Why Did the Inflation Targeting Regime with a Floating Exchange Rate (IT) Announced in September 2016 by Argentina's Central Bank (BCRA) Fail to Definitively Stabilize Prices?

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I. Abstract

This paper assesses the underpinning causes behind the fall of Argentina's recent IT regime. A literature review of inflation targets along with analyses of market data delineate that weak monetary institutions, aggressive relative price adjustments and fiscal dominance played a substantial role in undermining the BCRA's pursuit of price stability. In the monetary domain, a high initial inflationary context coupled with the lack of a de jure strengthening of central bank independence compromised the program. Likewise, aggressive corrections of regulated prices and the adjustments of an overly appreciated domestic currency reverberated in Argentina's inflation. Finally, the Treasury's procrastination in closing the budget deficit resulted in a high sterilization cost for the BCRA as well as in the modification of preestablished targets, weakening the regime's credibility.

II. Introduction

While inflation was once a global issue, today "most economies no longer struggle with runaway prices…instead they find inflation is too low, as judged by their targets" (Curr 2019). Argentina, however, is among the few countries that continue to suffer from chronic price instability. Attempted stabilization programs in Latin America's third largest economy have been as varied as they have been ineffective, and no definite solution appears to be under way.

Towards the end of 2015 a wave of optimism regarding Argentina's economic prospects overran the international community, as Mauricio Macri -a moderate market-friendly candidate- took office. The liberalization of foreign exchange markets and the swift settlement of a fourteen yearlong battle against debt holdouts were initial milestones conquered by the new administration that enthused markets.

In September 2016, Argentina's Central Bank (henceforth BCRA) formally announced that it would implement an inflation targeting regime with a floating exchange rate (henceforth IT). The adoption of this monetary anchor was a source of hope for a definite eradication of price instability in the country. Several emerging markets -among which neighboring Chile, Uruguay, Brazil, Colombia and Peru stand out- had reaped positive experiences from this scheme. However, despite the initial disinflation recorded early under the IT program, the policy effort eventually collapsed in 2018 (Barraza and Sturzenegger 2020).

This paper provides an assessment of the leading causes behind the fall of Argentina's IT program. By means of a review of the economic literature on this topic and available market data, the main factors that hindered the BCRA's IT regime will be evaluated. **The paper pinpoints three variables that played a significant role in this process: deteriorated monetary institutions, sharp relative price adjustments and fiscal dominance.**

The paper proceeds as follows. Section III will provide a brief theoretical framework, which will serve as the cornerstone for Section IV. Specifically, Section III will outline the preconditions for an IT regime to thrive in achieving price stability, the advantages and disadvantages of this monetary regime, and the particular obstacles that emerging markets face when implementing inflation targets. These concepts will be instrumental in order to identify the specific prerequisites that Argentina failed to meet when it adopted a full-fledged IT regime.

Section IV will review conflicting standpoints as well as it will analyze relevant data on the three leading variables that subverted the BCRA's program, in order to provide a conclusive explanation for Argentina's failure to secure price stability via inflation targets. Finally, Section V will synthesize the main points covered throughout the paper and the key lessons that can be drawn from Argentina's experience.

III. Inflation Targeting

Inflation targeting was first adopted as a monetary regime by New Zealand in 1990 and has grown to become the world's most popular monetary anchor (International Monetary Fund 2019). Authorities across developed and emerging markets employ inflation rates as their chief intermediate targets to meet policy goals associated with price stability (International Monetary Fund 2019).

The Fundamentals of Inflation Targeting

As illustrated by Mishkin (2000), an inflation targeting regime encompasses four elements.

1. Public announcement of medium-term numerical targets

Policymakers must publicly announce numerical targets for inflation. More often than not, targets are presented as ranges, while the time horizons covered vary from case to case (Bernanke and Mishkin 1997).

Determining the composition of the price series to be used for inflation monitoring is a central aspect of this monetary scheme. Though there are cases in which core inflation is employed as the underlying metric, most IT economies have introduced some variant of the consumer price index (Bernanke and Mishkin 1997).

Regardless of the chosen metric, it is the central bank's duty to unreservedly explain the details of the price series that will serve as a reference to assess the performance of monetary authorities. In a proper IT regime, the public must perceive this indicator as accurate, timely and comprehensible (Bernanke and Mishkin 1997).

Moreover, the announcement of the targets can be carried out by "by the government, the central bank, or some combination of the two", in a manner that does not call into question the autonomy of monetary authorities. (Bernanke and Mishkin 1997).

2. Institutional commitment to price stability as the primary goal of monetary policy

Economies that adopt an IT regime must explicitly and recurrently stress that the overriding objective of monetary policy is to ensure price stability. Low and predictable inflation should be the central bank's primary goal, to which all other ambitions are subordinated (Mishkin 2004).

Central bank independence via legislative support is fundamental in an IT regime (Mishkin 2004). The absence of fiscal dominance, thus, is a mandatory precondition for the success of this scheme (Di Tella 2019).

3. An information inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments

Furthermore, in an IT regime the monetary policy reaction function should incorporate an array of different inputs. Variables such as but not limited to monetary aggregates, exchange rate fluctuations, fiscal policy and exogenous shocks should be taken into account by monetary authorities.

Bernanke and Mishkin (1997) argue that inflation targets are a middle ground in the well-known dichotomy of rules versus discretion. They classify inflation targeting as a "framework", since the it provides monetary authorities with a clear objective and an array of instruments through which to pursue their goals.

4. Increased transparency of the monetary policy strategy through communication with the public and the markets about the plans, objectives, and decisions of the monetary authorities

Transparency is vital for an IT regime to succeed. Monetary authorities should constantly communicate developments, decisions and objectives in order to foster confidence and accountability.

In most economies that employ inflation targets as a monetary anchor, the "central bank publishes regular, detailed assessments of the inflation situation, including current forecasts of inflation and discussions of the policy response that is needed to keep inflation on track" (Bernanke and Mishkin 1997).

On the same note, by explicitly conveying its policy intentions, monetary authorities facilitate private-sector planning, foster public debate on the objectives of economic policy and increase their accountability (Bernanke and Mishkin 1997). Put differently, the increase in transparency and accountability of monetary authorities is a necessary condition in any IT regime.

Strengths of Inflation Targeting

Like any other monetary regime, IT has strengths and limitations. As outlined by Mishkin (2000), an economy that targets inflation will count with three distinctive benefits.

1. A stable relationship between money and inflation is not critical (unlike in monetary targeting)

Unlike monetary targeting, IT does not depend on a stable relationship between aggregates and inflation. As Mishkin (2000) puts it:

> In contrast to monetary targeting, another possible monetary policy strategy, IT has the advantage that a stable relationship between money and inflation is not critical to its

success: the strategy does not depend on such a relationship, but instead uses all available information to determine the best settings for the instruments of monetary policy.

Mishkin and Savastano (2007) outline that "monetary targeting as a strategy for emerging market countries is not viable because of the likely instability of the relationship between monetary aggregates and inflation". IT, on the other hand, gives monetary authorities the discretion to set the monetary instruments in an optimal manner, given all available relevant information.

2. Easily understood by the public

Inflation targets are relatively comprehensible metrics for lay economic agents. The simplicity of the scheme facilitates coordination of expectations among price setters and takers. Unlike in a monetary aggregate program, agents do not need to fully grasp the complex and changing relationship between aggregates and prices to form expectations. A horizontal and straight-forward monetary regime increases transparency, thus reducing macroeconomic uncertainty and, in turn, increasing central bank accountability.

3.Increased accountability for monetary authorities

A numerical inflation target increases the accountability of monetary authorities, as economic agents can easily understand policy objectives. This brings two important benefits vis-à-vis other monetary regimes. In the first place, increased public scrutiny dissuades monetary authorities from falling in time-inconsistency-traps (Mishkin 2004). Moreover, in IT countries, a greater understanding of monetary policy has placed the focus of public debate on the significance of long-term objectives such as central bank independence and price stability (Bernanke, Laubach, Mishkin and Posen, 1999).

Limitations of Inflation Targeting

IT has clear advantages, yet it is far from being a panacea for monetary challenges (Mishkin 2004). There are extensive analyses on the disadvantages of seeking to anchor expectations via inflation targets. Below, the most significant points raised by the detractors of IT will be discussed.

1. Amplified supply shocks

Some detractors of IT characterize it as an excessively rigid regime. By establishing an inflexible objective, monetary authorities commit themselves to a certain path, regardless of changing macroeconomic circumstances. Consequently, the effect of unexpected shocks on the economy's output, if the regime is taken literally, will be amplified (Mishkin and Posen 1997 and Sturzenegger 2019).

For instance, in the event of an unforeseen negative supply shock that inflicts inflationary pressure on the economy, such as an increase in regulated prices, the central bank will be forced to tighten monetary policy in order to meet its preestablished target. This dynamic will, in all likelihood, amplify the shock's damaging effect on the economy's output. Such a constraint can become dangerous in volatile economies, as it could foster high output volatility. This phenomenon has led several economists to argue in favor of income policy implementation under contexts of macroeconomic instability (Di Tella 2019, Mishkin and Posen 1997).

To be fair, however, rigid inflation targeting regimes have historically succeeded in tackling price volatility, which is also a significant cause of production variability (Mishkin and Posen 1997).

To better handle unforeseen supply shocks, some economies have adopted regimes characterized as "flexible inflation targeting" (Svensson 1997 and Bernanke, Laubach, Mishkin and Posen 1999). Though adjustable targets provide monetary authorities with the necessary discretion to properly handle shocks, they carry significant costs. Changes in targets and, particularly, in the use of monetary instruments will likely unanchor inflation expectations, nurture macroeconomic uncertainty and corrode central bank credibility (Calvo 2001).

2. Monetary lags and limited accountability

The relationship between monetary impulses and inflation is not always linear. Extensive and variable lags (Friedman 1961) in monetary policy and unpredictable changes in the demand for money are significant obstacles faced by central banks that operate within an IT scheme (Mishkin 2000).

This phenomenon has two significant implications for monetary authorities (Bernanke and Mishkin 1997). Firstly, the extent to which monetary policy can be rendered effective in the pursuit of a particular target is narrowed. Under changing lags and behavior patterns it becomes challenging for central banks to accurately forecast the inflationary implications of moving monetary levers (Mishkin 2000). Such an impediment, which is particularly significant in volatile economies, can corral authorities towards target misses, eroding their credibility and thus the effectiveness of the regime (Calvo 2001).

The second implication of monetary lags is the increased difficulty in properly assessing the central bank's performance, which decreases its accountability. As the implementation and the effects of monetary policy grow distant, it becomes harder for lay people to attribute causality between these variables. Consequently, the incentives for central banks to avoid intertemporal inconsistencies are reduced.

3. Vulnerable to fiscal dominance

IT is not sufficient to eradicate fiscal dominance, a key precondition for the implementation of a fruitful regime (Mishkin 2000). In order to succeed, an IT scheme must be built on strong institutional foundations. This prerequisite is as imperative as it is challenging, particularly for emerging markets. Mishkin (2000) eloquently illustrates this disadvantage:

> Governments can still pursue irresponsible fiscal policy with an inflation targeting regime in place. In the long run, large fiscal deficits will cause an inflation targeting regime to break down: the fiscal deficits will eventually have to be monetized or the public debt eroded by a large devaluation, and high inflation will follow. Absence of outright fiscal dominance is therefore a key prerequisite for inflation targeting, and the setting up of institutions that help keep fiscal policy in check are crucial to the success of the strategy.

