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The Near Impossibility of Saving in Argentina: Exploring Three Options to Combat Devaluation

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The Near Impossibility of Saving in Argentina: Exploring Three Options to Combat Devaluation

submitted to
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by
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Abstract

Argentina's economic environment makes it nearly impossible to avoid devaluation of personal savings. This is due to the high inflation facing the peso and furthered by foreign exchange controls. I hypothesized that the decentralized and generally unregulated nature of cryptocurrencies could characterize USD-pegged Stablecoins as an alternative savings strategy comparable to saving in USD cash, but more accessible during periods of exchange restriction. To study this hypothesis, I first analyzed the cultural, inflationary and regulatory challenges facing saving in Argentina (relating to The Convertibility Plan of the 1990s, El Corralito, the default on foreign debt in the early 2000s and dollar purchasing restrictions) and then analyzed expected payouts of saving via formal channels, USD-pegged Stablecoins, and informal channels. However, I found that while any cryptocurrency-cryptocurrency transaction does not face governmental regulations, fiat currency-cryptocurrency transactions do face regulations which hinder Stablecoins as a saving strategy. In addition to the regulations that face any transaction in the foreign exchange market in Argentina, the divergence of the informal market value of the Argentine peso (ARS) from the official value of the peso during periods of exchange restriction further nullifies any hypothesized benefits of using Stablecoins as a comparable saving strategy to USD cash when USD cash is less accessible.

Resumen (español)

El entorno económico de Argentina hace que sea casi imposible evitar la devaluación de los ahorros personales. Esto se debe a la alta inflación que enfrenta el peso y fomentada por los controles cambiarios. Planteé la hipótesis de que la naturaleza descentralizada y generalmente no regulada de las criptomonedas podría caracterizar a las Stablecoins vinculadas al USD como una estrategia de ahorro alternativa comparable al ahorro en efectivo en USD, pero más accesible durante los períodos de restricción cambiaria. Para estudiar esta hipótesis, primero analicé los desafíos culturales, inflacionarios y regulatorios que enfrenta el ahorro en Argentina (relacionados con el Plan de Convertibilidad de la década de 1990, El Corralito, el incumplimiento de la deuda externa a principios de la década de 2000 y las restricciones a la compra de dólares) y luego analicé los pagos esperados de ahorro a través de canales formales, Stablecoins vinculados al USD y canales informales. Sin embargo, descubrí que si bien cualquier transacción de criptomoneda a criptomoneda no enfrenta regulaciones gubernamentales, las transacciones de criptomoneda a moneda fiduciaria sí enfrentan regulaciones que obstaculizan a Stablecoins como estrategia de ahorro. Además de las regulaciones que enfrenta cualquier transacción en el mercado cambiario en Argentina, la divergencia del valor de mercado informal del peso argentino (ARS) del valor oficial del peso durante los períodos de restricción cambiaria anula aún más cualquier beneficio hipotético de usar Stablecoins como una estrategia de ahorro comparable al efectivo en USD cuando el efectivo en USD es menos accesible.

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Introduction[1]

In light of the prominence of the United States Dollar (USD) in the Argentine economy and the inaccessibility to USD during periods of exchange restriction, I wondered if the characteristic unregulated and decentralized nature of cryptocurrencies could pose investing in USD-pegged Stablecoins[2] as a comparable and effective alternative savings strategy. To answer this question, I first analyzed the cultural, inflationary and regulatory challenges savers face in Argentina and then analyzed expected payouts of saving via formal and informal methods.[3]

This research question is motivated by a vested interest in empowering Argentine individuals to save despite the country's unstable economic environment. Fanelli (2002) describes that the instability in the Argentine economy is unlikely to be fixed easily or in the near future due to the cyclical mismanagement of resources and implementation of unsustainable monetary policy.

> There is a vicious circle between the financial fragility of the banks, the budget imbalance, inflation and depreciation. If the government helps banks through rediscounts or issues money to finance the deficit, it is increasing the monetary base and fueling the demand for foreign currency. If you let the nominal exchange rate adjust, inflation accelerates. If the Central Bank sells foreign currency to meet the increase in demand, the reserves soon run out (Fanelli, 42).[4]

Through the attempt to answer the research question, this paper demonstrates different savings strategies that Argentine residents can implement as a means to survive this economic environment.

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[1] A note on the singular versus plural pronouns. In this paper, I use they/them pronouns for both singular and plural. This is in support of gender expression and freedom, striving away from the gender binary in the English language.

[2] Stablecoins are a subset of cryptocurrencies whose value is pegged to another asset: typically a fiat currency, commodity, or another cryptocurrency. Throughout the paper, when Stablecoins are mentioned, this is specifically in reference to USD-pegged Stablecoins.

[3] A note on methodology: the majority of this research was conducted using sources originally written in Spanish. As such, much of the bibliography consists of work from Spanish authors and sources. Access to content originally produced in Spanish was integral to this research process as this topic has yet to be studied in depth and further published in English.

[4] Hay un círculo vicioso entre la fragilidad financiera de los bancos, el desequilibrio presupuestario, la inflación y la depreciación. Si el gobierno ayuda a los bancos mediante redescuentos o emite dinero para financiar el déficit, está aumentando la base monetaria y alimentando la demanda de divisas. Si deja que el tipo de cambio nominal se ajuste, la inflación se acelera. Si el Banco Central vende divisas para enfrentar el aumento de la demanda, las reservas pronto se agotan (Fanelli, 42).

I hypothesized that the decentralized and generally unregulated nature of cryptocurrencies[5] could characterize USD-pegged Stablecoins as an alternative savings strategy comparable to saving in USD cash, but more accessible during periods of exchange restriction. However, I found that while any cryptocurrency-cryptocurrency transaction does not face governmental regulations, fiat currency-cryptocurrency transactions do face regulations which hinder Stablecoins as a saving strategy. In addition to the regulations that face any transaction in the foreign exchange market in Argentina, the divergence of the informal market value of the Argentine peso (ARS) from the official value of the peso during periods of exchange restriction further nullifies any hypothesized benefits of using Stablecoins as a comparable saving strategy to USD cash when USD cash is less accessible.

1. The Argentine Context

Due to large scale failings of financial institutions in Argentina throughout the country's history, there is a lack of trust and therefore lack of engagement in formal Argentine financial systems. In this paper, I discuss the major economic events surrounding Argentina's default on foreign debt in 2001 and the seizure of individual's bank-held assets in what is called El Corralito to provide context and validation for this cultural distrust. Specifically, I focus on the era of The Convertibility Plan in which the government imposed a one-to-one peg between the national currency and the US dollar (USD), which led to the accumulation of significant foreign debt and, as a consequence, default on these loans.

The financial sector in Argentina is and has been exclusionary due to the country's hyperinflationary economic state and the citizen's lack of trust in the currency, financial institutions, and financial policies. A core challenge for Argentinians resulting from this is that saving and preventing the devaluation of their savings is deemed nearly impossible. In this first section of my analysis, I will provide an overview of historical events and economic trends in Argentina that are key contributors to residents' inaccessibility to savings in order to provide context as to why I explored Stablecoins as an alternative savings method to combat the devaluation challenge.

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[5] Crypto-earnings gained by investing in Bitcoin or other traditional cryptocurrencies typically do not face governmental or institutional regulations.

It is important to recognize that the "bad" macroeconomic conditions in Argentina are generally characterized by significant devaluation of its currency and a resulting recession which is in line with Fanelli (2002). The Argentinian economy consistently faces currency challenges due to the mismanagement of its capital resources, having lasting and significant effects on its residents. D'Avella (2012) mentions that attempts to combat devaluation caused by severe inflation have unfortunately furthered long-term economic instability, which is in line with the consequences of The Convertibility Plan.

1.1 The Convertibility Plan

The Argentine government imposed a one-to-one peg between the national currency and the USD from March 28, 1991 to January 6, 2002 during the period which is called La Convertibilidad, henceforth referenced by its English name, The Convertibility Plan. This name is reflective of the easy conversion of pesos to USD within the formal banking sector—the exchange rate was one dollar to 10,000 australs through the end of 1991, then one dollar to one convertible peso starting in 1992 when the national currency changed. This drastic monetary policy aimed to stabilize the value of the Argentine currency, ending the country's cycles of hyperinflation.

The Convertibility Plan lasted nearly a decade, ending with the financial crisis of 2001. Argentina was unable to maintain sufficient reserves in the circulating currencies, namely USD, in major part due to demanding foreign loan payment terms and the societal preference to hold USD as an asset due to its historical superiority to Argentine currencies.

Even before The Convertibility Plan, USD had been heavily integrated into Argentine financial culture and practices. D'Avella (2012) outlines that by pairing the national currency to the USD during The Convertibility Plan, Argentina transitioned the existing individual level, microeconomic practice of exchanging pesos for dollars to a macroeconomic scale. Before The Convertibility Plan, it was common practice for individual Argentine residents to practice saving in dollars rather than the national currency due to the relative stability of the dollar. By saving in a currency that is more stable than the hyperinflationary Argentine currency, Argentinians are able to limit the effects of devaluation on day-to-day spending and longer-term investments. D'Avella (2012) notes that the practice of buying dollars to change back to pesos when necessary

was firmly installed in the Argentine middle class. The practice of saving in USD was prevalent before The Convertibility Plan and continues to various degrees depending on the accessibility of dollars.

Dollars and the Argentine currency are and have been used simultaneously and interrelatedly in many Argentinian households, whether for day-to-day conversions, savings, or larger investments. So, The Convertibility Plan strove to implement monetary policy that would align the national currency with the dollar as the dollar already played such a significant and important role in the economy.

However, further connecting the Argentinian currency with the USD was not primed to help with the country's long-term economic stability. While the peg provided welcome stability to the money in the pockets of Argentinians, it limited the government's ability to conduct monetary policy. D'Avella (2012) highlights that as the Argentine government could not simply print more USD to accommodate demand, state services could only be financed by international lenders during a recession. During this period, the International Monetary Fund (IMF) was the main source of national financing. During The Convertibility Plan, Argentina relied on these foreign loans instead of expanding their own monetary base or increasing their competitiveness through competition on foreign trade. Making matters worse, Fanelli (2002) highlights that any appreciation of USD directly affected the competitiveness of Argentine exporters as most of Argentina's exports did not go to the United States during this period. So, any growth in the value of the USD meant that the Argentine currency became overvalued. While this decade provided some calm for Argentinians in the light of currency volatility, it primed the economy to suffer a crisis and take drastic measures to mitigate macroeconomic consequences like through El Corralito.

The one-to-one currency peg during The Convertibility Plan, while not an inherently unsustainable monetary policy, was paired with unsustainable borrowing behavior on behalf of the government which ultimately led to the economic crises in the early 2000s. Given that the peg eliminated inflation risk, it is likely that Argentina faced more favorable loan terms during the period of The Convertibility Plan. Since the only risk the country faced when borrowing was credit risk, they could borrow money at more favorable interest rates. Hence, Argentina likely borrowed too much money due to the lower interest rates, did not invest it into the country's

productivity and therefore was unable to pay back the loans. D'Avella (2012) concludes that toward the end of the twentieth century, it became nearly impossible for Argentina to keep up with paying off foreign loans while also allowing its residents to convert their bank-held USD savings into cash. As such, the monetary policy of The Convertibility Plan ended formally in January of 2002, being one of three major economic events which characterizes this era of economic crisis in the early 2000s—the end of The Convertibility Plan, the default on foreign debt, and El Corralito.

