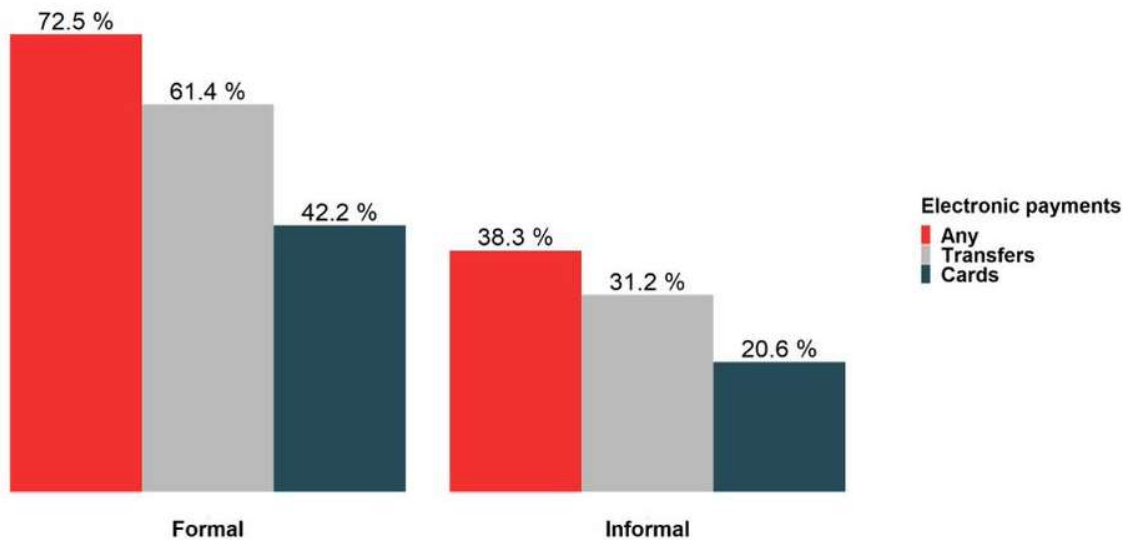
Figure 4: Payment shares in sales values by different payment instrument



Notes: Authors' calculations. The category "Others" refers to prepaid electronic and paper-based instruments such as vouchers.

From the perspective of B2B payments, the MPS20 also explores the experience of merchants with different payment instruments and channels. Around 70% of merchants use cash for their operational expenses. In the case of electronic transfers, there is a large gap in its adoption between micro merchants (36.9%) and the small (70.9%) and the medium and large (92.7%) counterparts. Besides, only a third of informal merchants have adopted electronic payments for their operational expenses compared with the high levels of adoption among formal merchants (Figure 5).

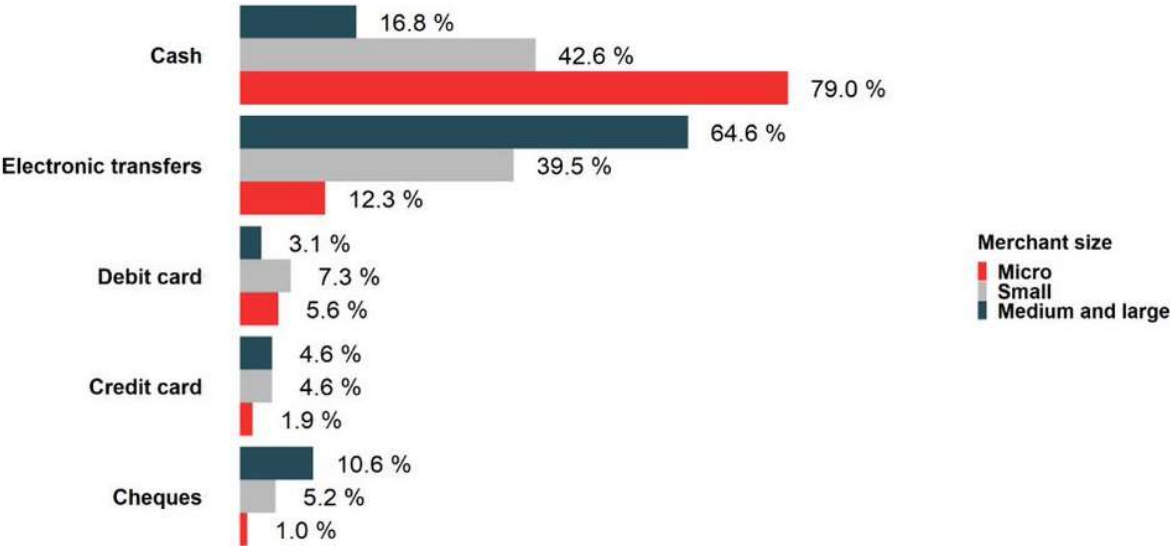
Figure 5: Adoption of electronic payment instruments and channels for merchants' operational expenses.



Note: The category "Any" refers to the use of transfers or cards.

In contrast to the progress they have made in the adoption of electronic payments, merchants reported that they still conducted most of their operational expenses in cash (77.4% in value) followed by direct transfers (13.6%). However, the use of electronic payments among small, medium and large merchants is more than half of its operational expenses (Figure 6).

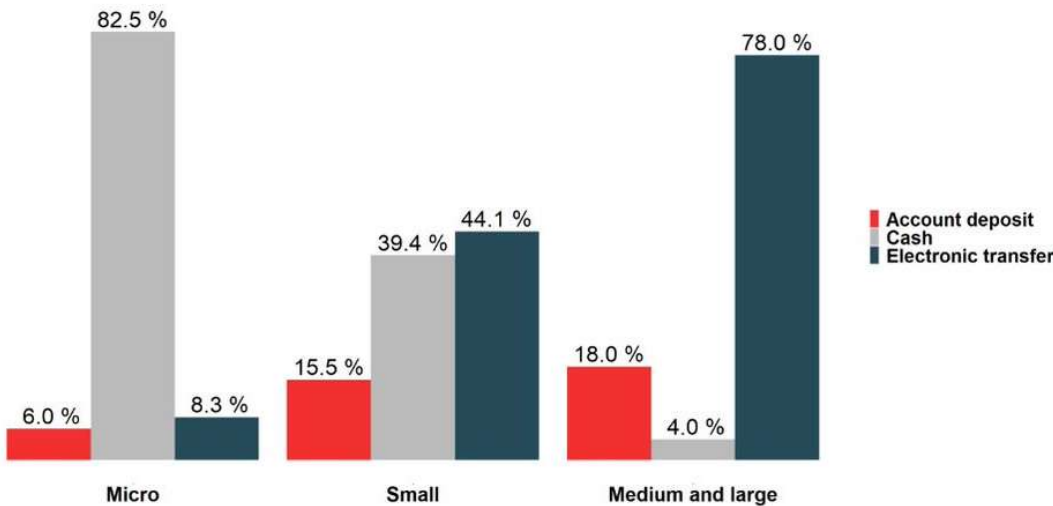
Figure 6: Payment shares in operational expenses by payment instrument



Notes: Authors' calculations.