4. The perils of exchange rate fluctuations

Exchange rate flexibility, a key aspect of IT, has raised concerns as it might trigger financial instability, particularly in emerging markets (Mishkin 2000). Several factors, such as liability dollarization or high pass-through coefficients often dissuade monetary authorities from "tolerating much variation in their exchange rates" (Calvo and Reinhart 2002).

Hence, exchange rate flexibility, though imperative for IT, might nurture financial instability. This is particularly true in emerging markets, where passthrough from exchange rates to prices and liability dollarization tends to be higher (Calvo and Reinhardt 2001). Such circumstances have fueled a "fear of floating" and procyclical policies in many economies (Calvo and Reinhart 2002). Sturzenegger's and Levy Yeyati's (2005) empirical study, for example, revealed "that among the countries that claim to float, a large number intervene recurrently to stabilize their exchange rates, providing support for Calvo and Reinhart's 'fear of floating' hypothesis".

Needless to say, exchange rate flexibility has several advantages. Edwards and Levy-Yeyati (2003) denote that floating exchange rates serve as buffers to alleviate terms of trade shocks and suggest that economies that float grow faster than those who sustain fixed exchange rates. Flexible exchange rates increase fiscal accountability and thus foster discipline, Tornell and Velasco (2000) argue. As exchange rate flexibility allows for "unsound fiscal policies to manifest themselves immediately", the incentives for intertemporal inconsistencies in the fiscal front will be diminished under this regime (Tornell and Velasco 2000).

Stabilization programs differ on their stance regarding the optimal degree of official intervention in the foreign exchange market. In such a complex and controversial arena, it is the central bank's duty to weigh the strengths and limitations of different monetary blueprints, taking into account the restrictions and particularities of the economy in which it operates.

Inflation Targeting in Emerging Markets

The idiosyncratic characteristics of emerging markets pose additional challenges for the implementation of successful IT regimes. According to Calvo and Mishkin (2003), emerging markets have five distinctive institutional characteristics that cannot be sidelined by monetary authorities:

1. Weak fiscal institutions
2. Weak financial institutions
3. Low credibility of monetary institutions
4. Currency substitution and liability dollarization
5. Vulnerability to sudden stops of capital inflows

Though IT has been an effective vehicle for several emerging markets to tackle price instability, these five features escalate the magnitude of the challenge faced by monetary authorities.

Weak fiscal institutions:

Emerging markets tend to lack fiscal discipline, which seriously conditions the prospects of an IT regime. Sustained fiscal imbalances bring about two inescapable consequences: inflationary pressure and financial instability.

International capital markets eventually close their doors to economies that show continued fiscal indiscipline, triggering, in all likelihood, a monetization of the country's budget deficit. Hence, fiscal irresponsibility puts pressure on monetary authorities to monetize debt, increasing money balances and therefore accelerating inflation (Woodford 1995).

Likewise, a pressing need for revenue often results in asset confiscation within emerging markets, fostering financial instability (Mishkin and Savastano 2001). In Argentina, for example, the Kirchner administration expropriated Aerolíneas Argentinas in 2008 and YPF in 2012, for pennies on the dollar. A sharp contraction of the financial sector, a decline in private sector investments and unfavorable court rulings followed. As outlined by Calvo (2003), enhancing fiscal balances is a fundamental step towards avoiding sudden stop crises.

Consequently, Mishkin (2000) delineates, in emerging markets:

> Fiscal reforms which increase transparency of the government budget and budget rules which help keep deficits from spinning out of control are needed to prevent the fiscal imbalances that can lead to a collapse of an IT regime.

Therefore, fiscal reforms should, ideally, precede the enactment of an IT program. Heymann and Leijonhufvud (1995) note that sound fiscal reforms should focus on the design of:

an efficient tax system and effective methods of collection coupled with a systematic and comprehensive budget process to allocate expenditures that explicitly acknowledges an intertemporal budget constraint. This process is far more challenging in emerging markets than it is in developed economies.

Weak financial institutions

A sound financial system is another key IT precondition that emerging markets struggle with (Mishkin 2004). In a program in which interest rates are subordinated to the central bank's targets, fragile financial systems will be compromised in the event of volatility (Mishkin 2004). This fragility can trigger two consequences: a reverse in capital flows and the deterioration of an important monetary transmission mechanism.

As soon as markets perceive the weakening of an economy's financial system, capital flows reverse, resulting in a sharp depreciation of the local currency (Mishkin 2004). Consequently, inflationary pressures will rise, hindering the central bank's ability to meet preestablished targets.

Similarly, a fragile and small financial system could cripple an important monetary transmission mechanism. In an economy where credit is relatively low, swings in reference rates will have a relatively mild effect on the real economy (Mishkin 1996). This could hinder the central bank's ability to meet targets via reference rate adjustments.

Low credibility of monetary institutions

Mishkin (2004) delimits that there are two key institutional factors for an IT regime to be effective: clearly establishing price stability as the overriding goal for monetary authorities and central bank independence. Again, these are fundamentals with which emerging markets have historically struggled with.

For targets to effectively anchor expectations, the public must trust the central bank and its independence from the executive branch. In this domain, de jure independence is not sufficient. Legislation that ensures the central bank's autarky must be coupled with a strong perception of its sovereignty by the public (Mishkin 2000). Otherwise, markets will disregard inflation targets and coordinate expectations based on other metrics, such as fiscal policy objectives.

Currency substitution and liability dollarization:

Currency substitution and liability dollarization are common and dangerous phenomena in emerging markets. Chronic inflation erodes a currency's capacity to store value and serve as feasible a unit of account, which paves the wave for its substitution. Liability dollarization and

an excessive prominence of the exchange rate are consequences of currency substitutions that undermine inflation targets.

Financial institutions that have dollarized deposits will tend to offer dollarized loans in order to avoid currency mismatches (Mishkin 2004). Under these circumstances, exchange rate fluctuations can heavily jeopardize debtors, whose incomes are in local currency but must service dollarized obligations. By the same token, if the government's public debt is placed in foreign capital markets, which is common among emerging markets, exchange rate fluctuations will have an impact on the sustainability of the country's debt (Calvo 2001). This could align policymakers' incentives in a dangerous manner, nurturing excessive exchange rate appreciations (Calvo 2001).

Also, in economy's in which foreign currencies play a significant role, the exchange rate will hoard excessive attention. This could hinder the central bank's capacity to anchor expectations solely via inflation targets.

Vulnerability to sudden stops of capital inflows

Calvo and Reinhart (2000) delimit how emerging markets are often exposed to sudden stops: significant, unanticipated and negative changes in capital flows. These episodes are usually followed by a sharp depreciation of the local currency, which accelerates inflation and dislocates expectations.

Stylized facts of successful implementations

Although tackling price instability by means of inflation targets is a challenging endeavor for emerging markets, there have been plenty of successful cases. Two distinctive features have characterized fruitful implementations: strong institutional development and a progressive adoption of the program (Mishkin 2004).

Mishkin (2004) outlines how Chile strengthened institutions and sought a gradual implementation of its IT regime. For one part, it introduced new legislation that granted the Central Bank's autonomy a year before enacting an official target (Mishkin 2004). Moreover, the treasury led a sound fiscal policy throughout the early stages of the regime, securing fiscal surpluses for seven consecutive years (Mishkin 2004).

Regarding the velocity with which targets were adopted, it was not until 1999 that Chile enacted a full-fledged IT regime, after eight years of a transition program through which a robust disinflation process was carried out. Across that period, the country's central bank coupled inflation targets with recurrent interventions in the foreign exchange market to avoid significant depreciations (Di Tella 2019). Therefore, both institutional strengthening and a gradual approach to the regime stand out from Chile's IT experience.

Like Chile, many emerging economies have delayed the adoption of a strict IT regime. This gradual implementation, as it will be later discussed, comes in many forms. transition regimes in which inflation targets are complemented with income or exchange rate policies have been frequent in emerging markets.
Several Latin American countries, while they publish periodic inflation targets, continue to intervene in the foreign exchange market in order to avoid excessive volatility. On this note, Chamon, et al. (2019) claim:

> inflation-targeting central banks in emerging markets have continued to closely monitor the exchange rate, not only because of its implications for inflation, but also because of financial stability risks that sharp exchange rate movements may entail.

According to Chamon, et al. (2019), coupling inflation targeting with exchange rate intervention presents monetary authorities with four important advantages: amassing reserves in a proactive manner, mitigating financial instability risks, alleviating pass-through inflationary pressure and addressing persistent shocks (*i.e.* dutch disease). Needless to say, central bank intervention in the foreign exchange market carries its costs and it is the central bank's duty to properly weight them before acting. Hence, exchange rate intervention has been a common vehicle through which emerging markets have transitioned to a pure inflation targeting regime.

Another characteristic of a gradual implementation of IT is an ex-ante disinflation process. As Chamon, et al. (2019) puts it:

> Disinflation in several Latin American countries was carried out through "crawling peg" schemes. Once inflation stabilized at acceptable levels and inflation expectations were anchored, these countries moved to flexible exchange rates and eventually to a full-fledged inflation target, using the interest rate as the policy instrument.

Therefore, emerging markets which have adopted inflation as their chief intermediate target have commonly done it in a particular manner. A process of institutional strengthening prior to adopting IT coupled with a gradual implementation of the regime have characterized the aforementioned processes. Exchange rate intervention and a preceding disinflation process have been vehicles through which emerging economies have gradually transitioned to a pure inflation targeting regime.

IV. Argentina's Inflation Targeting Experience

In September 2016, the BCRA formally launched an IT regime that sought to "strengthen monetary transparency and consolidate the economy's disinflation" (BCRA 2016). Table 1 illustrates that Argentina's monetary authorities had communicated their intent to gravitate towards inflation targets as early as in January 2016. While the program formally contemplated the period 2017-2019, Table 1 and Table 2 display the BCRA's informal inflation objective for 2016.

Table 1: Timeline of Argentina's IT Regime	
Dec-15	Liberalization of FX markets
Jan-16	A system of inflation targets with floating exchange rate announced as the "north of [Argentina's] monetary policy"
Jan-16	The BCRA confirms IT regime will be adopted at the start of 2017
May-16	IPOM- BCRA confirms an informal target for 2016's inflation (25%)
Sep-16	Formal targets announced for the 2017-2019 period
Jan-17	IT regime officially launched
Dec-17	Modification of initial targets (28D)
Jun-18	End of Argentina's IT regime

Source: BCRA

Under IT, the main policy instrument employed by monetary authorities is the interest rate, which acts upon the real economy through three different mechanisms: the credit channel, the exchange rate and inflation expectations (BCRA 2016). In Argentina, the BCRA established a Monetary Policy Council (COPOM) in order to define the institution's reference rate (BCRA 2016). Composed of the Central Bank's highest authorities, the COPOM met on a weekly basis in order to determine Argentina's 7-day repo rate (BCRA 2016).

Furthermore, the price series that it would use in order to measure inflation was clearly communicated by the BCRA. The interannual variation of the general price level of the broadest consumer price index published by INDEC was determined as the series through which the fulfillment of the targets would be corroborated (BCRA 2016). Finally, fluid communication channels were formally announced: periodic monetary policy reports (IPOM) and weekly summaries of the COPOM's decisions coupled with ad hoc press conferences and presentations.

