Discussion of papers:

"Consumer Surplus of Alternative Payment Methods: Paying Uber with Cash", by Alvarez & Argente

&

Cash and Crises: No surprises by the virus, by Rösl & Seitz

Prepared for the Bank of Finland Economics of Pyments X Conference, October 2021

José Luis Negrín

Bank of Mexico

Disclaimer: The views expressed in these comments are only mine and do not represent those of Banco de Mexico

Summary of “Consumer Surplus of Alternative Payment Methods”

- The paper estimates the loss in consumer surplus that emerges from banning cash as a payment mechanism even when there is an alternative payment method (credit cards). The loss does not emerge from the service being purchased (Uber rides), but from the inability to use of a payment method: cash.
- A&A provide a theoretical model of the demand for Uber trips. In the model, riders choose the number of Uber trips and the payment method for those trips. There are three types of users depending on their choice of payment: pure cash, mixed and pure credit. “Pure cash” users also decide whether to register a card in the App or not.
- A&A develop a parameterized version of the model and estimate its key parameters, which, plugged into the model, yield estimates of the cost of banning paying in cash.
- To estimate the parameters they need in their theoretical model, A&A conduct three experiments with Uber riders in the State of Mexico (in Mexico), in 2018. In the data, about 20% of expenditures on Uber trips correspond to “pure cash” users, 50% correspond to mixed users, and 30% to pure credit card users.
- In the experiments:
  - They randomly provide discounts for either type of payment method for mixed users.
    - The link between the relative price of paying in cash vs. paying in credit (which varies exogenously) and the share of trips paid in credit allows obtaining an estimate of the elasticity of substitution between paying in cash vs. paying in credit.
  - They randomly provide discounts for Uber trips, irrespective of means of payment for mixed users, and in cash, for cash users.
    - The link between the price of an Uber trip (which varies exogenously) and the miles ridden in each week allows obtaining an estimate of the elasticity of demand for Uber trips.
  - They randomly provide rewards given in exchange for registering a credit card in the app.
    - The link between the size of the reward offered and the take-up of the reward (given if a card is registered) allows obtaining an estimate of the cost of registering a card.
- Plugging the estimated parameters back into parameterized versions of the theoretical model, A&A are able to compute the change in consumer surplus arising from a ban on paying with cash. The consumer surplus lost by a ban on cash is about 56% of riders’ total expenditure on Uber rides; it comes from averaging CS over both pure cash users and mixed users.