1.2 El Corralito and the Default on Foreign Debt

El Corralito[6] is the term that was used to describe the consequences of The Convertibility Plan, which arguably created cultural trauma around trusting the Argentine financial sector. In 2001, there was approximately a year-long period in which strict limits on bank withdrawals were imposed by the government as a means of preventing bank runs, which would have caused severe economic collapse. El Corralito particularly affected Argentinians of the middle class who had been placing their savings within the banking system, taking advantage of the one-to-one conversion during The Convertibility Plan to engage in transactions and investments. However, while the government hoped El Corralito could prevent economic collapse via bank run, economic collapse occurred nonetheless due to the default on foreign debt on December 26, 2001.

During El Corralito, Argentinians couldn't access any USD savings held within a bank and as such struggled to financially sustain their families. This restriction had two significant effects. First, a barter economy became more common in many neighborhoods in Buenos Aires due to the difficulties of sustaining a family on this budget. Second, those who saved in cash during The Convertibility Plan did better than those whose assets were tied up in bank accounts during El Corralito because of the flexibility it provided them. D'Avella (2012) notes that bank deposits were trapped during El Corralito, but those with cash were able to move and exchange pesos and dollars outside of the formal financial system.

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[6] El Corralito directly translates to The Playpen. This name signified that bank deposits were trapped as the government played with citizen's savings in a last ditch attempt to prevent economic collapse.

Despite the promises of the government that economic consequences like El Corralito wouldn't happen as a result of The Convertibility Plan, many Argentinians found themselves having lost access to their savings in an effort to minimize the macroeconomic consequences of accumulating so much foreign debt. The collective memory of El Corralito and the tendencies Argentinians developed from 2001 forward represent a massive distrust in the financial system. One might think: if El Corralito could happen, what is to stop future mismanagement of the economy to impact their store of money and assets?

Before this withdrawal limitation was implemented, Argentinians had already started doubting the financial and economic stability of the country and, as such, they had been shifting capital out of the country. D'Avella (2012) poses that this doubt stemmed from the confluence of three factors: the ten-year period of neoliberal policy during The Convertibility did not produce the promised benefits of long-term currency stability; the wealthy were able to move their capital abroad and out of the national banking system (a process which Comisión Especial de la Cámara de Diputados 2001 (2005) called a highway of money); and, major funds on Wall Street began to speculate against Argentine debt. The highway of money in particular accelerated the default on foreign debt as the government did not have enough USD in circulation to pay off the steep loans. This trend of USD leaving the country contributed to the government's reasoning for freezing people's assets in the banking system during El Corralito. It was a last-ditch effort to prevent the complete loss of capacity to pay off foreign debt.

The IMF provided a rescue package in June of 2001, but by that point the default was considered inevitable and no further loans were issued to Argentina. On December 6th of 2001, Argentina defaulted on its debt amounting to over USD 90 billion, the largest default on foreign debt in history to date. About 80 billion USD worth of bonds were defaulted, approximately 51% of which were issued in the preceding three years according to Blustein (2005). As mentioned previously, the imminence of the default was likely and probably could have been predicted earlier than 2001 when the IMF declined to give out more loans to Argentina.

El Corralito represents a crisis in Argentina using the Fanelli (2002) definition, not just an isolated breach of contract, as it entailed a violation of property rights and set a precedent for the danger of future contract breaches. When the federal government of Argentina defaulted at the end of 2001, Argentinians' lost their property: namely their savings in USD as the Central

Bank of Argentina (BCRA)[7] mandated the exchanging of bank-held USD assets into their worth in pesos. D'Avella (2012) reports that several days after the country announced the default, it was announced that all bank deposits would be converted to pesos, marking the immediate devaluation of Argentinian's bank savings due to dislinking it from the dollar. Since then, as seen in Figure 1, the Argentine national currency has experienced consistent and significant inflation especially in comparison to the USD.

1.3 Changes in the Savings and Investment Spheres in Argentina after El Corralito

The end of The Convertibility Plan, the economic crisis marked by El Corralito and the default on foreign debt left Argentinians without a clear and accessible way to prevent the devaluation of their money and erased any of the financial benefits of the 1990s. The early 2000s marked a reversion to the instability that existed prior to the USD currency peg and eliminated the temporary economic stability that Argentinians enjoyed. In this section, I will highlight the mentality about saving that followed this economic crisis, focusing on how saving in USD and investing in real-estate aimed to minimize the effects of devaluation of the peso.

In economically unstable countries such as Argentina, saving in USD is common and can provide a safe haven against devaluation. This is likely a core reason for why Argentinian savers are estimated to hold about 10% of the world's United States-issued cash that is in circulation. This accounts for about USD 200 million in paper dollars out of the approximate USD 2 billion in circulation as of 2020, with the number having grown during the COVID-19 pandemic according to La Capital (2021). USD plays such a significant role in the Argentinian economy as demonstrated by the statistic that there are more dollars per capita in Argentina than in the issuing country meaning that each resident has more USD cash on them per person than in the USA according to La Capital (2021). As savings in dollars became more accessible again after the strict USD exchange restrictions during El Corralito were lifted and the economic crisis subsided, it is no surprise that the amount of USD cash saved increased by over 300% according to Infobae (January 8). USD cash was and continues to be a savings safe haven in Argentina in light of the economic crises in the early 2000s.

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[7] The Spanish translation of the Central Bank of Argentina is the Banco Central de la República de Argentina. Any sources gathered from the Central Bank will be referenced under the Spanish name.

These statistics make sense because after El Corralito reinstilled massive distrust of the finance system, there was a resurgence of what D'Avella (2012) calls "colchonismo" or plata del colchón (the idea of storing cash under your mattress to keep it safe from the banking sector).[8] In the previous paragraph, I mentioned that Argentina has the highest amount of USD cash saved as a country other than the USA and per capita. Beyond having such significant levels of USD cash, Argentina has very high rates of cash saved outside of the finance system, likely one of the reasons why the country's economy is stagnant. According to Sticco (2011) approximately 35% of Argentina's GDP was held in cash in 2011. As cash was living outside of the financial system, there was little flexibility for financial institutions or the government to invest in the country's productive capacity. The Argentine economy failed Argentinians in the early 2000s and by keeping money out of the financial sector, the Argentinians are "failing" the economy.

Interestingly, dollars in cash were not the only safe haven against devaluation that Argentinians sought after this economic crisis. The reasoning behind the rise of real estate investment in Buenos Aires post-El Corralito and the default is actually similar to why I hypothesized that Stablecoins could be an effective savings strategy: they both are resistant to the inflation challenges of the peso and they both operate outside of the traditional finance system. But first, I will highlight the context of how real estate proved to be a desirable investment strategy to prevent the devaluation of these investors' savings.

Real estate became a way to derive stability and concrete value from savings, representing all that the banking sector was not. It represented a way to escape nominal friction and make this value real and durable. D'Avella (2012) also highlights how real estate provided an alternative investment strategy to saving in USD.

When saving with the "colchonismo" strategy, people incur high liability. In theory, banks provide a secure location to store your money in comparison to hiding money in walls, under floorboards, or under mattresses. Obviously this was not the case in Argentina due to institutional distrust of its citizenry. However, investing in real estate became a way to minimize the liability of maintaining a dollar savings hidden within the home. As D'Avella (2012) mentions, the transactions in the real estate sector particularly during this time were done with dollars rather than pesos which suffered extreme devaluation trends. However, this also meant

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[8] Colchón is Spanish for mattress.

that those with minimal to no dollar savings did not have great access to the real estate sector. But, for those with the means to incur the upfront significant cost of investing in real estate, this sector became a safer and accessible investment or savings option as the real estate industry operates in USD rather than pesos. In addition, the seizure of physical property like real estate by the government was not a significant threat, contrasting with El Corralito which demonstrated the vulnerability of the monetary sector for individuals. Real estate represented an alternative way to store value after the crisis of the early 2000s, drawing upon the stability of the dollar and being more trustworthy than the finance sector or their mattresses.

While investing in real estate was an interesting reaction to the economic crisis for those privileged enough to do so, it was not an accessible form of saving, investing, or preventing devaluation for the general population. First, as I mentioned, most real estate transactions were made in USD. Second, investing in real estate includes upfront costs and the loss of cash liquidity, making it inaccessible to the lower socioeconomic classes. Third, this practice was only ever made on a small geographic scale, with the main real estate development being seen in the city of Buenos Aires. Fourth and finally, there is limited space in which to continue building. After El Corralito and the financial crisis, there was physical space in which to build in Buenos Aires. However, the development of the city, gentrification, and lack of available construction area is driving the cost of entry into the real estate market unreasonably high for this to be considered an accessible savings or investment strategy. Due to these four reasons as well as current savings challenges like exchange restrictions that I discuss in subsequent sections, there is a call to have a more accessible form of saving to prevent devaluation. I hypothesized that Stablecoins could fill that role.

1.4 Argentine Inflationary Environment

Figure 1 shows the inflation growth trends of Argentina as compared to the United States. Argentina has faced increasing inflation rates since the financial crisis in the early 2000s when the country defaulted on foreign debt, froze bank assets during the period called El Corralito, and ended the one-to-one peg set forth by The Convertibility Plan. This figure intentionally starts in 1992 after the implementation of The Convertibility Plan to demonstrate the calming of inflation rates during the approximate ten year period during which that monetary policy was in place.

Figure 1 includes data through the most recently completed calendar year to demonstrate the increasing trend in inflation rates to date since the major economic crisis of the early 2000s.

Figure 1. Annual Inflation Rates in Argentina and the United States from 1992 to 2022
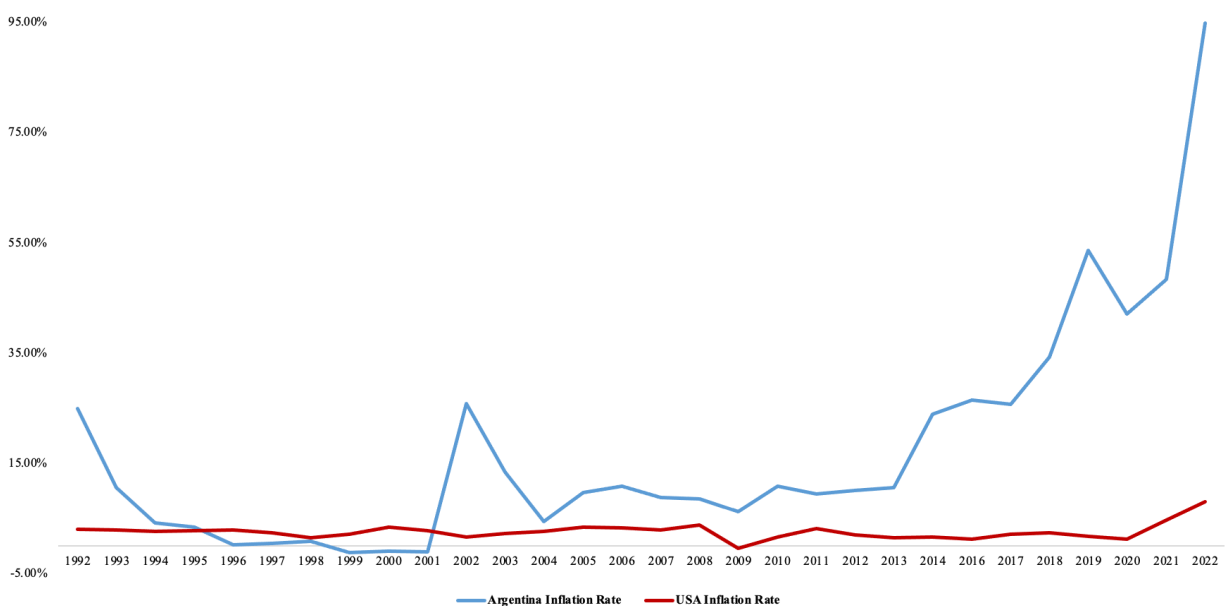
Source: WorldData.info (2023); USInflationCalculator.com, obtained US inflation rate for 2022 as it was absent in the prior source

While not included in this figure so as to maintain a reasonable visual scale, it is important to note that inflation rates in Argentina prior to 1992 were extremely high: 3079.81% in 1989, 2313.96% in 1990 and 171.67% in 1991. The Convertibility Plan was implemented in 1991, so the inflation rates of 1991 to 1992 (171.67% to 24.90%) reflect the recovery of stability in the early period of this monetary policy. As described in Section 1.1, The Convertibility Plan was implemented to combat the hyperinflation stemming from accumulating high amounts of national debt, a shrinking international reserve and a necessity to pay off billions of dollars in bond warrants.