In addition, with the enactment of the IT program came a validation of Argentina's recently liberalized exchange rate (Table 1). The BCRA, nonetheless, clearly manifested that it would intervene in the foreign exchange market under "certain circumstances, to manage the profile of its balance sheet and prevent unjustified fluctuations" (BCRA 2016).

While inflation targets did not provide a definitive solution for price instability, the program began with a high degree of credibility. As outlined by Sturzenegger (2019):

> After many years with inflation oscillating between 25 and 40%, the first measure of inflation expectations in June 2016, reported expected inflation for 2017 of 19.0% and for 24 months ahead of 15.7%. In October 2016, when the Central Bank survey asked for the first time a multiyear expectation of inflation, the expectation for 2017 was 19.7%, for 2018 was 14.8% and for 2019 below 10%.

Despite a promising start, Argentina's IT framework failed in achieving its paramount objective: granting sustained price stability. As outlined in Table 2, targets were never met and 2018's inflation rate reached 47.6%, quadrupling the initial objective.

Table 2: Initial Inflation Targets and Real Inflation Rates

Date	Initial Targets (Sep-16)	Real Inflation Rates
2016*	25%	40.3%
2017	12%-17%	24.8%
2018	8%-12%	47.6%
2019**	6.5%-3.5%	54.5%

(*) Informal target announced on May-16 (**) IT regime ended on mid-2018

Source: BCRA

This section analyzes the three main factors that undermined the BCRA's monetary program: weak monetary institutions, aggressive relative price adjustments and fiscal dominance. Different views will be contrasted, and available data examined in order to assess each of these variables and their implications on Argentina's IT regime.

1. Implications of Argentina's Weak Monetary Institutions:

As outlined in Section III, central bank credibility is a critical IT precondition as well as a scarce asset among emerging markets. Argentina's weak monetary institutions posed a significant challenge to the BCRA.

In this domain, the obstacle was twofold. First, an opaque track-record coupled with relatively high initial inflation levels limited the BCRA's ability to consolidate Argentina's disinflation process. The second hurdle was the lack of de jure central bank independence, as the BCRA's outdated charter remains far from the standards that an IT regime demands.

Relatively high inflation levels and the BCRA's credibility

Contrary to what the theory suggests and unlike the bulk of comparable case studies, Argentina implemented pure IT amid unusually high price instability. A rather short disinflation process prior to the regime's enactment averted the BCRA from garnering enough credibility and undermined the precision of established targets (Di Tella 2019).

Masson and Savastano (1997) argue that in emerging markets inflation targets will tend to be more effective if they are preceded by a strong disinflation process. If pure IT is implemented under a context of significant price instability, Mishkin (2004) outlines:

> inflation forecast errors are likely to be large, inflation targets will tend to be missed, and it will be difficult for the central bank to gain credibility from an IT strategy, and for the public to ascertain the reasons for the deviations.

On the same note, Di Tella (2019) delineates that "it is unusual to use 'pure' IT to bring down inflation. It is more standard to use [it] as a way of 'cementing in' the fall in inflation achieved through other means". A robust ex-ante disinflation process allows monetary authorities to garner credibility and increase their chances of meeting established targets. In turn, "greater credibility makes disinflation less costly [and] helps hold down inflation once it is low" Blinder (2000).

Regarding the underlying drivers of central bank credibility, Blinder (2000) numbers three critical variables, none of which manifested in Argentina's monetary history: central bank independence, a history of living up to made promises, and an unequivocal record of fighting inflation.

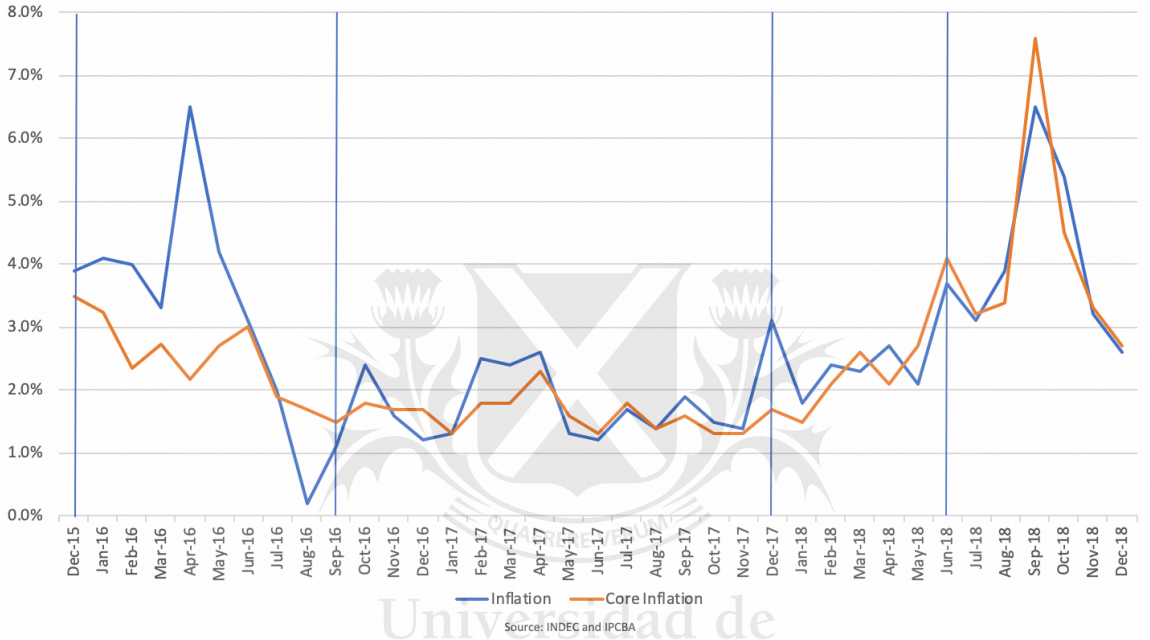
The BCRA had neither cemented a strong disinflation process nor had monetary authorities gathered sufficient credibility by the time the IT program was launched. Argentina's longstanding battle against price instability had been all but successful, as the country averaged an annual inflation rate of 105% in the period 1918-2015 (Camara Argentina de Comercio y Servicios 2018). Coupled with a history of sharp fiscal dominance, this constituted a heavy load inherited by the Sturzenegger administration. Hence, a record of broken promises and persistent high inflation compromised the BCRA's credibility by the end of 2015.

Despite a discouraging track-record, the BCRA did not carry out a robust disinflation process before launching a full-fledged IT regime. In 2016, while monetary authorities informally targeted a 25% inflation rate, the general price level rose by 40%. Given this context, the transition to a pure IT program in September 2016 appears to have been premature.

This is not to say that inflation had not begun to give in. Sturzenegger (2019) illustrates that, prior to the targets' implementation, Argentina had already started to quickly reduce inflation. Furthermore, Barraza and Sturzenegger (2020) use both a recursive CUSUM test and a Markov switching dynamic model to document a change in the data generating process of inflation

following the implementation of the IT regime. Figure 1 portrays a decline in monthly inflation and core inflation prior to the formal target adoption and a continued decrease ex-post. In particular, between August and December 2016 Argentina's annualized inflation rate averaged 17%. Likewise, inflation expectations (REM) for 2017 were of 19% on June 2016 (Sturzenegger 2019). It must be noted, nonetheless, that 2016's annual inflation rate constituted the greatest price upswing in ten years.

Figure 1: Monthly Inflation (December 2015 - December 2018)



Further proof of the disinflation process that preceded the formal enactment of the IT program, Sturzenegger (2019) exposes, is the fact that "in October 2016, Argentina placed USD 8.3bn in peso bonds at 5, 7 and 10 years at a nominal annual rates of 18.2%, 16% and 15.5%, which measures the confidence in the stabilization program".

In hindsight, however, Argentina's initial disinflation process was not long enough. Di Tella (2019) argues that the adoption of a pure IT scheme was rushed, for inflation was still at a relatively high level by the end of 2016. Di Tella (2019) also affirms that "Argentina's context was nothing like the context of other countries relying exclusively on IT and Sturzenegger's plan was anything but standard in terms of the initial rate of inflation". When asked about Argentina's experience, John B. Taylor -one of the pioneers in the field of inflation targets- explained: "the target system is adequate for a certain low range of inflation, but there have to be alternatives outside that range, such as the model of monetary aggregates" (S. Diamante 2018).

The reviewed literature is clear: enacting a pure IT regime under a high inflationary context entails credibility risks for monetary authorities. While Argentina had initiated a disinflation process, prices were far from being stabilized. Adopting an IT regime amid high inflation had

two implications: a forsaken opportunity to garner more credibility through a longer disinflation process and an increase in the risk of costly target misses, which eventually materialized.

Analyzing comparable case studies reinforces the notion that the BCRA advanced towards a full-fledged IT too fast. Table 3 follows the same criteria used by Sturzenegger (2019), showing all countries that had annual inflation rates above 20% at least once since 1990 and that implemented IT or eventually converged to IT. Two insights stand out. First, high inflation IT countries applied transition regimes for an average of over five years before adopting a pure IT framework. Argentina's monetary shift was 7.5x faster than the average transition. Second, the BCRA implemented a full-fledged IT program under a context of greater inflation than other comparable economies in which this regime succeeded. Specifically, the inflation rate of the year prior to the announcement of the regime was, in Argentina, 3.65 standard deviations away from the mean of the sample provided in Table 3. This hurried commitment limited the BCRA's ability to reap credibility from a longer disinflation process. The BCRA suffered from a relatively low credibility stock, which amplified the harmful effects of target misses and external shocks on expectations.

Table 3: IT and High Inflation

Country*	Annual Inflation Rate When Transition Regime Was Adopted	Years under Transition Regime	Year of Pure IT Regime Adoption	Annual Inflation Rate on the Year Prior to IT Adoption
Argentina	**40.3%**	**0.75**	**2016**	**40.0%**
Poland	46.19%	6	1998	14.98%
Romania	34.50%	4	2005	11.90%
Hungary	28.30%	5	2001	9.78%
Colombia	32.36%	9	1999	9.30%
Mexico	35.26%	5	2001	9.00%
Czech Republic	20.25%	4	1997	8.57%
Israel	18.96%	7	1998	8.10%
Turkey	47.20%	4	2006	7.70%
Slovakia	10.46%	5	2005	7.56%
Indonesia	45.42%	6	2005	6.06%
Iceland	15.50%	10	2001	5.15%
Brazil	147.98%	4	1999	3.30%
Chile	25.91%	9	1999	3.20%

(*) All of these countries, except for Slovakia and Argentina, continue to operate under an IT regime
Source: Sturzenegger (2019), Di Tella (2019), Jahan (2017) and Rapetti (2016)

Table 3's classification slightly differs from that presented by Sturzenegger (2019), who argues that Mexico, Turkey and Indonesia (highlighted in grey) enacted IT frameworks with a floating exchange rate in 1996, 2002 and 1999 respectively. However, the utilization of more than one

monetary anchor indicates that these were not pure IT programs, but rather transition regimes through which disinflation processes were consolidated (Di Tella 2019 and Jahan 2017).