Overall, the MPS20 shows that the commerce sector in Colombia has already a strong footing in the adoption of electronic payments and has embraced the traditional payment cards and a plethora of other electronic payment schemes. Nevertheless, the cash ecosystem remains strong among micro merchants, in terms of both the payments they received from sales to the payments they made for operational expenses, including B2B payments and payroll, thus reinforcing the circle of cash (Figure 7).

Figure 7: Payroll values by payment instrument.



Notes: Authors' calculations.

IV. Factors enabling the acceptance of electronic payments by merchants

The results indicate a marked heterogeneity in the levels of merchants' adoption of electronic payments. Identifying the factors that are associated with different levels of adoption provides a dashboard of the challenges that IP will have to overcome to successfully overtake cash payments, and provide an alternative to the traditional rails and thereby enhance competition in the retail ecosystem (Hartmanh et al., 2019).

The present research explores the factors associated with the likelihood of adopting three retail payment methods through Probit models: cards, mobile payment apps and online banking. Cards are important as they are the predominant electronic payment instrument in P2B retail transactions and will be active contestants to IP. Mobile payments such as Daviplata, Nequi and Movii, are key because they are the current IP offer and the closest to the last mile for an interoperable IP ecosystem (Hayashi and Lei-Toh, 2020). Finally, online bank transfers are becoming popular among merchants because they do not have to pay to accept them, given that the transaction fee is in many cases borne by the payor. However, they may be rapidly overtaken by IP as the latter brings more convenience and instant funds availability.

Factors associated with adoption are divided into (i) merchants' socioeconomic traits and (ii) incentives to adopt electronic payment instruments as manifested in merchant's perceptions of different attributes of each payment method.

A. Payment cards

Adoption of payment cards (debit or credit) is significantly associated with merchant size, being 18 to 41 percentage points (pps) lower for micro merchants compared with their larger counterparts (Table 2). It is also 8pps more likely among merchants with 10 years or more of operation. Adoption is also more likely the higher the ticket value up to a point (USD \$130 - \$180) after which it drops considerably (Figure 8). Finally, acceptance is 20pps lower for informal merchants than merchants in the formal sector and lower among those with limited competences in accounting and payments.

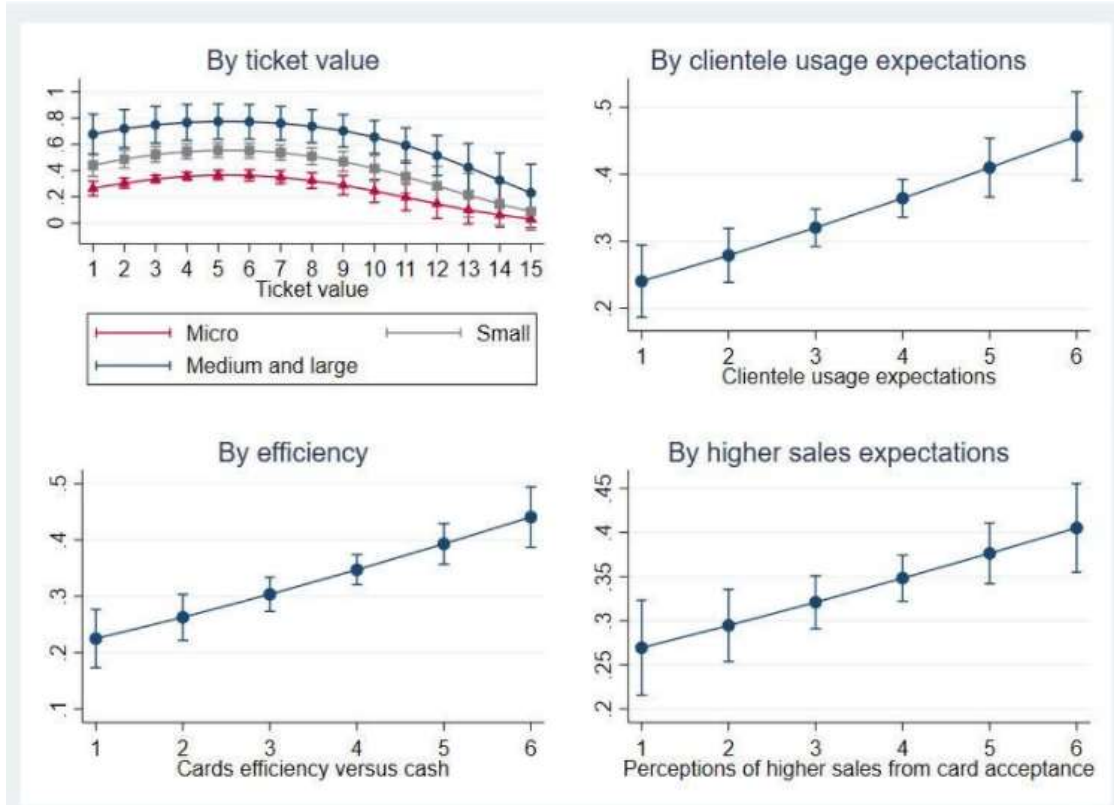
As for incentives, the most important are merchants' expectations that their clientele would hold and demand cards at the POS, with 13pps difference between those with high and low expectations (Figure 8), and perceptions of higher efficiency and sales derived from card acceptance, with 8pps difference (Figure 8). Similar effects are found with expectations of higher competitiveness from card acceptance (Figure 8). Beyond the fact that card fees are ad-valorem, which may explain the significant non-linearities with respect to average ticket values, no additional cost effects are found.