The high inflationary environment in Argentina is the core reason why saving in the national currency is deemed ineffective and nearly impossible. As such, in addition to the massive distrust instilled in the population due to the economic crises in the early 2000s, Argentinians are forced to seek alternative means of saving in order to prevent rapid and significant devaluation. Historically, the most common saving strategy has been saving in USD

cash as described in Section 1.3. Because of the inaccessibility to USD under exchange restrictions (the current and historical restrictions are described in Section 1.5), I hypothesized that an alternative that mimics the value of USD like Stablecoin could present a valid and less restricted savings strategy. However, I ultimately find that Stablecoins are not an all-encompassing strong savings alternative to USD cash (acquired formally or informally) because of the exchange rate it faces and the exchange controls applied to cryptocurrency platforms when fiat currencies are deposited or withdrawn.

1.5 Current Foreign Exchange Controls

In light of how intertwined USD is in the Argentine economy, especially due to inflation, the current dollar purchasing restrictions in the legal market are particularly pertinent in understanding the challenges to saving. In this section, I outline the current restrictions relating to foreign currency exchange and the implications on Argentine savers.[9]

As stated in BCRA (2022) section 3.8, the foreign currency purchase limit for residents per calendar month is USD 200 for the formation of external assets, remittance of family aid and for operations with derivatives. The policy outlined in BCRA (2022) delves into the nuance of this regulation (i.e. what deducts from the USD 200 purchase allowance, how to handle cancellations of charges and under what circumstances the limit is less than USD 200). However, for the general purposes of this paper, the core regulation that is important to understand is that any standard Argentine resident faces a dollar purchasing restriction of USD 200 per calendar month. This restriction applies to the purchase of any foreign currency in the sense that an Argentine resident cannot purchase in excess of the value of USD 200 in any foreign currency.

As the Central Bank of Argentina (BCRA) implemented this exchange restriction to control the outflow of foreign currency, there are several safeguards outlined in Exterior y Cambios (2022) to ensure the USD 200 restriction is difficult to evade. For example, Exterior y

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[9] It is important to note here that Argentina has a robust black market currency exchange for USD. The regulations that I outline in this section describe limitations felt by the legal financial market. In Section 3, I describe the process by which an Argentine resident may access dollars, and at what rate, in the illegal market: also referred to in this paper as the informal, parallel, street or black market. I do not include econometric analysis of the illegal market despite its massive presence in Argentina as its exchange volume, frequency, and other key characteristics are not recorded or publically available and therefore an econometric analysis would not produce statistically significant findings. However, I will provide conjecture about the parallel market when appropriate to provide helpful context.

Cambios (2022) section 4.1 outlines that a resident cannot evade the USD 200 limit by purchasing prepaid cards or using credit or debit cards when abroad. These transactions are recorded via the BCRA's online platform[10] or reported to the BCRA by the relevant entity. Under this current regulation, if an Argentine resident is traveling to the US and desires to make more than USD 200 worth of commercial purchases, they must do so spending already obtained USD cash (whether obtained formally or informally), earning an income in USD (if in the US for work purposes, and this faces additional regulations), or by partaking in the informal market.

Above, I describe the USD 200 restriction for purchasing dollars. Argentine residents also face restrictions in how much USD they can transfer out of the country for remittance purposes. As stated by the BCRA (2020) in an announcement on the 28 of March, 2020, residents may only transfer up to USD 500 per calendar month from a local account to a remittance account abroad via their financial institution's electronic transfer method. This restriction is added on top of any restriction or regulation pertaining to international payment systems or the country in which the operation is carried out. The implications of the regulation are important: even if an Argentine resident has enough trust to store USD in the formal Argentine banking sector, they face restrictions on how that currency can be used. Because of how robust the informal foreign currency exchange market is and the restrictions imposed on USD bank holdings, there is little to no incentive for holding foreign currency like USD in the bank and transacting in USD in the formal financial sector.

While the formal restrictions on USD are steep, there are exceptions in which Argentine residents are able to access a value greater than USD 200: obtaining a mortgage and paying off foreign debt. According to Exterior y Cambios (2022) section 3.9, residents are able to take out a mortgage through the bank up to a value of USD 100,000. However, during the period in which an individual's name is associated with an active mortgage, the individual will not be able to purchase USD through formal channels (i.e. up to the USD 200 restriction outlined in Exterior y Cambios (2022) section 3.8). Hence, if this individual wishes to save in USD while also having an active mortgage, their only means of doing so is via the black market. Exterior y Cambios (2022) section 3.11 states that residents have access to the foreign exchange market in the case that they have foreign indebtedness or established trusts and require this access to attend to their

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[10] The BCRA has an online platform through which foreign exchange transactions are verified and tracked.

foreign indebtedness or contracts. So, the BCRA will allow the resident to flow USD through official channels for this purpose. The aforementioned flexibility in the foreign exchange restriction is pertinent to recognizing the purposes for and extent to which an Argentine resident saves.[11]

Argentina is no stranger to foreign exchange restrictions. The BCRA declared exchange restrictions from the end of 2011 to the end of 2015, which will be discussed further in Section 2.1, as well as several other times in the country's recent history. These exchange restrictions have typically been implemented as a way to mitigate the macroeconomic consequences of accumulating foreign debt, stabilize inflation and to artificially strengthen the value of the peso to incentivize its usage. However, as will be discussed in further sections, exchange restrictions tend to have the opposite effect by leading to unsustainable currency strength and stimulating black market demand for access to dollars, as found by Gahn (2017).

2. Data Analysis

2.1 Breaking Down the Data

Table 1 lists the exchange rates at the beginning of 2023 for the Dólar Oficial, Dólar Blue, Dólar MEP and Dólar CCL which reflect the relative value of the peso to the dollar under various conditions. Rates are listed for the second, rather than the first, of January 2023 as it was the first official day of trade of 2023, being a Monday. This date was chosen for simplicity and cleanliness of data as full annual data is only accessible in this study through the end of 2022.

The Dólar Oficial is the official rate of exchange used by Argentine financial institutions such as the Central Bank of Argentina (BCRA). The Dólar Blue reflects what I refer to in this paper as the informal market value of the peso. This exchange rate reflects the parallel value of the peso to the dollar and is used in informal markets. When purchasing, selling or using USD in any non-bank, common commercial setting, the rate used closely resembles the Dólar Blue. This parallel exchange rate diverges significantly from the official exchange rate during periods of

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[11] Due to the fact that the Argentine real estate market operates predominantly in USD, an inaccessibility to a formal mortgage would hinder the majority of the country's population from accessing housing. In periods of exchange controls, Argentininians would have to rely on personal or familial USD cash savings, likely having to engage further in the black market currency exchange, in order to access real estate.

exchange controls as described in Section 2.2. The Dólar MEP[12] is reflective of the rate the government offers for electronic payments, particularly for the usage by foreign tourists making credit card transactions via Visa or Mastercard. This exchange rate is intended to closely follow the parallel exchange rate. As cash transactions—which follow the Dólar Blue in commercial settings—are not as traceable, the government likely implemented the Dólar MEP to increase visibility and transparency on business' revenues as also hypothesized by the economists referenced in Laurici (2023). The Dólar CCL[13] is used in official exchange markets for the purchase of bonds in pesos or bonds in dollars, each of which must be sold in kind. This rate is used to make a deposit into a United States investment account. The Dólar CCL also closely maps the informal market value of the peso, or the Dólar Blue.

Table 1. Spot exchange rates for Argentina's Dólar Oficial, Dólar Blue, Dólar MEP and Dólar CCL on 1/02/2023

	USD-ARS *(x USD-1 peso)*	ARS-USD *(x pesos-1 USD)*
Dólar Oficial	$ 0.00549	$ 178.25
Dólar Blue	$ 0.00271	$ 346.00
Dólar MEP	$ 0.00291	$ 329.21
Dólar CCL	$ 0.00281	$ 344.88

Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

The first column shows how many USD one Argentine peso was worth on 1/2/23. The second column shows how many Argentine pesos one USD was worth on 1/2/23. It is important to recognize the difference in value of the Dólar Oficial versus the three following rates. While the Dólar Blue, Dólar MEP and Dólar CCL are reflective of more similar value (ranging from 0.00291 to .00271 USD-ARS or 329.21 to 346.00 ARS-USD), the Dólar Oficial values the peso significantly higher than the other included rates (.00549 USD-ARS or 178.25 ARS-USD).

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[12] In Spanish, MEP stands for *medido electrónico de pagos*, or electronic means of payment. For more details about the Dólar MEP, see BCRA's article on MEP, BCRA (2023).
[13] In Spanish, CCL stands for *contado con liquidación*, or counted with liquidation.

So, the official rate of exchange, or the Dólar Oficial, currently values the peso at a rate almost double to what the informal market values the peso as represented by the Dólar Blue and further reflected by the Dólar MEP and Dólar CCL. This trend is maintained and obvious during periods of exchange controls as described in Section 2.2. Argentina is currently under steep exchange controls as described in Section 1.5 which restarted in October of 2019 and steepened thereafter.

Table 2. Statistical Metrics Regarding the Datasets Used for Measuring Dólar Oficial, Dólar Blue, Dólar MEP and Dólar CCL

	Variance	Standard Deviation	Range
Dólar Oficial	0.0151964	0.1232736	0.3449
Dólar Blue	0.0178224	0.1335006	0.5927
Dólar MEP	0.0000616	0.0078489	0.0256
Dólar CCL	0.0039749	0.0630469	0.2573

Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

Note: The data available for each exchange rate varies. The time periods for each dataset are the following: 9/9/04-3/24/23 (Dólar Oficial), 1/11/02-3/24/23 (Dólar Blue), 10/29/18-3/23/23 (Dólar MEP) and 2/22/10-3/23/23 (Dólar CCL). The frequency of each dataset is business days.

Table 2 shows statistical metrics for the four exchange rate datasets. The variance measures how spread out the data is from the mean with a higher variance indicating a larger spread and a lower variance indicating a smaller spread. The standard deviation, being the square root of the variance, is another similar measure of the spread of data. As opposed to variance, it is expressed in the same units as the dataset. The range is the difference between the maximum and minimum in the dataset, giving a general picture into how much variability there is in the dataset.

With these statistics in mind, conclusions can be drawn about the characteristics of each dataset. Dólar Oficial and Dólar Blue have the largest spreads with variances of 0.015 and 0.018

respectively. It makes sense that these variances are higher than those of Dólar MEP and Dólar CCL because the data available for Dólar Oficial and Dólar Blue is available for earlier dates for which the difference in value between the peso and USD was smaller[14] as well as the comparative growth rates of inflation.[15] This same logic can be applied to explaining the range of each rate. It makes sense that the spread of the Dólar Oficial is smaller than that of the Dólar Blue as the BCRA has implemented currency controls during this period to artificially stabilize the currency and reflect it at a higher value. The Dólar Blue, however, reflects the perceived value of the peso which has a lower value than the Dólar Oficial particularly during times of exchange restrictions as elaborated on in the next section.

