What do Latin American Central Banks say? A study of monetary policy committee reports in Brazil and Mexico

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1 Abstract

Central Banks adopting inflation targeting increasingly rely on communication strategies to influence financial markets. Their communication also has broad economic policy repercussions. The politics of central banks' communication are still understudied in developing countries. The current paper analyses monetary policy committee reports in Brazil and Mexico. The two countries have adopted inflation targeting and have suffered similar external pressures, although their use of communication strategies have diverged over time. The research employs natural language processing techniques to identify the main themes of the reports since the implementation of inflation targeting in 1999 in Brazil and 2001 in Mexico. Former studies have investigated the tone of Central Banks' communication by distinguishing hawkish and dovish periods. The paper overcomes this traditional division by evidencing a rich variety of communication strategies adopted. It shows how and when Central Banks adopt "prudential" and "reformist" communicative strategies. We show that the prudential strategy is adopted during leftist governments and aims to reassure the stability of markets and is usually employed when leftist governments are in power. The reformist strategy is adopted during rightist governments, and try to conditioning interest rate changes on economic reforms. We argue that to protect their credibility towards governments, inflation targeting Central Banks are less likely to push for reforms during leftist governments, but will act as reform catalysts during rightist governments.

2 Introduction

Central Bank's communication under inflation targeting regimes is commonly regarded as depoliticized and aiming only for transparency (Svensson, 2010a). Nevertheless, political economy studies have recently shown deep political implications and aims in Central Banks speeches. Political factors drive conflict in Central Banks Committees (Moschella and Diodati, 2020). Bargain among the committee defines how precise is the communication (Baerg, 2020). Central Banks will push for reforms until they see their legitimacy threatened (Braun et al., 2021).

The implementation of inflation targeting in Latin American countries can be read as a "transplantation"(Johnson, 2016) of imported monetary practices to new environments. During the process of internalization of these monetary practices, there is an expectation that the economy will work in line with the assumptions established in the international readings of inflation targeting (Bernanke et al., 1999). The limits of the outcomes of inflation targeting are usually attributed to dysfunctional domestic financial markets. Once Central Banks depends on liquid financial markets to influence activity and inflation(Braun, 2018), the promotion of market reforms is understood by Central Banks as the only way out for achieving its own goals.

But if Central Banks depend on market reforms to achieve its goals, the support for reforms on its speeches should be constant after the implementation of inflation targeting. Nevertheless, what the Monetary Policy Committee reports in Mexico and Brazil show is that Central Banks support reforms intensely, but not during every period. In Brazil, the main period of support for reforms starts in the beginning 2016. In Mexico, it starts in 2013 and fades after 2018.

This research uses Natural Language Processing techniques to analyse the communication of Brazilian and Mexican Central Banks. This method has proven useful to understand how Central Banks try to legitimize its actions and how their practices evolve (Baerg and Lowe, 2018; Diessner and Lisi, 2019). I also rely on secondary sources and policy documents to understand the policy reaction to Central Banks actions.

I argue that Central Banks in Latin America adopting inflation targeting will adopt reformist communication when there is a free market reformist in government. The Central Banks do not pressure constantly for market-oriented reforms, and do not strongly oppose leftist governments in its discourses. Instead, it tries to calm down markets under leftist governments and reform markets under rightist governments. During the Governments of Michel Temer (2016-2018) and Jair Bolsonaro (2019-2022) in Brazil the pension and labour market reforms promoted by the governments were catalysed by Central Bank's discourses. Similarly, the reforms promoted by Enrique Peña Nieto were supported by the Mexican Central Bank. On the other hand, in periods of leftist governments, as the Worker's Party Government in Brazil (2003-2016) and Morena in Mexico (2019-), Central Banks adopt a "Prudential" Communication, seeking stabilization of markets instead of market reforms. During leftist governments, the imperatives of credibility are higher not only towards financial markets, but also towards leftist governments.

We argue that alternative explanations for the use of reformist communication does not explain both cases. For this, we review the literature on the transnational network socialization, structural market power, identity background of the Central Bankers and Central bank Independence showing that those do not explain the timing of the reformist support.

Finally, the paper sheds new lights on the relationship between independent Central Banks and Governments. It is usually suggested that leftist governments tend to influence Central Banks, and reduce its independence (Dornbusch and Edwards, 1990; Acemoglu et al., 2013). Instead, we show that this relationship is currently complexified by the constant attempts of Central Banks to maintain its independent - and prudential - posture during leftist governments, but become increasingly politicized in rightist governments. Central Banks in inflation targeting countries in Latin America are reasonably independent from governments, but the way they exercise this independence is different under leftist and rightist governments.

In terms of institutional change, the paper suggests that Central Banks can act as "catalysts" of market reforms, but not as starters of reforms. During leftist governments, instead of proposing structural reforms, Central Banks will act as conservative and prudential stabilizers.

3 Central Banks actions in Latin America

Current defenders of the *financial dependency* theories point how Central Banks became a center piece on the financialization of the developing economies. (Reis and de Oliveira, 2021) argue that after the 1980's,

> "The economic intervention apparatus of developmental states – geared towards ISI practices and industrial policies—has been replaced by 'technical' Central Banks and Finance Ministries that act in the service of financialized accumulation. Fiscal austerity policies, tight inflation controls, and export-oriented incentives became the primary tools of economic policy.".

From the literature on financialization, the centrality of the Central Banks in planning the financial reforms. The inspiration from this literature comes from Karl Polanyi (1944, p.170) famous dictum that "laissez faire" was planned and imposed by the state. While the state would have a fundamental role on the commodification of the economies, the Central Bank would act on the opposite direction - provide forms of non-market coordination, by the time related to the control of flows of the gold standard (see also **?**). Polanyi (1944, p.228) claims that Central Banks were created with the goal of protecting markets against the markets themselves, to protect markets from the failures caused by the markets.

Although in the initial Polanyi contribution, the Central Bank is seem as a form of countermovement against commodification, authors following his tradition emphasized how Central Bank could act in the direction of freeing markets ((Krippner, 2011), (**?**)). Krippner (2011) while concurring with Polanyi claim that *laissez faire* was a product of the state, she argues that financialization of US economy had some unintended aspects. Especially, the main push towards financialization after the 1970's deregulation caused by Reagan's fiscal policy and Volcker's monetary policy shock. The high interest rates - seeking to fight inflation and reduce deficits - ended up creating the high margins in financial sector, leading to the growth of finance.

(Gabor, 2011) adds on to the choir of the the whole of central banks in economic liberalization. In her seminal work on the post-communist Romanian Central Bank, **?**, p.11 argues that "the central bank was instrumental in the redefinition of the relationship between state-owned production and state-owned banks along "impatient finance" lines". The monetary policy decisions had a central role in redefining the relationship between finance and state (Gabor, 2011, p.11). The frameworks tying monetary policy to demand-pulled inflation were important to justify high interest rates against criticism from the government, productive sector and justify central bank's push for liberalization (Gabor, 2011, p.218).