Table 2: marginal effects of the Probit models of cards, mobile payments and online bank transfers

Variables	Accept cards	Accept mobile app payments	Accept online bank transfers
Small merchants dummy	0.184***	-0.040	0.119***
Medium and large merchants dummy	0.409***	-0.073*	0.226***
Franchise dummy (franchise = 1)	0.004	-0.006	-0.004
Years of operation	0.021***	-0.009	0.011
Average ticket value	0.015**	0.007	0.002
Multidimensional informality dummy (informal=1)	-0.200***	-0.040	-0.076**
Cientele usage expectations	0.042***	0.012	0.037***
Expectations of higher competitiveness	0.027***	0.012	0.017*
Technological competences		0.019**	0.039***
Financial strength		0.021**	-0.001
Liquidity requirements		0.023**	0.021**
Privacy dummy (need for privacy=1)		-0.022	-0.100***
Adequate banking services and information		0.003	0.026***
Transactional efficiency of cards vs. cash	0.041***		
Relative costs of cards vs. cash	0.002		
Relative risk of card payments vs. cash	-0.014*		
Expectations of sales growth from accepting cards	0.026***		
Relative costs of mobile payments vs. cash		-0.026***	
Relative risk of mobile payments vs. cash		-0.017**	
Transactional efficiency of mobile payments vs. cash		0.062***	
Expectations of sales growth from accepting mobile payments		0.031***	
Expectations of higher access to financial services by accepting e-payments			-0.018*
Efficiency of transactional accounts vs. cash			0.015*
Transactional efficiency of e-payments vs. cash			0.024***
Bars, hotels and restaurants dummy	-0.077	-0.045	-0.144***
Food, drinks and groceries dummy	-0.128***	-0.048	-0.205***
Health, sport and beauty dummy	-0.019	-0.018	-0.128**
Clothing and footwear dummy	0.074	0.028	-0.07
Appliances and home dummy	-0.020	-0.014	0.054
Technology dummy	-0.080	-0.004	-0.121*
Transport services and others dummy	-0.200***	0.135*	-0.008
Observations	1.933	1.933	1.933
Chi squared	410.99***	298.86***	398.24***

*** p<0.01, ** p<0.05, * p<0.1

Figure 8. Factors associated with the probability of acceptance of debit or credit cards



Note: i) In the “ticket value” scale, 3 means “USD \$13”, 6 means “USD \$130”, 9 means “USD \$770”, 12 means “USD \$5,130” and 15 means “USD \$10,260”. ii) In “clientele usage”, “efficiency” and “higher sales” expectations, scale 6 means that the merchants have very high expectations and 1 means very low expectations. “Clientele usage expectations” are merchants’ expectations about the demand of electronic payments by their clients.

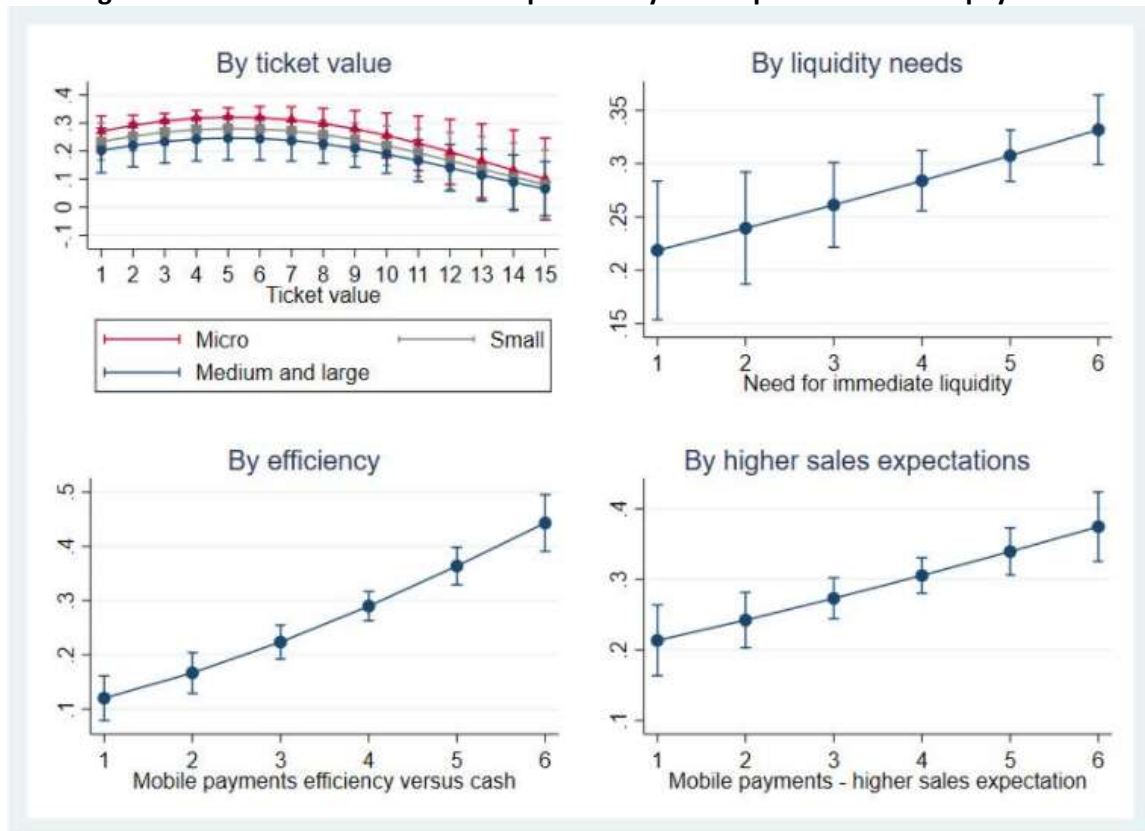
B. Mobile payments

The first thing to underscore is the fact that mobile payments (ie account-to-account transfers made through payments applications, as opposed to electronic wallets that enable mobile card payments and online bank transfers) are more likely to be adopted by micro merchants (31%) than the small (21%) and medium and large (23%) counterparts. There is also no significant difference in mobile payments adoption between formal and informal merchants or between merchants with different years of operation (Table 2). Currently though such payments are mostly done on a P2P basis (León, 2021), maybe because there are no transaction fees involved and merchants want to keep a low profile for such sales.