Before adopting clear-cut inflation targets in 2001, Mexico operated under a temporary program for five years, which was instrumental to the country's disinflation process (Schmidt-Hebbel and Werner 2002). During the transition period, Mexico's Central Bank had a set of clear rules for official intervention in FX markets, as well as it published objectives for the evolution of the country's monetary base, domestic credit and international reserves (Ramos-Francia and Torres García 2005). As outlined by the Federal Reserve Bank of Dallas (2011):

> Mexico installed the necessary components for full-fledged inflation targeting by 2001. The Banco de México dropped the other two elements of its monetary policy strategy—net domestic credit and international reserves—leaving an inflation target as the single, explicit monetary policy goal.

On the same note, Ramos-Francia and Torres García (2005) describe that Mexico was under a monetary transition until "2001, when Banco de México announced that it was formally adopting an inflation targeting framework". Thus, Latin America's second largest economy consolidated a disinflation process via a multi-anchor regime that combined inflation targets with domestic credit, international reserves and monetary base objectives. Again, this case study contrasts with Argentina's, which moved towards a pure IT regime much faster and under a context of higher inflation.

Turkey's monetary regime throughout the 2002-2005 period combined inflation targets with income policies and official intervention in FX markets (Dervis and Serdengeçti 2001 and Di Tella 2019). "Monetary policy practice in this transition period [was] named the 'Implicit Inflation Targeting Regime'", which combined inflation objectives with monetary aggregate targets and the introduction of a new currency (Central Bank of the Republic of Turkey 2010).

As for Indonesia, the Asian country implemented a full-fledged IT program in 2005, after six years of a transition monetary framework (Jahan 2017 and Bank of Indonesia 2013). During that period, the Bank of Indonesia coupled inflation targets with monetary aggregate objectives and had the "single monetary policy objective of achieving and maintaining the stability of the rupiah" (Bank of Indonesia 2013). Again, Turkey's and Indonesia's cases starkly contrast with Argentina's transition. Instead of consolidating disinflation via an alternative regime, the BCRA swiftly moved to adopt a full-fledged IT program under a high inflationary context. As shown, this was unconventional relative to other high inflation IT countries.

Under a context of high inflation, forecast errors are likely to be large. Missing targets, particularly at the outset of a new monetary regime, is disadvantageous in terms of credibility for central banks (Mishkin 2004). This is the fundamental reason why a robust disinflation process has preceded the adoption of a pure IT regime in the bulk of Table 3's sample cases. Therefore, when compared to other IT experiences, Argentinean authorities followed a far

tighter schedule to implement a full-fledged IT framework, failing to reap the vital credibility benefits of a consolidated disinflation process.

Consequently, once targets were missed, this resulted in a great toll for the program. Particularly, missing the 2017 target was costly for Argentina's Central Bank. The stalling of the disinflation process in the second half of 2017 coupled with "the fact that the target for 2017 would be missed by a margin that widened towards the end of the year led to continued doubts about the success of the disinflation program" (Sturzenegger 2019). This was the anteroom of the definite dislodge of expectations that took place in mid-2018.

As outlined in Section II, the theory suggests that a consolidation of the observed disinflation trend in the second half of 2016, prior to an IT regime adoption, would have been more convenient for Argentina. A context of lower inflation would have decreased the chances of a target miss, and thus enhanced the prospects of the BCRA's IT program (Mishkin 2004). Likewise, a longer disinflation process would have endowed the BCRA with a greater credibility stock. Under these circumstances, the impact of a target miss on inflation expectations would have been less dramatic (Blinder 2000). Thus, a short disinflation process increased the odds of a target miss and averted the BCRA from harnessing sufficient credibility. This low credibility, in turn, amplified the effects of the 2017 target miss (and other shocks), undermining the BCRA's IT program.

De jure independence: the BCRA's Charter

As outlined in Section II, the institutional commitment of monetary authorities to price stability must be complemented with "legislative support for an independent central bank" in order for an IT regime to succeed (Mishkin 2000). This is a particularly challenging prerequisite for emerging markets, which "have often had a past history of monetary mismanagement" (Mishkin 2000). Categorical de jure independence is another IT precondition that Argentina failed to meet prior to the framework's implementation. The BCRA's outdated Charter severely hindered Argentina's stabilization program, for it openly restricted the Central Bank's independence.

The last reform of the BCRA's Charter took place in 2012, under Cristina Fernandez de Kirchner's administration. Claiming that the Charter is far from the independence standards that an IT regime demands would be an understatement. A lack of central bank de jure independence was a severe obstacle for Argentina's IT program, one which hindered a robust convergence of inflation expectations.

As an illustration, the Charter's Section 9 outlines that "the members of the Board may be removed from office by the National Executive for failure to comply with the provisions set forth in this Charter or for falling within any of the ineligibility criteria referred to in the preceding section". In other words, Argentina's President has the power to remove the BCRA's governor at any time, after receiving a non-binding recommendation from a committee of the National Congress. The fact that Argentina's Central Bank has had over sixty governors since it

was established in 1934 -with only one of them completing his term- appears to be, at least, partially explained by this clear subjugation to the executive branch (Pereira and Navarro 2018). On this note, Sturzenegger (2019) recognizes that one significant flaw of the IT program "that would turn critical later on was that it was lacking Central Bank independence, as the President can easily remove the Central Bank governor".

Moreover, the Charter's Section 20 stipulates that the BCRA "may make temporary advances to the National Government in an amount equivalent to up to twelve per cent (12%) of the monetary base". Put differently, the BCRA's legislation validates the monetization of fiscal imbalances. While loans to the treasury declined during the first phase of the IT regime, once international capital markets contracted, and Argentina's budget deficit was growing, it seems reasonable for inflation expectations to have abruptly dislocated.

Another aberration of the BCRA's charter lies in Section 24, which specifies that the Bank must "charge the National Government's account with the fee for domestic and external public debt servicing on its behalf, as well as any expenses arising therefrom". Hence, the Treasury can service the country's sovereign debt with the BCRA's reserves. This was a common practice across the last stage of the Fernández de Kirchner administration, which decanted in a BCRA with negative net reserves by the end of 2015 (Sturzenegger 2019).

The great majority, if not all, of emerging markets that adopted inflation targets as their chief monetary anchor granted de jure central bank independence prior to the regime's implementation, in many cases through profound legislative reforms. Chile, for instance, "passed new central bank legislation in 1989, which gave independence to the central bank and mandated price stability as one of its primary objectives" prior to the adoption of an implicit IT regime (Mishkin 2000). Moreover, "in the Czech Republic, the independence of the central bank was anchored in the Constitution" (Jonas and Mishkin 2004). Colombia also embarked on a monetary institutional development in 1991, eight years prior to the adoption of inflation targets. Colombia's new central bank charter prohibited the institution from extending "credit (development credits) to the private sector or to the Government", created a new Board of Directors that "acts independently of the Government" as well as it conferred "constitutional status to the aim of preserving the currency's buying power as the Bank's principal objective" (Banco de la República de Colombia 2020).

Analogously, before advancing in the implementation of a transition program that eventually decanted in a full-fledged IT scheme, the Bank of Indonesia's charter was exhaustively reformed. "A new Bank of Indonesia establishment law prescribed full independence for the central bank with regard to policy formulation and implementation" and it prohibited the "central bank from financing government deficit spending and from purchasing government bonds on the primary market" (Juhro and Goeltom 2015).

Unlike many emerging markets that engaged in IT, Argentina did not strengthen its central bank independence. An unfortunate legal statute, which gives de jure control of the entity to the

Executive power in all dispositions, made it very hard to garner credibility and, much harder, to honor such a challenging mandate as achieving price stability.

The fact that the BCRA's charter contemplated specific mechanisms for the executive branch to pick and choose officials and monetize fiscal imbalances was a significant drawback for Argentina's IT regime. While de jure autarchy does not guarantee de facto independence, it certainly contributes towards it. Both the theory reviewed in Section III and the international experience delineate that de jure central bank independence is a critical precondition for an IT regime to succeed, one that Argentina failed to meet.

2. Relative Prices

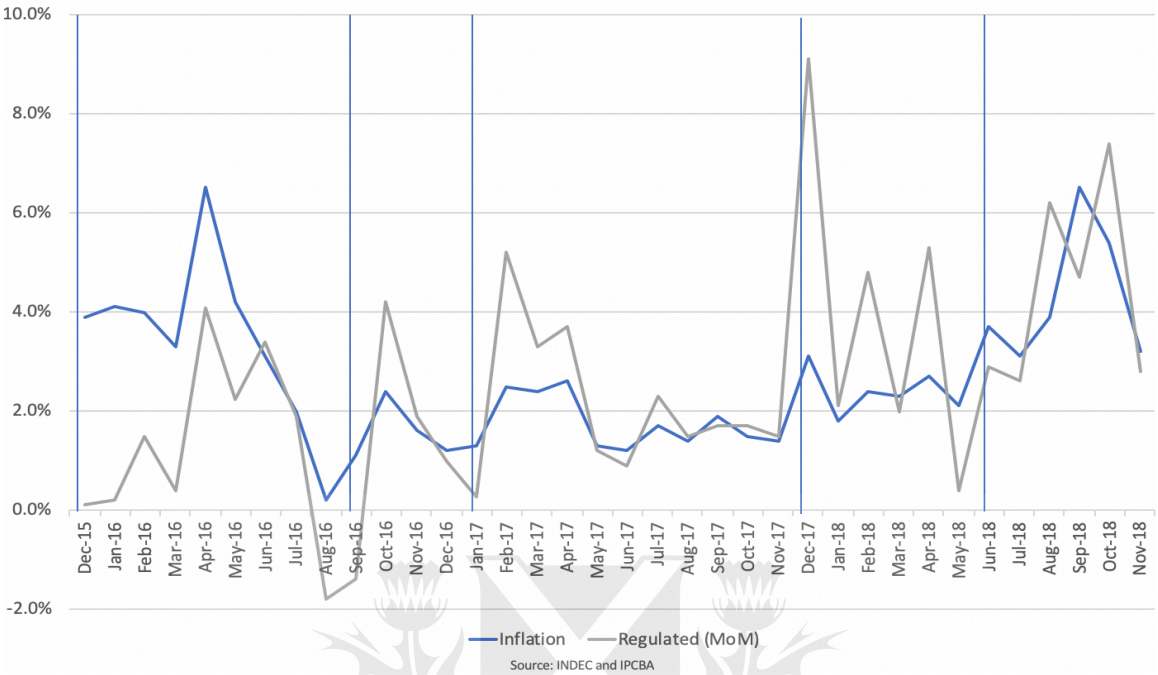
The second significant barrier to the successful consolidation of Argentina's IT regime laid in the relative price front. Here the challenge was also twofold. President Macri inherited "Argentina's longest and most profound tariff freezing" along with distortive capital controls (Navajas 2015). Dismantling these irregularities was as urgent as it was risky, both from a political and an inflationary standpoint. Ultimately, the liberalization of a highly appreciated exchange rate and the increase in the real value of regulated prices jeopardized Argentina's stabilization program, as these relative price corrections reverberated in the economy's consumer price index.

Regulated prices

Argentina's long due regulated price correction not only implied an unsustainable fiscal load, but it as well disincentivized investments in energy and transport. Navajas (2015) outlines that energy subsidies had grown from USD 200 million in 2003 (0.12% of GDP) to USD 18 billion (3.2% of GDP) in 2014, and that a country with a vast natural endowment had become a net energy importer. The fiscal strain that such a scheme implied coupled with a deteriorated service for consumers deemed the update of regulated prices critical.