The concept of infrastructural power of the Central Bank helps to explain this causal relationships among Central Banks and financial reforms Braun et al. (2018). The controversies around the power of monetary policy can be read through the lenses of the infrastructural power of finance(Braun, 2018). The infrastructural power arises when the policies implemented by the Central Bank depends on the market infrastructure. The expected implementation of monetary policy would require that the open market operations of the Central Bank would balance around the target interest rate the whole set of the economy's interests rates. Braun (2018) explores the possibilities that private financial actors have to curtail the expected results of monetary policy. Since the state depends on the financial markets to achieve their desired policy outcomes, financial actors leverage on this dependence to force certain paths of policy action. In the case of Brazil, since a large share of debt was detained by Public Banks, these public banks were seen as infrastructural impediments to the conduct of monetary policy. In fact the concept of infrastructural power was born as the States infrastructural power, when using finance to achieve its goals:

> Michael Mann, who coined the concept, referred primarily to the infrastructural power of the state over civil society (Mann 1984; 1993). From this perspective, it appears that when treasuries, monetary authorities, or public development banks harness financial markets as vehicles of state power, they generally strengthen state capacity [...]. Going further, others argue that such infrastructural entanglements provide grounds for 'superseding the price

> mechanism' in certain parts of the financial system, or for democratising finance altogether [...]. The reverse dynamic, by contrast, is less understood: the political power that accrues to private financial actors as a result of state actors seeking to govern through financial markets. Braun (2018, p.3)

In fact, in a study on the European Central Bank, **?** find that the ECB pushed for "structural reforms" until 2014, when it became silent on the issue. The authors claim that the silence on the issue arise from a trade-off between the search of governability and the banks legitimacy. For improving its governability, the ECB considers that the market flexibilization is necessary, especially the labour market reforms, which would make wages respond to monetary policy shocks, increasing monetary policy power. On the other hand, since labour reforms are not under Central Bank's mandate, the pressure for labour market reforms clashes with the legitimate field of action.

The study of the ECB is interesting in a supranational context, but leaves unexplained how do Central Banks speak when responding to national dynamics. Besides, (**?**) explore less the times when Central Banks are *silent* about reforms. What do they talk about when they are not mentioning reforms?

4 Inflation Targeting Central Banks in Latin America

For a long time, inflation and monetary policy were a conflictual issue in Latin America. Not only the discussions around inflation divided politicians and academics, but the phenomenon itself was understood on distributive conflict terms. Conflicting claims over income would be the ultimate cause for inflation: workers' claims for higher wages would trigger companies' claims for higher prices. This mechanism would entail a wage-price spiral, that was the widespread understanding of the inflationary process. In accordance, the policies to curb inflation would try to solve the distributive conflicts of the inflationary process. Centralization of wage bargaining, sectoral price controls and the consultations with labor and companies were employed for controlling inflation.

The structuralist school (Sunkel, 1958; Rangel, 1963; Furtado, 1964), famous for its connections with the United Nations Economic Commission for Latin America (ECLAC), argued that the wage-price spiral was a propagation mechanism for the basic inflationary causes that arise from the underdeveloped productive structures. The competing claims over income would propagate the cost shocks originated from supply-side bottlenecks (Carvalho, 2019). The ultimate control of inflation would only be achieved through the development of productive structures.

This and similar views were highly influential for the conduct of monetary policy in the continent (Vernengo and Caldentey, 2014; Carvalho, 2019). Jacome et al. (2018) shows that until the 1990's, Central Banks in the whole Latin America had among its goals the promotion of development. Central Banks tried to alleviate balance of payments crises, to promote development and to incorporate country specific wage bargaining structures (Vernengo and Caldentey, 2014). The multiplicity of goals was supported by diverse actors, from industrialists, labor unions, monetary policy experts and government officials (Jacome et al., 2018; Franco, 2017). These actors not only shared the understanding of the inflationary process, but were part of the decision making, for instance,taking seats in the Monetary councils (Jacome et al., 2018).

The reign of developmentalist Central Banks came to and end in the 1990's, amid the complex socioeconomic transformations lived in the region, informed by neoliberal ideas. A new shared understanding of the inflationary process shaped new institutions and practices. Inflation was increasingly seen as an exclusive outcome of bad management of money supply and excessive government spending. The conflictual face of inflation and monetary policy was absent, and distributional conflicts stemming from monetary policy were ignored.

By that time, overcoming hyperinflation was the measure of success for Latin American Presidents(**?**). Every social class would come to agree that the main goal of economic policy was to control the extremely high inflation. Governments experimented institutionally, imported and discarded new practices in a fast pace. The solution for the "inflation problem" involved reducing the heavy external debts, changing price indexation practices, and reforming the Central Bank. The overcoming of high inflation in almost every country inaugurated a phase that has been labelled the "golden age of Central Banks" in Latin America (Jacome et al., 2018). From the 1990's on, every Latin American Central Bank would become more independent and increase its focus on the inflation control.

The control of inflation would be achieved through the management of interest rates. The final goal would be the search for the market determined interest rate that would equilibrate supply and demand, maintaining stable inflation. Following the Washington Consensus, financial liberalisation aimed to obtain interest rates determined by the market. The market determination of interest rates would serve two goals, first it would avoid "the resource misallocation that results from bureaucrats rationing credit according to arbitrary criteria"(Williamson, 1990, p.13). And second, "real interest rates should be positive, so as to discourage capital flight and, according to some, increase savings" (Williamson, 1990, p.13)[1]. As the economist who coined the term Washington Consensus explains:

> *Financial Liberalisation.* The ultimate objective is market-determined interest-rates, but experience shows that, under conditions of a chronic lack of confidence, market-determined rates can be so high as to threaten financial solvency of productive enterprises and government. Under that circumstance a sensible interim objective is the abolition of preferential interest rates for privileged borrowers and achievement of a moderately positive real interest rates. (Williamson, 1996, p.14)

The World Bank and the IMF relied on research by Ronald McKinnon and Edward Shaw to justify the liberalization of interest rates in developing countries since the 1970s (Studart, 1995). Ronald McKinnon and Edward Shaw studied the relationship between finance and development. According to these authors, underdeveloped countries suffered from a lack of depth in the financial system due to financial repression, caused by government action. Governments restricted loanable funds, limiting corporate financing. Policies such as credit targeting, high compulsory reserve rates, regulated real interest rates, low bank competition, barriers to entry for international banks, and the existence of public banks would prevent real interest rates from being determined by the market and would be below the equilibrium level (McKinnon, 1993).

Low interest rates, conditioned by state action, would lead to a low level of savings and reduced investment. Liberalization of financial markets would eliminate such frictions and allow the market to be driven to the desirable equilibrium. To the extent that interest rates were raised toward the equilibrium rate, there would be a positive effect on growth. As interest rates rise, savings, capital accumulation, and resource allocation efficiency would increase.

Despite their widespread use for policy prescription, the assumptions of the financial liberalization models were criticized for their poor econometric evidence and the successive banking and exchange rate crises in countries that adopted the liberalization measures (Hermann, 2003). After the flaws were admitted by the original proponents, financial liberalization proposals began to call for a gradualism in the adoption of reforms and an expansion in their scope to incorporate "macroprudential" measures (McKinnon, 1993).

Liberalization should be preceded by fiscal adjustment, monetary stabilization and

[1] As John Williamson (1990, p.13) concedes, the maintenance of high interest rates may harm investment (and consumption) and lead to a explosion in public debt.

reform of the monetary policy model, which should have price stability as the sole objective. After "macroeconomic stabilization", capital and exchange market liberalization could be safely adopted. In the medium term, banking liberalization policies should be adopted, which would include the closing of directed credit lines, privatization of public banks, and policies to stimulate banking competition.

A central institutional innovation was the adoption of inflation targeting [2]. In its golden age, Central Banks are independent and should target only one variable: inflation. Until the 2008 crisis, political science literature has not focused on specific Central Banks practices, as inflation targeting[3], even though stabilizing inflation can be seen as the defining characteristic of the neoliberal macroeconomic regime (Blyth and Matthijs, 2017)[4].