There is a weak positive association between ticket value and mobile payments adoption, perhaps because mobile apps are still cumbersome compared with cash at low-ticket value stores (Figure 9). Mobile payments adoption also varies by technical competences in accounting and payments¹, financial strength and, most importantly, the need for immediate availability of funds (Figure 9).

¹ See Dalton et al. (2018) for further evidence on electronic payments adoption and businesses’ technical competences.

Figure 9. Factors associated with the probability of acceptance of mobile payments



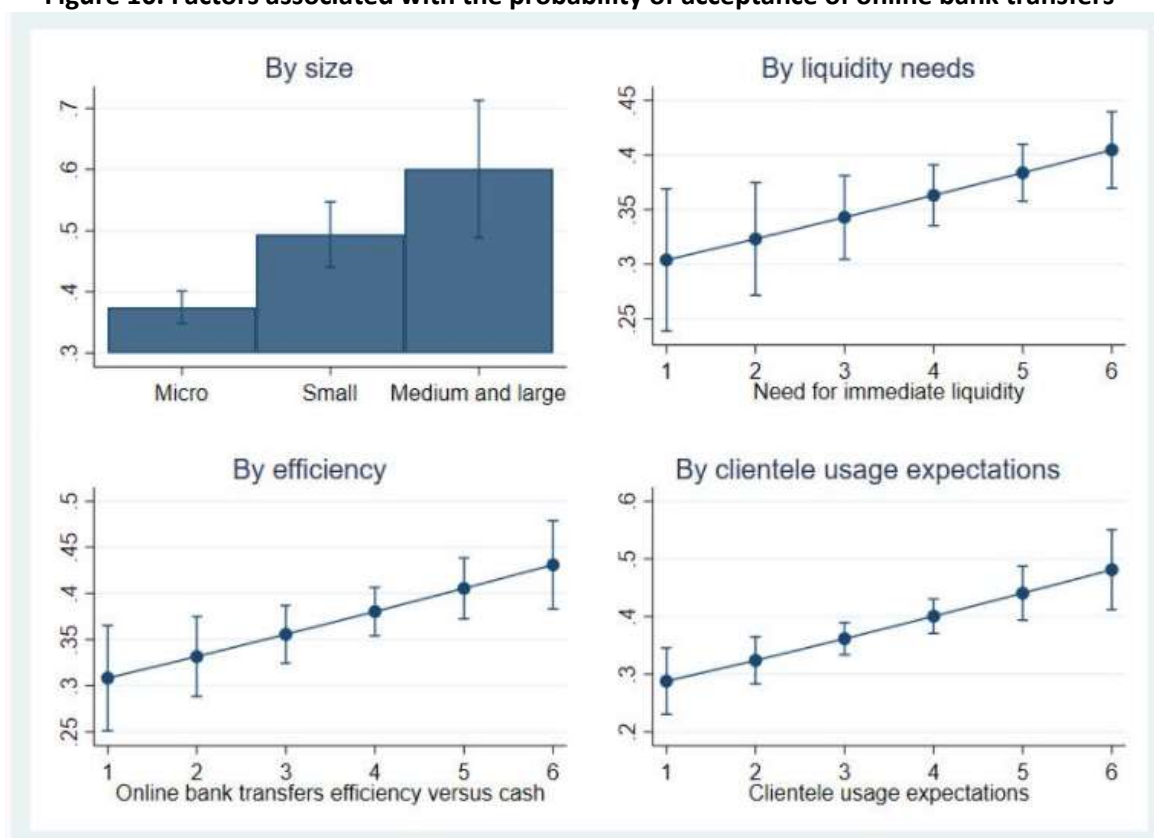
Note: i) In the “*ticket value*” scale, 3 means “USD \$13”, 6 means “USD \$130”, 9 means “USD \$770”, 12 means “USD \$5,130” and 15 means “USD \$10,260”. ii) In “*Liquidity*”, “*efficiency*” and “*higher sales*” expectations, scale 6 means that the merchants have very high expectations and 1 means very low expectations.

In terms of incentives, mobile payments adoption is significantly associated with the perceived relative efficiency, costs and risks of mobile payments compared with cash (Table 1, Figure 9). This shows the importance that IP, through mobile payment applications, may have as close substitutes to cash. One strong factor in accepting mobile payments is the expectation of higher sales (Figure 9). Indeed, two thirds of merchants expect sales growth from accepting mobile payments.

C. Online bank transfers

Acceptance of online banking payments rises significantly with traits such as merchant’s scale, being formal, years of operation and technical competences (Table 1 and Figure 10). Higher privacy concerns are associated with lower acceptance rates. But acceptance increases with merchants’ preference for immediacy of funds (Figure 10).

Figure 10. Factors associated with the probability of acceptance of online bank transfers



Note: In "Liquidity", "efficiency" and "Clientele usage" expectations, scale 6 means that merchants have very high expectations and 1 means very low expectations. "Clientele usage expectations" are merchants' expectations about the demand of electronic payments by their clients.

Incentives such as expectations of higher competitiveness, efficiency gains and access to a strong portfolio of banking services increase the likelihood of accepting online bank transfers (Figure 10). Finally, the positive association between acceptance and merchants' expectations of a clientele familiar with different electronic payment methods provides evidence of network externalities in the online banking space (Figure 10).