As expected, tariffs were aggressively adjusted by Macri's administration, a fiscal measure that antagonized with the BCRA's IT regime. Figure 2 depicts the constant rise in regulated prices throughout the period in which inflation targets were in place. As shown, sharp corrections were carried forward in 2017 and 2018. For example, Electricity, Gas and other Fuels -a component of Argentina's national CPI- rose by 255% in the aforementioned period. Analogously, the Public Transport CPI component presented a variation of 85% for the same period. These corrections, though anticipated, turned out to be a significant drawback for the BCRA's IT program, as they impacted the general price level (Sturzenegger 2019).

Figure 2: Regulated Monthly Inflation and Total Monthly Inflation (December 2015 - December 2018)



Source: INDEC and IPCBA

Sturzenegger (2016) argues that, from a general equilibrium perspective, an increment in regulated prices -given an unaltered demand for real money balances- should not have any impact on inflation:

> When a given price goes up, it is clear that the budget constraint of an economic agent implies that less can be spent on other goods, and that the price of these goods should go down. The final result, if we assume that the demand for real balances does not change, is that the final prices, on average, remain constant. In this case, the economist who thinks in general equilibrium would answer, the effects of tariffs on prices would be nil.

On the other hand, Rapetti (2016) stresses that in Argentina downward price rigidity cannot be dismissed. Under these circumstances, any relative price correction will inevitably accelerate inflation in the short run. This line of thought is consistent with the theory of structural inflation. Sturzenegger (2016) acknowledges this possibility and, furthermore, exposes that utility price increases were ultimately a "significant drawback" for the BCRA (Sturzenegger 2019).

Mishkin (2000), analogously, notes that a "factor affecting inflation controllability that is especially relevant in the emerging market context is the (at times large) incidence of government-controlled prices on the index used to compute headline inflation". On this note, Mishkin (2000) advises against the implementation of a pure IT regime under a context of significant price corrections in the regulated domain, as this will accelerate inflation.

Government policies can have significant effects on inflation via regulated prices, which renders fiscal and monetary coordination fundamental in tackling price instability. Indonesia's Central Bank, which adopted a full-fledged IT regime in 2005, has a particular section in its website that underscores this point:

> since inflation in Indonesia is not only influenced by demand pull, but also cost push factors, it is vitally important for the Government and Bank Indonesia to coordinate their actions through integrated macroeconomic policies if inflation targeting is to be effective.

The BCRA's ambitious inflation targeting program was antagonized by aggressive corrections of regulated prices. A disconnect between fiscal and monetary authorities undermined Argentina's capacity to honor its targets. On the inflationary impact of regulated price hikes, Navajas (2015) warned that increases in Argentine tariffs could trigger an acceleration of inflation. Subsequently, Navajas (2019) demonstrated that the hikes in utility prices illustrated in Figure 2 impacted Argentina's inflation and core inflation in the short term while the IT regime was in place. In agreement with Navajas (2019), Fanelli (2019) sustains that Argentina's inflation was, to a great extent, cost-push inflation, for both tariffs and the exchange rate increased dramatically across 2017 and 2018.

Analogously, Di Tella (2019) claims that increases in utility prices during Macri's tenure had certain characteristics that differentiate them from other price hikes and exacerbated their impact on inflation:

> changes that are a) so large, b) that take place in so many products, c) that take place so close in time and d) that take place so clearly as a result of government action, might have a different impact on inflation, perhaps because there is a signaling dimension to them (as compared to, say, the change in the price of one type of light bulb).

While there are conflicting views on the extent to which regulated prices hindered Argentina's IT program, the fact that they played a role in accelerating inflation appears to be settled. In particular, a strong upswing in utility prices at the beginning of 2017 compromised the BCRA's ability to meet that year's target. Table 4 illustrates that the average annualized inflation rate for the first six months of 2017 was over 25%, a consequence of corrections of tariffs at the outset of the year (see Figure 2). A growing discrepancy between the 17% target and actual inflation, which became evident from the beginning of 2017, deteriorated the credibility of the BCRA and its targets.

Table 4: Monthly Inflation for the First Half of 2017

	Inflation (MoM)	Annualized Inflation	Regulated (MoM)	Inflation Expectations 2017 (REM Average)
Jan-17	1.3%	16.8%	0.3%	20.4%
Feb-17	2.5%	34.5%	5.2%	20.8%
Mar-17	2.4%	32.9%	3.3%	21.3%
Apr-17	2.6%	36.1%	3.7%	21.4%
May-17	1.3%	16.8%	1.2%	21.9%
Jun-17	1.2%	15.4%	0.9%	21.7%
Average	**1.9%**	**25.4%**	**2.4%**	**21.3%**

The Central Bank's ability to meet 2017's target began to be heavily questioned as early as in April 2017, when different newspapers noted that monthly inflation would have had to be below 1% for the rest of the year in order for the BCRA to meet the official target[2]. As outlined in Table 4, expectations were anchored well over 20% for 2017, despite the BCRA's insistence to uphold the preannounced target. This was a load that Argentina's Central Bank had to carry throughout the year, which eroded its credibility.

A caveat is in order. While tariff corrections were aggressive, they did not provide the Treasury with the expected fiscal relief. Regrettably, Sturzenegger outlined, "a large fraction of the increase went to recover the profitability of energy sector firms, with a more muted effect on fiscal accounts". This point and its implications will be developed in the upcoming section.

Therefore, sustained and aggressive corrections of regulated prices at the outset of 2017 were a significant detractor of Argentina's IT regime. Changes in regulated prices reverberated in monthly inflation at the beginning of the year, which hindered the BCRA's ability to meet preestablished targets. This disconnect between monetary objectives and fiscal policy impacted inflation expectations and eroded the BCRA's credibility throughout the year, hindering Argentina's IT regime.

Exchange rate fluctuations

As the Sturzenegger administration took office on December 2015, one of the great challenges it faced was dismantling the capital controls that had been imposed on November 2011. By the end of 2015, the Argentine peso was excessively appreciated, secondary foreign exchange markets were thriving, and the loss of export competitiveness was starting to impact the country's current account. As an illustration, statistics show that Argentina's current account balance decreased in USD 24 billion (471%) from 2006 until 2015, yielding a deficit of about USD 18 bn (3% of GDP) in 2015.

[2]See Infobae and El Economista articles

Sturzenegger (2019) provides a detailed explanation on how the BCRA successfully lifted capital controls within the first week of his administration, despite a deteriorated balance sheet. The immediate normalization of the foreign exchange was a positive milestone, which helped the BCRA garner credibility. This initial conquer came not without a cost for the BCRA, as monthly inflation increased significantly in the months that followed the liberalization of the FX market (see Figure 2).

Subsequently, the BCRA adopted an IT regime that confirmed Argentina's transition to a floating exchange rate. Sturzenegger (2019) outlines this decision responded to "Argentina's trauma with the final period of the convertibility" and to the fact "that other countries floated their exchange rates in disinflation processes similar to that of Argentina". Downplaying the value of the exchange rate, Sturzenegger (2019) argues, gave way to inflation targets as the sole nominal anchors for the economy. Consequently, the BCRA did not provide a clear-cut exchange-rate intervention policy to complement the published targets.

In addition, Sturzenegger (2019) claims that while the IT program was in place, FX variations did not have a significant impact on the general price level. The results of a VECM focused on weekly core prices, FX and regulated prices "show that during the IT period, once expectations are considered, the statistical relation between prices and FX and utility prices virtually disappears" (Sturzenegger 2019).

Nevertheless, the experience of other emerging markets with IT and the effects of swings in FX markets on monthly inflation denote that the relegation of the exchange rate to a secondary role was counterproductive. Discrete corrections of a highly appreciated peso reverberated on the country's general price level, via tradable prices as well as through expectations. Argentina's "historical love affair with the dollar" exacerbated these effects (Di Tella 2019). Hence, a second obstacle in the relative price front were the sharp corrections of Argentina's floating exchange rate.

Unlike the BCRA, many emerging markets chose to couple their IT programs with an active and clear-cut intervention policy for FX markets, in order to avoid large swings in the exchange rate. As it was previously delineated, Chile adopted a dual anchor, coupling inflation targets with exchange rate targets until, after an eight-year transition, it enacted a full-fledged IT regime. Likewise, Colombia instituted a rules-based foreign exchange auction program in October 2015 as a "mechanism to prevent disorderly depreciations" (Chamon, et al. 2019). On the same note Chamon, et al. (2019) illustrates that Paraguay's central bank intervenes in FX markets using two mechanisms:

(1) preannounced sales of the US dollars it receives from the ministry of finance to exchange into guaraníes to support its public expenditures; and (2) discretionary interventions, without previous announcement, to address any abrupt market movements.

Di Tella (2019) underscores other emerging market cases in which exchange rate policies were fundamental at the outset of their inflation targeting programs, such as that of Mexico and Turkey (which were previously discussed in this paper).

Chamon, et al. (2019) outlines that the underlying motives of official intervention in emerging FX markets are diverse: preventive accumulation of reserves, attenuation of risks to financial stability due to exchange rate volatility, mitigation of passthrough effects and issues associated with competitiveness of the tradable sector (Chamon, et al. 2019). The BCRA, nonetheless, offered no clear-cut intervention policy, which paved the way for significant and unexpected corrections of the exchange rate that accelerated inflation.

Argentina's idiosyncratic characteristics rendered the stability of its exchange rate vital for the success of the BCRA's IT program. Cavallo, Neiman and Rigobon (2018) outline high passthrough levels in emerging markets, particularly in Argentina. Being a highly dollarized economy, swings in the exchange rate have a direct impact on both Argentine prices and expectations. On the same note, Calvo and Reinhart (2001) stress that in emerging markets passthrough levels tend to be higher than in developed economies. Therefore, exchange rate fluctuations can have an impact on prices, especially in Argentina. Some degree of exchange rate stability is, thus, a necessary condition for successful disinflation to take place in Latin America's third largest economy.

Reinforcing this point, Rapetti (2016) claims that the exchange rate is central to a successful monetary scheme in Argentina. He argues that the correction of relative prices is not the only mechanism through which exchange rate fluctuations impact inflation, particularly in economies where foreign currencies play a significant role. As he puts it:

> The exchange rate operates as an anchor of domestic prices not only via its effect on tradable prices but also on inflationary expectations, especially in dollarized countries where foreign currency also operates (at least partially) as a unit of account and, consequently, has an important role in coordinating expectations.

As outlined, the relevance of the exchange rate in the Argentine economy in by no means trivial, making it a significant input in the formulation of expectations. The US Dollar has a valuable hedging property that has made it particularly appealing for Argentine residents: "it's real value covaries in a positive manner with crises; it's an asset whose price tends to increase throughout economic hardships" (Fanelli 2004). A steady increase throughout the last decade in Argentina's foreign assets, reaching USD 385 billion (77% of GDP) in 2019, portray the exchange rate's importance for the economy. Buscaglia, Kiguel and Levy Yeyati (2017) explain this phenomenon:

> On currency issues, Argentina is not your typical developing country. Argentines have historically saved in dollars and, after decades of instability in the peso, the dollar is the unit of account of the economy. As a result, the pass-through from depreciation of the

> peso to an increase in prices is large and fast. This means that a large depreciation quickly causes flight to dollar safety that often becomes permanent.