For allowing a macroeconomic regime focused solely on inflation stability to exist, a heavy wave of institutional change had to occur (Blyth and Matthijs, 2017, p.209):

> certain actors were empowered or disempowered by that target, and certain institutions were privileged over others. Workers and debtors have gradually seen their powers and returns curtailed as inflation has fallen and the ability to bargain for a greater share of value has collapsed as trade unions' wings were clipped while the owners of capital, and creditors, have prospered. Similarly, on an institutional level, to ensure price stability an independent central bank and a flexible labor market, both institutions designed to mitigate inflationary pressures have been widely spread. In contrast, incomes policies and corporatist- type institutions were gradually weeded out.

Deregulated financial markets, disempowered workers and a central role for monetary policy are the three institutional changes required to establish the new regime (Blyth and Matthijs, 2017, p.216). Those pre-requisites resulted in new practices that could stabilize policies around its core constitutive rules. In this context, inflation targeting became an "anchoring practice" (Adler, 2019, p.127)- that defined the criteria used in more specific targets. Other practices, as interventions in the foreign exchange markets and government budgeting could not conflict the core rule of inflation targeting. [5]

[2]It is interesting to note that inflation targeting was never adopted to curb inflation, but mainly to maintain it stable (Jacome et al., 2018).

[3]Mukherjee and Singer (2008) is a notable exception, who evidence that the adoption of inflation targeting occurs in countries where the Central Bank and the political authorities agree that inflation control should be the main goal of monetary policy.

[4]Blyth and Matthijs (2017) are well aware of the risk of reducing neoliberal macroeconomic regime to a sole goal. The authors point that this is an empirical issue that can be confirmed or rejected. An interesting test is to evaluate under which conditions countries are able and inclined to modulate among different goals.

[5]In the foreign exchange markets, the inflation targeting has been associated with the adoption of dirty floating exchange rates, with Central Banks intervening in order to reduce the volatility, employing a wide range of instruments

Latin America presents an interesting region for studying how inflation targeting, a practice created in developed countries and conflicting with past economic policy goals, could take root and evolve over time. Especially interesting is to evaluate how different actors promoted or resisted the adoption and stabilization of the practice.

Inflation targeting was formally adopted by an increasing number of Latin American countries since the first countries started adopting in 1990's (see Table 1,). After a first wave that included Brazil, Colombia, Chile, Mexico and Peru, other countries slowly introduced it. Countries with a with a strong developmentalist history, as Brazil and Mexico, adopted in the first wave. Chile, Colombia and Peru would notable for their liberalized insertion in the world economy (Bizberg, 2019). In the sequence, smaller economies as Guatemala and Uruguay would adopt inflation targeting years before 2008 financial crisis, while Paraguay, Costa Rica and Republica Dominicana adopted right after the crisis. Ecuador and Venezuela, both oil exporting countries, did not adopt inflation targeting, but followed instead very different paths. In 2000, Ecuador adopted the North-American dollar as the national currency. Meanwhile, Venezuela struggled for maintaining a workable monetary sovereignty. In another interesting history, Argentina is considered to be the only country where inflation target failed, for its adoption in 2017 and subsequent abandonment. Smaller economies, as those from Caribbean, were believed not suitable for adopting inflation targeting, but the more recent implementation by Dominican Republic and Jamaica has questioned this common wisdom.

Table 1: Monetary Policy Frameworks in Latin America and Caribbean

Inflation Targeting (Adoption Year)	Other		
	Exchange Anchor	Monetary Aggregate	Other
Chile (1999)	Ecuador	Bolivia	Venezuela
Brazil (1999)	El Salvador	Suriname	Cuba
Colômbia (1999)	Panamá	Argentina*	Haiti
Mexico (2001)	ECCU		
Peru (2002)	Guyana		
Guatemala (2006)	Trinindad and Tobago		
Uruguay (2007)	Curaçao, Bahamas		
Paraguay (2011)	Honduras		
Costa Rica(2011)	Nicaragua		
República Dominicana (2012)	Barbados, Belize		
Jamaica (2017)			

Source: Author's elaboration based on Central Bank's websites and IMF's Annual Report on Exchange Arrangements and Exchange Restrictions.
* Argentina adopted inflation targeting for small time frame between 2017 and 2018, during a balance of payments crisis.

such as repurchasing options and exchange swaps. Regarding fiscal policy, inflation targeting has been associated to stronger fiscal policy rules. Financial Development policies, and the action of Development Banks, have also been questioned for its competing effect with inflation targeting (Bonomo et al., 2016).

Several economic papers were devoted to the statistical analysis why countries adopt inflation targeting (Mishkin, 2000; Hu, 2006; Mukherjee and Singer, 2008; Samarina and De Haan, 2014; Ismailov et al., 2016; Soe and Kakinaka, 2018). In a sistematic review, Samarina and De Haan (2014) find that “ countries with low inflation, high output and exchange rate volatility, a flexible exchange rate regime, fiscal discipline, less developed financial markets, and a market-based financial system are more likely to adopt IT” (Samarina and De Haan, 2014, p.372). From this statistical literature, Mukherjee and Singer (2008) is the only article that seriously evaluates political variables relevant for the adoption of inflation targeting. Besides including the traditional economic variables, Mukherjee and Singer (2008) tests whether partisanship affects the adoption of inflation targeting, finding that the probability of adopting is higher when a country combines a right-leaning government and a central bank without regulatory authority. By looking into the necessity of an alignment between parties and Central Bank officials, Mukherjee and Singer (2008) echoes theories that understand that diffusion requires a domestic consensus on the practice (McNamara, 1998). Although relevant from an heuristic point of view, this literature is hardly able to deal with different trajectories for the adoption of inflation targeting.

In contrast with the original experience in New Zealand, when Latin American countries introduced inflation targeting, handbooks on inflation targeting written by the North-American Academy already existed. They were used as a guide for the newcomers. However, it doesn’t mean that there wasn’t any degree of experimentation and creation. The political and intellectual struggles to implement certain practice take different forms depending on the past trajectory of the country (Ban, 2016).

For the Latin American cases, the only literature evaluating the adoption of inflation targeting comes from Central Banks itself, from the IMF or from the ECLAC (Jacome et al., 2018; Pérez Caldentey and Vernengo, 2020). Those accounts focus mainly on the economic outcomes of different policies, but less on how come such policies came to be accepted and adopted.