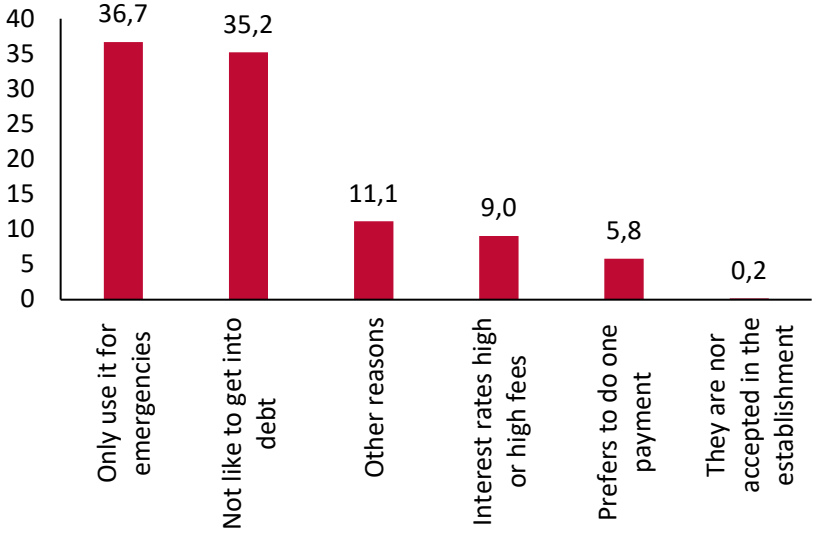
Main comments

- A&A is an excellent paper (with several contributions to the literature):
  - It provides a framework to understand both the decision of registering or not a credit card to pay for Uber rides, and the decision to pay in credit or in cash.
  - The experimental approach allows obtaining a novel and robust estimate of the elasticity of substitution between paying with cash and credit for a homogeneous good: an Uber ride.
  - Thus, it circumvents confounding factors associated to comparing payment method choices employed for different goods or at different times and contexts. An elasticity of 3 seems low. This may relate to the very high use of cash in Mexico.
  - The experimental estimates for the elasticity of substitution, the elasticity of demand, and the cost of registration allow obtaining convincing approximations to CS loss from banning paying in cash.
  - I like that they identify the benefit that comes from using a certain payment means; it is not utility derived from consumption but derived from paying with a certain mean. This means that some people derive a benefit from paying with cash for Uber trips.
  - The study's limitation (acknowledged in the paper) that price variation comes only from discounts and not from price increases, so that estimation of the demand function is done only with prices below equilibrium and extrapolating above eqm (through using a parametric model), does not take anything from it.
- Some possible suggestions:
  - I assume that A&A have data on origin-destination of rides. It would be interesting to estimate "demographic-specific" elasticities of substitution between cash and credit cards, across zip codes/municipalities of different income levels and availability of access points (bank branches, ATMs, POS, banking agents). The impact on CS may be very different in lower income groups.
  - Credit cards provide two services to users: credit (paying later for today consumption) and convenience (in countries like Mexico a certain security); however, as compared to cash, payments are not final and users are identified (in Mexico the informal economy is large). In the study by A&A, both cash and credit card payers are identified, so the only difference between paying with cards and cash is that payments are not final. It would be interesting to do a similar exercise but instead of using credit, using debit cards to eliminate the credit aspect, because they would be closer substitutes. Maybe the elasticity of substitution would be higher.
  - Using cash reflects a bunch of cultural elements that may affect the estimation (even though they present other evidence that seems to confirm the estimates, they are mostly in Mexico, except for the Panama experiment).

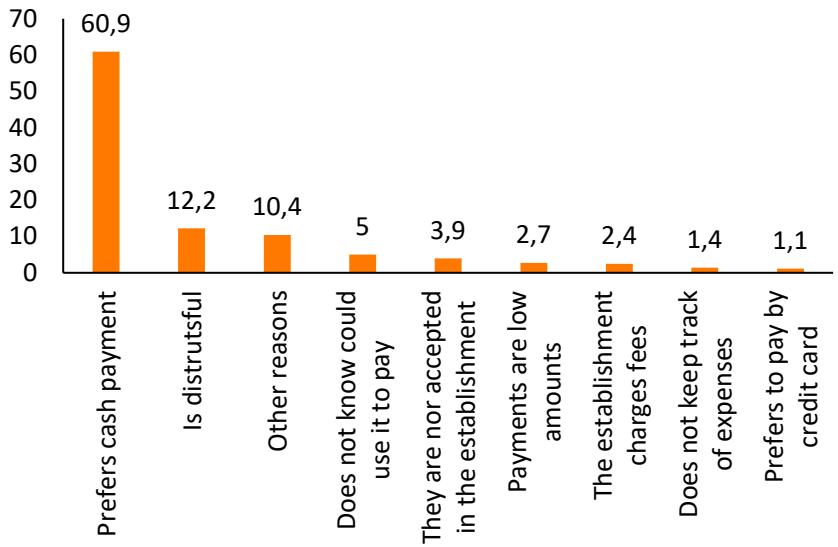
Some survey data on cash preference in Mexico (ENIF 2018)

- 1/3 of holders of debit cards report not using them; about 1/5 of credit card holders report not using them.

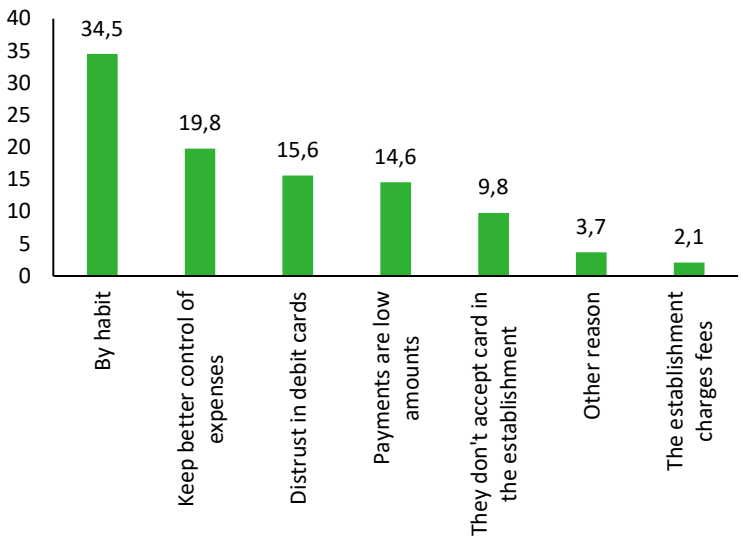
Main reason for not using their credit card



Main reason for not using their debit card



Main reason to prefer cash over debit card



- Among debit account holders, there is a high preference for cash (2018)
  - Even among those with a transactional account, cash is reported to be the main method of payment for purchases below $500 MXN (90%) and above $500 MXN (75%).
  - Overall, more than half of account holders at all income levels prefer to pay with cash for purchases below $25 USD.
  - More than half of high-income account holders prefer to pay for purchases over $25 USD with non-cash means.