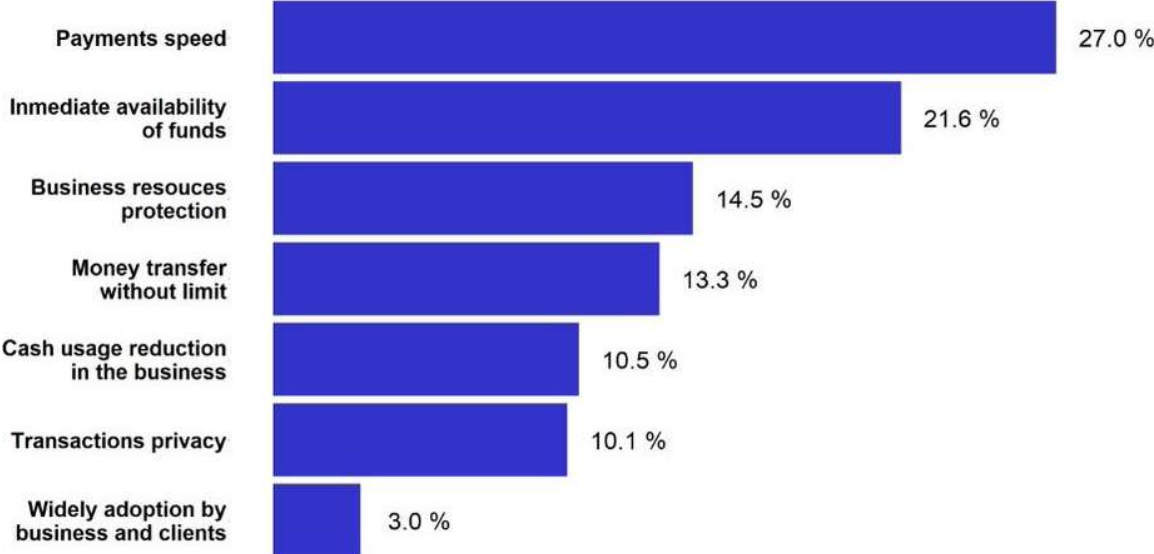
V. The potential demand for instant payments in Colombia

The MPS20 included a section on IP. It stated a hypothetical scenario describing a new IPS that (i) would clear and settle payments within seconds; (ii) money would be immediately available to the payee; (iii) money from sales would be available immediately for operational expenses; and (iv) the system would be widely adopted by both consumers and businesses.

Merchants were asked to provide the three attributes they would consider most important to adopt the hypothetical IPS. Payment speed came out first and immediate funds availability second. Other

attributes such as integrity of funds, no payment restrictions and privacy, came up equally important, for half as many merchants as for the top two reasons (Figure 11).

Figure 11: Merchants’ top-of-mind reasons to consider in their intention to adopt IP



Source: Authors’ calculations.

Merchants were also asked to reveal their intention to adopt the IP system facing two alternative per-transaction fees: COP \$500 (USD 12.5 cents) and COP \$100 (USD 2.5 cents). Regardless of transaction fees, medium and large merchants seem to be more likely to adopt IP. Nevertheless, the percentage of adopters drops significantly as the fee approaches the 12.5 cents charge. For micro merchants it fell from 53% (at 2.5 cents) to 19% (at 12.5 cents) whereas for medium and large merchants it fell from 77.2% to 32.3%.

The results of the Probit of merchants’ intention to adopt IP imply that merchants are relatively inelastic to per-transaction fees, with the micro merchants being more inelastic (-0.51) than small (-0.61) and medium and large merchants (-0.64) (Table 3 presents only the average marginal effect of transaction fees).

There are no significant differences in the intention to adopt IP by sector, years of operation or being a retail chain. In addition, there is no significant difference between formal and informal merchants or between those merchants with accounting and payments competences and those without. In contrast, IP acceptance increases with merchant size and financial strength, and it is positively associated with average ticket value, maybe reflecting the efficiency of cash that merchants currently experience in low ticket value environments.

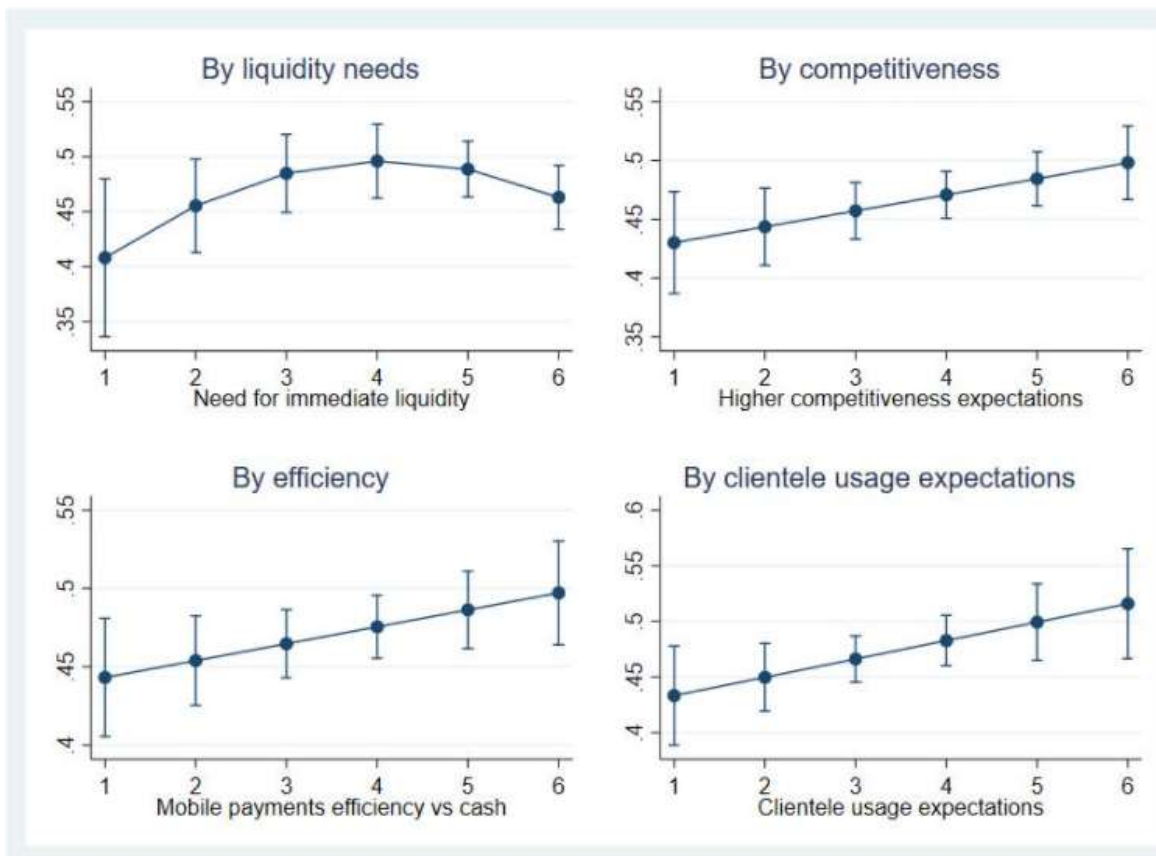
The results highlight the association between IP adoption and merchants’ liquidity needs. Those merchants with a higher need of immediate funds could be up to 9pps more likely to adopt IP than their more at-ease counterparts (Figure 12). It is worth noticing that most merchants (63%) report high demand for immediate funds availability.