5 Communication of Central Banks under inflation targeting

Central Bank’s communicational efforts were initially seen with suspicion by Central Bankers(Krippner, 2011, p.114), but were slowly incorporated as part of the policy framework itself - as a discursive practice that has independent effects. As Central Banks become more outspoken, its announcements become guides to market reactions, and politicians become increasingly aware of the details of what has been said. As inflation targeting became the main anchoring practice (Adler, 2019) of monetary policy, its communicational elements became central for the conduct of monetary policy. Krippner (2011, p.131) shows the surprising role of communication in the case of US federal reserve:

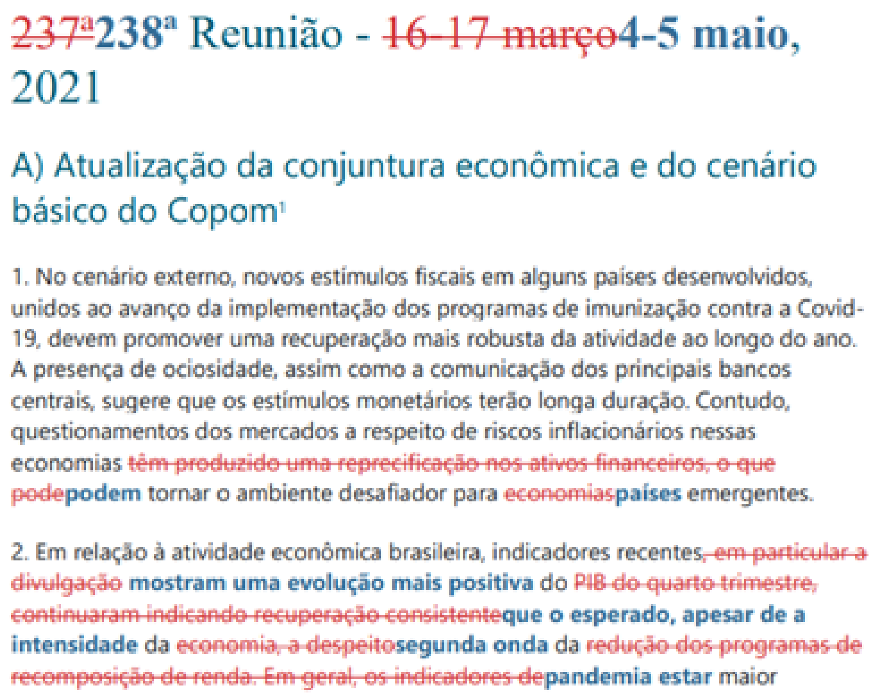
> As committee members gained experience with the new disclosure policy over the course of 1994, they observed a curious result. When the Federal Reserve announced where it intended the federal funds rate to go, traders immediately moved the rate in anticipation of the move, and as a result the Federal Reserve actually had to conduct fewer operations in the reserve market to obtain the desired rate.93 British central banker Charles Goodhart (2000; emphasis added) referred to this as the advent of "open mouth operations."94 Perhaps more important than the effect of open mouth operations on the federal funds market, policymakers' increasingly expansive explanations of FOMC actions in statements, speeches, and congressional testimony provided opportunities to "condition" responses in the bond market. As a result, it was not necessary to adjust the federal funds rate as frequently or by as much to achieve necessary adjustments in long- term interest rates. As Board Adviser Donald Kohn explained, "Because the bond market anticipates your actions, long-term rates rise to the levels needed to counter the infl ation impulse with much less movement in the funds rate."

By announcing the policy rate changes, Central Banks have to put less effort into the open market operations. By their "open mouth operations" Central Banks can - to some extent - obtain the same results as the the actual bond purchases.

In the cases of Brazil and Mexico, monetary policy announcements have been central to the relationship of the banks with markets and politicians. The Bank of Mexico is obliged under the Article 51 of the "Bank of Mexico Act" to present to the Federal Government and to the Congress a quarterly Inflation Report (Capraro and Panico, 2021). While the Inflation report is a legal obligation with the congress and the federal government, the minutes of the monetary policy decisions are the most widely-repercuted and scrutinized document of monetary policy.

The monetary policy announcement are in general well structured documents, where the Central Bank announce the policy decision, justifies it with macroeconomic data and often offers prospects of future direction of change of rates. Given the forward looking tone of the reports, financial markets follow closely the word choices in each minute released, comparing changes from meeting to meeting. Figure 5 shows an annotated minute, from may 2021, where the unknown author has compared the former minute and the current one. This kind of document have broad circulation in WhatsApp groups dedicated to financial markets discussions, and commentators pay special attention to the tone of the forecasts, that can indicate the direction of the future monetary policy changes. For instance, in Figure 5 it shows an alteration from a initial recuperation of the pandemic effects to a surprise of the intensity of the recuperation, which could be interpreted - by financial market analysts as a dovish change.

Figure 1: Annotated editions in a Brazilian Minute of Monetary Policy Decision (4-5 May of 2021)



~~237ª~~238ª Reunião - ~~16-17 março~~4-5 maio, 2021

A) Atualização da conjuntura econômica e do cenário básico do Copom[1]

1. No cenário externo, novos estímulos fiscais em alguns países desenvolvidos, unidos ao avanço da implementação dos programas de imunização contra a Covid-19, devem promover uma recuperação mais robusta da atividade ao longo do ano. A presença de ociosidade, assim como a comunicação dos principais bancos centrais, sugere que os estímulos monetários terão longa duração. Contudo, questionamentos dos mercados a respeito de riscos inflacionários nessas economias ~~têm produzido uma reprecificação nos ativos financeiros, o que pode~~**podem** tornar o ambiente desafiador para ~~economias~~**países** emergentes.

2. Em relação à atividade econômica brasileira, indicadores recentes~~, em particular a divulgação~~ **mostram uma evolução mais positiva** do ~~PIB do quarto trimestre, continuaram indicando recuperação consistente~~**que o esperado, apesar de a intensidade** da ~~economia, a despeito~~**segunda onda** da ~~redução dos programas de recomposição de renda. Em geral, os indicadores de~~**pandemia estar** maior

Source: Document circulated in Brazilian whatsapp group of discussion on Financial Markets and Central Banking .

A central tenet of inflation targeting has been the communication of policy targets and the Central Banks' interpretation of economic evolution through inflation reports and the minutes of the committees of monetary policy. Although we have a great understanding of the initial adoption of inflation targeting, much less has been said about its further evolution and the evolution of its comunication. Taylor-Rules estimations have advanced the understanding of Central Banks' preferences on inflation and output (Moura and de Carvalho, 2010; Modenesi et al., 2013). But traditional Taylor rules leave aside the evolution and ignore the communicative aspects of inflation targeting (Baerg and Lowe, 2018). This is problematic considering that communication and transparency are central tenets of contemporary monetary policy frameworks

(Svensson, 2010b; Holmes, 2009).

Central Banks communication provides a relevant measure of the main ideas influencing policy. When a Central Bank speaks, it reveals their beliefs, intentions and expectations. Central Bank communication coordinates markets expectations and directly affects asset prices. The question become how to interpret the communication of the Central Banks, in a reliable and replicable way. Economists and political scientists have employed a range of natural language processing techniques to understand how Central Banks speak and what are the effects of its speeches.

For instance, Silva et al. (2020) investigates the effects on financial markets of news related to monetary policy news in Brazil. Silva et al. (2020) creates an index of positive and negative news, based on more than 2000 news published by Broadcast, a Brazilian news source widely adopted by financial markets. The work finds that there is a two way relationship between news and financial markets asset prices. While negative news on monetary policy affects exchange rates and stock indices, the change in stock indices and prices also regulates the tone of the news disclosure. The approach adopted by Silva et al. (2020) is less relevant for our purposes, since it doesn't deal directly with the Central Bank policy, but with the way it is interpreted by media sources.

Garcia-Herrero et al. (2019); Aguilar and Pérez-Cervantes (2021) study how the talk of the Mexican Central Bank affects markets. Garcia-Herrero et al. (2019) evaluates the effects of the *tone* of (BdM) on the money markets and find that the more hawkish the tone, higher are money markets responses. As in the work of Silva et al. (2020), in the work of Garcia-Herrero et al. (2019) the tone is assigned by the researcher, giving more room for interpretation and lacking replicability.

Aguilar and Pérez-Cervantes (2021) are less reliant on researchers' discretion, due to the adoption of Natural Language Processing techniques. (Aguilar and Pérez-Cervantes, 2021) shows that the communication of Mexican Central Bank "coordinates" (Schmidt, 2008) the talk of Banks with their clients. Before the communication of the Central Bank, Private Banks are more dispersed in their talks with clients, but after the communication, their talk converge on the evaluation of the outlook of the economy and on forecasts.