The significance of the exchange rate in Argentina's economy and its intimate relationship with inflation has been widely discussed. Being a relevant unit of account as well as a key instrument to store value, the US dollar affects both tradable prices and inflationary expectations. Low exchange rate volatility appears to be a necessary condition for price stability in Argentina. This being said, the BCRA's decision to downplay Argentina's exchange rate throughout the IT program was both unconventional when compared to other emerging market cases as well as risky, given Argentina's particular history with the US dollar.

This risk that the BCRA took eventually materialized. The lack of a precise intervention policy for FX markets nurtured discrete corrections of Argentina's highly appreciated exchange rate. In turn, these swings in the price of the US dollar reverberated on monthly inflation, conditioning the BCRA's IT regime.

As previously discussed, the first big correction came with the liberalization of FX markets that took place towards the end of 2015. As shown in Figure 3, once capital controls were lifted on December 17, the Argentine peso depreciated by over 35% in one day. Rapetti (2016) illustrates how the post-liberalization correction, outlined in Figure 3, accelerated monthly inflation:

> Using the data of the CPI of the City of Buenos Aires[3] it is observed that between June and October of [2015], the inflation of the consumer basket remained at a stable rate around 1.8% monthly. Between December and February - when the sequence of relative price corrections occurs - inflation accelerates above 4% per month. Moreover, in February, inflation of all prices, taking out the item that includes electricity rates, was 3.1%.

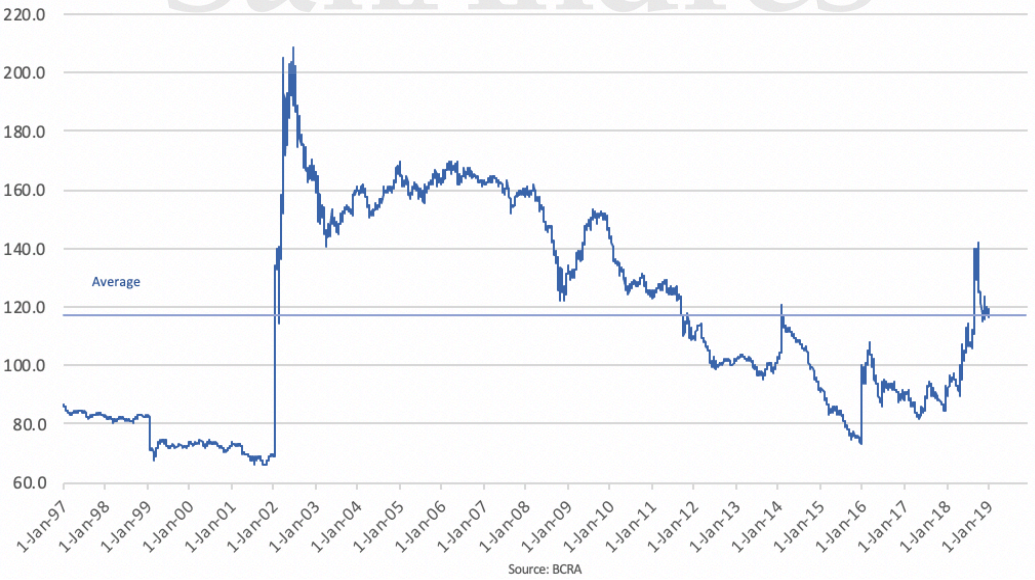
The overshooting of monthly inflation that ensued from Argentina's exchange rate liberalization undermined the IT program in two ways. First, it compromised the BCRA's ability to meet its informal inflation target of 25% for 2016. As outlined, target misses -particularly at the outset of a new monetary regime- are costly in terms of credibility for monetary authorities. Secondly, the adoption of IT amid a high initial inflation level refrained monetary authorities from garnering the credibility that a robust disinflation process offered as well as it increased the chances of a costly target miss. Whether there was a less costly mechanism through which to break with capital controls, given economic and political restraints, remains an open question.

[3] Until May 2016, Argentina had no national statistics of inflation, for numbers had been severely tampered with by the Fernandez de Kirchner administration. Consequently, during that period, the CPI of CABA was used as a proxy for national inflation.

Figure 3: Argentina's Multilateral Real Exchange Rate Index (17/12/15=100)

Moreover, Figure 4 depicts that despite the liberalization of FX markets, the Argentine peso remained overly appreciated relative to its past values, throughout 2017 and a significant part of 2018. This was a direct consequence of the conversion of government foreign debt carried forward by the BCRA (Sturzenegger 2019). In other words, the Argentine peso remained relatively appreciated during the inflation targeting regime when compared to its 2003-2015 levels. Particularly, Figure 4 illustrates that Argentina's multilateral real exchange rate during 2017 and 2018 was at a similar level to the one reached in the late 1990s, under the Convertibility Plan. This excessive appreciation postponed a correction of relative prices until it was inevitable, and quite large.

Figure 4: Argentina's Multilateral Real Exchange Rate Index (17/12/15=100)



Argentina's current account tourism debits throughout the IT program reinforce the notion of the peso's excessive appreciation. National statistics show that in 2017 citizens spent over USD 11 billion in foreign tourism (1.7% of GDP), almost four times as much as in 2006. While this cannot be solely attributed to an overly appreciated peso, it can certainly be taken as a proxy of the competitiveness of country's real exchange rate.

Hence, Figure 4 shows that irrespective of the liberalization of FX markets, Argentina's currency remained overly appreciated throughout the IT program. This phenomenon postponed a long-needed correction of relative prices. Instead of smoothing out the exchange rate adjustment via official intervention in FX markets, Argentina faced an abrupt depreciation that was triggered by 2018's *sudden stop*. While sudden stops are largely dictated by the liquidity status of developed countries, an overappreciated exchange rate is one important domestic factor that exacerbates their effect (Ferreti and Razin 2000). As shown in Figures 3 and 4, the Argentine peso sharply depreciated throughout 2018 despite an increased intervention of the BCRA in the FX market. This unanchored inflation expectations and accelerating monthly inflation, undermining the BCRA's capacity to meet 2018's target (Figure 1).

Though the BCRA consistently recognized the relevance of official intervention in FX markets in other countries' stabilization programs, it did not provide a clear-cut framework or objective for its own interventions. Bearing in mind Argentina's high pass-through level and degree of dollarization, this was particularly risky. Consequently, abrupt corrections of an overly appreciated peso triggered an upsurge in inflation via passthrough and expectations, compromising the BCRA's IT program.

3. Fiscal Dominance

Fiscal dominance is a significant obstacle to any monetary program, and IT is by no means the exception. Argentina's long overdue fiscal consolidation debilitated the BCRA's autonomy and impacted market expectations, compromising the IT regime.

Masson and Savastano (1997) explain that the lack of fiscal dominance is critical to an IT program, which implies:

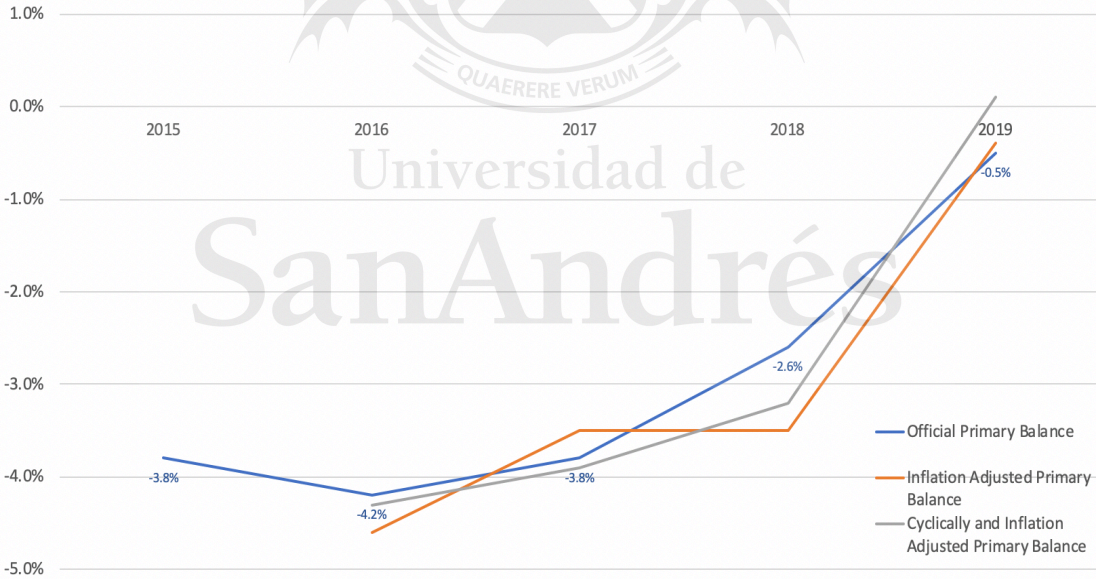
> That the public sector direct borrowing from the central bank (and the banking system) will be low or nonexistent, that the government will have a broad revenue base and therefore will not rely systematically and significantly on the revenues from seigniorage, that domestic financial markets will have enough depth to absorb placements of public (and private) debt instruments and that the accumulation of public debt will not give rise to explosive or "unpleasant dynamics".

However, Argentina did not meet this precondition. Rapetti (2018) provides a detailed description of the evolution of fiscal accounts during the first two years of the Macri administration and the initial phase of the IT regime:

> In 2015, the primary deficit of the consolidated public sector (including the provinces) reached 4.7% of GDP and the financial deficit (including the payment of interest on debt) amounted to 6.1% of GDP. In 2016, disregarding the extraordinary income from the tax amnesty, these values reached 6.2% and 8% of GDP. In 2017, the primary and financial deficit were of 4.4% and 6.6% of GDP, respectively.

In other words, Argentina's deficit grew in 2016, before it began to gradually decrease in 2017. Sturzenegger (2019) pinpoints the three main variables that deterred Argentina's fiscal consolidation while inflation targets were in place: a tax reform, growth below expectations and an increase in pension payments. While it improved the efficiency and distributive impact of taxes, the 2017 "tax reform anticipated a gradual reduction of the tax burden reaching 2.9% of GDP by 2022" (Sturzenegger 2019). Similarly, pension payments were increased in 2016 "to compensate for lack of indexation of pensions during the years 2002-2006", increasing annual government expenditure by about 1.4% of GDP (Sturzenegger 2019). Figure 5 eloquently illustrates the Federal Government's inaction in the fiscal front. It, moreover, exposes that during his first year in office, President Macri increased the country's budget deficit by 0.4% of GDP.