Table 3: marginal effects of Probit models of merchants' intentions to adopt IP

Variables	Adoption of instant payments (1)	Adoption of instant payments (2)
Log of per transaction fee	-0.199***	-0.199***
Small merchants dummy	0.066***	0.047**
Medium and large merchants dummy	0.081**	0.058*
Franchise dummy (franchise = 1)	-0.019	-0.035
Years of operation	0.0002	0.003
Average ticket value	0.013**	0.010*
Multidimensional informality dummy (informal=1)	-0.046*	-0.027
Technological competences	0.011	0.010
Financial strength	0.027***	0.019**
Liquidity requirements	0.025**	0.020*
Expectations of higher competitiveness		0.014**
Financial services access expectations		0.017***
Clientele usage expectations		0.017*
Transactional efficiency of mobile payments vs. cash		0.011*
Relative risk of mobile payments vs. cash		-0.011*
Merchants with cash and cards only dummy		-0.085*
Bars, hotels and restaurants dummy	-0.040	-0.017
Food, drinks and groceries dummy	-0.088**	-0.055
Health, sport and beauty dummy	-0.088**	-0.066
Clothing and footwear dummy	-0.065*	-0.044
Appliances and home dummy	0.035	0.048
Technology dummy	-0.035	-0.027
Transport services and others dummy	-0.004	0.019
Observations	1.933	1.933
Chi squared	563.67***	595.78***
*** p<0.01, ** p<0.05, * p<0.1		

Note: Model (1) includes merchants' socioeconomic characteristics. Model (2) includes socioeconomic characteristics and variables proxy for incentives to adopt IP.

Figure 12: Factors associated with the probability of adopting Instant Payments



Note: In “Competitiveness”, “efficiency” and “Clientele usage” expectations, scale 6 means that merchants have very high expectations and 1 means very low expectations. “Clientele usage expectations” are merchants’ expectations about the demand of electronic payments by their clients.

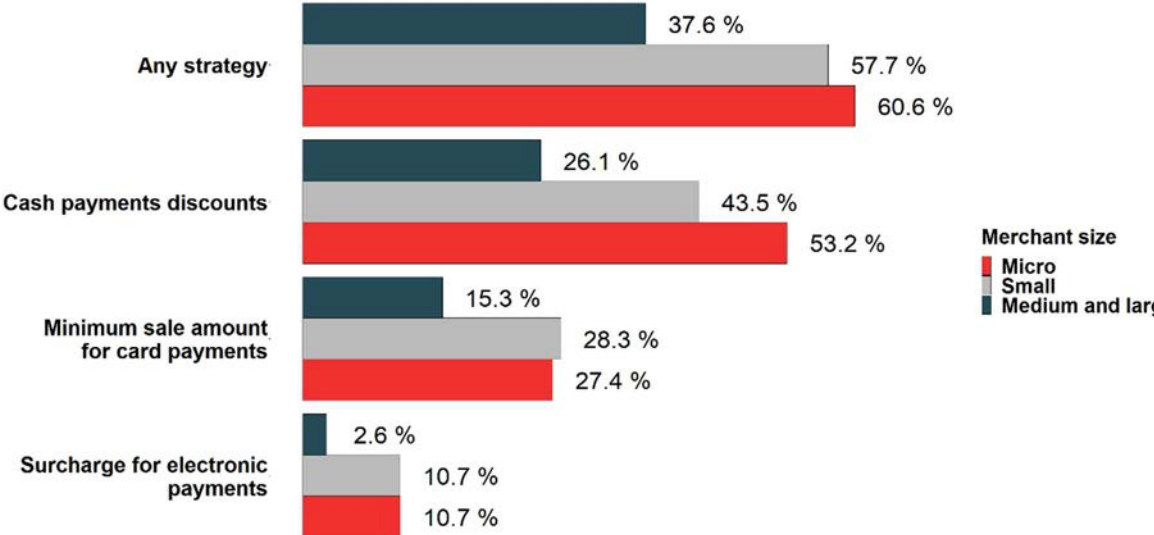
As conjectured previously, the current experience of merchants with different electronic payment alternatives seem to permeate their intentions to adopt IP. Merchants are more likely to adopt instant payments if they believe that doing so will give them immediacy of funds and increase their competitiveness and future access to financial services. Demand for instant payments is also higher among merchants that perceive mobile payments to be more efficient and safer than cash. There is evidence that the adoption of instant payments would be lower among merchants operating in the traditional cash and cards space (8pps lower than their counterparts) — a sign that cards have their niche among merchants. Finally, the probability of merchants adopting instant payments is more likely to increase if this is something that their customers demand, thus underscoring the two-sided nature of instant payments (Figure 12).

VI. Discussion

Even during the pandemic, cash continues to be the preferred payment method among Colombians in the P2B space. Nevertheless, the result of the present study show that merchants have embraced electronic payment instruments and channels, taking advantage of alternatives like IP mobile payments, online bank transfers, QR codes and contactless payments at the POS, as well as aggregators and gateways for e-commerce.

Cards continue to have their market niche among merchants with higher scale of operation in high-ticket value stores. However, the likelihood of card acceptance falls among informal merchants and those that perceived cash is safer and more efficient, and do not see any benefits in terms of competitiveness or sales growth. Furthermore, the fees currently charged by the industry seem to be misaligned as 60% of merchants accepting cards, use dissuasive strategies to induce clients to pay with cash (Figure 13) (Arango-Arango et al., 2021a).

Figure 13: Merchants’ strategies to induce customers to pay with cash



Source: Authors’ calculations.