2.2 The Causal Nature of Exchange Controls on the Exchange Rate Gap

Figure 2. Daily Exchange Rate Prices USD-ARS (x USD-1 peso) from 1/01/2002 to 1/01/2023
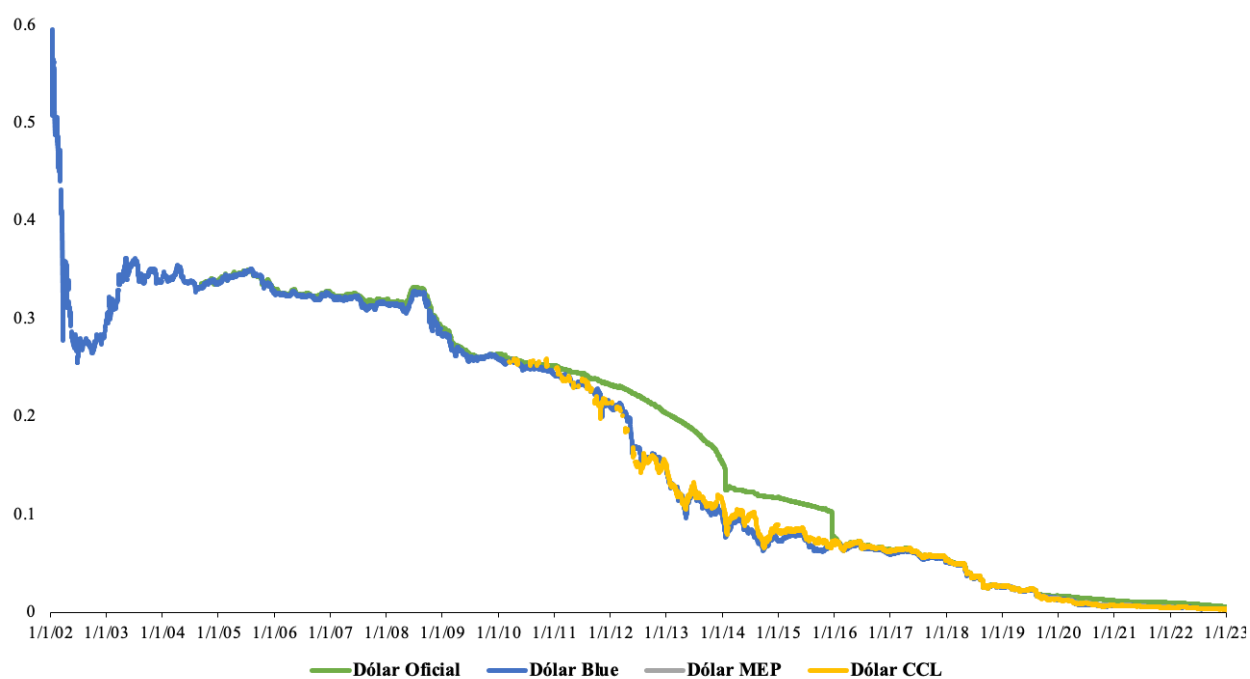
Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

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[14] See Figures 2, 3 and 4 for historic information on the value of the peso.
[15] See Section 1.4 for information on inflation in Argentina.

Limited access to dollars through formal channels stimulates black market demand for USD. The high demand is pre-existing due to the extreme and consistent inflation facing the country as well as the lack of trust in financial institutions. So, Argentinians will go to the black market instead if they cannot obtain USD through legal channels. Monetary policies such as exchange controls, especially dollar purchasing restrictions, stagnate the flow of formal transactions and devalue the national currency.

Figure 2 depicts daily exchange rate data for four of Argentina's recognized exchange rates: Dólar Oficial, Dólar Blue, Dólar MEP and Dólar CCL dating back to the beginning of 2002, just after the financial crisis described in Section 1.[16] Figures 3 and 4 depict periods in which Argentina faces exchange restrictions. In each of these isolated periods, the Dólar Oficial diverges from the other three rates, reflecting the existence of the parallel exchange rate.

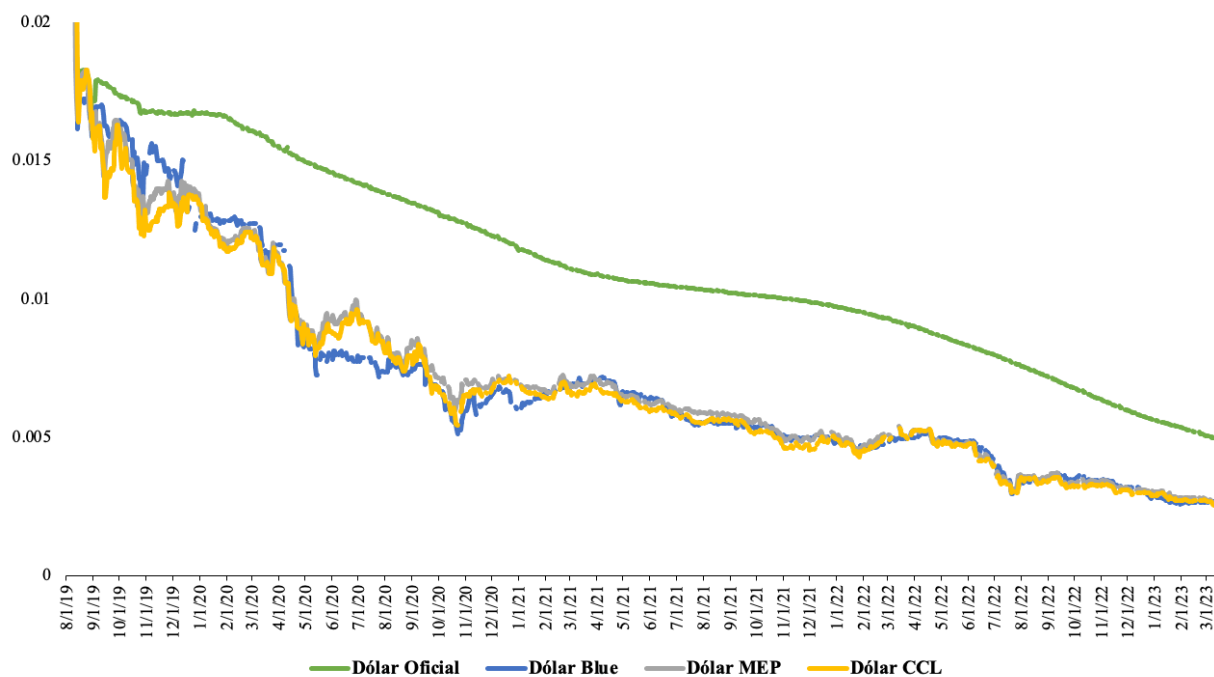**Figure 3. Daily Exchange Rate Prices USD-ARS from 10/01/2011 to 1/01/2016**
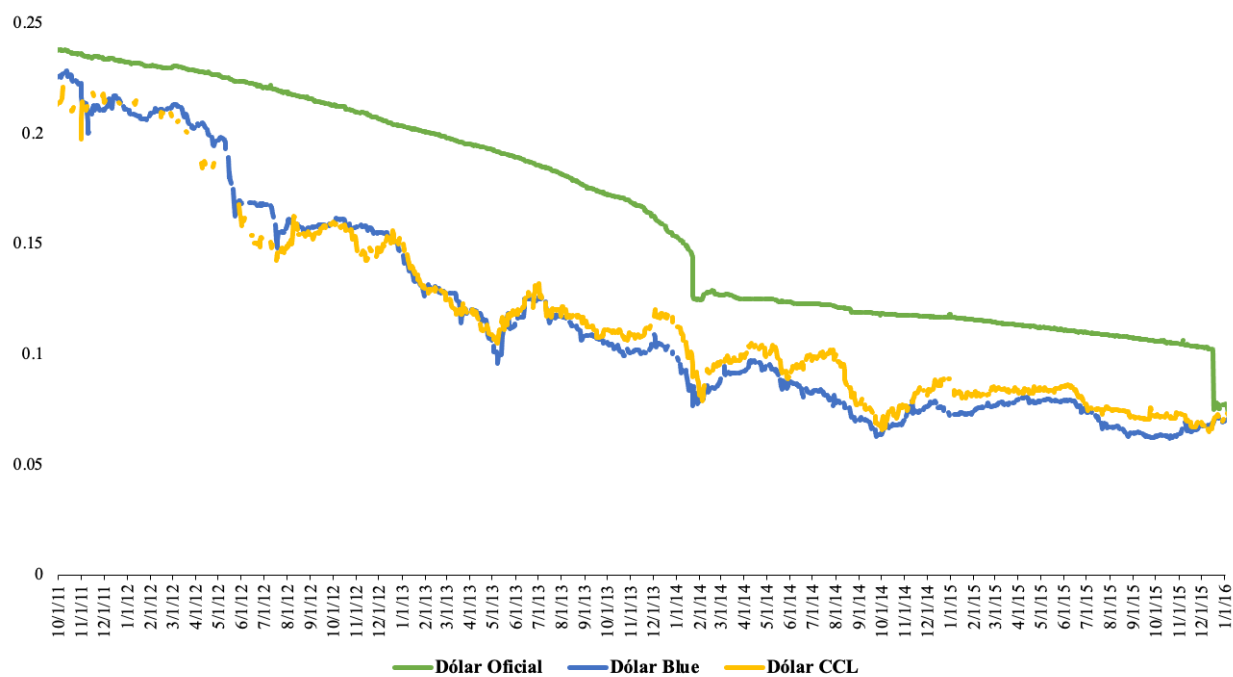
Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar CCL
Note: Dólar MEP is not included in this chart as its inception is after the final date in this range.

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[16] To see each of the exchange rates visualized in isolation of each other, see Figure A1 in the appendix.

Figure 3 shows the daily exchange rate data for Dólar Oficial, Dólar Blue, and Dólar CCL from October 1, 2011 through January 1, 2016. This date range is inclusive of the period of exchange restrictions implemented by former Peronista president, Cristina Fernández de Kirchner on October 31, 2011 and lifted on December 16, 2015 by then newly elected neoliberal president, Mauricio Macri as described in CNN Español (2015). Fernández de Kirchner implemented exchange restrictions through General Resolution 3210 by the Federal Administration of Public Revenues (AFIP).[17]

Figure 4. Daily Exchange Rate Prices ARS-USD from 8/01/2011 to 3/23/2023

Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

Figure 4 depicts the four exchange rates from August of 2019 through March of 2023, when this data was pulled to be analyzed (reflecting present-day for all intents and purposes). Despite Mauricio Macri having been the one to lift Fernández de Kirchner's exchange restrictions in 2015, Macri implemented new exchange restrictions on September 1, 2019

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[17] In Spanish, AFIP is the Administración Federal de Ingresos Publicos.

through the Decree of Necessity and Urgency 609 as seen in Poder Ejecutivo Nacional (2019). This decree states that large exporting companies have to request permission from the BCRA to access the exchange market to undergo business transactions, transfers abroad require prior BCRA authorization and that Argentine residents have a monthly dollar purchasing limit of USD 10,000. Since this decree, the purchasing limit has tightened dramatically to USD 200 as discussed in Section 1.5.

In light of these exchange controls, the parallel exchange rate gap reemerges along with the ensuing challenges of overvaluing the official currency. Under the pressure of steep dollar purchasing restrictions, Argentinians are left with no other option than to purchase dollars in excess of the limitation on the black market. As theoretically any foreign exchange matter (whether USD or a good of value) in the current regulatory environment must be reported to and follow the regulations of the BCRA, it is important to recognize the effect has been to increase black market transactions (buying and selling dollars, engaging in unregulated investing spheres like cryptocurrencies, etc).