Figure 5: Evolution of Argentina's Government Budget Balance (2015-2019)



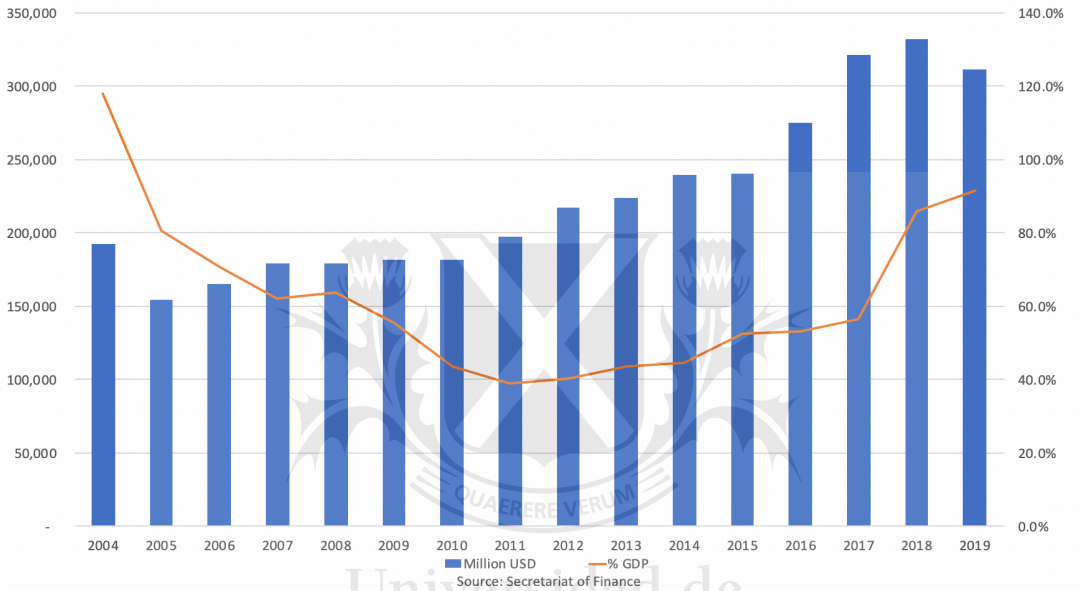
Source: Sturzenegger (2019)

Intertemporal fiscal equilibrium is vital for price stability, otherwise deficits will eventually have to be monetized and inflation will accelerate. The aforementioned measures went against Argentina's deficit reduction, and thus against BCRA's objective to secure price stability. In all, Argentina's enhancement of fiscal accounts was sluggish, conditioning the BCRA's autonomy. The IT regime was undermined by both the change in inflation targets and the high sterilization cost that the BCRA was virtually forced to tolerate, two clear consequences of Argentina's fiscal dominance.

Fiscal accounts, external financing and sterilization costs

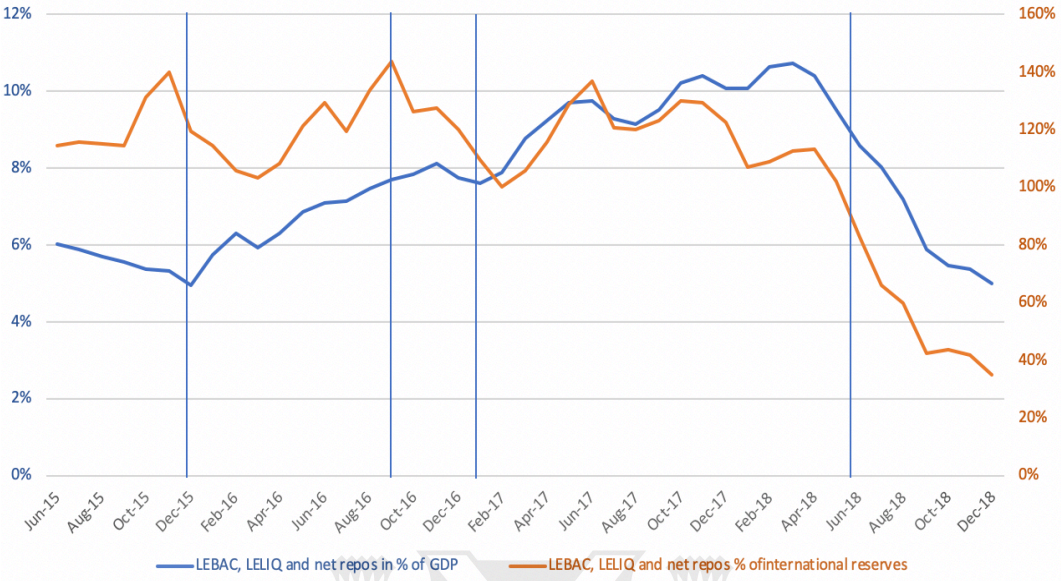
As depicted in Figure 6, Argentina's fiscal disequilibrium during the IT program increased the Treasury's reliance on external financing, which forced the BCRA to pay a high sterilization cost (Sturzenegger 2019). This damaged both the regime's transparency and the BCRA's credibility, impacting inflation expectations.

Figure 6: Evolution of the Federal Government's Debt



Estimates show "gross debt leaping from 57.1% of GDP in 2017 to 85% in 2018, while net debt (i.e., excluding BCRA IOUs and ANSeS FGS holdings) at 55.6%." (J.P. Morgan 2018). This phenomenon was the leading cause of a steep increase in capital inflows which resulted in an overly appreciated peso, denoted in Figure 4 (Sturzenegger 2019). The BCRA confronted this challenge with an "aggressive program of reserves accumulation, buying reserves which it sterilized by issuing peso liabilities" (Sturzenegger 2019). Figure 7 outlines the sharp increase in the BCRA's interest paying liabilities, both in terms of GDP and relative to international reserves. Note that in the initial months of 2018, the LEBAC stock amounted for almost 11% of GDP and more than 100% of the BCRA's international reserves.

Figure 7: LEBAC, LELIQ and Net Repos



While the forced reserve accumulation process was merely a change in the structure of the BCRA's liabilities -switching monetary base for LEBAC- it was quite a controversial move (Sturzenegger 2019). The risk of such a process was twofold: a shift in focus from inflation targets to the exchange rate and the LEBAC stock as well as the potential implications of the quasi-fiscal deficit on inflation expectations.

As per the first risk, the interest paying liabilities were backed by an accumulation of international reserves. Consequently, the inflation objective was "conditioned… to an exchange rate objective" (Sturzenegger 2019). Having the BCRA expressed its intention to maintain inflation targets as the sole nominal anchors for the economy, this move was perceived as incoherent. Adding the exchange rate as an implicit anchor detracted from the IT program's transparency and accountability, for the BCRA's sterilization policy began to hoard excessive attention. Sturzenegger (2019) delineates that:

> A discussion was framed as if the interest on Lebacs were a source of inflation itself, requiring a distinction between the Central Bank quasi-fiscal deficit (which, as mentioned before, typically ended in a surplus) and the cash quasi-fiscal deficit which was the amount of pesos issued regardless of the asset side of the balance sheet.

This phenomenon outlines how the BCRA's sterilization process was both controversial and difficult to fully grasp for lay economic agents. Hence, the Treasury's heavy reliance on external financing resulted in an increased preponderance of a controversial and relatively unintelligible instrument: the BCRA's peso denominated liabilities. As outlined in Section II, one of the foremost advantages of an IT regime is its transparency. The LEBAC stock eclipsed the BCRA's targets and added a degree of complexity to the regime. A swifter fiscal consolidation could have neutralized, or at least attenuated, such a drawback for the IT regime.

The second risk refers to the potential consequences of the quasi-fiscal deficit. A mounting LEBAC stock posed the question of whether the BCRA would be able to constantly rollover its debt and, if not, of how it would service it. Analysts feared that such a dynamic would inevitably result in an increase of inflation, a debate that was not favorable to the Central Bank's credibility (Sturzenegger 2019). Particularly, given the increase in the quasi-fiscal deficit vis-à-vis the monetary base, analysts feared a scenario in which the BCRA failed to rollover a significant number of LEBAC, triggering an increase in the monetary base that would elicit an acceleration of inflation.

While Sturzenegger (2019) shows that the reduction of the BCRA's liabilities needed not be done through an increase in the monetary base, the controversy that the counterpart of the sterilization process nurtured eroded the Central Bank's credibility. On this, Hevia, Rapetti and Furiase (2017) outlined:

> If an inflationary strategy requires a lot of sterilization via LEBAC and the argument is "don't worry because a devaluation corrects everything", it is implied that there will be a devaluation in the middle. The credibility of a deflation that needs a devaluation to be sustainable over time makes noise.

The quasi-fiscal deficit -a consequence of a forced sterilization program- placed the BCRA in the eye of the storm, subjecting it to constant criticism and recrimination[4]. This evidenced the Central Bank's lack of independence, as its price stability program was conditioned by the Treasury's issuance of external debt.

Hence, Argentina's fiscal procrastination forced the BCRA into a costly sterilization program which severely hindered the IT regime. In this domain, the hurdle was twofold. First, the issuance of peso denominated liabilities added a degree of complexity and a second nominal anchor to the program, undermining its transparency. Second, the quasi-fiscal deficit fostered controversies that placed the BCRA under constant criticism, eroding its credibility.

Modification of Argentina's inflation targets

On December 28, 2017 (28D), inflation targets were modified by the Minister of the Treasury in a joint press conference with the BCRA's President and other government officials. This was largely interpreted by markets as a profound institutional shift (Sturzenegger 2019). Slower than expected budget corrections had hinted a disconnect between the Treasury's gradual fiscal strategy and the BCRA's aggressive monetary policy, which the announcement confirmed. Fiscal objectives were demonstrated to outweigh the BCRA's targets, signaling strong fiscal dominance. As discussed in Section III, outright central bank independence is a vital prerequisite of IT, which is why the 28D's change in targets triggered a dislodging of expectations.

[4] See: Cronista article, Clarin article

The modification of inflation targets came shortly after the government consolidated strong support in the 2017 midterm elections. Sturzenegger (2019) provides a detailed description of how the recalibration unfolded:

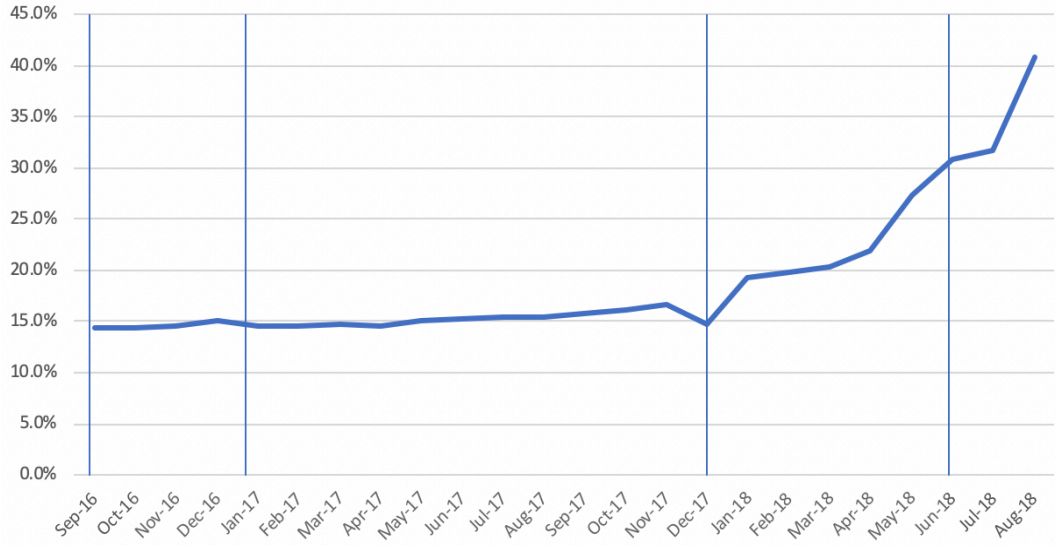
> The change in the targets was announced December 28th, 2017, in a relatively bizarre twist, as that day Argentina celebrates 'fool's day'. To communicate the change the government staged a press conference where it announced that it wanted more inflation. The President had decided to fire the Governor if needed to go ahead. So, the Central Bank was confronted with an Executive that had decided to lower rates, increase the inflation targets 5p.p. (from 10 to 15%), and shorten the maturity of Central Bank liabilities (basically 1-5 months). In an attempt to contain the credibility, effect a reduction in transfers from the Central Bank to the Treasury to half in 2019 and to the equivalent of seigniorage starting in 2020 was also announced.