The state of merchants’ acceptance of electronic payments is a good yardstick to understand the challenges that IP would face in P2B transactions. As the research shows, cash will continue to be a reference point to which electronic alternatives will have to stand apart in terms of efficiency, costs and risks. Its convenience, speed, anonymity and instant clearance and settlement contrast with the still cumbersome user’s experience with mobile apps and online bank transfers, probably the access points of an IP ecosystem.

Second, IP are not different from current electronic payment alternatives with respect to the two-sided nature of P2B transactions. For merchants, the three mayor drivers of adoption of IP would be liquidity, costs, and efficiency. Our results show that immediate funds-availability is of prime concern for most merchants and therefore they should be poised to adopt IP.

To enjoy wide acceptance among merchants — especially micro merchants — the fees for instant payments would need to be quite low (between 2.5 and 12.5 cents per dollar) to compete with the low marginal costs associated with cash. In fact, a survey performed by the Central Bank in 2018 showed that for these merchants the cost of cash is close to COP \$200 (USD 5 cents) (Arango-Arango and Betancourt-García, 2020). In addition, as evidenced with card and mobile payments, the technology for accepting payment (through EFTPOS terminals or mobile devices) should be priced affordably so that fixed costs do not limit adoption among micro merchants. Likewise, the technical expertise necessary to set up instant payments should also be minimal so that it is not a barrier to adoption.

Clearance time at the POS is critical, hence the technology of the last mile also will need to be nimble enough to accommodate small, medium, and high-ticket values. As our estimate shows, currently cards and mobile payment schemes are more suitable at stores with higher average ticket values, and cash dominates low-ticket purchases. This is also the expectation merchants have with IP. Technologies such as NFC and QR or bio-identification should fill the efficiency gaps in speed, for IP to be competitive at the POS. Finally, the IP's last mile will have to offer at least the efficiency that merchants find in cash.

The fact that mobile payments are being embraced by merchants provides a good foundation for embedding an interoperable instant payments ecosystem. In turn, this should provide the preliminary groundwork for measures to formalize more of the commercial sector. The present study finds that formal and informal merchants would be highly interested in IP. This is promising and aligns with their appetite for mobile payments. However, VAT evasion would be of concern as it brings an extra incentive to remain informal and avoid traceable electronic payment methods. Of concern here, however, is the issue of VAT evasion, which provides an extra incentive to transact in cash in order to avoid traceable payment methods. Figures for Colombia and Perú show that VAT evasion among merchants could be anywhere between 12.8% per cent and 33.2% (Aurazo and Vega, 2020).

The results imply that IP should be embedded in the packages offered by PSP to promote sales, customer loyalty, facilitate accounting, and cash flow management, and access to financial services such as credit. Moreover, probably there would be the need for transaction reversibility on top of IP services (Payments Europe, 2020).

The uptake of IP by the other side of the P2B market, the consumers, would again face the convenience that cash already offers in terms of ease of use, instant clearing and settlement, anonymity, cash discounts and speed. IP should be designed, at a minimum, to guarantee these features, especially in the design of the last mile through mobile payments (Hayashi and Lei-Toh, 2020). Instant payments would also have to compete with the convenience, incentives and perks offered by card networks, along with their restless innovation, such as contactless and mobile-enabled card payments. In fact, major franchises such as Visa and Mastercard are entering instant payment services (Visa, 2021). Tying IP to government transfer programs or specific payment needs such as public services could be an anchor in the initial stages of promoting IP in the P2B space (Hayashi and Lei-Toh, 2020).

Finally, the degree of IP usage will be subject to network externalities. As shown by previous studies the rate of adoption by merchants plays a strong role in the likelihood of consumers' adoption of

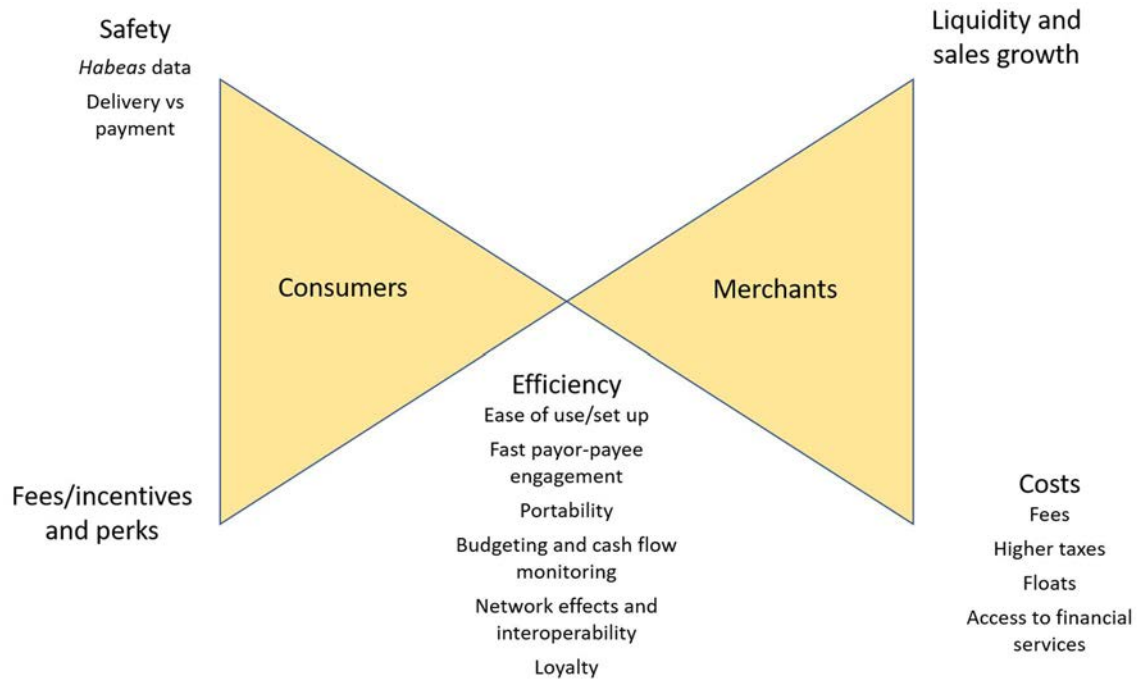
payment cards (Arango-Arango et al., 2017; Rysman, 2017 and Bounie, 2017). The results show that these cross externalities are also present on the merchants' adoption across different electronic payment schemes, including IP. Yet, these externalities are not necessarily internalized by individual merchants' *ex-ante*. In fact, ubiquity weighs only 3% on merchants' top priorities to adopt IP (Figure 11).