Gahn (2017) explains that the divergence of the official exchange rate and the unofficial exchange rate stems from exchange rate controls imposed by the government. Gahn (2017) uses a Threshold Autoregressive Model (TAR) to show the temporal causality of exchange policy on the emergence and widening of the exchange rate gap. He further uses Ordinary Least Squares (OLS), the Granger method and other econometric techniques to show that the observed significant gaps between these two rates are caused by exchange restrictions.

He goes on to explain that the effects of exchange restrictions are significant in Argentina as it is a periphery country.[18] Having a supply of currency is vital for the development of periphery countries as they require imports of capital and supplies. So, exchange controls can be a powerful tool in aiding in the development of these countries.

The divergence of the official exchange rate (Dólar Oficial) and the unofficial exchange rate (Dólar Blue) in 2011 is explained by Gahn (2017) by the exchange controls implemented on October 31, 2011 via Resolution 3210 of the Federal Public Revenue Administration (AFIP) in

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[18] Periphery countries are characterized by having very small shares of global wealth, depending on (and occasionally being exploited by) more developed nations and having weak governmental institutions. Frequently, periphery countries are on the outskirts of global trade because of unstable or ineffective governments, weak public institutions, or technological obstacles as described by Schenoni and Escudé (2016).

AFIP (2011).[19] Gahn (2017) elaborates that this resolution arose in a context where Argentina did not have the ability to borrow abroad, conflict had been growing with the agro-export sector since 2008 due to the intention to increase taxes on the cereal export[20] and the formation of foreign assets was being promoted. This caused the parallel exchange rates to create an unsustainable process of reserve accumulation and later abandonment of controls.

I further justify the findings in Gahn (2017) by analyzing the correlations of various pairs of exchange rates as seen in Table 4.

Table 3. Average gap with and without exchange restrictions.

Average gap without exchange restrictions	3.13%
Average gap with exchange restrictions	61.72%

Source: Gahn (2017)

Gahn (2017) demonstrates that the observed gaps between the Dólar Oficial and the Dólar Blue are larger during periods of exchange controls by calculating the average gap during periods with and without these governmental controls as seen in Table 3.

Gahn (2017) finds that the appearance of a parallel exchange rate is due to the existence of exchange controls, or restrictions in the strict sense, which limit the amount of currency that economic agents can acquire for either commercial, speculative or saving purposes. Gahn (2017) continues to elaborate that the existence of these exchange restrictions and the associated incapacity to acquire an unlimited quantity of foreign currency (typically USD) through official channels gives rise to the creation of an informal, and typically illegal, parallel currency market. As seen in this paper, the parallel exchange rate for Argentine pesos to USD and vice versa is valued at a completely different rate than the official exchange rate, typically to the detriment of peso-holders seeking to buy USD valued goods, services or currency.

The correlations displayed in Table 4 were calculated in Stata using the pairwise deletion correlation command, "pwcorr." This computes the correlation for all cases that are not missing

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[19] Resolución 3210 de la Administración Federal de Ingresos Públicos (AFIP)
[20] The tax increase was proposed in the Resolution 125/08 of the Ministry of Economy and Production of the Nation (or the "Resolución 125/08 del Ministerio de Economía y Producción de la Nación").

values in the specific set of variables whereas the basic correlation command, "correlate," computes the correlation for all cases that are not missing values across the entire dataset. While the incremental difference in correlation is minimal between using each command, I chose to calculate using "pwcorr" for the following reasons.

Table 4. Correlation Coefficients of Exchange Rates

	1/1/02-1/1/23	No Exchange Controls		With Exchange Controls	
		1/1/02-10/30/11 (*)	12/17/15-8/31/19 (*)	10/31/11-12/16/15	9/1/19-3/24/23
Dólar Oficial to Dólar Blue	0.9875	0.9976	0.9988	0.9417	0.9227
Dólar Oficial to Dólar MEP	0.9825	N/A	0.9988	N/A	0.9537
Dólar Oficial to Dólar CCL	0.9675	0.9435	0.9991	0.9220	0.9530
Dólar Blue to Dólar MEP	0.9973	N/A	0.9852	N/A	0.9893
Dólar Blue to Dólar CCL	0.9974	0.9439	0.9988	0.9889	0.9878
Dólar MEP to Dólar CCL	0.9994	N/A	0.9913	N/A	0.9986

Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

*Note: The starting date range for Dólar CCL is 2/21/10 and the starting date range for Dólar MEP is 10/29/18 because there is no data available prior to those dates.

I chose to calculate correlation using this command instead of the basic correlation command as the range of available data differs greatly across each variable. Because correlation measures the strength of the relationship between two variables, any variation in the availability of data for the other variables should not affect the calculation of correlation of the pair at hand. I

am analyzing the strength of the relationship between two exchange rates under various conditions in isolation and comparing the range of correlations seen for different variable pairs to draw conclusions. Hence, as "pwcorr" uses more available data in the calculation than "correlate," the correlation coefficients are stronger reflections of the respective relationship.

Table 4 shows the correlations for six different pairs of the four exchange rates analyzed in this paper: Dólar Oficial to Dólar MEP, Dólar Blue and to Dólar CCL as well as for Dólar Blue to Dólar MEP and Dólar CCL. It also shows the correlation of Dólar MEP to Dólar CCL for each time period which is simply included to demonstrate that the two rates are closely correlated (always greater than .990). This goes to show that it is reasonable to claim that these exchange rates are similar enough to both reflect the informal market value of the peso. The correlations measured across the full period (1/1/02-1/1/23) are all relatively high. However, the correlation for each relationship of the Dólar Oficial to Dólar Blue, Dólar MEP or Dólar CCL—which are more reflective of the informal market value of the peso—include a greater unexplainable difference ranging from 1.25% to 3.25%. This is likely due to the inclusion of two three-plus periods of exchange controls in the measured range.

When solving for the correlation in periods without and with exchange controls, the correlation adjusts as expected: the unexplainable difference for the relationships including the Dólar Oficial are lower than the full period without exchange controls and higher with exchange controls. This is expected as the four exchange rates should be mapping each other in periods without exchange controls and should be diverging during periods with exchange controls. So, the difference that is unexplainable by simply the exchange rate values in the dataset during periods of exchange controls is explained by the findings of Gahn (2017) that parallel exchange rates emerge in light of these restrictions. The correlations between Dólar Blue, Dólar MEP and Dólar CCL demonstrate strong relationships between these exchange rates which is to be expected across the full date range regardless of exchange restrictions as each reflect the informal market value of the peso.

The notable exception to the expected behavior of correlation is the following: Dólar Oficial to Dólar CCL, 1/1/02 to 10/30/11. The lower correlation can likely be attributed to the lack of exchange rate data available for Dólar CCL for that period as the first datapoint for Dólar CCL is 2/21/10. As such, this value can be considered statistically insignificant.

Regardless of exchange controls, it is expected that Dólar MEP and Dólar CCL should roughly map Dólar Blue as both are generally reflective of the informal market value of the peso (which is exactly represented by Dólar Blue). For all periods except for 1/1/02 to 10/30/11, there is no more than a 1.48% unexplainable difference. The 5.61% unexplainable difference for Dólar Blue to Dólar CCL during 1/1/02 to 10/30/11 is likely due to the lack of data analyzed for this period as the first datapoint for Dólar CCL is 2/21/10. As such, this value can be ignored. [21]

3. Savings Strategies in light of Argentine Exchange Controls

3.1 Assumptions Regarding Selecting the Optimal Saving Strategy

In the context of this paper, I am assuming that liquidity of financial assets is not a concern for the sample Argentine savers that are depicted as examples in Figure 5. I am assuming that the ability to convert an asset to cash quickly and with ease is not important in a saving context because of the long-term horizon.

I am also assuming that Stablecoin prices in Argentina generally reflect the informal market value of the peso, which I have found to be represented by the Dólar Blue, Dólar MEP and Dólar CCL. Based on daily exchange rates accessed via Coinbase and Binance, it appears that this assumption is close to reality. A pitfall of this study is that exact data on Stablecoin prices was not available to be analyzed. This is likely due to the decentralized, anonymous and peer-to-peer nature of cryptocurrency platforms. Hence, in order to perform an analysis of how value is created or minimized by exchanging it and transferring through various channels, I decided to estimate a substitute for the value of a typical Stablecoin.

3.2 Three Prominent Savings Options for Argentinians in the Presence of Dollar Purchasing Restrictions

Figure 5 demonstrates the options an Argentine resident has regarding saving below or above the USD 200 mark depending on their characteristics and monthly savings capacity. I have identified USD 200 as the threshold because of the Central Bank of Argentina (BCRA)

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[21] For a visual representation of these correlations, see Figure A2, Figure A3 and Figure A4 in the appendix.

purchasing restriction of USD 200 per month. As described in Section 2.2, this dollar purchasing restriction is one monetary policy that contributed to the widening the gap between the official

Figure 5. Decision Tree for Argentine Savers with the threshold of USD 200
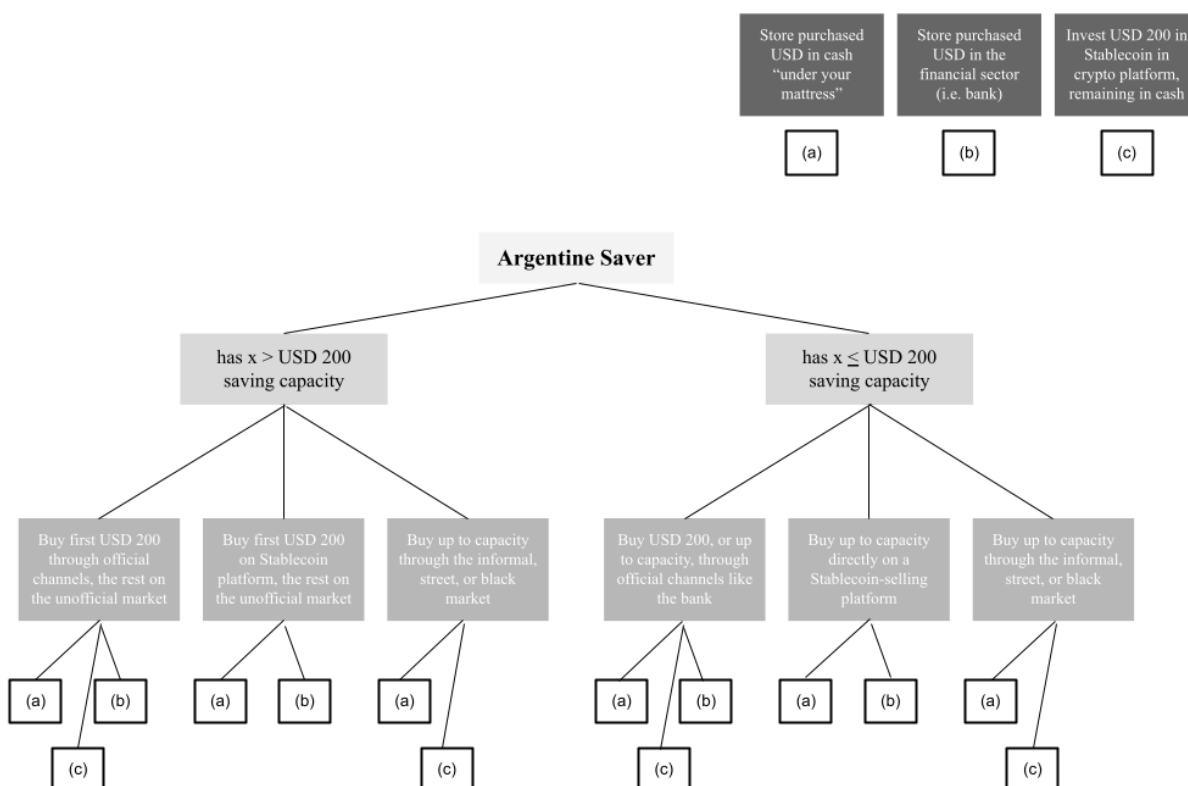
exchange rate and the unofficial, or parallel, exchange rate which reflects the informal market value of the peso. In periods where the exchange rate gap is present, Argentine residents can only purchase up to the legally mandated value (currently USD 200) through formal channels like Argentine banks in which they receive a higher value exchange rate–Dólar Oficial.[22][23] Once the citizen desires to save more than USD 200 per month, there is no formal opportunity to do so. Hence, as described in Section 2.2, they must turn to the informal markets which operate using the exchange rate reflective of the informal market value–Dólar Blue, or the parallel exchange rate. Because the dollar purchasing restriction is found to be a causal factor in creating parallel

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[22] For information on "current" exchange rate values taken on 1/02/23, see Table 1.
[23] Due to historical factors, cultural tendencies, and currency stability, Argentine savers strive to maintain savings in USD. This is elaborated on in Section 1.

exchange rates, it is inextricably linked to these exchange-rate challenges facing saving above USD 200.