These works inspires further investigation not only on the effects of Central Banks over markets, but on the comprehension of Central Banks policies itself. Research on the communication of Central Banks has been fruitful for understanding the evolution of policies in European and North American contexts (Baerg and Lowe, 2018; Diessner and Lisi, 2019; Moschella et al., 2020), but is incipient for Latin American economies.

5.1 Methods and Data

5.1.1 Data

The main corpus consists of the monetary policy decisions by the Mexican and Brazilian Central banks. Those decisions were obtained from the Central Bank websites, using web-scrapping techniques. The corpus covers the whole period of adoption of inflation targeting, which was formally implemented in Brazil in 1999 and in Mexico in 2001. The Brazilian reports range from 1998 to the latest available report on march 2021, covering 216 documents. For Mexico the reports start on January 2000 and are available until November 2021, totaling 193 documents. The future goal of the research is to enrich the corpus of text, with data from other sources besides the monetary decisions, including presidential speeches, inflation reports - and possibly working papers. The access to this data will be further eased with the adoption of web-scrapping techniques, that were already developed for the extraction of Monetary Policy Decisions. Most of the web scrapping and data analysis was performed in Python, but the web scrapping of Brazilian Central bank was performed in R.

5.1.2 Topic Analysis

The text corpus was modelled through Latent Dirichlet Allocation (LDA), a method for obtaining the topics contained in a document. LDA and similar methods have recently been proved a fruitful way of evaluating the communication of Central Banks (Baerg and Lowe, 2018; Ribeiro and Ribeiro, 2017; Moschella et al., 2020; Diessner and Lisi, 2019; Aguilar and Pérez-Cervantes, 2021).

For obtaining meaningful results from the LDA, the text is cleaned and non-relevant words are removed. The words were transformed to its root form, by Python methods of lemmatization in Portuguese and Spanish [6]. After, common expressions formed by two or three words (bigrams and trigrams) were obtained. A share of the more common and less common words and expressions was removed, seeking to improve the coherence of topics (Hovy, 2020). The removal of frequent words ends up excluding most common topics such as inflation and growth, but is important to make documents distinguishable. Every document in the corpus contain the words inflation and GDP, so the presence of these words isn't particularly informative about the evolution of monetary policy. Finally, the LDA model was computed through the library gensim, in Python.

[6] Lemmatization achieved better results than tokenization in terms of topic coherence. Python tokenizers in Spanish and Portuguese are not as reliable as those for english languade.

The LDA model seeks to uncover the structure of a corpus of text by extracting its more relevant topics. The topics review which are the main threads, issues and concerns of the texts (Hovy, 2020, p.72). Two metrics are important for the LDA interpretation: the likelihood of each word for each topic and the likelihood of each topic for a specific document. The words per topic gives an indication of the meanings of the topic. And the topic per document shows how relevant those topics are for each document.

The main expected result is to understand how the main topics on the communication of the Central Banks evolved, after the adoption of inflation targeting in Brazil and Mexico. The number of topics in a corpus of texts is chosen by the researcher, based on the topic coherence. When a topic is coherent it is self-explanatory and easy to interpret by anyone who reads them (Hovy, 2020, p.78). We evaluated two measures of coherence, for choosing the number of topics the UMass evaluation score and the Cv score as recommended by Hovy (2020). Besides the measures of coherence, various numbers of topics were attempted, in order to achieve the best interpretability of the data.

Topic modeling provides an automated solution to investigate the timing of changes in a broad range of topics in Central banking. The evaluation of temporal dimension and broader topics provides interesting advances in relation to traditional techniques to evaluate Central Bank's ideas. Traditionally, estimations of Taylor Rules (Taylor, 1993; Moura and de Carvalho, 2010) have divided countries across the *hawkish/dovish* axis, regarding their preferences for lower inflation or higher growth. Those measures can barely deal with changes in thematic dimensions beyond inflation. Moreover, changes in Central Bank preferences are usually estimated with time varying parameters, which don't perform well with fewer observations.

6 Central Banks *frames* in Brazil and Mexico

The sections below presents the interpretation of the topic modelling performed for the decisions of monetary policy in Brazil and Mexico. A first observation is that the topics identified clearly define distinct stages on central banks communication. The phases largely relate to presidential mandates, what allows us to interpret how the Central Bank speaks under different governments. Even in Mexico, a case of high formal Central Bank Independence, it is clear the evolution of Central Bank communication, in different governments.

In their communication with markets, Central Banks go well beyond the traditional analysis of inflation expectations and foreign conditions. Under leftist governments, Central Banks - in Brazil and Mexico - Have adopted a "Prudential" discourse, that seeks to reassure markets of the normality of operations, even under complex financial situations. An intensification of the mentions of "reforms" was identified in both countries, in a movement that initiates after the 2008 crisis, but that takes further momentum after 2012.

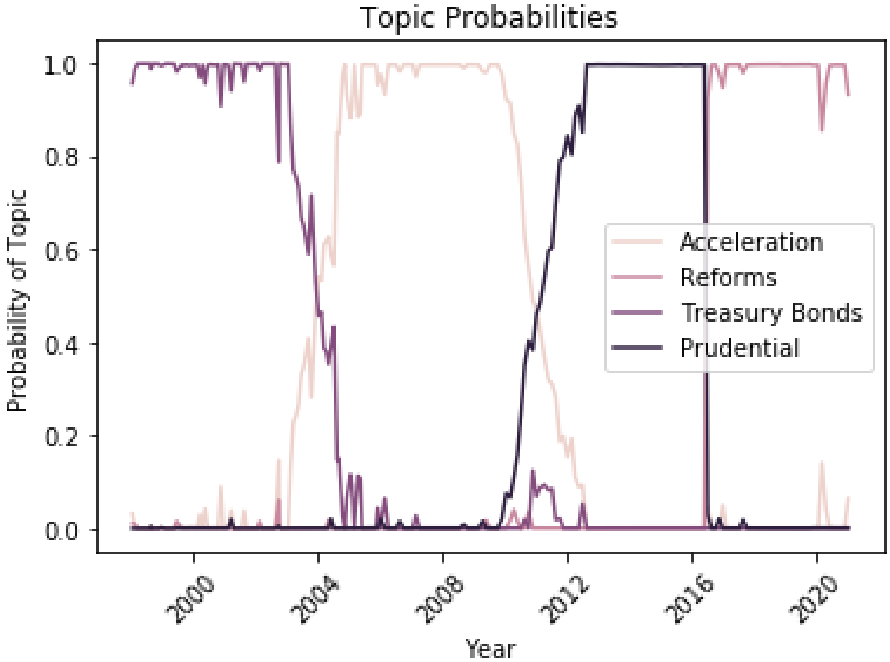
6.1 Brazil

The evolution of monetary announcements distinguishes 4 phases in Brazil, identified by the most relevant topic on each phase. Topics were labeled according to the table 2.

Treasury Bonds Immediately after the implementation of inflation targeting, the main concerns were with conventional measures of monetary policy. The main relevant words include "LFT" and "LTN", which are the Portuguese acronym for the Treasury Financial Bonds and Bonds of the National treasury[7]. Traditional instruments, such as compulsory deposits and bonds auctions, are also distinctively represented at the initial phase of *the sample*. The initial period includes the aftermath of the Russian crisis, and the Brazilian devaluation crisis that led to the adoption of inflation targeting. During the initial period, Central Bankers struggled to consolidate practices of monetary policy and adapt to the highly volatile international financial markets. The organization of the committee of monetary policy, the taxation of speculative capital and the intensification of open market operations occurred under this first phase (Lopes, 2013; Franco, 2017). The period also marks a transition to Workers' Party government, in which the Central Bank performed a role of reassuring markets of a stable transition (do Brasil, 2019).