Although one might expect the speed and finality of instant payments to be the prime commonality shared by both consumers and merchants, the present research suggests that the efficiency and convenience of the user experience will be pivotal (Figure 12), as the common benchmark will be, again, cash. The other key dimensions differ depending on each side's perspective.

When it comes to the successful deployment of instant payments in developing economies like Colombia, the final consideration would have to be the market structure and pricing arrangements. The different PSPs involved in bringing instant payments services to both consumers and businesses would need the right incentives to cooperate and compete.

For deposit institutions that are the gatekeepers of payment systems, as they have the exclusive charter in the provision of transaction accounts, a tension would exist between their card-based revenue streams and instant payments. This has led banking systems in many jurisdictions to segment the market, so that instant payments are used to serve the P2P market and cards continue to be used for P2B payments. In fact, in many jurisdictions instant payments other than P2P are provided at higher fees than those charged on batch bank transfers (European Fintech Association, 2020). In these sense, Box 1 proposes a forward-looking view of an instant payments ecosystem where open banking and finance would provide the interoperability and accessibility required to open up instant payments for P2B transactions.

Figure 14: Convergence of two-sided needs by consumers and merchants



Source: Authors' elaboration.

Open banking and finance reforms, however, would not be sufficient to realize the full benefits of a P2B instant payments ecosystem. As in credit card networks, instant payments may be susceptible to interchange fees to provide the PSP originator and the PSP receiver with incentives to engage their clientele pools into interoperable networks. As shown in Box 2, such interchange fees could trickle downstream to payees and payors. (Box 1).

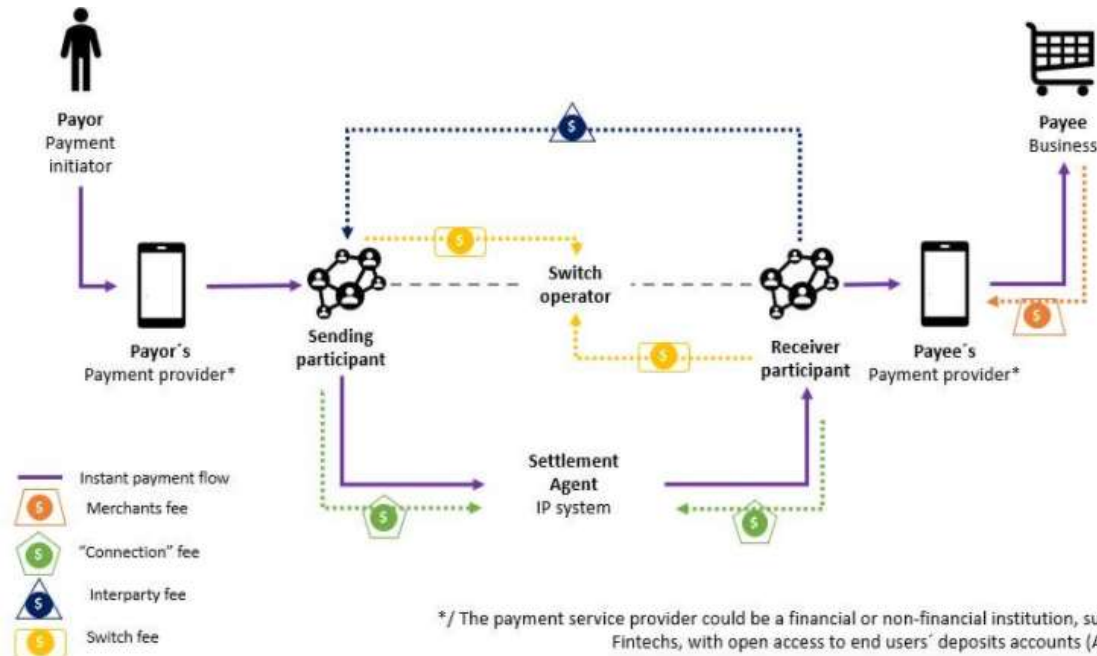
Pricing P2B-IP services will be a delicate balancing act as it would have to deliver sufficiently low per- transaction fees to successfully compete with cash, reach high levels of P2P participation, and coexist with other electronic payment alternatives (Faster Payments Council, 2020). Perhaps, the significant potential gains the banking industry may obtain from a reduction in cash processing costs may be a strong incentive to seek an adequate pricing structure for their different payment rails.

The possible modernization of the Colombian central bank's ACH to provide IP services may also help strike this balance as it may have control over interchange fees and provide ample access (Rysman and Schuh, 2016). The latter, will be pivotal if open banking and finance materializes in Colombia as it will empower non-financial service providers to expand adoption of IP among consumers and businesses (Heaslip and Hines, 2017). Setting up the IP ecosystem as a nation-wide strategy for the democratization of the digital economy could ripe the fruits already enjoyed by economies like India (D'Silva et al., 2019).

Box 1: Instant payments in the P2B space and open banking

The following diagram describes an IP ecosystem for P2B transactions. It foresees the participation of various agents to guarantee ample access and usage. Access shall be promoted with open banking regulations that would allow non-bank payment service providers (e.g. Fintechs) to be direct participants of payment systems under certain conditions and connect with end users' deposits accounts. This is important to level the playing field between instant payment services and other retail payment alternatives.

The diagram also foresees a series of fees that would probably rise to incentivize the participation of the different parties and secure network sustainability. Not surprisingly, the diagram suggests a fee structure that resembles the one currently seen in many cards and interbank payment networks. Fees would be charged by the infrastructure providers (the switch and the settlement parties). There could be interbank fees charged bilaterally or multilaterally among PSP participants in the infrastructure. These fees will trickle down to the end users as PSP participants would charge non-bank PSPs for access to their network of clients and non-bank PSPs will also claim their margin in providing services to end users.



Source: Authors' elaboration based on Cook, W., L. Dylan and S. Sbeih (2021) "Building Faster Better: A guide to inclusive instant payment systems."

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