The question of how to save as explored in this thought exercise is twofold: where to purchase USD value and then how to store it. Maximizing the purchase of USD through formal channels is the best option for maximizing value. At its core, savers maximize value by purchasing through official channels during periods of exchange restrictions because the Dólar Oficial is the exchange rate used whereas the other savings channels demonstrated in Figure 5 each use an exchange rate reflective of the informal market value of the peso. As seen in Section 2.1, the Dólar Oficial values the peso at almost double the informal market value under current exchange restrictions, therefore making it prudent to purchase as many dollars as possible through the official channels at the better rate. If the saver purchases USD directly from the informal market in pesos or Stablecoins of USD value directly from a cryptocurrency platform in pesos, they are effectively cutting their payout in half. However, if they first purchase up to USD 200 at the bank, for example, and then store that money in cash or in Stablecoin, they will achieve a higher payout. The following sections dive into the nuance of this strategy to maximize the purchase of USD and then store the value in USD.

3.3 Can save ⩽ USD 200

The case of an Argentine resident who can save at or below USD 200 per month in the presence of parallel exchange rates and the dollar purchasing restriction is simpler than that of someone who can save more than USD 200 per month. For the saver of less than or equal to USD 200, they face three options as seen in Figure 5: purchase USD up to their capacity formally at the Dólar Oficial, directly on a cryptocurrency platform which sells Stablecoins or informally at or close to the Dólar Blue.[24]

In this section, I will describe why these are the three options for savers of less than or equal to USD 200, the implications of each saving strategy, and the expected payoff of each strategy. This discussion is motivated by the desire to ascertain the validity of holding a savings

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[24] While the Dólar Blue has an observable value that was used in this data analysis, it is possible that transactions in the informal market will be made at or around this exchange rate. This is because the Dólar Blue is representative of the perceived informal market value of the peso which is subject to subjective fluctuations depending on the vendor's willingness to negotiate and interpretation of demand.

in Stablecoin and to demonstrate which savings strategy enables the most value preservation in light of inflation, parallel exchange rates, and governmental regulations.

Figure 6. Tracking the Payoff of Saving USD 200 under Various Saving Strategies
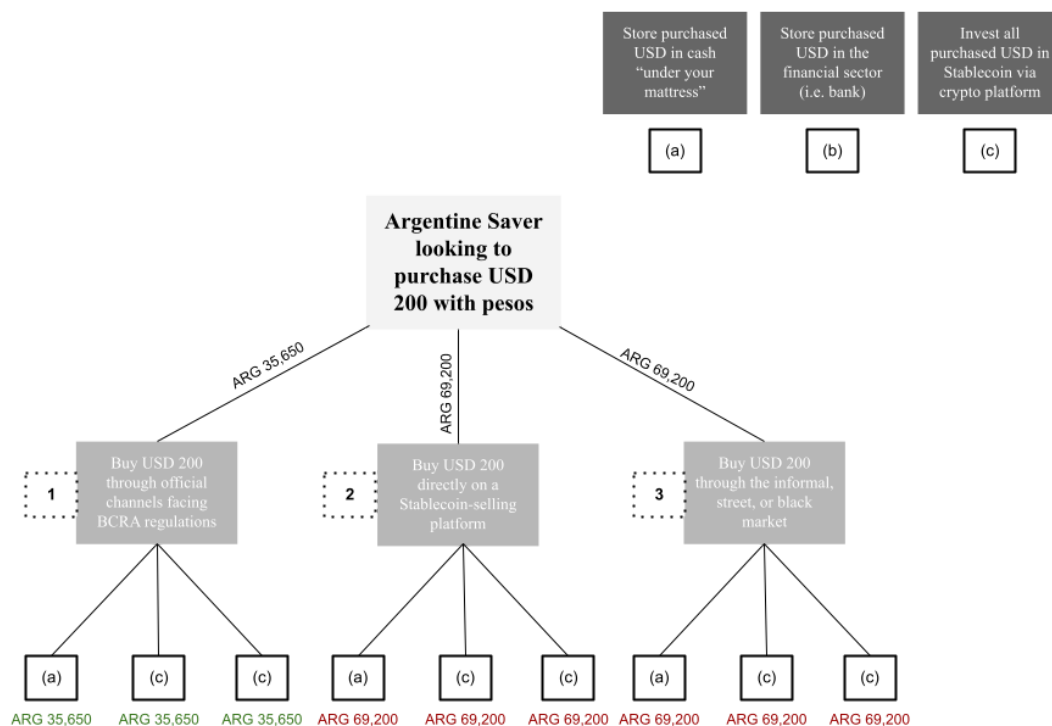
Note: The exchange rates used to calculate payouts in this decision tree use the exchange rates for 1/02/23 given in Table 1. Option 1 determines payout using the Dólar Oficial rate. Options 2 and 3 determine payout using the Dólar Blue rate.

There are several formal channels through which an Argentine resident can access USD in order to purchase up to the USD 200 maximum. The subsequent purchasing channels as well as specific regulations that I highlight are outlined in BCRA (2022).

No matter how the USD 200 is purchased—at the bank, via an official international exchange platform,[25] credit or debit transactions abroad, loading of prepaid cards, etc—the BCRA implemented an online system that enables involved entities to verify that the purchaser is

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[25] Even under current exchange restrictions, Argentine residents are able to access international exchange platforms for the formation of external assets. Should the resident desire to invest up to USD 200 per month in a foreign brokerage rather than simply withdraw USD 200 cash, it appears that these BCRA restrictions would not restrict them from doing so. This could mitigate the issue of trust in the Argentine banking sector because residents have the ability to invest outside of the Argentine financial sector. But, they are limited to a very small amount.

authorized to carry out the exchange operation. BCRA (2020) mentions that the system checks if the purchaser has reached the established limits for the calendar month and for not having exceeded them in the prior calendar month.

Figure 6 tracks the payoff of saving USD 200 under various saving strategies. This decision tree demonstrates that an Argentine Saver obtains the highest value by purchasing up to the maximum USD formally, no matter which succeeding option they choose for storing their savings. Considering storage options (a), (b), and (c) each achieve the same payout relative to pesos, the decision between the three comes down to the nuance of each method: degree of trust, restrictions on withdrawals or usage, and expected transformation of value.

Option (a)—storing purchased USD in cash, or the "colchonismo" strategy—appears to be the safest and strongest option in light of the financial environment in Argentina. By saving in USD cash, the saver is able to access and use their savings under no restrictions and using a historically trustworthy strategy as described in Section 1.3.

There are two reasons why a saver would choose to avoid option (b), maintaining a foreign asset savings account at an Argentine bank: the lack of trust in the financial sector and restrictions usage and the limitations on the withdrawal of USD from these accounts as described in Section 1. In regards to the first point, the lack of trust is justified as El Corralito marked the freezing and conversion of foreign asset accounts in the national banking sector. Elaborating on the second point, residents have a USD 500 per month restriction on sending remittances abroad from locally held foreign asset accounts as described in Section 1.5. So, saving outside of the financial system not only proves more trustworthy, but also faces fewer regulatory limitations.

The payout achieved when saving in cash, (a), and saving in Stablecoin, (c), is equivalent, therefore providing no advantage to take the additional step to save USD 200 in Stablecoin (I will describe in Section 3.4 why a resident cannot purchase cryptocurrency of value greater than USD 200 per month). If a saver chose to place the USD 200 they purchased at the bank in Stablecoin, actually be taking on additional risk[26] for no greater payout.

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[26] A note on the riskiness of cryptocurrency: Similarly to how El Corralito caused intense financial hardship for Argentina, the Stablecoin sector is also susceptible to failure and complete loss of value. In May of 2022, the Terra network crashed along with its Stablecoin TerraUSD (UST) and its platform coin Luna. To help clarify the relationship, Luna was to Terra what Ether is to Etherium: the first is the platform's cryptocurrency and the second is the platform on which its programs run. Terra also had the Stablecoin TerraUSD which linked its value to the Luna coin. Rather than maintaining reserves in USD, gold, or a stable store of value which effective Stablecoins like Tether do, Terra believed they could maintain a Stablecoin based on their algorithm and a reserve of Bitcoin even

3.4 Can save > USD 200

For an Argentine Saver who has the capacity to save in excess of the value of USD 200, their savings strategy should be the same as outlined in the previous section for the first USD 200. Where the logic differs is in the excess amount that they are aiming to save because of the current exchange controls imposed by the BCRA outlined in Section 1.5.

The only desirable option for saving dollars in excess of USD 200 is (a), storing in cash outside of the financial sector. This is because of the dollar purchasing restrictions implemented in BCRA (2022). The saver would not deposit any excess dollars purchased informally in the bank due to the lack of trust and usage limitations re-established in the previous section. The resident would actually not be able to save in excess of USD 200 monthly with Stablecoin.

When saving in excess of USD 200, it is obvious under current exchange controls that you cannot purchase more than USD 200 per month through formal channels like the bank. However, what may be less obvious is the way in which this restriction extends to Stablecoins. The inflow and outflow of currency through cryptocurrency platforms in regards to the purpose of forming external assets is legally subject to the regulations set forth in BCRA (2022). This restriction started in 2019 through an earlier "Exterior y Cambios" communication, BCRA (2019). While any gains or losses reflected solely in cryptocurrency value are not currently regulated by the BCRA, any transaction including fiat currency is subject to the foreign exchange restrictions.

The purchase of cryptocurrency assets like Stablecoins with pesos is technically considered a foreign exchange transaction for the formation of external assets by the BCRA so the inflow of currency into these platforms is subject to the current monthly purchasing limitation up to the value of USD 200.[27] The regulations regarding the outflow of fiat currency

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though TerraUSD was pegged to the dollar. Ultimately, Terra, Luna and TerraUSD failed due to the lack of backup in dollars as this caused TerraUSD to lose its peg to the dollar which is what qualified it as a Stablecoin. This is considered the biggest crypto crash to date as it is estimated that this collapse wiped out USD 60 billion from the digital currency space as described in Q.ai (2022). This type of crash, or bankruptcy, in the cryptomarket is not an isolated incident. On November 11 during the month-long period of writing this paper, another crypto giant FTX crashed, causing US 10 billion of user funds to be trapped on the exchange according to McGimpsey (2022). While these incidents are not reflective of every Stablecoin, they demonstrate the volatility, instability, and danger of storing value in the crypto market.

[27] However, once a cryptocurrency asset has been acquired, the usage of, gains or losses of the coin are currently unregulated by the BCRA as their value is not federally recognized. If the resident was able to undergo all transactions using only cryptocurrency, they would be able to do so without governmental limitations.

from selling an asset such as a Stablecoin are more nuanced as they depend on the currency in which the trade is settled. Figure 7 is a decision tree that shows the options following purchasing up to the USD 200 limit directly in Stablecoin.