[7]LFTs are indexed to the policy interest rates and the LTN are fixed rate bonds, currently they are named Selic-Treasury and Fixed-rate Treasury.

Figure 2: The topics of Brazilian Central Bank communication 2000 - 2021



Source: Author's elaboration - based on the minutes of the Monetary Policy Committee of the Brazilian Central Bank.

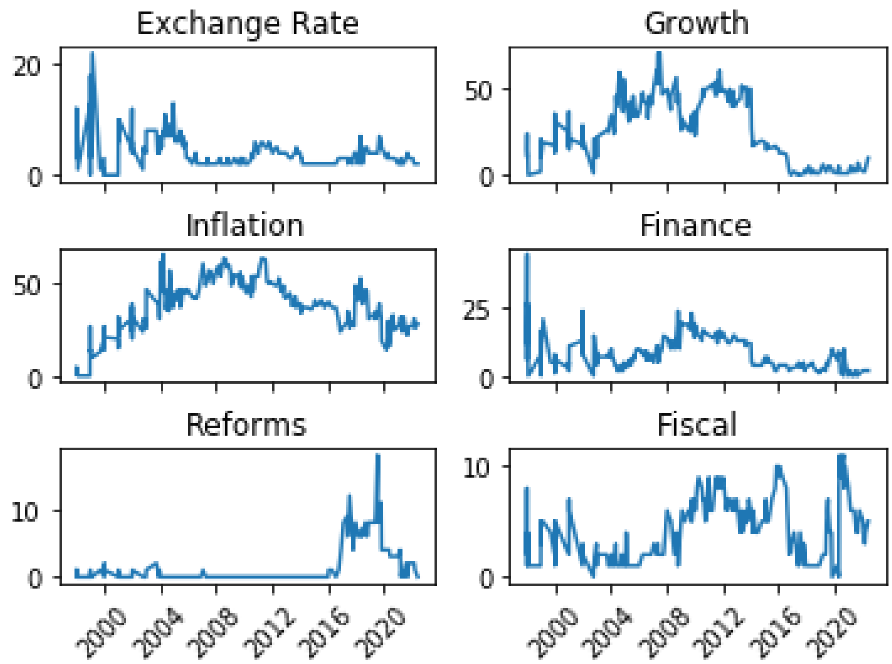
Table 2: Brazilian Minutes: 10 Main words of each topic

Label	10 First words of the topic
Acceleration	"substanc", "vesp", "deflaca", "exib", "inic" , "aceler", "man", "vag", "max", "alcool"
Reforms	"reform", "ancor", "focu", "dire", "debat", "concord", "atualizaca", "prescrev", "desinflaca", "barr",
Treasury bonds	"venc", "lft", "leilo", "resgat", "deposit", "ltn", "cart", "colegi", "recolh", "intenco",
Prudential	"pond", "concessa", "ibc br", "repercusso", "ocorrenc", "zon", "complex", "ald", "sidn", "agricult"

Until 2003: Foreign Finance and exchange dominance

The initial period is marked by the mentions to the pre-inflation target interest rates and inflation measures. A pronounced space for exchange rate and financial discussions. (Diessner and Lisi, 2019) points that the first mention to "financial dominance" is in a text of Brazilian Central Bank. And this is related to the association of financial dominance and exchange rate and external pressures. In the beginning of the implementation of inflation targeting in Brazil the main preoccupation was the alignment of foreign markets expectations (Bogdanski et al., 2000). These expectations were all

Figure 3: Occurrences of chosen words in Brazilian minutes



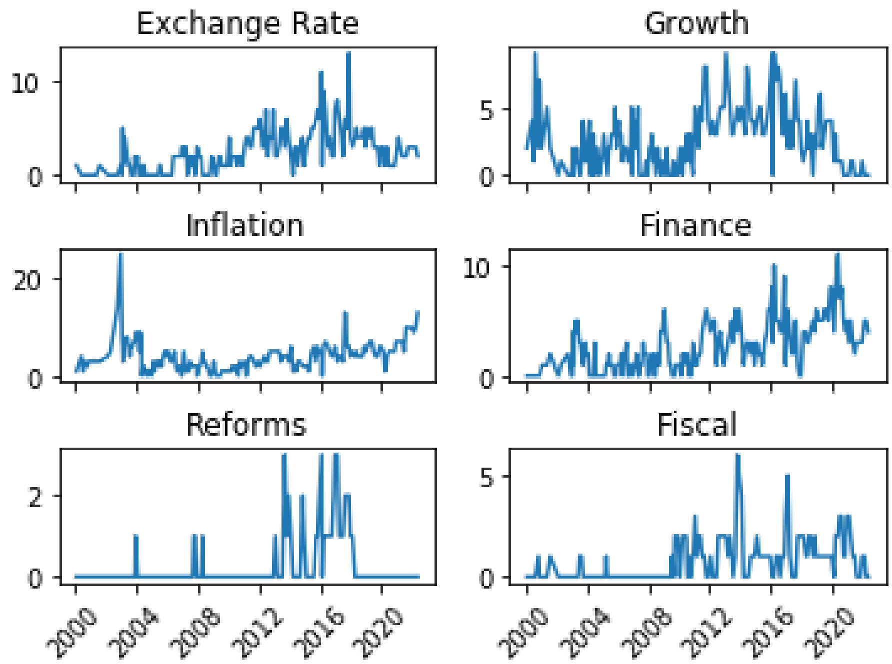
Source: Author's elaboration - based on the minutes of the Monetary Policy Committee of the Brazilian Central Bank.

associated with the "financial dominance".

2004-2008: "Conventional Monetary policy": The two mandates of Luiz Inacio Lula da Silva, a former metalworker elected in a center-left platform. The first years of Lula's government were of high growth and moderate income distribution, what was pushed by the rise in commodity prices (Campello, 2015). The period of international tranquil had a brief interval during the 2008 financial crisis, and bounced back with the strengthened capital flows pushed by Quantitative Easing in developed countries. During this time, the main distinct words from Central Bank communication are deflation and acceleration, which shows a concern with the goals of monetary policy, on inflation and growth.

The period of Lula's government before the Great Financial Crisis was marked by what became called "conventional monetary policy". Normal times were guaranteed by stable international financial markets, increasing commodity prices and stable rates of growth and inflation. The Brazilian Central Bank had its talk focused around the common hawkish and dovish divisions, and the respective focus on "Inflation" or "Growth". Even if inflation was controlled during the whole period, it had an increasing salience until 2012. The actual peak on the consumer price index happened in 2015, when the number of mentions to the term inflation in the reports had dropped.

Figure 4: Occurrences of chosen words in Mexican minutes



Source: Author's elaboration - based on the minutes of the Monetary Policy Committee of the Mexican Central Bank.