The change in targets responded to fiscal objectives. A "quick reduction in inflation represented a challenge to fiscal accounts, because of the dynamics of backward indexation on half its spending" (Sturzenegger 2019). In particular, both pensions and social aid are formally indexed backwards in Argentina. Estimations show "that the budget improves (deteriorates) about 0.4% for each increase (fall) in yearly inflation" (Sturzenegger 2019). It was precisely the lack of progress in the fiscal front during the first years of the government that fueled this change in the targets (Sturzenegger 2019). Consequently, December's press conference signaled a triumph of the Treasury over the BCRA's quest for price stability, exposing Argentina's stark fiscal dominance.

The modification of targets was the straw that broke the camel's back. Markets had been forgiving of Argentina's fiscal procrastination, the lack of a de jure institutional strengthening and deviations from inflation targets. After December 28, however, expectations were unanchored, and inflation picked up (Sturzenegger 2019). Sturzenegger (2019) delimits the crisis that ensued from this institutional shift and the impact it had on the economy's main variables. As illustrated, expectations were dislocated, inflation accelerated and capital flows reversed, triggering the beginning of the crisis that marked the end of Argentina's IT scheme (Sturzenegger 2019).

Figure 8 portrays how the December's press conference echoed on a particular measure of expectations: the annual inflation expectations for 2018. As shown, markets steadily anticipated a rise of about 15% in the general price level for 2018 from September 2016 until December 2017. Once the press conference was held, a substantial change in the trend of expectations took place, as the anticipated inflation for 2018 increased at a rate that had no comparable precedents in that particular time series.

Figure 8: 2018 Average Annual Inflation Expectations (REM)



Source: BCRA

The context under which Argentina's inflation targets were modified, moreover, exacerbated the negative effects of the institutional shift. Two relevant developments stood out towards the end of 2017: a rising Federal Funds Rate and the unexpected turmoil caused by Macri's pension reform. As for the first phenomenon, the change in targets was announced shortly after Congress approved a long-awaited pension reform, amid visible social and political unrest. Argentina's government secured a cut in spending of about 0.6% of GDP for 2018, though not without significant political cost. Despite a strong performance in 2017's mid-term elections by Cambiemos, the pension reform package triggered both a national strike and violent protests in the outskirts of Argentina's congress. Having still a long way to go in terms of cutting expenditures -roughly 4% of GDP- the turbulence casted doubts on Macri's ability to reach a fiscal consolidation that markets had already discounted.

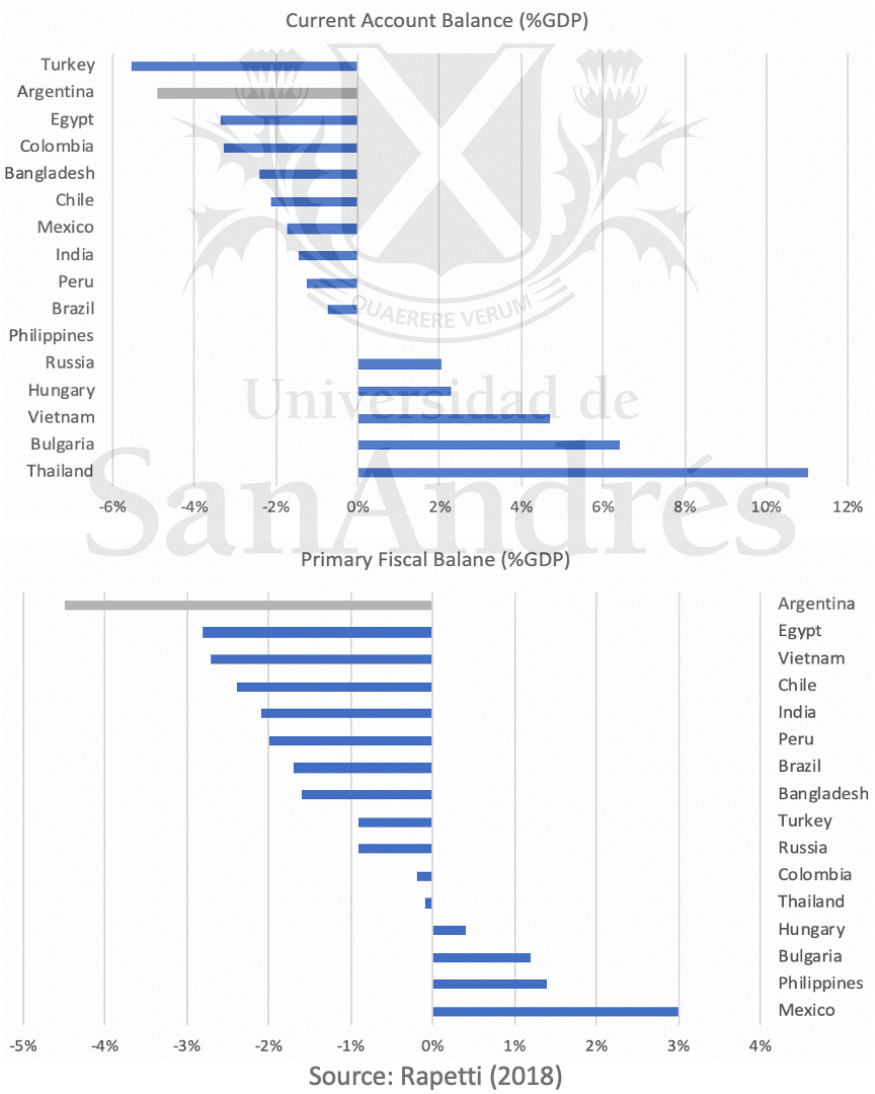
The second relevant event pertains the change in the United States' monetary policy, which began in 2016 and extended through 2018. A rise in the Effective Federal Funds Rate across the IT period increased Argentina's cost of debt accordingly. In an economy with a large budget deficit, slow growth and a strong political restriction to cut expenditures or raise taxes, an increase in the cost of debt triggered profound uncertainty regarding Argentina's solvency. As noted by Calvo (1998), "a sudden stop may come to be true through a self-fulfilling prophecy mechanism". Rising interest rates made it evident that a "slowdown of capital inflows could push the economy into insolvency", fuelling the effects shown by Sturzenegger (2019).

While sudden stops are largely determined by the liquidity status in developed countries, fiscal and current account deficits are significant domestic factors that can anticipate the likelihood of a reverse in capital flows (Razin and Ferretti 2000). Figure 9 eloquently illustrates Argentina's vulnerability in terms of budget and current account deficits vis-à-vis other emerging markets. At the time of the shock, "Argentina was among the countries were sharp reversals were most

likely. Turkey and Egypt, also with signs of high external vulnerability, were among the most affected" (Rapetti 2018). An evident reticence or inability to correct fiscal imbalances, despite the change in targets, left Argentina in a vulnerable position amid the contraction of international credit markets.

Hence, the context under which inflation targets were modified in Argentina amplified the move's corrosive effects on the economy. The pension reform turmoil signaled that the path towards fiscal consolidation would be longer and harder than expected, which combined with a rising cost of debt for Argentina triggered uncertainty regarding the country's solvency. The Treasury's fiscal procrastination left the country in a particularly vulnerable position to face a contraction of capital markets.

Figure 9: Argentina's Vulnerability (2017)



Source: Rapetti (2018)

In all, the modification of Argentina's inflation targets signaled strong fiscal dominance, a condition under which an IT framework cannot prosper. The move made it clear that the BCRA's ambition to secure price stability was subordinated to the Treasury's objectives, which had initially increased the fiscal deficit before beginning to gradually reduce it. The effects of the change in targets were exacerbated by an unfavorable context: an increasing cost of debt combined with unexpected difficulties to cut public spending. Thus, the change in targets severely undermined Argentina's IT regime, as it evidenced categorical fiscal dominance under a particularly fragile context.

VI. Concluding Remarks:

This paper intends to offer two specific contributions: a literature review on IT–outlining its preconditions, advantages and disadvantages, as well as the particular challenges faced by emerging markets that wish to adopt it as a monetary regime- and an analysis of the underpinning causes behind Argentina's frustrated experience with this particular framework. Coupling the literature review developed in Section III with recent publications and data on Argentina´s case, Section IV identified the three leading factors that undermined the BCRA´s IT program. Namely, these were weak monetary institutions, aggressive relative price adjustments and fiscal dominance.

On the monetary front, two factors compromised the success of Argentina's inflation targets: their introduction amid relatively high inflation and the lack of de jure independence for the BCRA. Contrary to what the theory suggests and to the bulk of comparable case studies, Argentina adopted a pure IT framework without having cemented a robust disinflation process. A hurried commitment to inflation targets refrained the BCRA from garnering the credibility that a profounder disinflation process offered and nurtured target misses, which are particularly costly at the outset of an IT regime. The second monetary factor that compromised Argentina's program was the lack of de jure independence for the BCRA. Specific mechanisms for the President to remove central bank officials and monetize fiscal imbalances are contemplated in the institution's Charter. This detracted from both the Central Bank's credibility and from its capacity to block the 28D's target modification.

As per Argentina´s steep relative price corrections, chronic updates of regulated tariffs as well as the adjustments of a highly appreciated exchange rate reverberated on the economy's inflation. Regulated monthly inflation as high as 5% condemned the BCRA to a faulty start in the pursuit of 2017's target, eroding the program's credibility. Likewise, an overly appreciated exchange rate gave way to discrete corrections once the FX market was liberalized, corrections that echoed on the general price level as well as they unanchored expectations.

Fiscal dominance, a threat to any IT regime, was not thoroughly addressed prior to the implementation of targets in Argentina. Manifested in a high sterilization cost payed by the BCRA and the 28D's target modification, the subordination of the Central Bank to fiscal objectives compromised Argentina's IT regime. The Treasury's heavy reliance on external financing, while it allowed the BCRA to amass foreign reserves, came with a high sterilization cost both in terms of the institution's transparency and credibility. Similarly, the change in targets towards the end of 2017, amid a very delicate domestic and international context, signaled an indisputable fiscal dominance that markets had discounted Macri's administration would have amended by then.

Thus, Argentina's IT regime did not succeed in brining price stability to the country for an array of factors that can be classified in three interdependent categories: monetary obstacles, aggressive relative price adjustments and fiscal dominance. Leveraging Section II's theoretical

framework along with recent articles and data on Argentina's experience, this paper assessed the mechanisms through which each of these factors impacted the BCRA's IT framework. While this paper provides a detailed analysis of the regime's shortcomings, it does not explore the next best available alternative given the economic and political restrictions of the time. Whether the government and the BCRA had the political capital to pursue a more effective path towards price stability remains an open question.

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