Figure 7. Decision Tree Diagram for the (2) Branch - How to Store a Savings Purchased Directly on a Stablecoin Platform
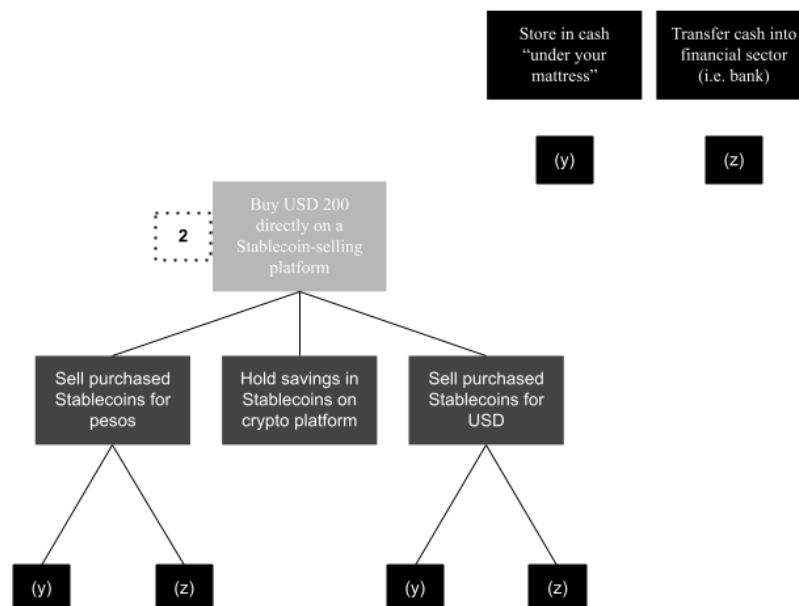
The option of selling purchased Stablecoins for pesos is illogical as this would signify that the saver purchased Stablecoins in pesos only to sell them and receive theoretically the exact same amount in pesos. This would actually be an even poorer decision because regulation 3.8.4 in BCRA (2022) states that if a resident transfers money into a cryptocurrency platform for the purpose of purchasing a coin that is classified as a security,[28] they must not enter into any other securities transactions with settlement in foreign currency from the moment access is requested through the subsequent 90 day calendar period.

Therefore the only two positive payout options are to leave your purchase in Stablecoin or to transfer it out of the cryptocurrency platform for USD cash. As described in Section 3.3 in the discussion about Figure 6 which lists example payoffs, a resident is worse-off investing

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[28] Note that which cryptocurrencies are considered securities as well as the regulatory environment for cryptocurrency is evolving. The Argentine Securities Commision (CNV) considers certain cryptocurrencies as securities depending on their characteristics and marketing.

directly in Stablecoin than purchasing USD 200 through official channels. So this option is deemed not ideal. For the last option, if the saver decides to first purchase USD 200 directly in Stablecoin with the intent of immediately converting that into USD cash, not only would that render the payoff nearly identical to purchasing directly from the informal market, but it would also further limit the saver due to regulations. In regards to BCRA (2022), it appears that the first transaction of purchasing the value of USD 200 would count toward the monthly USD 200 limit as well as the transaction for selling the Stablecoins for USD 200 in cash. So, this would effectively cut the saver's potential monthly saving capacity in half as their ability to obtain the value of USD 200 per month would be extended to a two month period if they decided to do so in Stablecoin, settling in USD cash. Furthermore, their saving returns would be approximately a quarter of what they could receive by simply purchasing USD 200 cash from the bank as the cryptocurrency sphere uses the informal market value exchange rate of the peso. If a saver even got this far down the decision tree and was deciding between (y) and (z) as depicted in Figure 7, they would be better off saving in cash, (y), than putting this money into the financial sector, (z), for the same reasons described in Section 3.3.

As residents are limited in the formation of external assets (whether by exchanging pesos for dollars at the bank or by forming digital currency assets like Stablecoin on an international cryptocurrency exchange) up to the value of USD 200, this implies that the only reasonable option for saving in excess of this limitation is by purchasing dollars in cash on the black market exchange. If the saver desires or has the need to save USD in excess of the limitation, doing so informally is better than not saving at all as they still get a positive payoff in addition to the relative stability of the US currency to the peso.

Conclusion

Argentina's economic environment makes it very difficult to avoid devaluation of personal savings. This is due to the high inflation facing the peso and furthered by foreign exchange controls.

I start my discussion by providing context into the extreme and understandable societal distrust of the Argentine financial sector that can be significantly attributed to the failings of The Convertibility Plan of the 1990s and the ensuing economic crisis in the early 2000s marked by El

Corralito and the default on foreign debt. This lack of trust contributes to and explains the "colchonismo" savings behavior of Argentinians. The devaluation of the peso after the end of the Convertibility Plan also explains why residents with the necessary financial means turned to real estate as a stable form of investing or saving in light of inaccessibility to dollars as described by D'Avella (2012).

In light of the presence and importance of USD in the Argentine economy (with Argentinians holding approximately 10% of the printed USD cash according to La Capital (2021)), I hypothesized that the decentralized and generally unregulated nature of cryptocurrencies could characterize Stablecoins as an alternative savings strategy comparable to saving in USD cash, but more accessible during periods of exchange restriction.

However, as demonstrated in Section 3 through the use of decision trees, no matter the manner in which an Argentine resident attempts to save with Stablecoins, the combination of regulations—as seen in BCRA (2022)—and the lower value exchange rate during times of exchange restrictions—as described in Section 2—makes this savings strategy as ineffective and worse than the alternatives. Even if Stablecoins were completely untouched by Argentine regulations, my hypothesis that Stablecoins could provide an alternative saving strategy comparable to saving in USD cash due to the one-to-one peg is proven wrong due to the higher payoff of exchanging up to the exchange limit through official channels and then taking advantage of the black market dollar exchange for any excess saving capacity.

While Stablecoins do not present an effective alternative savings strategy for Argentinians, my hope is that future research will continue to explore ways that residents in high inflation and highly regulated economic environments can prevent the devaluation of their savings in order to achieve greater financial freedom. Perhaps this economic liberty will come from identifying savings strategies outside of the formal financial sector. However, I suspect that the most sustainable and empowering savings strategies will have to be rooted in existing or future financial systems and policies.

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Appendix

Figure A1. Daily Exchange Rate Prices USD-ARS from 1/01/2002 to 1/01/2023: Dólar Oficial, Dólar Blue, Dólar MEP and Dólar CCL Isolated
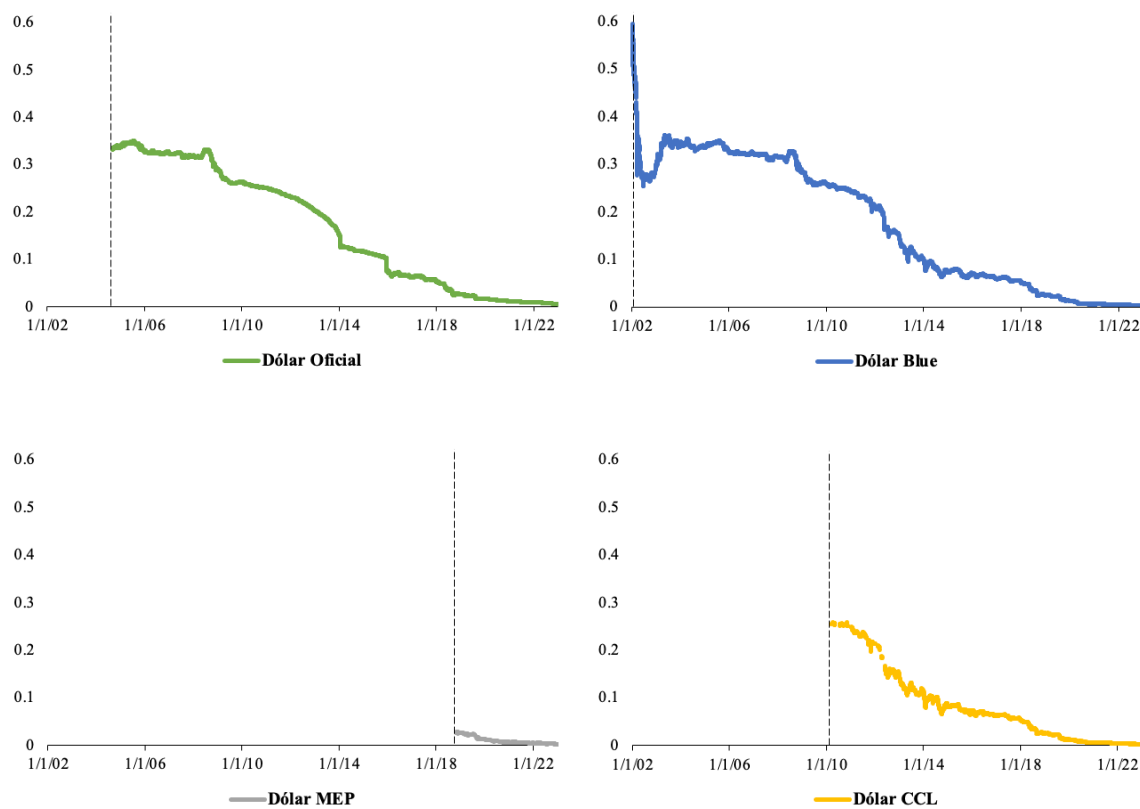
Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

Figure A2. Correlations of Exchange Rates from 1/1/02-1/1/23
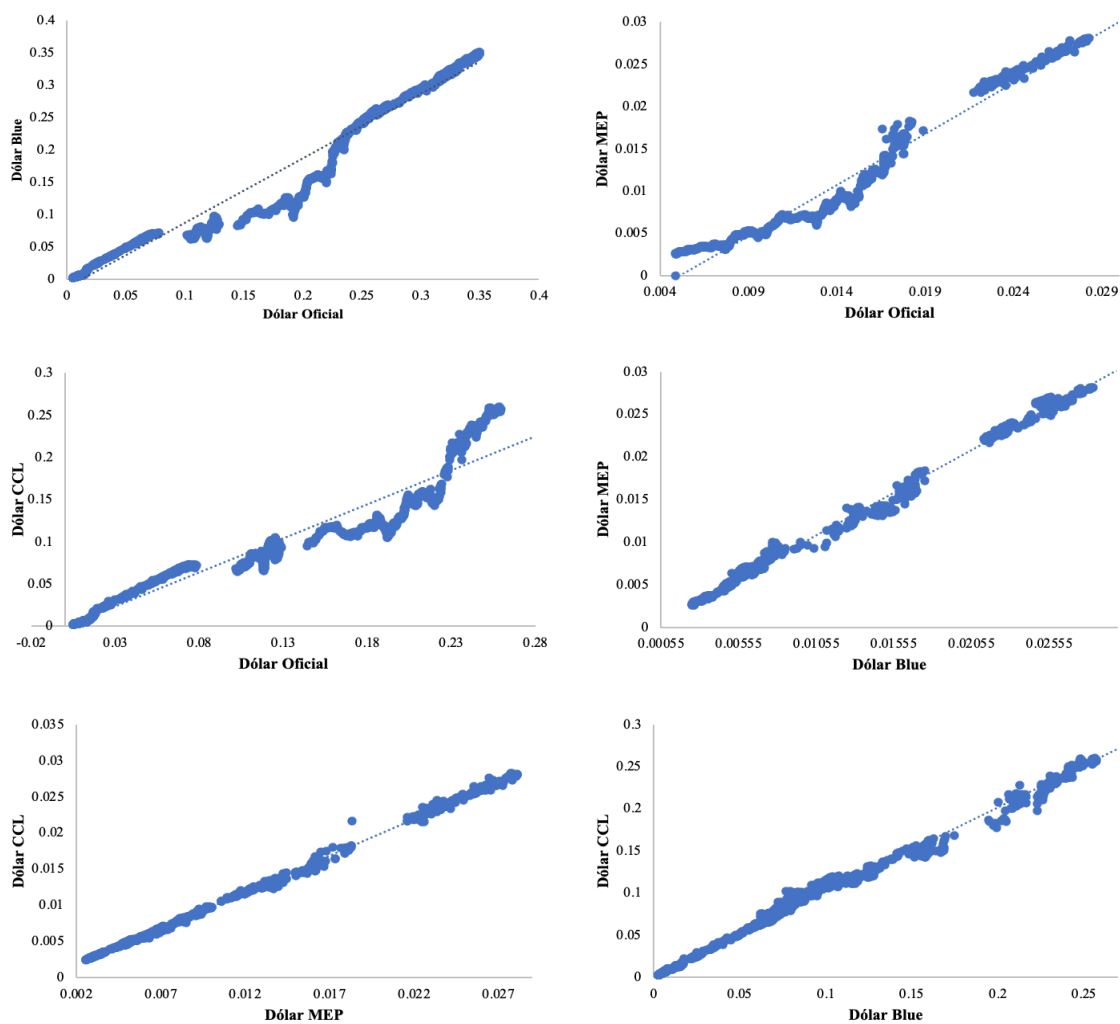
Sources: Investing.com (2023), Dólar Oficial; ámbito (2023), Dólar Blue; Rava Bursátil (2023), Dólar MEP; Rava Bursátil (2023), Dólar CCL