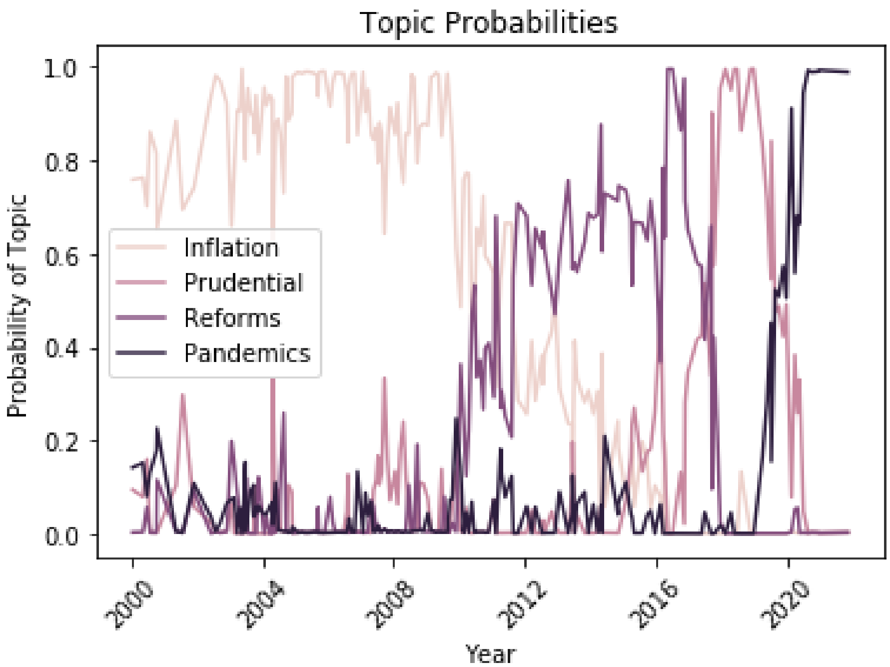
2008-2014: "Prudential tone - fiscal financial dominance":The former concerns with traditional goals of monetary policy on inflation and acceleration are incrementally transformed after 2010. After the 2010 crisis, and specially, after 2012 and the North American Taper Tantrum, a prudential discourse takes place. Prudence is seeing here as measures to reassure financial markets of the financial stability of the country. The period coincides with Worker's Party Dilma Rouseff government, which attempted the adoption of a new developmentalist project.

2008 crisis generated a wave of comments on the financial and fiscal nexus of monetary policy, that wasn't felt before. After the crisis both the financial issues became more influential in monetary economics and fiscal issues became more salient, both for some influential texts on ricardian equivalence and due to increased fiscal burden for the actions taken (in Brazil) to deal with the slowdown in economic growth. The financial wave inaugurates a new understanding of monetary policy, but in the speech of CB's it doesn't appear the reformism.

2016-2022: "Reformism":

After the prudential tone, an emphasis on reforms takes place at the Central Bank. Those reforms are accompanied by an increased emphasis on "anchoring" expectations and on market expectations through the "focus" bulletin. The period initiates in 2016, after the impeachment of Dilma Rouseff and the comprehends the mandates of Michel Temer and Jair Bolsonaro. During the period, the reforms of financial system included the restrain of public banks, the formal independence of Central Bank, a labor reform and a pensions reform.

Figure 5: The topics on Banco de Mexico communication 2000 - 2021



Source: Author's elaboration - based on the monetary policy decisions of the Banco de Mexico.

Table 3: Mexican Minutes: 10 Main words of each topic

Label	10 First words of the topic
Inflation	"inflacion_anual", "quincen", "pagin", "ofert", "vigor", "grafic", "aliment", "inpc", "comenz", "vari"
Prudential	"enfrent", "posicion", "sesg", "fortalec", "cotizacion", "mantuv", "rang", "on", "adopt", "variacion"
Reforms	"posibil", "transitori", "moment", "estructural", "mantuv", "prevalec", "permanent", "pued", "provenient", "reform"
Pandemics	"oper", "inclu", "sujet", "adopt", "sosten", "persistent", "decidi", "estan", "miembr", "ret"

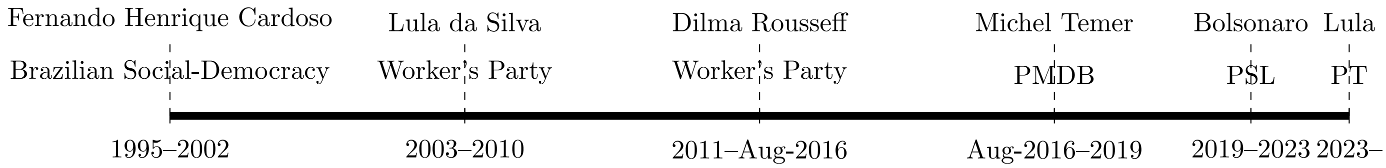


Figure 6: Presidents of Brazil since 1995

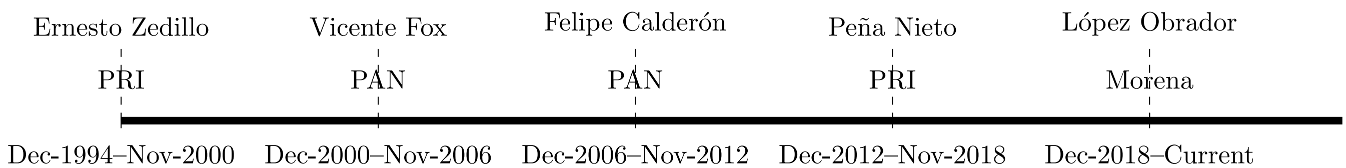


Figure 7: Presidents of Mexico since December - 1994

6.2 Mexico

Four topics were identified by the LDA algorithm and named according to the main words of the topic, as shown in Table 3 [8].

Figure 5 shows the probability that each topic was present on the decisions of monetary policy over time. The technique allows us to evidence a great transformation of monetary policy communication that initiated before the 2008 crisis, but that gained momentum after 2012. This new strategy persists during the pandemic, after a brief interregnum where a prudential communication was adopted. Four communicative strategies where adopted by Mexican Central Bank, under formal inflation targeting. The first strategy focus on traditional inflationary pressures, from food prices and consumer prices. The 2008 crisis inaugurated a strategy in which appreciation and structural reforms took the center stage of monetary policy concerns. Finally, following the election of Andrés Manuel Lopez Obrador, the central bank adopts a prudential communicative strategy. The prudential strategy emphasizes the normality of the banks operations, reassuring the financial stability. Interestingly, the prudential strategy was also present in the beginning of the formal implementation of inflation targeting.

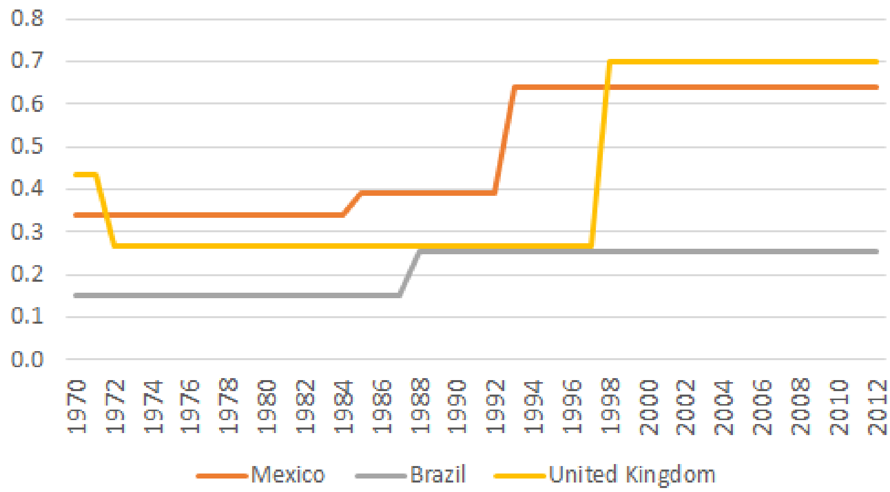
7 Discussion: Explaining Central Banks in Mexico and Brazil

Most of the literature on Central Banks in Latin America argues that the lower position in the international currency hierarchy leads Central Banks to push for market-based practices. Although it is true that market pressures are highly influential on the deter-

[8] Coherence tests have been performed for fine tuning the model and selecting the number of topics.

mination of domestic practices in developing countries(Kaltenbrunner and Painceira, 2017; Roos, 2019; de Paula et al., 2017), it doesn't explain the timing of the adoption of the reformist tone. In Brazil, structural market pressures were high during most of the period post-2014, and the downgrade on its bonds in the end of 2015 increased the pressure. But those structural pressures were not strong in Mexico across the period the Central Bank adopted the reformist tone. Moreover, both Central Banks accumulated large reserves during the commodity super cycle from 2003 to 2014, what largely soothes the external foreign pressures on domestic markets.