	Share that prefers to pay with cash purchases below ~25 USD	Share that prefers to pay with cash purchases above~25 USD
Low income	96%	87%
Medium income	87%	72%
High income	76%	44%

Summary of “Cash and Crises: No surprises by the virus”

- This paper is part of the literature called “the paradox of banknotes”, which refers to the fact that at the aggregate level, the demand for bank notes has increased while the use of alternative payment methods (cards, electronic transfers and digital in general) has boomed; that is, electronic payments are displacing cash to pay, but demand for bank notes has not gone down.
- The paper provides an insight into the motives of cash demand in times of crises and presents evidence of a trend toward non-transactional demand for cash; it reviews in a descriptive manner the experience of several developed countries.

Crisis	Problem	Reason for increase
2000	Uncertainty: expectation of technological failure	transaction and hoarding
2008/09	global trust in banks generated a crisis of confidence	hoarding
Covid 2019	Promotion of digital means to avoid contagion and social distancing made all of those who could go digital, go digital.	precautionary motives and psychological reasons

- The public seeks physical money once confidence in the technological infrastructure deteriorates; cash is a stabilizing factor at times of doubt about the digital infrastructure.
- Main point is that cash has been important for successful crisis management: it reduces uncertainty and provides a public insurance service.

Main Comments

- Seems to me that the paper is at its initial stages and it is, for now, mainly descriptive (regressions are not looking for causality) but has a lot of potential.
- Some suggestions:
  - There are other periods of comparable growth in the global demand for cash (2002, 2011) that are not crisis times. This is also true within countries.
  - The econometric exercises presented include indicator variables for crisis periods. However, other things that influence the number of banknotes in circulation could be changing at times of crisis. A useful test would be to generate random placebo crisis periods and see whether these are or not significant determinants of cash holdings.
  - An alternative approach could be to exploit variation in the *severity* of a given crisis across countries, instead of just the crisis indicator variables.
  - It would be interesting to include data from emerging and developing economies, where digital payments are not totally accessible.
  - Regarding the econometric approach, in addition to having country-specific regressions, data from multiple countries (including emerging and developing) could be used in one single regression specification that could include country fixed effects. You would get an average effect instead of country results.
  - In addition, it could be useful to collect information on variables related to hoarding that could serve as alternative regressors (these should also increase in times of crisis). Also, the specifications could include another plausibly relevant determinant of cash holdings, the expected inflation rate.
  - With respect to the presentation of the results, it would be informative to include the actual values of the estimated coefficients for regressors GDP, interest rate, and exchange rate, instead of their significance.
- Looking ahead, it is plausible that demand for cash may not increase as steeply in times of crisis, if trust in digital financial services and their convenience continues to increase.

Putting the papers together

- These papers are very different; nevertheless, there is some common ground between them, related to the use of cash.
- Why do we use cash (traditional theory: transaction, speculation and hoarding motives)?
  - It is a very convenient way to pay: it is fast, final and anonymous (transaction motive);
  - It is widely accepted even in hard times (transaction motive);
  - It does not require to have a technological infrastructure for it to be accepted, like broadband mobile signal;
  - In times of uncertainty about technology or about the financial system cash can be trusted and keeps it value (hoarding motive);
  - It helps us administer expenses (behavioral treat, related to both motives).
- These reasons are still valid today because they reflect trust.
- The paper by Alvarez and Argente shows that even though riders have an alternative payment means, a close substitute in fact, many people still prefer cash to pay and there is a cost in wellbeing from banning cash; the paper by Rösl and Seitz shows that while digital payments are increasing, people demand cash at critical moments because they trust it and what it represents.
- From a policy perspective, it seems that we will live with cash for the foreseeable future.
- We are here gathered at a Central Bank and our business is to generate trust. So we make better cash every day: more secure, more resistant, adequate for people with special needs, more available and even more beautiful.

New Mexican Bill issued to commemorate 200 years of Independence