Figure A3. Correlations of Exchange Rates in Periods Without Exchange Controls: 1/1/02 to 10/30/11 and 12/17/15 to 8/31/19
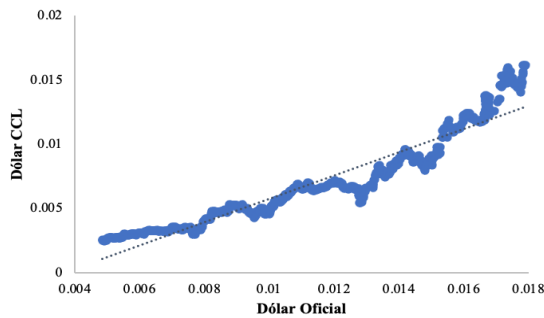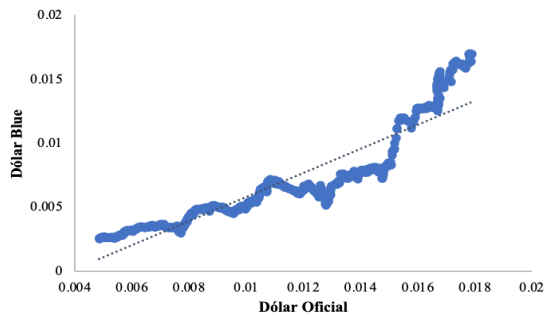
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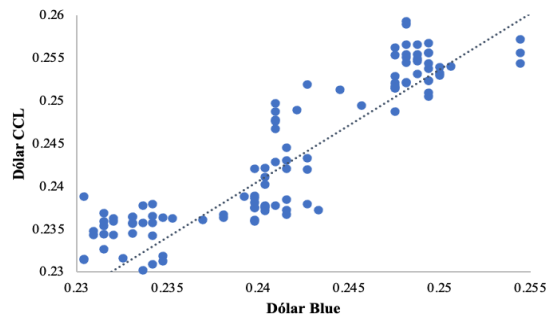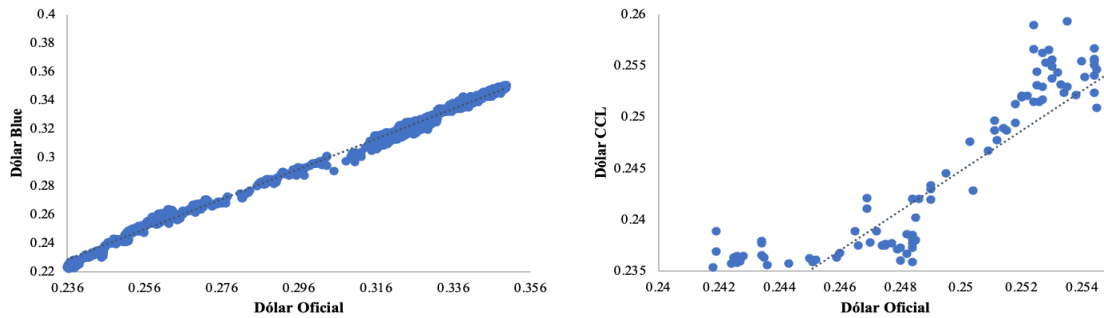
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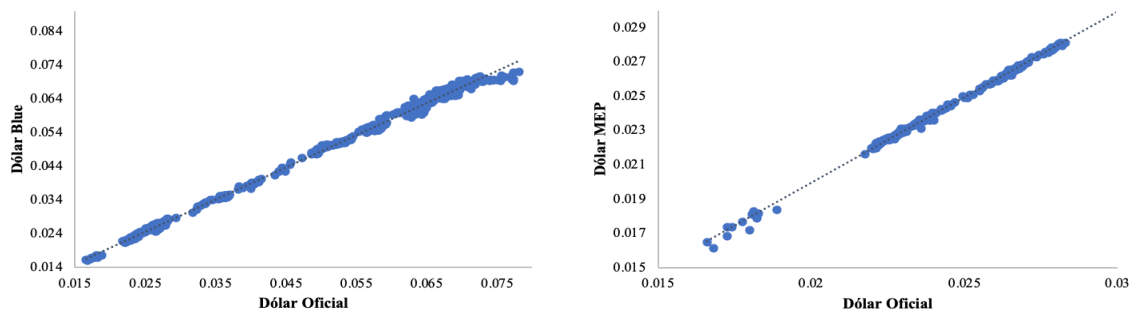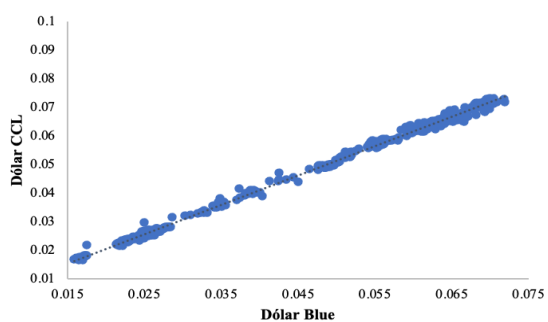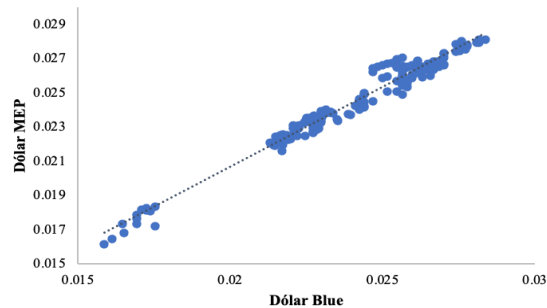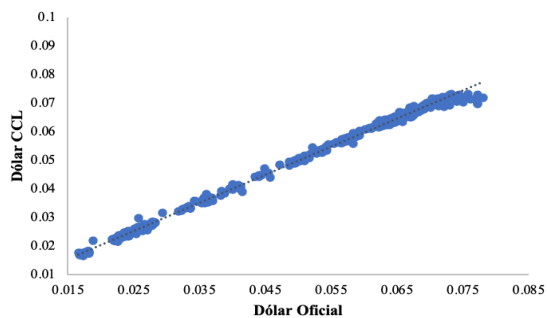
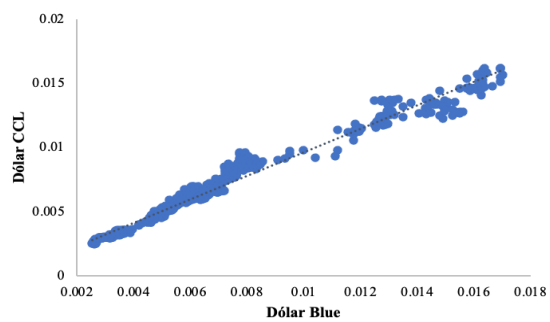*Note: The starting date range for Dólar CCL is 2/21/10 and the starting date range for Dólar MEP is 10/29/18 because there is no data available prior to those dates.*

Figure A4. Correlations of Exchange Rates in Periods With Exchange Controls: 10/31/11 to 12/16/15 and 9/1/19 to 3/24/23
10/31/11-12/16/15
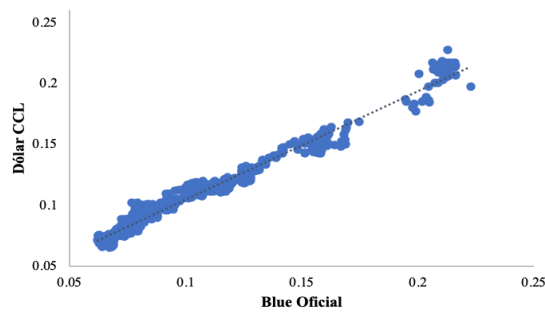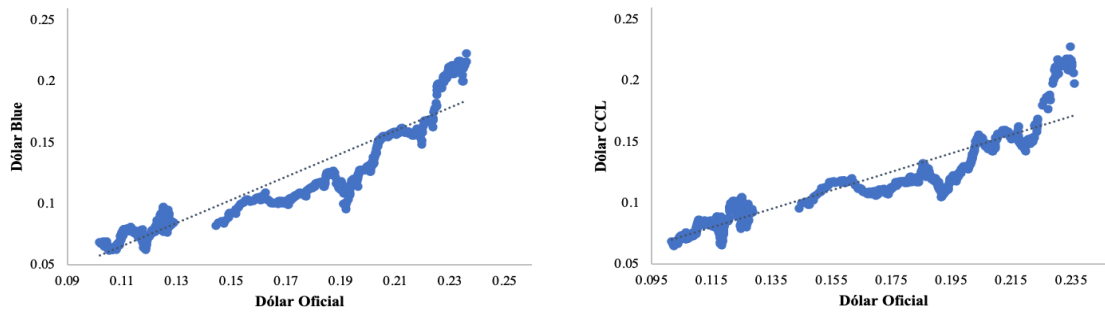
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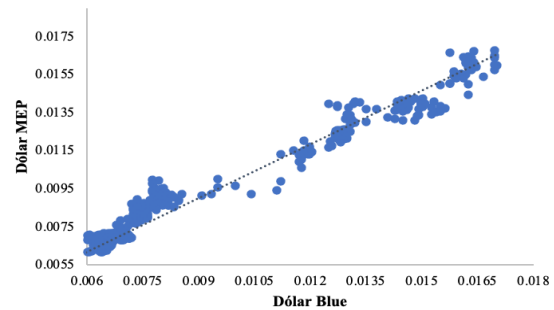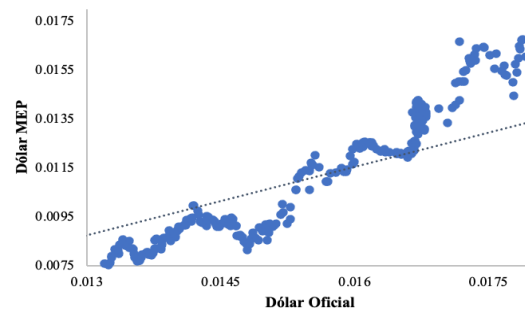
Note: The starting date range for Dólar CCL Isolated is 2/21/10 and the starting date range for Dólar MEP is 10/29/18 because there is no data available prior to those dates.