Figure 8: Central Bank Independence Index Brazil and Mexico (1970-2012)



Source: Data from Garriga (2016), UK data included for the sake of comparison.

Central Bank Independence or the training of the Central Bankers also doesn't explain the variations in the tone of Central Bank communication. While Brazil had a less formally independent Central Bank (see Figure 8), both Central Banks were *de facto* independent (Jacome et al., 2018). The reliance on interest rates as the main guidance tool was questioned by Brazilian politicians and public bankers, but the Independence of Brazilian Central Bank was barely questioned during the last twenty years. The possible exception is the period when, under Alexandre Tombini's lead (2011-2016), the Central Bank decided to lower interest rates despite the high inflation expectations. This suspicions were later abandoned when the Central Bank restarted a rate hike under the same administration and started mentioning reforms on its speeches.

Both Central Banks were intensely tied with transnational Central Banks Networks during the whole period of the adoption of inflation targeting(Jacome et al., 2018; Vernengo, 2016; Babb, 2004; **?**). [9]. The training of Brazilian and Mexican Central

[9] Moreover, the tie with transnational network could imply that Latin American Central Banks would follow the lead

Bankers are strongly associated with North-American Universities and the International Financial System. In Brazil, the economics post-graduate programs in the country today are polarized between heterodox and orthodox centers, epitomized by UNICAMP and PUC-RIO, respectively (Fernandez and Suprinyak, 2019; Dequech, 2018). But as we can see on Table , the Central Bank has been only led by US-trained economists, or by a banker in the case of Henrique Meirelles. After the 1990's the department of economics at PUC-Rio became highly influential in monetary policy due to its strong ties to North-American universities and financial markets (Codato et al., 2016).

Table 4: Brazilian Central Bank's Presidents Academic Background

In Office		Central Bank President	Education
Aug-97	Jan-99	Gustavo Franco	M.A Puc-Rio; PhD Harvard
Jan-99	Mar-99	Francisco Lopes	B.A UFRJ; M.A EPGE/FGV; PhD Harvard
Mar-99	Dec-02	Arminio Fraga Neto	B.A and M.A Puc-Rio; PhD Princeton
Jan-03	Dec-10	Henrique Meirelles	B.A UFRJ; MBA UFRJ
Jan-11	Jun-16	Alexandre Tombini	B.A UNB; PhD Illinois
Jun-16	Feb-19	Ilan Goldfajn	B.A UFRJ; M.A PUC RIO; Ph.D MIT
Feb-19	Current	Roberto Campos Neto	B.A and M.A UCLA

Source: BCB website.

In Mexico, the breakdown of developmentalist strategies and the Central Bank reforms in the 1970's was also accompanied by a polarization of economics program. Universidad Autónoma de Mexico leaned toward on Marxist, dependency theories and heterodox economics and ITAM approached the University of Chicago. But as occurred in Brazil, since the 1990's Central Bankers were almost only recruited from ITAM and North-American universities (Babb, 2004), see also Table 5 .

Table 5: Mexican Central Bank General Directors Academic Background

In Office		Central Bank President	Education
Jan-98	Dec-09	Guillermo Ortiz Martínez	B.A UNAM; PhD Standford
Jan-10	Dec-17	Agustín Carstens	B.A ITAM; PhD University of Chicago
Jan-17	Nov-17	Alejandro Díaz de León	B.A ITAM; MA Yale
Jan-22	Current	Victoria Rodríguez Ceja	B.A Tec De Monterrey; M.A Colmex

Source: Banco de Mexico website.

Although inflation targeting

of central countries networs. But the trends in Europe and Latin America diverge, suggesting domestic causes for the reformist tones. The mentions for "structural reforms" in the European Central Bank has its peak in the beginning of the 2000's and has since a diminishing recent salience(?). In Brazil and Mexico the reformist tone comes stronger after 2013 in Mexico and 2016 in Brazil.

	Hard Times	Stable Times
Pre-2008	Hawkish	Dovish
Post-2008	Prudential or Reformist depending on the party in power	Prudential

8 Conclusions

Politics in hard times are commonly characterized as an interest based-politics (Gourevitch, 1986). While it's true that Central Bank's policies have generally acted in the direction of freeing markets their words and acts are subject to legitimacy constrains that relate to their public nature.

Central Banks in Latin America, acting under inflation targeting, modulate their declarations in relation to the government in power. This is true for formally and informally independent Central Banks. Even when disagreeing from governments policies, Central Banks refrain of talking about reforms when governments are not pushing for market reforms. Central Banks in Latin America are not constant reform supporters. Central Banks act as catalysts of reforms, supporting when the reforms are proposed by the government in power.

The paradoxical silence of Central Banks on structural reforms (**?**) is substituted by a prudential tone, where the market stability is reassured. A reformist tone was not present in the immediate aftermath of the 2008 crisis in neither country. In fact it only appears in Brazil in 2016 and in Mexico in 2013.

In Brazil it start appearing yet under the government of Dilma Rousseff, which had lost support from parliament and would be impeached. In Mexico it appears in the beginning of the Government of Enrique Peña Nieto, the President from the PRI, who restarted promoting financial reforms.

During leftist governments, Central Banks will tend to adopt a prudential tone, regardless of it's hawkish or dovish policy stances. The position as a neutral institution is necessary to preserve credibility and try to stabilize expectations of financial markets. On the other hand, during neoliberal reformist governments, the Central Bank is freed from credibility commitments in the sense that it doesn't feel frictions in the announcements of policy changing conditions.

This is interesting because one could expect that Central Banks would position themselves strongly pro-market reforms during leftist governments, blaming the lack of reforms on the negative outcomes. Instead, Central Banks position themselves only as supporting the continuation of reforms, and hardly on the initiation of it.

For theories of institutional change, this proposal places inflation targeting central banks in a conservative position under leftist governments and in a reformist position under rightist governments. One would thus expect that Central Banks will try to mute on political issues during rightist governments and be more talkative during rightist governments.

This explanation does not depend on to the macroeconomic instabilities, to variety of capitalism nature (or growth model), or to CB formal independence. Instead, it is basically linked to the government in power in the recent context of CB's linked to international networks through inflation targeting practices.

(Capraro and Panico, 2021) argues that "financial liberalizations and the outgrowth of the financial industry are weakening the productive structure and the international competitiveness of the Mexican economy and will eventually make the present conduct of monetary policy unsustainable." The excessive size of the financial industry in Mexico - pushed themself by the Central Bank - may make monetary policy socially unsustainable.

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